Colorado Oil and Gas Conservation Commission

Monitor Wells Summary Report
September 2008

3M Project Monitoring Program
La Plata County, Colorado

Prepared By
Colorado Oil and Gas Conservation Commission
Norwest Applied Hydrology
Denver, Colorado

October 27, 2008

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

The 3M Project Monitoring Program in La Plata County, Colorado was initiated by the Colorado Oil and Gas Conservation Commission (COGCC) in January 2001. This report describes the results of wellhead and bottomhole pressure monitoring at four monitoring well sites through September 3, 2008. The monitoring work was carried out by staff of the COGCC and Norwest Applied Hydrology (Norwest) on behalf of the COGCC. Figure 1 shows the location of the four monitoring well sites. Table 1 identifies the monitoring wells, locations, and the depths of completion at the four monitoring well sites. Table 2 lists the depth and type of pressures transducers used in each monitoring well. Table 3 provides a chronology of monitoring well installation, operation and maintenance activities from January 2001 through September 3, 2008.

2.0 MONITORING ACTIVITIES AND DATA SUMMARY

2.1 MONITORING ACTIVITIES – JANUARY 2008 – SEPTEMBER 3, 2008

Remote downloading of well pressure measurements automatically recorded at each of the four monitoring sites was continued on a weekly basis by Norwest in Denver via telemetry through July 2007. Analog telecommunication service was replaced with digital service by provider in August 2007. Since August 2007, extraction of automatically recorded monitoring site data in analog format must be performed on site via a lap top computer link to each Hermit data logger.

Monitoring site maintenance activities performed during this reporting period included inspection of each monitor well site and extraction of recorded logger data on September 3, 2008.

2.2 MONITOR WELL PRESSURE DATA SUMMARY

Well pressure continues to be measured and recorded twice daily (12-hour interval) by Hermit 3000 Data Loggers. There were no data records missed or lost at any of the sites during this reporting period.

Applicable well pressure and calculated water level data for the entire period of record for each monitoring well are plotted in annotated charts. The water level in a well is calculated using the depth of the lower transducer and the difference in pressure between upper and lower transducers. This calculation is applicable at sites where the water level in a well is above the lower pressure transducer and below the upper pressure transducer.

Well pressure data analysis and interpretation by site and monitor well are summarized below. Well pressure measurements recorded by the data logger at each monitor well site are available upon request to all interested parties.

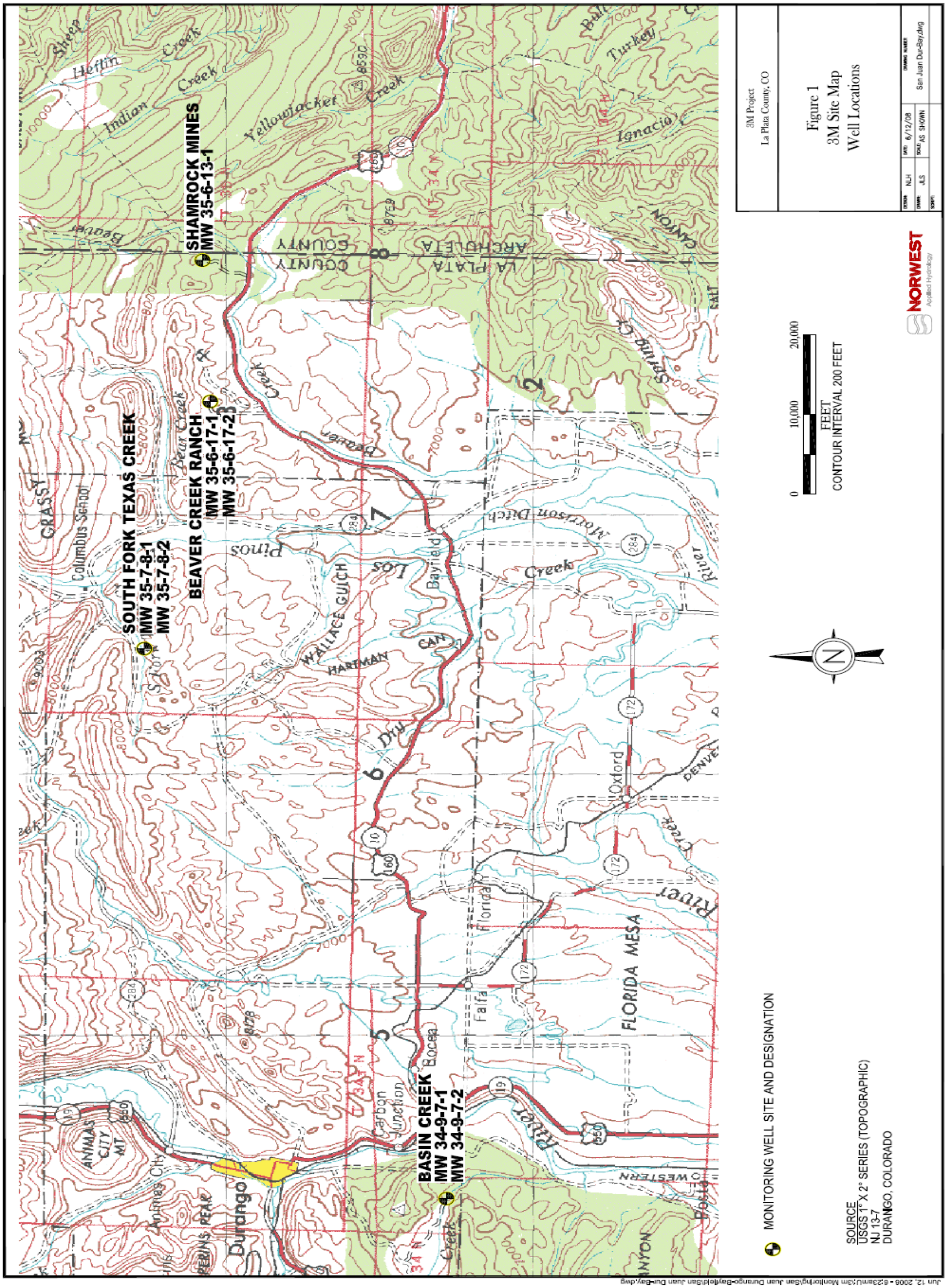

SHAMROCK MINES
MW 35-6-13-1
BEAVER CREEK RANCH
MW 35-6-17-1
MW 35-6-17-2
SOUTH FORK TEXAS CREEK
MW 35-7-8-1
MW 35-7-8-2
BASIN CREEK
MW 34-9-7-1
MW 34-9-7-2
MONITORING WELL SITE AND DESIGNATION
SOURCE
USGS 1° X 2° SERIES (TOPOGRAPHIC)
NJ 13-7
DURANGO, COLORADO
0
10,000
20,000
FEET
CONTOUR INTERVAL 200 FEET
3M Project
La Plata County, CO
Figure 1
3M Site Map
Well Locations
NORWEST
Applied Hydrology
San Juan Dur-Bay.dwg
6/12/08
AS SHOWN
Durango
Bayfield
Oxford
Florida
FLORIDA MESA
Carbon Junction
Columbus School
Falfa
Bocea
Jun 12, 2008 - 6:23am\\3m Monitoring\San Juan Durango-Bayfield\San Juan Dur-Bay.dwg

Table 1
3M Project Monitor Well Completion Summary

Location	Well ID	Construction Completion Date	Drilled Depth (fbgs)	Cored Intervals (fbgs)	Casing Depth (fbgs)	Casing Stickup (fags)	Well Casing Material	Perforated Interval in Coal seam(s) (fbgs)	Log Type	Logged Depth (fbgs)	Log Date
Basin Creek	MW 34-9-7-1	01/28/01	820		802	1	2 ", Schedule 40 galvanized steel pipe	578 - 609	gamma ray, bulk density, caliper, resistance	819	01/27/01
									64" normal resistivity, 16" normal resistivity, sp	822	01/27/01
									temperature, differential temperature	822	01/27/01
									gamma ray, casing collar locator	763	09/27/01
	MW 34-9-7-2	04/25/02	570	359 - 374 * 498 - 513 578 - 593	561	1.5	2.875" & 2.375", Oilfield steel tubing	496 - 526	gamma ray, casing collar locator	550	05/02/02
South Fork Texas Creek	MW 35-7-8-1	09/20/01	486		463	1.6	2 ", Schedule 40 galvanized steel pipe	403 - 416	gamma ray, bulk density, caliper, resistance	485	09/19/01
									64" normal resistivity, 16" normal resistivity, sp	485	09/19/01
									temperature, differential temperature	485	09/19/01
									gamma ray, casing collar locator	462	09/27/01
	MW 35-7-8-2	09/21/01	420	410 - 425	425	1.6	2", Schedule 40 galvanized steel pipe	235 - 241 254 - 258 264 - 274	gamma ray, casing collar locator	420	09/27/01
Beaver Creek Ranch	MW 35-6-17-1	04/04/02	1,645	1,457 - 1,467 1,564 - 1,572	1,631	1.5	2.875", Oilfield steel tubing	1,572 - 1,576 1,582 - 1,584	64" normal resistivity, 16" normal resistivity, sp	1,645	04/03/02
									temperature, differential temperature	1,640	04/03/02
									gamma ray, bulk density, caliper, resistance	1,643	04/03/02
									gamma ray, casing collar locator	1,618	05/02/02
	MW 35-6-17-2	10/04/01	1,550		1,500	2	2", Schedule 40 galvanized steel pipe	1,437 - 1,449 1,458 - 1,472	gamma ray, neutron	1,499	10/10/01
									temperature, 4Pi density	1,493	11/14/01
									signal amplitude, travel time \ D T, VDL	1,484	11/14/01
									gamma ray, casing collar locator	1,483	11/27/01
Shamrock Mines	MW 35-6-13-1	05/07/02	627		606	1.5	2.375", Oilfield steel tubing	507 - 511 517 - 533 539 - 562	gamma ray, bulk density, caliper, resistance	626	05/06/02
									64" normal resistivity, 16" normal resistivity, sp	626	05/06/02
									gamma ray, casing collar locator	626	05/10/02

* Cored interval from initial well drilled, plugged and abandoned in February 2001.

