# Petroglyph Operating Company
# November 2010 Monthly Report

## Covering the period of 10/23/2010 through 12/10/2010

**Prepared for**
**Colorado Oil and Gas Conservation Commission**

**December 17, 2010**

**Prepared by**

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**Petroglyph Operating Company, Inc.**
**Monthly Report – November 2010**

Petroglyph Operating Company, Inc. (Petroglyph) is submitting this monthly report for the activities that have occurred at their Little Creek Field in the Raton Basin from the end of the last reporting period through December 10, 2010. Along with this monthly report, Petroglyph is submitting an electronic copy of all data including Microsoft Excel spreadsheets from which the attached summaries and graphs were created.

## 1.0 Phase 1 and Phase 2 Remediation System

The Phase 1 remediation system associated with the Methane Investigation, Monitoring and Mitigation Program (MIMMP) operated from December 8, 2008 through the start of the Phase 2 remediation system on August 6, 2010. Therefore, remediation at the site has been operational for approximately twenty-two months. The Phase 1 remediation system consisted of 4 recovery wells and 8 injection wells all completed in the Poison Canyon Formation and designed to pump water with methane, allow the methane to off gas and return the water to approximately the same location from which it was pumped.

The Phase 2 remediation system consists of 4 recovery wells in the Poison Canyon Formation and differs from Phase 1 in that it allows for pumping a limited amount of additional water from the Vermejo Formation from up to 2 production wells (Rohr 04-10 and Rohr 09-10) at a rate not exceed a total of 1,000 barrels per day or approximately 29 gpm. The additional water will be combined with the Poison Canyon water and sent through a reverse osmosis treatment system before being injected into the Poison Canyon Formation using the 8 injection wells. The addition of water during Phase 2 operations will result in a hydraulic barrier to movement of methane outside of the ring of injection wells in the remediation system.

Gas Flows in Remediation Wells

The Phase 1 system was started with pumping from Recovery 1 Kittleson and Recovery 3 PEI. Recovery 1 gas production was initially 25.7 MCFD and has dropped to a reading of approximately 4.4 MCFD at the start of this reporting period. During the period the high value was 5.8 MCFD and there were several days where the well was not pumped resulting in no gas flow (10/26-10/28, 10/30-10/31, 11/14-11/15, 11/25-11/28, and 12/2). Since the start-up of the Phase 2 system, pumping at Recovery 1 has been down more often than has been typical of past operations. When the recovery well pump goes down, even for a few hours as was the case during this reporting period, it often takes 1 to 3 days before normal gas flows resume.

Recovery 3 gas flows were measured at approximately 0.75 MCFD at the start of Phase 1 remediation and increased to approximately 1 MCFD and remained around 1 until late February 2009 and then began a slow and steady decline. Recovery 3 was shut down on 8/25/2010 because previous water analyses had shown high TSS results and bacteria problems which affect the operation of reverse osmosis system. The well continued to be shut down during this reporting period.

Recovery 4 has shown variability during Phase 1 ranging between approximately 0.9 MCFD and 0 until mid April 2009 when the readings were consistently under 0.001 MCFD. Readings at Recovery 4 showed an increase beginning in late July/early August 2009 and have been a bit variable since that time. During this reporting period the readings for Recovery 4 showed a slight overall increase with starting reading of 0.1606 MCFD and an ending reading of 0.2736 MCFD. The low reading for the period was 0.1313 MCFD and the high reading was 0.4688 MCFD.

Gas flows at Recovery 5 are estimated from Barton recorder data. Recovery 5 gas flows continued to show an overall decline. Initial readings from this well were between 15 and 20 MCFD. During the most recent reporting period the levels varied between 0.165 and zero MCFD. No gas was reported on 10/22 – 10-24, 10/26, 10/28, 11/5-11/6, 11/16 and 11/18 - 12/2. The well was shut-in on 12/3/10 due to no gas flow.

There is no gas flow in the Rohr 4-10 production well which is being pumped to provide additional water for the hydraulic barrier of the remediation system. The Rohr 4-10 well has not produced any gas during the current pumping and did not produce gas during full production.

Gas flow in POCI 55 monitoring well and the Recovery wells is shown graphically in Attachment 1. The POCI 55 well has not shown any gas flows since April 2008 shortly after the Phase 1 remediation system became fully operational.