Table 2
3M Project Monitor Well Pressure Transducers

Location	Well ID	Upper Transducer		Lower Transducer	
		Depth (fbgs)	Type and Rating	Depth (fbgs)	Type and Rating
Basin Creek	MW 34-9-7-1	0.5	PXD-261-30 psig	570	PXD-461-500 psia
	MW 34-9-7-2	4.6[1]	PXD-461-500 psia	485	PXD-461-500 psia
South Fork Texas Creek	MW 35-7-8-1	5	PXD-261-30 psig	390	PXD-461-500 psia
	MW 35-7-8-2	4	PXD-461-500 psia	225	PXD-461-500 psia
Beaver Creek Ranch	MW 35-6-17-1	5	PXD-461-500 psia	1,565	PXD-461-1,000 psia
	MW 35-6-17-2	2.5 ftags[2]	PXD-461-1,000 psia	None[3]	PXD-461-1,000 psia
Shamrock Mines	MW 35-6-13-1	5	PXD-461-500 psia	500	PXD-461-1,000 psia

1 MW34-9-7-2 upper transducer raised from 4.6 fbgs to ground surface April 23, 2004 and to 1.65 ftags August 25, 2004; upper transducer lowered from 1.65 ftags to 4.6 fbgs June 14, 2005
2 MW 35-6-17-2 lower transducer raised from 1420 fbgs to 1415 fbgs August 22, 2003
3 MW 35-6-17-2 lower transducer removed and upper transducer raised to 2.5 ftags April 22, 2004

Table 3
3M Project Monitor Well Chronology

Location	Well	2001				2002									2003				
		Jan	Sept	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Oct - Nov	December	Jan	Feb - Apr	May - Jun	Aug	Oct - Dec
Basin Creek	MW 34-9-7-1	Jan. 24-28: Drill & install well	Sept. 27: Perforate well	Nov. 28: Set up telemetry unit; replace bad xds cables	Survey	Jan. 18:Tighten wellhead fittings; rewire telemetry sys	Replace telemetry 12v battery sys, In-Situ assist							Lost telemetry communitcation with data logger	Jan 20: New well 34-9-7-1 upper xd (30 psig, sn 7201); rewire pwr regultr; replace logger bkup lith. batt; re-flash modem memory; enable modem auto pwr-up;	Telemetry system malfunction	May 20: Replace modem and cell phone;	Aug 21: Vent both wells and tighten wellhead xd	Oct 8: Conduct rapid blowdown & shutin test
	MW 34-9-7-2								April 24-25: Drill & install well	May 5: Perforate well May 9: Fish out cable May 22:	Survey							Aug 21: Vent both wells and tighten wellhead xd cable strain relief fittings	Oct 8: Conduct rapid blowdown & shut-in test
South Fork Texas Creek	MW 35-7-8-1		Sept. 17-20: Drill/install well; Sept. 27: Perforate well	Nov. 29: Set up telemetry unit; replace bad xd cables	Survey	Jan. 18: Tighten wellhead fittings; rewire telemetry sys	Replace telemetry 12v battery sys, In-Situ assist			May 21: Ck for leaks				Dec. 4: Data lost through end of year due to Hermit internal battery failure; lost telemetry communitcation with data logger Dec 7: Tightened wellhead fittings	Jan 20: rewire pwr regultr; replace logger bkup lith. batt; re-flash modem memory; enable modem auto pwr-up;	Telemetry system malfunction;	June 16: lower xd failed		Oct 8: Well pressure buildup test
	MW 35-7-8-2		Sept. 20-21: Drill/install well Sept. 27: Perforate well	Nov. 29: Set up telemetry unit; replace bad xd cables	Survey	Jan. 18: Tighten wellhead fittings				May 21: Ck for leaks			Oct 25: Vent well; replaced strain relief fittings; shut in well				May 20: Replace modem and cell phone;		Oct 8: Well pressure buildup test
Beaver Creek Ranch	MW 35-6-17-1						Replace telemetry 12v battery sys, In-Situ assist	Mar. 5-Apr 4: Drill & install well		May 2: Perforate well; May 20-21: Install xds	Survey	July 10: Replace lower xd cable with unvented cable		Dec 13: Insp by Raymond Const.- no wellhead gas leak; ; logger batt @ 0% capacity; modem problem Dec. 19: Data lost through end of year due to bad data logger bkup battery	Jan 7 & Jan 21: No wellhead gas leak @ MW35-6-17-2; Jan 21: rewire pwr regultr; replace logger bkup lith. batt; re-flash modem memory; enable modem auto pwr-up;	Telemetry system malfunction	May 20: Replace modem and cell phone;		Oct 7 & 21: Well pressure buildup test
	MW 35-6-17-2		Sept. 22-Oct. 4: Drill/install well	Nov. 26: Perforate well Nov. 27: Set up telemetry unit	Survey	Jan. 17 - Install new xd cables with SwageLok fittings; rewire telemetry unit			Apr 8: Pull lower xd cable; no data Apr 8 to May 20	May 21: Install unvented, heavy duty xd cable; shut in well		Gas leak @ top bushing; July 10: Vent well & ck bushing galls; July 11: shut in well	Nov. 14: Vent well; replaced valve and reseal all connections			Wellhead bushing leak	May 20: Wellhead bushing leak; wellhead assembly to be redesigned	Aug 20: New flanged wellhead assembly; xd cable leak at swagelok fitting	Oct 8 & 21: Well pressure buildup test; wellhead leaks @ pressure >570 psia;
Shamrock Mines	MW 35-6-13-1									May 3-7: Drill/install well; May 10: Perforate well; May 20, 21: Install pad, telemetry & data logger systems, & xds	Survey			Lost telmetry communitcation with data logger	Jan 21: rewire pwr regultr; replace logger bkup lith. batt; re-flash modem memory; enable modem auto pwr-up;	Telemetry system malfunction	May 20: Replace modem and cell phone;	Aug 20: Modem pwr down; replaced 12v battery	Oct 7: Replaced 12v battery pack; Oct 8: well pressure buildup tests; Oct 21: Replaced solar panel

Table 3, Continued
3M Project Monitor Well Chronology

Location	Well	2004			2005			2006			2007			2008	
		Jan - Mar	April	August	March	June	Oct - Dec	January	June -Nov	December	June	August	Nov - Dec	May	September
Basin Creek	MW 34-9-7-1			Aug 25: New data logger battery pack; vent well; gas sample		June 14: Inspection			June 21: Inspection		June 20: Inspection; replace logger battery; start new test	Analog modem telemtry sys. off line; local telecom. service changed to digital by provider; Hermit logger data must be extracted to a PC on site.	Nov 12 & Dec 12: Inspection and Hermit logger data extraction	May 6: Inspection and Hermit logger data extraction	September 3: Inspection and Hermit logger data extraction
	MW 34-9-7-2		Apr 23: vent well & raise upper xd from 5 fbgs to ground surface	Aug 25: vent well; raise upper xd to 1.65 ft above ground; gas sample		June 14: Inspection; pressure gauge leaking; vented well (artesian flow < 0.5 gpm); lowered upper xd to 4.6 fbgs (under water); replaced gauge with plug			June 21: Inspection						
South Fork Texas Creek	MW 35-7-8-1	No data reported for 6/16/03 to 4/22/04 -lower xd failed	Apr 22: vent well; temperarily replaced lower xd with 1000 psia xd	Aug 25: New data logger battery pack; vent well; tighten xd fittings; gas sample		June 13: Inspection; new data logger test started			June 21: Inspection		June 20: Inspection; replace logger battery; start new test	See above	Nov 12 & Dec 12: Inspection and Hermit logger data extraction	May 6: Inspection and Hermit logger data extraction	September 3:: Inspection and Hermit logger data extraction
	MW 35-7-8-2	Well pressure data suggest that wellhead xd cable strain relief fittings leak intermittently in winter	Apr 22: vent well; replaced strain relief fittings	Aug 25: vent well; tighten xd fittings replace lwr 1000 psia xd with new 500 psia xd; gas sample	Mar: Well pressure deviation from previous norm; possible wellhead leak or xd failure or decline in well gas pressure	June 13: Wellhead fitting leaks detected; June 14: Vented well and replaced both 500 psia xds; new data logger test started	Oct 25: Vent well; replaced strain relief fittings Dec 7: Tightened wellhead fittings	Jan 3: Tightened wellhead fittings	June 21: Tightened wellhead fittings October 31: Replaced all well head fittings November 10: Developed well and water sample collected	Dec 11 &13: Tightened wellhead strain relief fittings	June 20: Wellhead fittings leak; vent well; replaced xd cables with rugged polyethylene cables;		Dec 12: Wellhead strain relief cable fitting leak; vent well; installed Swaglok tube fitting on upper xd cable at wellhead	May 6: Inspection and Hermit logger data extraction; Slight leak at lower xd cable wellhead strain relief fitting	May 6: Inspection and Hermit logger data extraction; Very slight leak at lower xd cable wellhead strain relief fitting
Beaver Creek Ranch	MW 35-6-17-1			Aug 24: New data logger battery pack; vent well; Aug 25: gas sample		June 13: Inspection			June 21: Inspection		June 20: Inspection; replace logger battery; start new test	See above	Nov 12 & Dec 12: Inspection and Hermit logger data extraction	May 6: Inspection and Hermit logger data extraction	May 6: Inspection and Hermit logger data extraction
	MW 35-6-17-2	Wellhead leaks @ pressure >570 psia	Apr 22: vent well/removed lower xd; attached upper xd externally to wellhead; no leaks	Aug 24: vent well; Aug 25: gas sample		June 13: Inspection; slight leak detected from wellhead xd bushing			June 21: Inspection; slight leak detected from wellhead xd bushing October 31: Leaky wellhead xd bushing sealed						
Shamrock Mines	MW 35-6-13-1			Aug 24: New data logger battery pack; vent well, no gas to sample		June 13: Inspection			June 21: Inspection		June 20: Inspection; replace logger battery; start new test	See above	Nov 12 & Dec 12: Inspection and Hermit logger data extraction	May 6: Inspection and Hermit logger data extraction	May 6: Inspection and Hermit logger data extraction

2.2.1 BASIN CREEK

MW 34-9-7-1

This well has been monitored continuously since November 29, 2001, except for a period of data logger battery failure between May 3, 2007 and June 20, 2007. Initial and ending monitoring well pressures and calculated water levels in the well for the period of record are summarized in Table 4. Figure 2 charts the upper and lower pressure transducer data and the calculated water level in the well.

Table 4
Well Pressure Data Summary for Basin Creek Monitoring Wells

Well ID and Transducers (XD)	Period of Record	Initial Well Pressure psia	Ending Well Pressure psia	Net Change in Well Pressure psi	Initial Water Level in Well fbgs	Ending Water Level in Well fbgs	Net Water Level Change in Well ft
MW 34-9-7-1 Upper XD	11/29/01 to 9/3/08	11.46	17.13	5.67	20.97	111.22	-90.25
Lower XD		249.34	215.91	-33.43			
MW 34-9-7-2 Upper XD[1]	5/24/02 to 9/3/08	33.26[1]	21.73[1]	-11.53[1]	Well water level is above ground level; see discussion and Figure 3 for more details		
Lower XD		241.42	227.38	-14.04			

1 MW 34-9-7-2 upper XD at 4.6 ft below ground level is under water; initial value corrected June 2008.

Table 2 and Figure 2 show an overall 5.67 psi net increase in wellhead pressure for the entire 7.8-year period of record from November 2001 (11.46 psia) to September 3, 2008 (17.13 psia). Figure 2 shows a gradual buildup of about 8.3 psi in wellhead pressure, from 11.46 psia to 19.75 psia, during the first 11-month period following the initial well shut in on November 29, 2001. Since October 1, 2002, Figure 2 generally shows a pattern of minor seasonal fluctuations within an overall flat trend in wellhead pressure. Two spikes on the wellhead curve are due to a pressure buildup test (October 2003) and a gas sampling event (August 2004). The chart also shows two erratic fluctuations in the wellhead pressure and calculated well water level curves between January 15, 2007 and April 15, 2007 and between January 1, 2008 and March 15, 2008. The cause of these erratic fluctuations may be wellhead pressure transducer performance related rather than an erratic change in wellhead pressure or well water level since the bottomhole pressure curve does not exhibit the same erratic pressure curve for the same period of record.

In contrast to the wellhead pressure patterns, Table 2 and Figure 2 show a net decline of about 111.22 feet in the calculated well water level and a corresponding net decline in bottomhole pressure of about 33.43 psi for the period of record. Figure 2 also shows a pattern of slight seasonal fluctuations within an overall flat trend of bottomhole pressure and the calculated well water level between November 1, 2003 and January 1, 2006, followed by a declining trend from January 1, 2006 to about February 1, 2008. A record low bottomhole pressure of 204.3 psia occurred on January 31, 2008. Bottomhole pressure and the corresponding calculated well water level have been gradually increasing since February 2008.

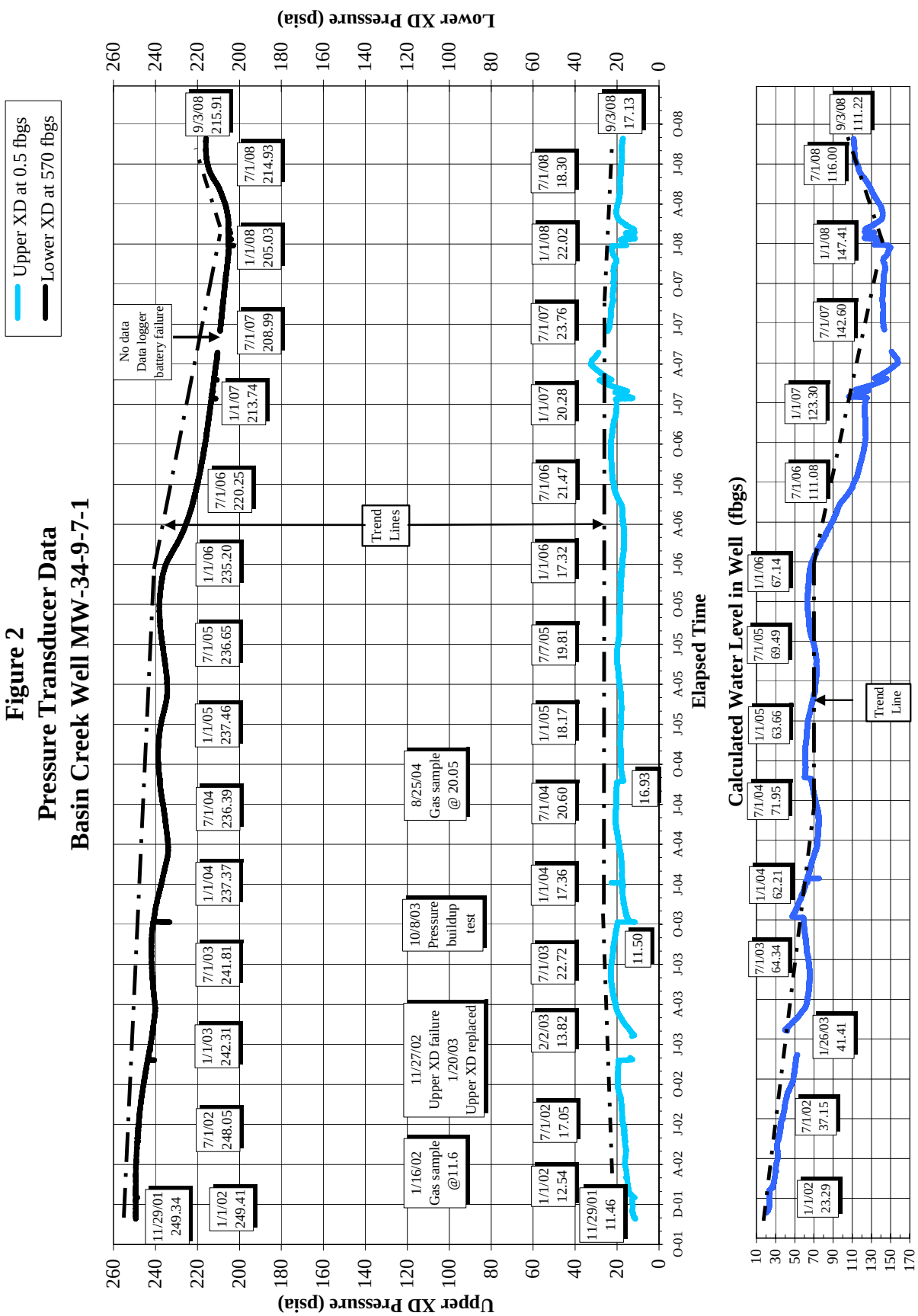


Figure 2
Pressure Transducer Data
Basin Creek Well MW-34-9-7-1

MW 34-9-7-2

Well MW 34-9-7-2 has been monitored continuously since May 24, 2002, except for a period of data logger battery failure between May 3, 2007 and June 20, 2007. Recorded pressure data and calculated bottomhole and wellhead differential pressures for well MW-34-9-7-2 are charted on Figures 3. Initial and ending monitoring well pressures and apparent water level in the well are summarized in Table 4 for the period of record with the upper transducer set at 4.6 feet below ground surface (fbgs) and the bottomhole transducer set at about 485.36 fbgs.