The gas flow data does not appear to show any significant impact from the Phase 2 operations. Recovery 4 is showing what appears to be a slight increase in gas from the well but the reason for this slight increase is difficult to determine and may or may not be related to the Phase 2 injection. As discussed below the effects of injecting additional water are beginning to be seen in some of the water well pressure data.

Pumping and Injection Rates in Remediation Wells

The average pumping rate for Recovery 1 was 19.10 gpm during the reporting period. The average pumping rate at Recovery 3 has been 4 gpm intermittently (or averaging about 1 gpm over a day's time) (Table 1). The well was shut-in on 8/25/2010. Recovery 4 is not functioning properly as explained in previous monthly reports and has not been pumped since early April 2009. Recovery 5 pumped at an average of 6.2 gpm. Due to no gas flow the well was shut-in on 12/3/2010. The Rohr 04-10 production well, activated as part of the Phase 2 remediation, pumped 4.3 million gallons of water at an average rate of 28 gpm. The Rohr 09-10 is expected to be used only as a back up well and has not yet been pumped for the Phase 2 operations.

Injection started in Injection 01 and 04 on December 9, 2008 and Injection 02, 03, 05, 06 and 07 on December 10, 2008 (Table 1). Injection rates vary for the individual injection wells and range from 1.5 to 11.1 gpm during this reporting period with individual wells showing both increases and decreases in injection rates during the period. The two wells

on the Rohr property (Injection 04 and 05) have accepted the most water. Injection 08 Haeffner has not accepted water very well. Most of the approximately 26 million gallons of water that have been recovered have been re-injected following methane off gassing and flaring during Phase 1 and the reverse osmosis treatment of Phase 2. The total Vermejo water injected into the Poison Canyon since the start of Phase 2 is 3.9 million gallons. The Phase 2 reverse osmosis system creates a filter residue which does include some water which is not re-injected.

Petroglyph has an extensive monitoring program for domestic water wells surrounding the remediation system for changes in both water levels and in gas detected at the wellhead. In addition, Petroglyph monitors several of their production wells for changes in water level. All of these results are discussed in subsequent sections of this report. None of the monitoring has ever shown results that can be directly attributable to the remediation system pumping.

Water Treatment System

The reverse osmosis system for water treatment has been operating as expected and has been reducing levels of fluoride in the pumped water to well below the limit of 4 mg/L with levels during this reporting period of 0.27 mg/L. Boron levels in the injected water were approximately 75 µg/L. The system produces an average of 10% brine solution including the flush water. Approximately 3584 barrels of brine were shipped during the month of November.

## 2.0 Phase 2 Sampling Plan

Fluoride, Boron and Dissolved Methane

The Phase 2 remediation system sampling plan requires additional water quality samples be taken to determine the quality of the injected water. This included weekly sampling of fluoride and boron at the finished water tank or at Injection No. 5 well during the first month of the Phase 2 system. The monitoring for the remainder of the first year of operation is monthly since the levels for the first month were below the permit limits. Results of the samples for the months of October and November are shown in Table 2a. Samples did not exceed the permit level of 4.0 mg/L for fluoride and 0.5mg/L for boron.

The recovery well dissolved methane samples at Recovery 1, Recovery 3, Recovery 05 and Rohr 04-10 were measured weekly during the first month of Phase 2. The first month's results indicated that a 50% dissolved methane reduction is being achieved prior to injection, therefore monitoring has been reduced to monthly. Results from this reporting period are shown on Table 2b. During this reporting period dissolved methane readings in the recovery water appeared to be somewhat higher than previous readings for Recovery 1 and Recovery 5. The results were averaged, using a weighting system based on average pumping rates from each well contributing to the water to be injected, to determine the recovery well dissolved methane concentration. This resulted in a weighted average dissolved methane concentration in the recovery wells of 11,528 µg/L. This background methane concentration is significantly higher compared to the 05 Rohr site – two readings reported at 380 µg/L taken on 10/11/10 and 240 µg/L taken on

11/10/10. The reduction achieved based on the November dissolved methane reading from Rohr 05 was approximately 97.9%; therefore more than a 50% reduction in dissolved methane is being achieved.