Figures 3 continues to show a trend of gradually declining well pressure and slight seasonal fluctuations in wellhead and bottomhole pressures within the overall declining trend for the period of record. A record low bottomhole pressure of 224.56 psia and record low wellhead pressure of 17.58 psia were recorded on February 18, 2008. From February 18, 2008 to September 3, 2008, Figure 3 shows a gradual increase of about 2.8 psi in well pressure. On September 3, 2008, the bottomhole pressure level was about 227.4 psia and the wellhead pressure level was about 21.73 psia. As indicated in Table 4, there has been a net decline in well pressure about of 11.5 psi (wellhead pressure) to 14 psi (bottomhole pressure) for the 7.8-year period of record.

A wellhead differential pressure test was conducted on April 23, 2004 to verify whether or not the upper transducer is under water when set in the well at a depth of 4.6 feet below ground surface. Figure 3 shows a notable difference in wellhead pressure relative to the location of the upper transducer. On April 23, 2004, the wellhead shut-in pressure at 4.6 fbgs was 27.80 psia versus 26.00 psia at ground level, a difference of about 1.8 psia. On August 25, 2004, the wellhead pressure transducer was raised to 1.65 feet above ground surface (ftags). The shut-in pressure at ground level was 25.66 psia verses 25.08 psia at 1.65 ftags, a difference of about 0.5 psi. Since there was no corresponding measurable difference in the bottomhole pressure, the observed wellhead pressure differential between 4.6 fbgs and 1.65 ftags confirms the upper transducer is under water at 4.6 fbgs and the apparent water level in well MW 34-9-7-2 is at about ground level when the well is completely shut in.

On June 14, 2005, the upper pressure transducer was set to the original installation level of 4.6 fbgs to monitor the overall trend of wellhead pressures since May 2002. The calculated differential well pressure curve in Figure 3 for the period of record with the upper transducer set at 4.6 fbgs shows minor seasonal fluctuations in differential pressure within an overall gradual decrease in differential pressure since January 2006. As shown in Figure 3, the well differential pressure was about 208.09 psi on January 1, 2006 and about 205.66 psi on September 3, 2008, a decrease of about 2.4 psi.

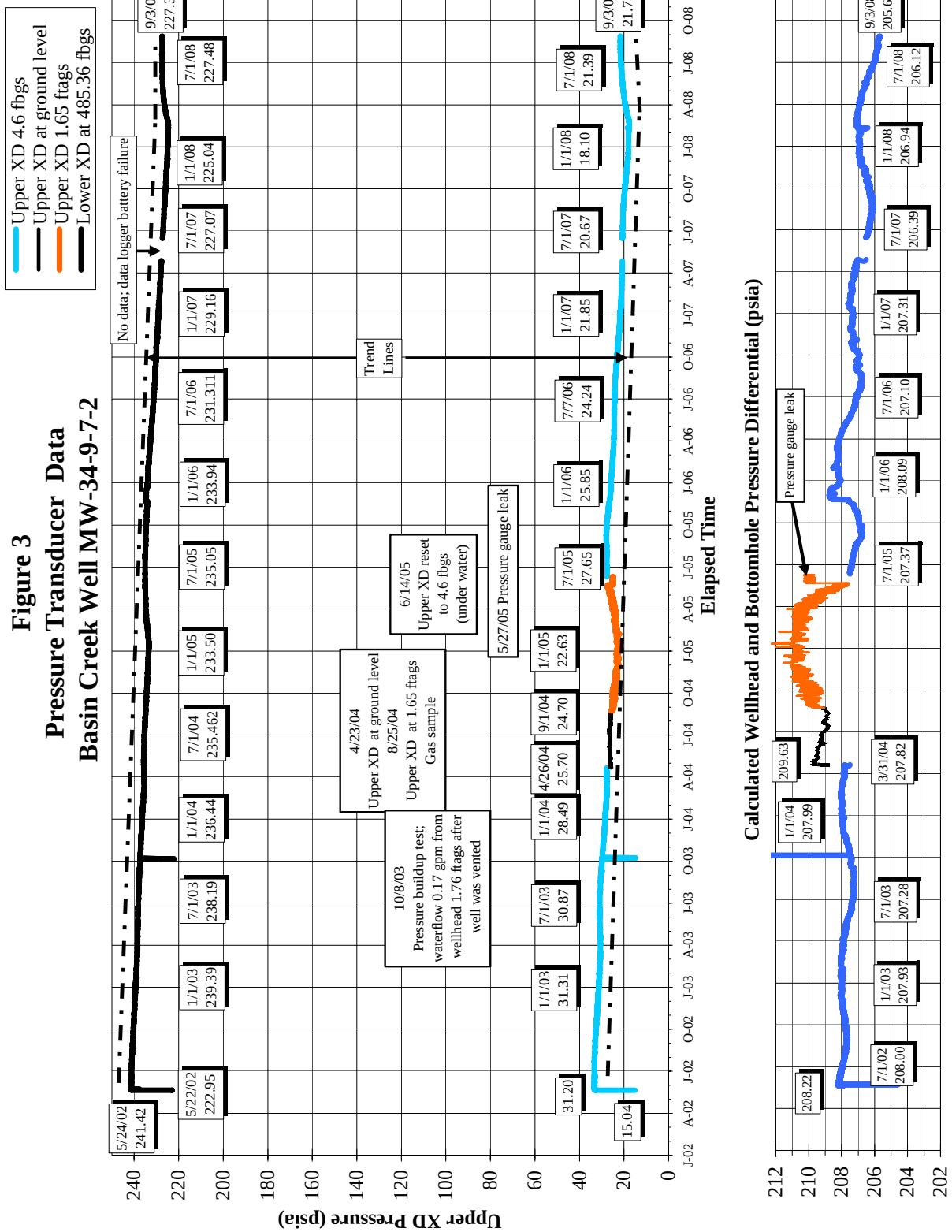


Figure 3
Pressure Transducer Data
Basin Creek Well MW-34-9-7-2
Upper XD 4.6 fbgs
Upper XD at ground level
Upper XD 1.65 ftags
Lower XD at 485.36 fbgs
Upper XD Pressure (psia)
Lower XD Pressure (psia)
Elapsed Time
No data; data logger battery failure
Trend Lines
4/23/04 Upper XD at ground level 8/25/04 Upper XD at 1.65 ftags Gas sample
10/8/03 Pressure buildup test; waterflow 0.17 gpm from wellhead 1.76 ftags after well was vented
6/14/05 Upper XD reset to 4.6 fbgs (under water)
5/27/05 Pressure gauge leak
Calculated Wellhead and Bottomhole Pressure Differential (psia)
Pressure gauge leak

2.2.2 SOUTH FORK TEXAS CREEK

Both monitoring wells have been monitored continuously since November 29, 2001, except for the period of monitoring system power failure between December 4, 2002 and January 20, 2003, and a data logger battery failure from May 3, 2007 to June 20, 2007.

MW 35-7-8-1

Data for MW 35-7-8-1 are charted in Figure 4 and summarized in Table 5. Upper transducer data recorded since January 1, 2002 indicate a relatively stable wellhead pressure, consistently ranging between 12.4 psia and 13.8 psia, about 1 to 2.5 psi above atmospheric pressure. The data logger recorded an atmospheric pressure at this site of about 11.24 psi. on September 3, 2008.

Figure 4 shows a trend of gradually increasing bottomhole pressure and rising water level in the well for the period of record between November 2001 and May 2005. Overall, the recorded bottomhole pressure increased about 8.3 psi, from 144.41 psia on November 1, 2001 to a high of 152.71 psia on May 18, 2005, which is nearly equivalent to the calculated 19.2 feet of water level rise in the well for the same period of record. (1 psi equals about 2.31 feet of water.) Figure 4 shows the water level in the well and corresponding bottomhole pressure in a gradually declining trend between May 2007 and December 2007. The bottomhole pressure declined to a record low of 143.34 psia on December 2, 2007 while the water level in the well declined to a record low of 89.46 feet below ground level on December 3, 2007. Between January 2008 and May 2008, Figure 4 shows a renewed trend of gradually increasing bottomhole pressure and rising water level in the well followed by a reversal in the trend since June 2008. As summarized in Table 5 for the 7.8-year period of record, the net change in bottomhole and wellhead pressures are only -1.92 psi and -1.16 psi respectively, while the net change in the calculated water level in the well is -1.75 feet.