Domestic Well Water Quality Before and After Initiation of Phase 2
Item 5 of the Phase 2 Conditions of Approval issued by the COGCC states:

> *"…Collect and analyze samples from all water wells inside the injection ring after 2 months of operation and before three months of operation. Collect and analyze samples from at least four water wells outside the injection ring but within 1 mile (one well in each quadrant of the ring) for comparison to previous analytical data from the same wells. These samples shall be collected after three months of operation and before four months of operation. Sampling will be conducted at a frequency of no less than yearly after initial sampling following initiation of Phase 2. Frequency of sampling will be quarterly in the first year of operation of Phase 2."*

To complete this analysis, water quality samples collected by both the COGCC and Petroglyph were compiled and analyzed for changes before and after the injection of reverse osmosis treated water associated with Phase 2. Tables 3 and 4 show the existing data prior to Phase 2 and for the samples collected after the initiation of Phase 2 for wells inside the mitigation ring and outside the mitigation ring, respectively.

**Domestic Wells Inside the Mitigation Ring Water Quality Results**
A total of five domestic wells within the mitigation system ring were sampled before and after the initiation of Phase 2 injection and recovery including wells owned by Smith, Coleman, Derowitsch, Hopke, Masters, and Houghtling (Table 3).

Some of the earlier samples collected prior to the initiation of Phase 2 were analyzed for total recoverable metals and not total metals. However, the two methods produce similar results and were grouped together for statistical analysis and comparison. Both dissolved and total analyses were performed for the post-Phase 2 iron and manganese analyses because the Environmental Protection Agency (EPA) requires reporting of total Iron and manganese and COGCC requires reporting of the dissolved portion.

Values listed as being less than the reporting limit (RL) and or less than the minimum detection limit (MDL) were set to zero for comparison.

None of the measured values after injection exceeded either EPA or COGCC regulatory standards except for those that already exceeded the standard prior to the initiation of injection. The values exceeding regulatory standards are associated with naturally high levels of fluoride in the ground water system where all analyses exceeded the domestic ground water primary standard of 4 mg/L with the exception of one sample from the Hopke domestic well on October 17, 2007 (Table 3). All four other analyses from the

Hopke domestic well between September 17, 2007 and October 12, 2010 are at or above the primary standard with no increasing or decreasing trend.

**Domestic Wells Outside the Mitigation Ring Water Quality Results**

A total of five domestic wells outside and within one mile of the mitigation system ring were sampled before and after the initiation of Phase 2 injection and recovery including wells owned by Wolahan, Kerman, Burge, McPherson, and Goodwin (Table 4).

Some early samples were originally analyzed for total recoverable and not total. However, the two methods are similar and were grouped together for statistical analysis and comparison. Both dissolved and total analyses were performed for iron and manganese because these were specified as being potential constituents of concern and total analyses satisfy EPA requirements while dissolved analyses satisfy COGCC requirements.

Values listed as being less than the reporting limit (RL) and or less than the minimum detection limit (MDL) were set to zero for comparison.

None of the measured values after injection exceeded either EPA or COGCC regulatory standard that did not already exceed the standard prior to the initiation of injection with the exception of the secondary standard for sulfate in the Burge and McPherson samples and the secondary standard for total dissolved solids in the McPherson sample.

The sulfate value in the Burge samples have been close to the secondary standard in the first and second samples from December 18, 2008 and June 9, 2009 at 240 and 236 mg/L, respectively, and the most recent sample collected on November 11, 2010 showed a relative percent difference (RPD) of only 10% compared to the historical samples at a value of 260 mg/L and just above the regulatory standard of 250 mg/L. This is not considered significant and is considered due to natural variation and within sampling and analytical error.

The McPherson well data does show a significant increase in TDS from approximately 490 mg/L in 2008 and 2009 samples to 670 mg/L in the 2010 sample and sulfate increased from approximately 230 mg/L in 2008 and 2009 samples to 390 mg/L in the 2010 sample. The increase in TDS is related to sulfate, calcium and sodium. The McPherson well is located at a youth ranch and is infrequently used and the increase could be related to poor well maintenance and or insufficient purging prior to sampling. The change is considered to be related to other processes and not as a consequence of the mitigation system operations. The McPherson well is further than most of the other wells in the area and the other domestic wells do not show any indication of water quality changes related to the mitigation system.