Figure 4 also shows slight seasonal fluctuations in bottomhole pressure and the calculated water level in the well within the overall increasing trend prior to May 2005, and slight to moderate seasonal fluctuations within the overall declining trend between May 2005 and September 2008.

Table 5
Well Pressure Data Summary for South Fork Texas Creek Monitoring Wells

Well ID and Transducers (XD)	Period of Record	Initial Well Pressure psia	Ending Well Pressure psia	Net Change in Well Pressure psi	Initial Water Level in Well fbgs	Ending Water Level in Well fbgs	Net Water Level Change in Well ft
MW 35-7-8-1 Upper XD	12/01/01 to 9/3/08	13.79	12.63	-1.16	88.39	90.14	-1.75
Lower XD		144.47	142.55	-1.92			
MW 35-7-8-2 Upper XD	1/15/02 to 9/3/08	91.32[1]	88.12	-3.20	Water level in well is >225 fbgs with complete shut-in; calculated water level in well is about 103 fbgs at 66.61 psia bottomhole pressure and 14.06 psia wellhead pressure		
Lower XD		91.91[1]	87.91	-4.00			

1 Both bottomhole and wellhead pressure are typically the same in MW 35-7-8-2 with complete shut in.

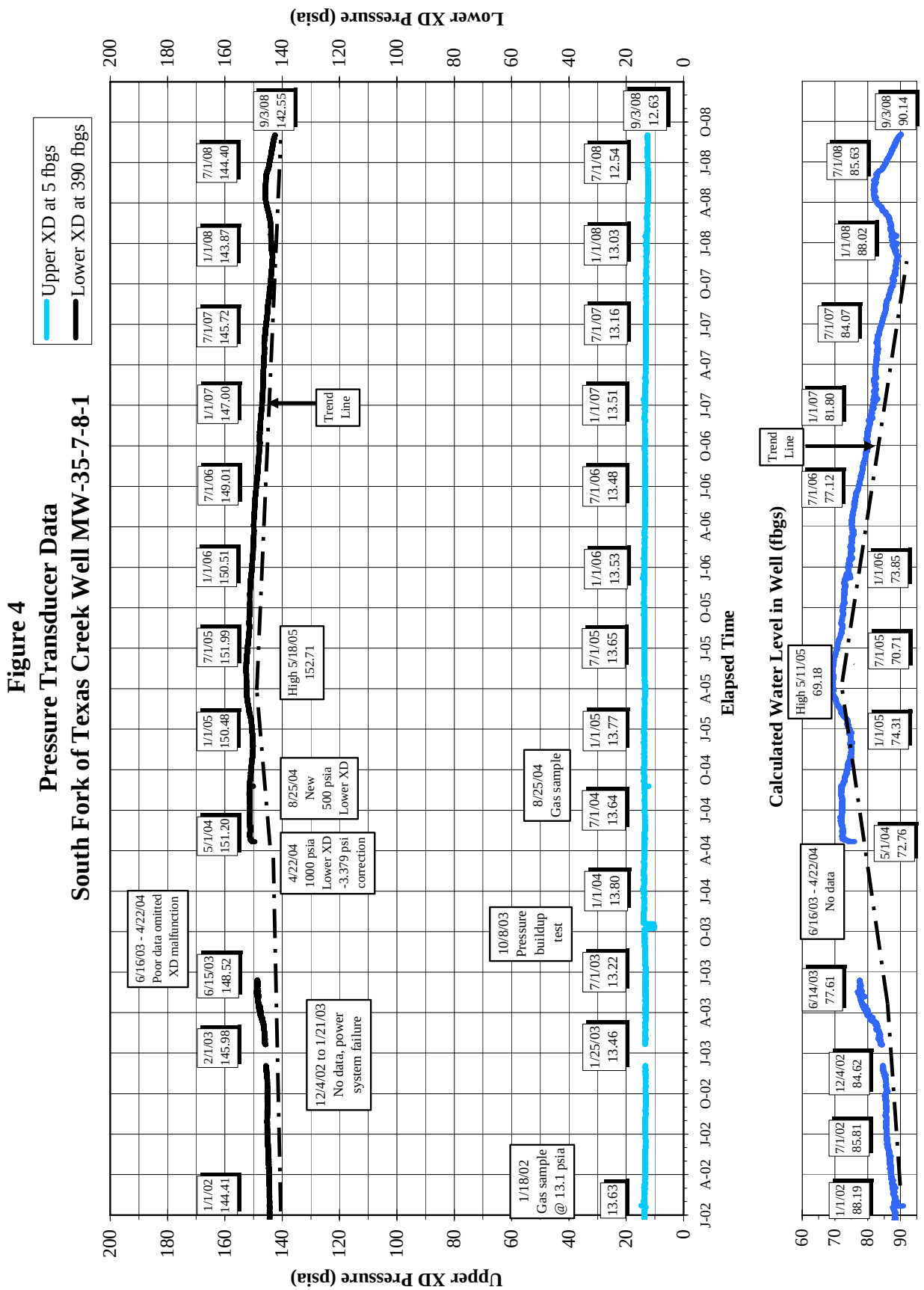


Figure 4
Pressure Transducer Data
South Fork of Texas Creek Well MW-35-7-8-1
Upper XD at 5 fbgs
Lower XD at 390 fbgs
Lower XD Pressure (psia)
Upper XD Pressure (psia)
Elapsed Time
Trend Line
6/16/03 - 4/22/04 Poor data omitted XD malfunction
12/4/02 to 1/21/03 No data, power system failure
10/8/03 Pressure buildup test
1/18/02 Gas sample @ 13.1 psia
4/22/04 1000 psia Lower XD -3.379 psi correction
8/25/04 New 500 psia Lower XD
8/25/04 Gas sample
High 5/18/05 152.71
Calculated Water Level in Well (fbgs)
High 5/11/05 69.18
6/16/03 - 4/22/04 No data

MW 35-7-8-2

Figure 5 charts the pressure data for well MW 35-7-8-2, which exhibits an entirely different pressure regime than the deeper monitoring well MW 35-7-8-1. Figure 5 (page 14) shows nearly equal wellhead and bottomhole pressures for the period of record when the well is completely shut in. For example, wellhead and bottomhole pressures recorded on September 3, 2008 were 88.12 psia and 87.91 psia respectively.

After about March 1, 2005, both upper and lower transducer charts show a differential drop in well pressure caused by leaks from several wellhead fittings. After the leaky fittings were replaced on June 14, 2005, well pressures gradually returned to previous levels with complete wellhead shut in.

The occurrences of leaky fittings resulting in incomplete wellhead shut in have provided the opportunity to observe that the well acts as a gas and water separator. The water in the well is gradually displaced by gas after the well is shut in and entirely displaced by gas once the wellhead pressure equals the bottomhole pressure. For example, the depth to water in the vented well on June 14, 2005 was calculated to be about 75 feet below ground surface based on the differential well pressures of 11.33 psia (wellhead) and 76.56 psia (bottomhole). The charts in Figure 5 show differential well pressures after the well was shut in on June 14, 2005 and until the wellhead pressure buildup equaled the bottomhole pressure of approximately 76 psia on July 2, 2005.

Leak-proof transducer cable seals required for complete well shut in have been difficult to maintain at the MW 35-7-8-2 wellhead since October 2005. One or more gas leaks from wellhead cable connections were confirmed during wellhead inspections performed in 2006 and 2007. Figure 5 shows the wellhead pressure is erratic for the period of record between October 2005 and December 2007. The cause of this erratic pattern is apparently related to leaky wellhead fittings rather than an erratic change in wellhead pressure since the bottomhole pressure curve does not show erratic pressure fluctuations for the same period of record.

True pressures and trends can not be measured until a complete shut in is accomplished. Attempts to achieve leak-proof seals in 2006 and 2007 included tightening of fitting connections, installation of new connection fittings and replacement of the cable strain relief fitting elastomer inserts. In addition, the thin-walled transducer cables originally installed in the well were replaced with rugged polyethylene cable on June 20, 2007. After the wellhead was shut in on June 20, 2007, the well pressure curves indicate complete shut in of the well was achieved until the buildup of both bottom hole and wellhead pressures peaked at about 77 psia on August 21, 2007 (see Figure 5). The charted decline and erratic pattern of wellhead pressure after August 21, 2007 is indicative of a potentially incomplete shut in. The recurrence of incomplete shut in was confirmed by detection of a wellhead gas leak at the upper pressure transducer cable strain relief connection during the November 12, 2007 wellhead inspection. This strain relief replacement fitting did not maintain a leak-proof seal at the cable connection and was subsequently changed to incorporate a different type of transducer cable connection.

On December 12, 2007, the upper pressure transducer cable strain relief fitting was replaced with a bored-through Swagelok tube fitting with a nylon ferrule designed to provide a leak-proof seal at polyethylene cable connections. This fitting was not leaking when inspected on May 6, 2008 and September 3, 2008; however, a slight leak was detected in the lower transducer cable strain relief fitting and may account for the erratic fluctuations in the well pressure curve December 2007 and May 2008.