## 3.0 Ongoing Investigation

Aquifer Characterization

Petroglyph continues to evaluate data collected through the remediation system operation and ongoing monitoring. A geologic model was created for the site using PETREL software and actual data from well logs completed during drilling of the remediation wells. Modeling of the flow of gas and water was completed using actual data and Computer Modeling Group Ltd.'s IMEX software. Updates to the model will periodically occur using data collected from the remediation system. The model updates will be provided as they are completed. The last model updates verified that the remediation system is reducing and containing the methane as projected during initial modeling and planning for the remediation system.

Gas Isotope, Dissolved Methane and Water Quality Sampling

The attached data disk includes the results from analyses received during this reporting period for seven injection and recovery well samples (Injection 5 Rohr, Recovery 1 Kittleson, Recovery 3 PEI, Recovery 5 Masters and Rohr 04-10) as well as 12 landowner well samples (Bergman, Burge, Coleman, Derowitsch, Goodwin, Hopke, Houghtling, Kerman, Klein, McPherson, Smith and Wolahan). All of the wells were sampled for gas results. The recovery and injection well sampling are used to demonstrate that the dissolved gas reduction is at least 50%. The results for dissolved methane sampling for those samples received since the last reporting period are shown in Table 5. Note that all of the dissolved methane sampling results are included on the data disk in the spreadsheet named "dissolved gas results 11-17-10."

Methane Source Investigation

Petroglyph continues to evaluate the data from monitoring in the domestic wells in the vicinity of the production wells and closer to the outcrop. The BLM wellhead and the Haupt #1 wellhead continue to show measurable methane in wellhead monitoring. Any additional information on the ongoing investigation will be included in the monthly reports and/or in separate reporting as the data is collected and evaluated.

## 4.0 Monitoring

Down-hole Pressure and Fluid Level Monitoring

*Private Wells*

Petroglyph has installed continuous pressure monitoring for fluid levels in water wells at Barrett, Bergman and Coleman located within one mile of the remediation system; Meyer located in the River Ridge Ranch Subdivision but more than one mile from the remediation system; Bruington located in City Ranch Subdivision; and Garza-Vela located in the Silver Spurs Ranch Subdivision.

Information from these wells is downloaded monthly by Petroglyph, graphed, and included in electronic data disk with this monthly report. The POCI 55 Monitoring Well

located near the remediation system also has a pressure gage. Attachment 2 shows graphically the changes in pressure for each of these wells. Attachment 4 is a combined graph showing the water levels in both the domestic wells monitored and Petroglyph production wells.

Water level elevations in the POCI 55 well increased from approximately 6240 to approximately 6247 feet through the monitoring period. Water levels at the Barrett well increased from approximately 6272 feet to 6274 feet at the end of the period. Bergman pressure and associated water levels increased from 6379 to 6380 feet at the end of the period. Coleman also showed an upward trend in water levels with a rise of 7 feet during the reporting period from approximately 6239 feet to 6246 feet. Increases in water level elevations have occurred consistently since the start of Phase 2 and appear to be in response to the increased amount of injected water (Vermejo water) associated with the Phase 2 remediation.

The Meyer well water elevations increased from beginning to end of the reporting period going from approximately 6119.8 to 6122.1 feet. Meyer lies more than 3 miles outside of the remediation ring and the well is completed through the Poison Canyon and to the top of the Vermejo Formation. Due to the distance from the remediation system injection wells, it is not clear that the rise in water levels is a result of the injection although the water levels have risen fairly consistently since late September. The Bruington well continues to show an upward trend in water levels with a rise of approximately 5 feet during the reporting period from approximately 6106 feet to approximately 6111 feet. This well is located over five miles from the remediation system and has been showing a rise in water levels since approximately March of 2009 so is not believed to be rising in response to the additional injection volumes. Data for the Garza Vela well is not provided because a connection to the transducer could not be made. The well will be pulled to determine if it is the transducer or cable that failed. The Gonzalez transducer showed a rise in pressure and associated water levels from approximately to 6119.1 feet to approximately 6122.3 feet. This well is completed in the Vermejo Formation and lies closer to the outcrop and any changes in water level are not attributable to the increased injection.

*Petroglyph Production Wells*

Fifteen Petroglyph production wells are currently monitored for fluid level and casing pressure: Lively 02-02, Lively 02-12, Lively 03-01, Lively 03-10, Lively 03-12, Lively 10-04, Rohr 04-10, Rohr 04-14, Rohr 08-01, Rohr 09-04, Rohr 09-05, Rohr 09-10, State 36-02, State 36-05, State 36-11. The Lively 02-02, Lively 02-12, Lively 03-01, Lively 03-10, Lively 03-12, Lively 10-04, Rohr 04-10, Rohr 09-10, State 36-02, State 36-05, and State 36-11 are measured using an echometer. The echometer provides a general indication of water level trends. Two monitoring wells are also monitored continuously for water levels (Lively 03-03, and Lively 10-12). The monitoring occurs in the formation into which the wells are completed, the Vermejo/Trinidad Formation. Changes in fluid levels in Petroglyph production wells are shown graphically in Attachment 3.

Since Petroglyph is no longer pumping these wells to draw down water levels, pressure is equalizing within the Vermejo coals. Consequently, water levels have risen in all wells as would be expected, although the rate of rise is leveling off in most wells. Five of the wells show no water level elevation change throughout the period: Lively 02-02, Lively 03-01Lively 03-10, Rohr 04-10 and State 36-05. Lively 02-12, Lively 03-12, and State 36-02 started and ended the period at the same elevation but experienced one or more fluctuations through the period. Rohr 9-05, Rohr 09-04, Rohr 04-14, and Rohr 08-01 showed minimal decreases during the period of 2.3 feet, 3 feet, 1.2 feet, and 3 feet respectively. Lively 10-04 showed a 30 foot decrease and State 36-11 showed a 46 foot decrease during the reporting period. Rohr 9-10 showed a 31 foot increase during the period. The Lively 10-04, State 36-11 and Rohr 09-20 are measured using an echometer so, as stated above, readings are more indicative of trends than actual measured footages.

*Comparison of Production Well and Private Well Data*

Attachment 4 compares the water elevations for certain Petroglyph production wells and the private wells which are measured and discussed previously. As shown in Attachment 4 the majority of the private wells have water levels significantly higher in elevation than the production wells. Production well water levels showed a large rise after pumping ceased (250-300 feet); however domestic well water levels have remained relatively constant to decreasing during the same period. This supports previous groundwater modeling and chemical analysis which indicate a lack of connection between the production wells in the Vermejo Formation and domestic wells in the Poison Canyon. Attachment 4 also includes a table which shows the completion interval, location and well status.

Gas Flow Monitoring In Domestic Wells

Gas flow monitors have been installed by Petroglyph at the Angely, Bounds, Bruington, Coleman, and Smith wells. All of these wells except for Bruington and Bounds lie within one mile of the remediation system. Continuous gas flow monitoring occurs at Coleman and Smith, while gas flow is spot monitored with a gage and orifice tester at Angely, Bounds, and Bruington. Gas pressure at the Bounds and Angely wells is currently monitored by COGCC or their consultant; however the data, when available, is presented in this report.

Attachment 5 includes graphs representing gas flow measurements from Bruington, Coleman, Angely, Bounds and Smith. The Bruington and Smith wells are not showing any gas. The water level recovery of the Bruington well precludes any gas flow so these results continue to show zero gas flow. Gas flow may resume when the well stabilizes. Gas concentrations at the wellhead are still monitored monthly and reported. The Coleman well only shows gas when the well is initially pumped. The Coleman well was monitored twice during this reporting period. On 10/20/2010 the well was pumped for 5 minutes at 200 gallons which reported a max flow rate of 14 MCFD. On 11/18/2010 the well was pumped for 90 minutes which reported a max flow rate of 8.9 MCFD. The Angely and Bounds wells were sampled during the reporting period by a consultant to COGCC and were both at a zero gas flow rate.

A drop in gas flow in the domestic wells appears to have occurred in correlation with the original implementation of the remediation system wells and venting of gas through these wells in late 2008 and early 2009 with continued decreases in gas flows from the remediation system recovery wells. This would indicate that the remediation system has been correctly located to remediate the area of largest gas concentration in the domestic wells.

Bi-Weekly and Monthly Water Well Monitoring

Petroglyph has routinely monitored for methane gas levels near 88 wellheads in the vicinity of the site. Measurements are taken near the wellhead, at the well vent and in some cases are also taken at the cistern or a second wellhead.

Table 6 shows all of the wellheads that are currently being sampled, the sampling start date, the date of the last sample, the number of samples since the last reporting period and a description of the sampling results and any changes from the previous reporting period. A column that discusses the historical readings for each site is included on the table.