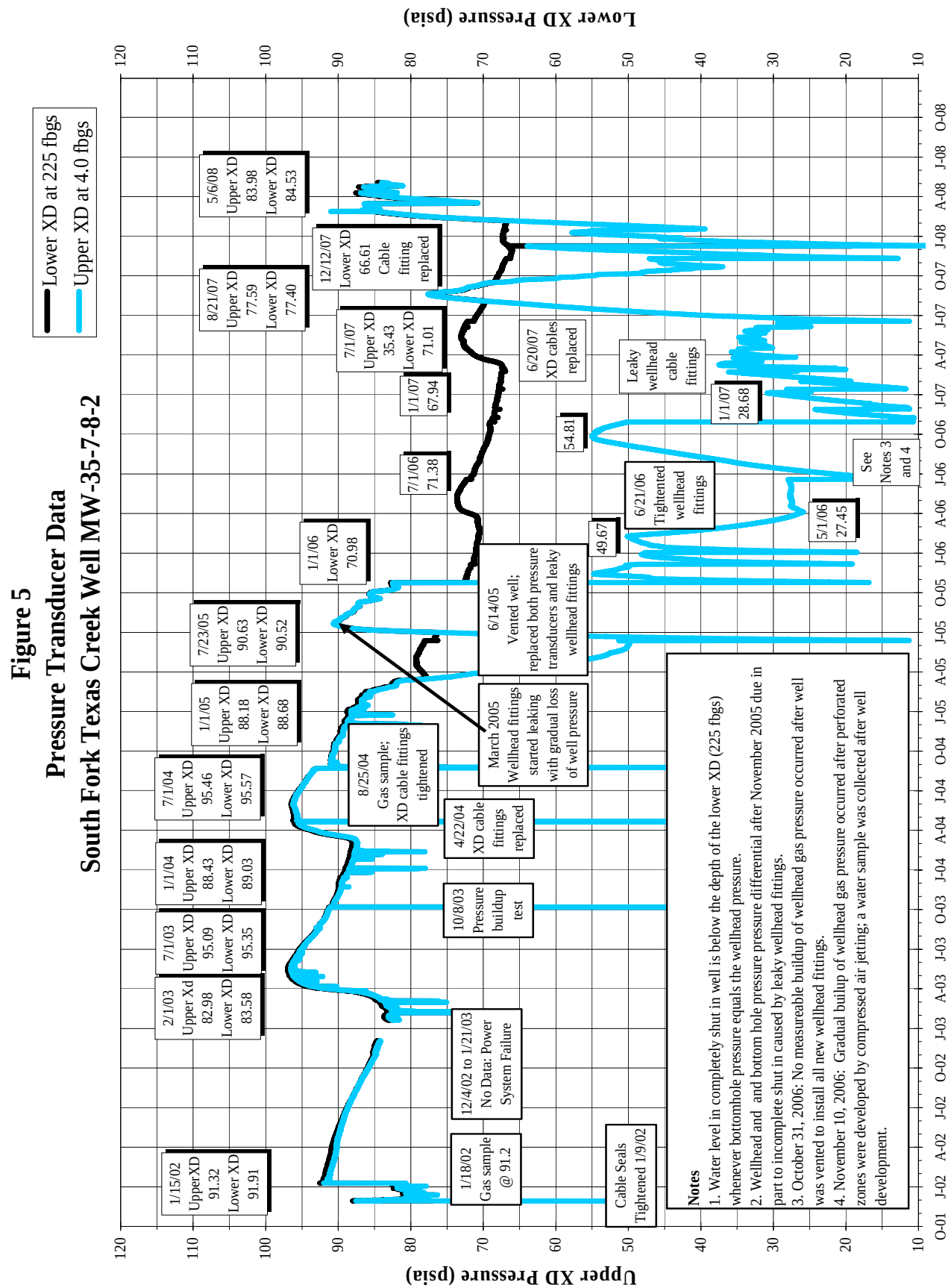


Figure 5
Pressure Transducer Data
South Fork Texas Creek Well MW-35-7-8-2
Lower XD at 225 fbgs
Upper XD at 4.0 fbgs
Upper XD Pressure (psia)
Lower XD Pressure (psia)
Elapsed Time
1/15/02 UpperXD 91.32 Lower XD 91.91
2/1/03 Upper Xd 82.98 Lower XD 83.58
7/1/03 Upper XD 95.09 Lower XD 95.35
1/1/04 Upper XD 88.43 Lower XD 89.03
7/1/04 Upper XD 95.46 Lower XD 95.57
1/1/05 Upper XD 88.18 Lower XD 88.68
7/23/05 Upper XD 90.63 Lower XD 90.52
1/1/06 Lower XD 70.98
7/1/06 71.38
1/1/07 67.94
7/1/07 Upper XD 35.43 Lower XD 71.01
8/21/07 Upper XD 77.59 Lower XD 77.40
12/12/07 Lower XD 66.61 Cable fitting replaced
5/6/08 Upper XD 83.98 Lower XD 84.53
1/18/02 Gas sample @ 91.2
12/4/02 to 1/21/03 No Data: Power System Failure
10/8/03 Pressure buildup test
4/22/04 XD cable fittings replaced
8/25/04 Gas sample; XD cable fittings tightened
March 2005 Wellhead fittings started leaking with gradual loss of well pressure
6/14/05 Vented well; replaced both pressure transducers and leaky wellhead fittings
49.67
54.81
6/20/07 XD cables replaced
Leaky wellhead cable fittings
1/1/07 28.68
6/21/06 Tightented wellhead fittings
5/1/06 27.45
See Notes 3 and 4
Cable Seals Tightened 1/9/02
Notes
1. Water level in completely shut in well is below the depth of the lower XD (225 fbgs) whenever bottomhole pressure equals the wellhead pressure.
2. Wellhead and and bottom hole pressure pressure differential after November 2005 due in part to incomplete shut in caused by leaky wellhead fittings.
3. October 31, 2006: No measureable buildup of wellhead gas pressure occurred after well was vented to install all new wellhead fittings.
4. November 10, 2006: Gradual builup of wellhead gas pressure occurred after perforated zones were developed by compressed air jetting; a water sample was collected after well development.

2.2.3 BEAVER CREEK RANCH

MW 35-6-17-1

Monitoring data for well MW 35-6-27-1 are charted in Figure 6 and summarized in Table 6. This well has been monitored almost continuously since May 21, 2002. As described below, the pressure regime for this well is different than the regime exhibited by well MW 35-6-17-2.

Figure 6 shows a notable change in well pressure regime subsequent to two pressure buildup tests conducted on October 7, 2003 and October 21, 2003. Between October 7, 2003 and March 5, 2004, the wellhead pressure increased about 91.3 psi, from 14.36 psia to a recorded high of 105.65 psia. This pattern was followed by a gradual wellhead pressure decline until July 2005, followed by a gradual increase in pressure through January 2005. Wellhead pressure gradually declined from about 87 psia in January 2005 to about 72.9 psia on January 1, 2006. Between January 1, 2006 and September 3, 2008, the wellhead pressure curve shows slight seasonal fluctuations and a net increase of about 4.9 psi, from 72.86 psia to 77.75 psia.

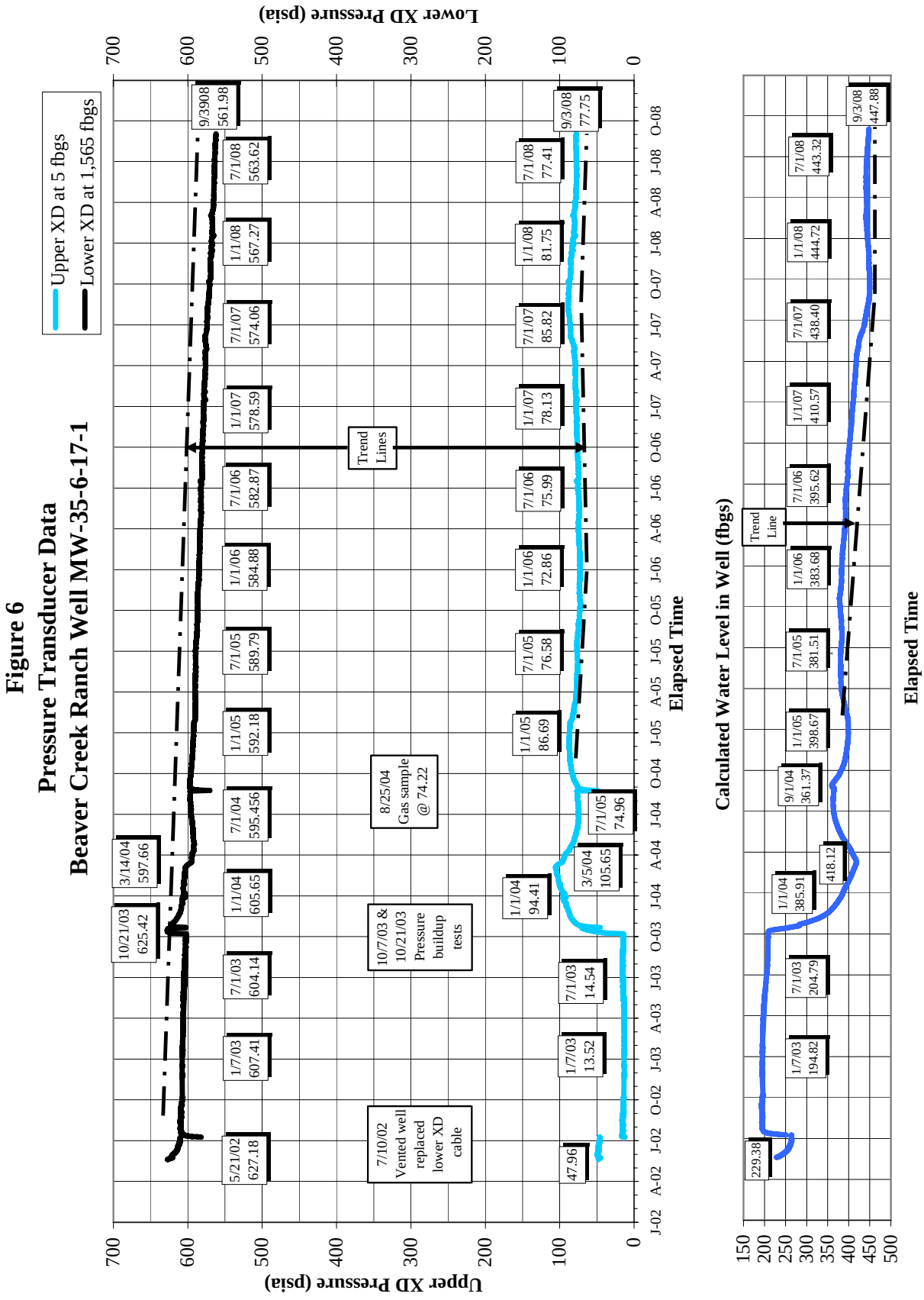
After the well was vented and shut in on October 7, 2003, there was a bottomhole pressure buildup of about 23 psi, from 602 psia to 625.42 psia on October 21, 2003. Between October 21, 2003 and September 3, 2008, the bottomhole pressure curve shows a steady and gradual decline from 625.42 psia to 561.98 psia, a net decline of about 63.44 psi. and an average decline of about 13 psi per year.

Figure 6 also shows changes in the water level regime since the October 7, 2003 buildup test. The calculated water level in the well declined almost 200 feet, from 219.08 fbgs on October 7, 2003 to 418.12 fbgs on March 10, 2004, and then rose to about 361.4 fbgs by September 1, 2004. Since September 1, 2004, Figure 6 shows slight seasonal fluctuations in the water level curve within an overall declining trend. The net decline in the calculated water level during the 4-year period between September 1, 2004 (361.37 fbgs) and September 3, 2008 (447.88 fbgs) was about 86.51 feet, an average of about 21.6 feet per year.

Table 6
Well Pressure Data Summary for Beaver Creek Ranch Monitoring Wells

Well ID and Transducers (XD)	Period of Record	Initial Well Pressure psia	Ending Well Pressure psia	Net Change in Well Pressure psi	Initial Water Level in Well fbgs	Ending Water Level in Well fbgs	Net Water Level Change in Well ft
MW 35-6-17-1 Upper XD	08/01/02 to 9/3/08	15.44	77.75	62.31	194.37	447.88	-253.51
Lower XD		609.55	561.98	-47.57			
MW 35-6-17-2 Upper XD	06/15/02 to 9/3/08	614.23	487.09	-127.14	1,377.64	No Data Lower XD removed	--
Lower XD		632.63	XD removed	--			

Figure 6
Pressure Transducer Data
Beaver Creek Ranch Well MW-35-6-17-1



MW 35-6-17-2

Wellhead pressure, bottomhole pressure, and calculated well water level data for well MW 35-6-17-2 are charted in Figure 7 and summarized in Table 6 for the period of record. This well has been monitored since December 3, 2001. Data were not collected between April 8, 2002 and May 20, 2002 due to a damaged lower transducer cable. There are no data for the periods December 1, 2002 to December 13, 2002 and December 19, 2002 to January 7, 2003 due to power system failure. Monitoring of bottomhole pressure ended after the lower transducer was removed from the well on April 22, 2004.

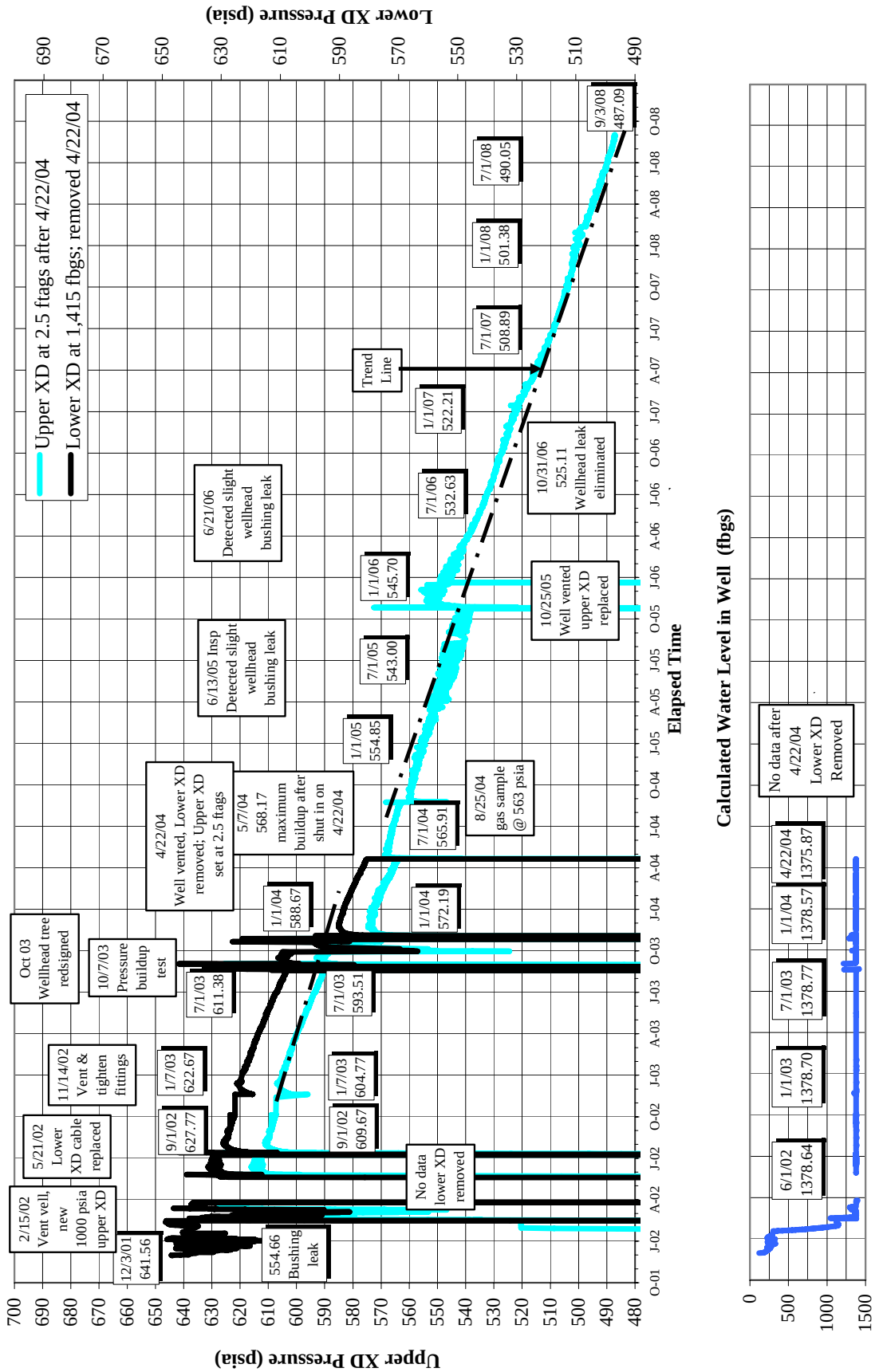
The wellhead pressure has been measured in excess of 600 psia, which is notably higher than in the other 3M monitoring wells. However, the wellhead was not completely shut in between February 2002 and mid-April 2004 because of a variety of wellhead fittings leaks. Consequently, the pressure data charted in Figure 7 between February 15, 2002 and April 22, 2004 are only considered to be minimum values.

True pressures and trends could not be measured until a complete shut in was accomplished in April 2004 after the well was vented and both pressure transducer systems were removed from inside the well. One 1000 psia transducer was adapted to tap directly into the top of the flanged wellhead assembly. This external transducer adaptation makes it possible to measure wellhead pressure without passing flexible transducer cables through the wellhead assembly. Bottomhole pressure and water level data are not available without a lower pressure transducer set below the water level in the well.