Of the 88 wellheads, 7 were not sampled during this reporting period. Sampling may vary during any one reporting period due to a variety of reasons. During this reporting period 56 wellheads were sampled once, 3 wellheads were sampled twice, 1 wellhead was sampled three times, 1 wellhead was sampled eight times, 19 wellheads were sampled 11 times, and 1 wellhead sampled 12 times.

As shown on Table 6, the wellheads sampled bi-weekly, in accordance with the Phase 2 Sampling Plan, during this reporting period were those within one mile of the remediation system. The Angely and Bounds wells are monitored by a consultant to COGCC and results for the sample events were reported to Petroglyph.

Monitoring results for the 81 wellheads sampled during this period showed that overall gas levels at 58 wellheads had no change from the previous monitoring period measurements and no detectable methane and one wellhead showed no changes but had detectable methane. Changes in % LEL, % by volume CH4, and % volume $O_2$ were evaluated to determine if the area around the wellheads was showing an indication of increasing or decreasing methane gas content as a result of Phase 2 operations. Of the remaining 22 wellheads, methane gas at 3 wellheads decreased with 2 wellheads showing only a slight decrease and 1 wellhead decreasing to 0 (Angely); 19 wellheads showed an increase with 2 showing only a slight increase. There are no discernable trends in the monitoring data which can be attributed directly to Phase 2.

Petroglyph compared those wells showing any detectable methane readings or changes in methane monitored during the reporting period with wells known to have been drilled into the coals within the Raton or Vermejo Formations and lying within 1 to 1.25 miles of the outcrop. Of the 22 wellheads reading detectable methane at the end of the reporting period (Barrett, Bergman, Bounds, Golden Land Cycle, Hopke, Houghtling, Lively 10-02, BLM 15-12, Meyer, Speh, Bruington, Degan, Gonzalez, Haupt #1, Hurley, Johnson, Tobyas, P. Eddleman, T. Eddleman, Lyon, Modlish, Roberts, Snow, and Orlie White), 5

are known to have been drilled into the Poison Canyon based on well depths in well logs available from the State Engineer with one of the 5 indicating in the driller's reports that the hole intersected coal. Nine are known to have been drilled into the Vermejo Formation with one of the wells (Lively 10-02) being a Petroglyph production well. Many of the wells completed in the Vermejo lie closer to the outcrop and routinely experience fluctuations in methane levels from none detectable to higher levels. 1 well is completed in the Trinidad Formation and 1 well is completed in the Raton Formation. The completion for the remaining 6 wells is not known.

The breakdown by subdivision or area as on Table 6 is as follows:

**Within 1 Mile of Remediation System**

- Gas near 25 wellheads routinely monitored
- All wellheads but Lively 10-02, BLM, Angely and Bounds were monitored bi-weekly during the reporting period.
- All the wellheads were sampled during this reporting period
- 16 wellheads showed no change with no detectable methane gas
- 2 wellheads showed a decrease with 1 wellhead decreasing to no detectable methane (Angely)
- 7 wellheads showed increases in detectable methane with one showing only a slight increase
- Detectable methane was measured at 8 wells (Bounds, Bergman, Barrett, Golden Cycle Land, Hopke, Houghtling, Lively 10-02 and BLM Well)

**River Ridge Ranch Subdivision and Vicinity Outside of One Mile**

- Gas near 21 wellheads is routinely monitored
- 17 wellheads were sampled during this reporting period; 4 wellheads were not sampled
- 15 wellheads showed no change with no detectable methane gas
- 2 wellheads showed a slight increase in methane gas (Meyer, Speh)

**City Ranch and Other Properties**

- Gas near 15 wellheads is routinely monitored
- 14 wellheads were sampled during this reporting period; 1 wellhead was not sampled.
- 13 wellheads were sampled once, and 1 wellhead was sampled twice
- 7 wellheads showed no change with no detectable methane gas
- 1 wellhead had detectable methane but levels had not changed since the last reporting period (Hurley)
- 5 wellheads showed an increase, 3 of which were slight increases (Degan, Gonzalez, Johnson, Haupt #1, Tobyas).
- 1 wellhead showed a decrease in methane (Bruington)

**Silver Spurs Ranch**

- Gas near 24 wellheads routinely monitored
- 22 wellheads were sampled during this reporting period; 2 wellheads were not sampled
- 21 wellheads were sampled once during this reporting period, and 1 was sampled three times.
- 17 wellheads showed no change with no detectable methane gas
- 5 wellheads showed a increase in methane levels with one showing only a slight increase (P. Eddleman, T. Eddleman, Lyon, Snow, O. White)

**Black Hawk Ranch**

- 3 wellheads were sampled during this reporting period all of which showed no change with no detectable methane gas.