After the well was shut in again on April 22, 2002, Figure 7 shows a relatively rapid build up in wellhead pressure to a maximum of 568.17 psia on May 7, 2004. Quarterly well inspections in 2005 and 2006 revealed a very slight leak from the pressure transducer bushing, which may have contributed to this gradual decline in pressure. The wellhead leak was eliminated on October 31, 2006 by permanently sealing the bushing to the flanged plate. True wellhead pressures charted after a complete shut in was accomplished on October 31, 2006 confirm a continuing trend of gradually declining well pressures. During the last four years of record, the wellhead pressure curve shows an over all steady decline to a record low of 487.09 psia on September 3, 2008.

The three brief interruptions in the wellhead pressure curve shown in Figure 7 since May 2004 include a partial venting of the well to collect a gas sample in August 2004, well venting and replacement of the wellhead transducer in October 2005, and well venting and re-securing the wellhead transducer in December 2005. The 1000 psia wellhead transducer was replaced on October 25, 2005 in response to erratic pressure transducer measurements recorded for second and third quarters of 2005. As Figure 7 shows, the higher wellhead pressures measured by the replacement transducer in November 2005 verses pressures measured by the original transducer in October 2005 confirm an apparent malfunction of the original transducer.

Figure 7
Pressure Transducer Data
Beaver Creek Ranch Well MW-35-6-17-2



2.2.4 SHAMROCK MINES

Well MW 35-6-13-1 monitoring data are charted in Figures 8 and summarized in Table 7 for the entire 6-year period of record. Since there are no producing wells in close proximity to this area, this well is used to collect background data and has been monitored continuously since May 22, 2002. Data were not collected for the period of June 11, 2007 to June 20, 2007 due to failure of the data logger battery.

Table 7
Well Pressure Data Summary for Shamrock Mines Monitoring Well

Well ID and Transducers (XD)	Period of Record	Initial Well Pressure psia	Ending Well Pressure psia[1]	Net Change in Well Pressure psi	Initial Water Level in Well fbgs	Ending Water Level in Well fbgs[1]	Net Water Level Change in Well ft
MW 35-6-13-1 Upper XD	5/22/02 to 9/3/08	12.06	11.72	Atmospheric Pressure	39.66	34.37	5.29
Lower XD		211.60	213.55	1.95			

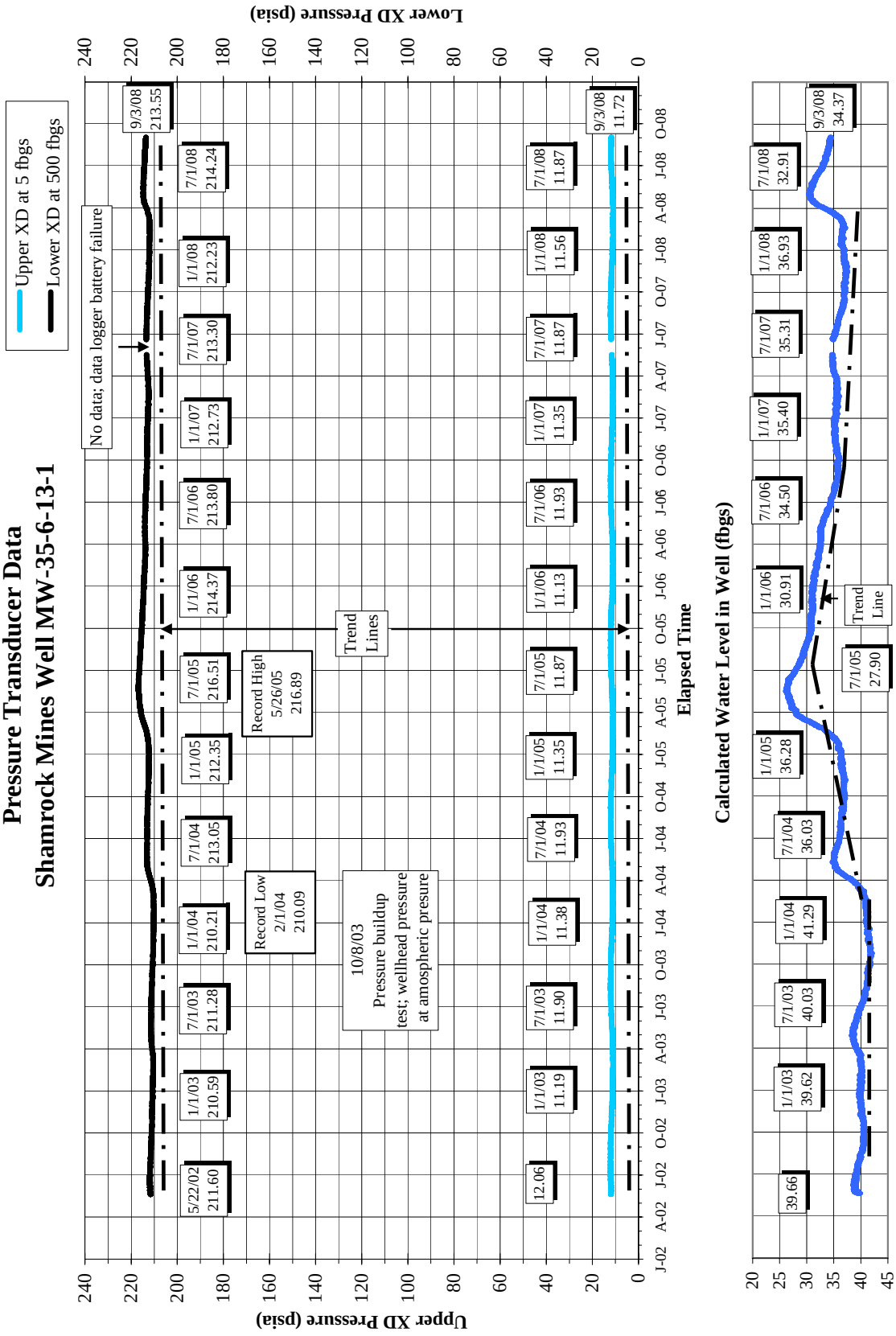
1 On May 26, 2005, the measured bottomhole pressure (216.89 psia) and calculated depth to water (26.53 ft) in well MW 35-6-13-1 were at their highest levels for the period of record.

Figures 8 shows the wellhead pressure regime continues to be stable at about atmospheric pressure and fluctuates within a range of 1 psi (between 11 psia and 12 psia). With wellhead pressure equal to atmospheric pressure, bottomhole pressure is equal to atmospheric pressure plus water pressure, which is a function of the water level in the well. Table 7 shows a measured bottomhole pressure of 214.81 psia when the water level in the well is 30.54 feet below ground surface. Figure 8 also shows the bottomhole pressure and calculated water level in the well continue to exhibit a similar trend of seasonal fluctuation. With wellhead pressure equal to atmospheric pressure, fluctuation of bottomhole pressure is attributable to the fluctuation of water pressure resulting from the fluctuation of the water level in the well.

Prior to February 2004, Figure 8 shows seasonal fluctuations in bottomhole pressure and water level curves within an overall slightly declining trend, followed by seasonal fluctuations of higher magnitude within an overall moderately increasing trend from February 2004 through May 2005. On May 26, 2005, the bottomhole pressure peaked at a record high of 216.89 psia and the water level in the well peaked at a record high of 26.53 feet below ground surface. The decline and subsequent increase in bottomhole pressure and the water level in the well during the 3-year period between May 2002 and June 2005 may be related to the return to more "normal" levels of precipitation in 2004 and 2005 after several years of "drought."

Since June 2005, Figure 8 shows slight seasonal fluctuations in the calculated water level and bottomhole pressure curves within an overall slightly declining trend from June 2005 through mid-February 2008. During the 6.5-month period between February 17, 2008 and September 3, 2008, Figure 8 shows a seasonal rise and decline in bottomhole pressure in response to a rise and decline in the water level. As shown in Table 7 and Figure 8 for the 6-year period of record, there has been a net increase of about 1.91 psi in well pressure and a net rise of about 5.29 feet in the water level in the well.

Figure 8
Pressure Transducer Data
Shamrock Mines Well MW-35-6-13-1



3.0 FUTURE WORK –FOURTH QUARTER 2008

Routine work will continue to include periodic checks of each monitoring system and download of recorded pressure measurement data. Planned maintenance activities during the fourth quarter of 2008 may include inspection of all monitor well sites and extraction of data logger records. The current well monitoring data loggers and telemetry systems use analog technology. Effective in August 2007, the telemetry systems could no longer be used for remote monitoring since telecommunications provider discontinued using analog telecommunication systems. Digital data logger and satellite communication systems are now required to continue with remote monitoring well pressures. Alternatives for converting to digital monitoring systems will by evaluated by the COGCC in 2008 in conjunction with the planned expansion of the monitoring well program in La Plata and Archuleta counties. In the meantime, the Hermit 3000 Data Loggers will continue to be used to automatically record well pressure measurements and logger data will be extracted from the Hermits on site.