Table 7 shows the current monitoring schedule including which wells are monitored bi-weekly and which wells are monitored monthly or at a different frequency.

Attachment 6 includes charts of gas monitoring of eighteen wells near the mitigation system. The wells being monitored have not indicated a direct response to the remediation pumping and injection. Of the wellhead charts included in Attachment 6 only those for Barrett, Bergman, Golden Cycle Land, Lively 10-02, Houghtling and Hopke showed methane in recent readings. Around the time of the startup of Phase 2 both Barrett and Bergman showed decreases in methane levels which continued through the last reporting period and previous reports indicated this could be a result of the Phase 2 pumping. However, during this reporting period methane levels have varied more widely and additional data is necessary to determine if these sporadic readings since late October represent a "pocket" of methane being removed and are short term with values returning to the lower levels seen since the start of Phase 2. The remaining wellheads with detectable methane readings do not appear to represent any new or unusual charges to the wells as a result of Phase 2.

Hand Held Measurements

Petroglyph conducts periodic ground surveys using a hand held methane detector at locations where gas has previously been detected, at locations where a property owner requests such a survey or at locations where previous surveys such as the helicopter survey have detected gas seepage. These surveys are conducted based on need or urgency so can range from several times a week to a one time survey based on concerns from a property owner. No handheld surveys were collected during the reporting period.

## 5.0 Mitigation

Methane Alarms

No activity occurred during the reporting period related to maintaining methane alarms or responding to any methane alarms. There are currently a total of 15 homes with alarm

systems provided by Petroglyph. No alarms have ever been triggered by the presence of methane.

Water Supply
Petroglyph is currently providing water to 16 homes. Table 8 provides a list of the homes currently receiving water. Water is delivered as needed and can vary from month to month due to residential water use and whether or not the homes are occupied.

Public Outreach
No public outreach occurred during this reporting period.

Health and Safety/Emergency Planning
No changes to Petroglyph health, safety and emergency planning occurred during the reporting period.

## 6.0 Schedule

The following is the currently anticipated schedule for Phase 2 of the Methane Investigation Monitoring and Mitigation Program.

- Continued pumping and injection of the Phase 2 system with ongoing monitoring to evaluate the response in surrounding wells.
- Implementation of the Phase 2 Sampling Plan with special samples taken in accordance with the Plan
- Routine bi-weekly, monthly and quarterly sampling will continue with new sampling sites added as needed.
- Hand held seep monitoring will continue as needed.

| Table 1: Recovery and Injection Rates associated with Phase 1 and 2 MIMMP (water flows as of 12/8/2010; gas flows as of 12/2/2010) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Well Number** | **Total Depth (ft)** | **PBTD** | **Injection Tubing Depth** | **Start-up Date** | **Average Injection Rate (gpm)** | **Water Total (gal)** | **Water Totals (bbls)** | | **Notes** |
| Injection 01 Pascual | 600 | 526 | 458 | 12/9/08 | 4.1 | 1,484,742 | 35,351 | | Average injection rate remained unchanged at 4.1 gpm. |
| Injection 02 Gonzales | 600 | 575 | 362 | 12/10/08 | 4.4 | 1,562,106 | 37,193 | | Average injection rate decreased from 4.7 to 4.4 gpm. |
| Injection 03 Benevides | 725 | 629 | 454 | 12/10/08 | 1.5 | 1,228,920 | 29,260 | | Average injection rate decreased from 1.6 to 1.5 |
| Injection 04 Rohr | 675 | 667 | 455 | 12/9/08 | 9.9 | 6,722,898 | 160,069 | | Average injection rate decreased from 11.1 to 9.9 |
| Injection 05 Rohr | 750 | 735 | 458 | 12/10/08 | 11.1 | 8,264,256 | 196,768 | | Average injection rate decreased from 13.0 to 11.1 |
| Injection 06 Masters | 725 | 695 | 438 | 12/10/08 | 6.6 | 5,592,678 | 133,159 | | Average injection rate increased from 6.2 to 6.6 |
| Injection 07 Walden | 750 | 713 | 457 | 12/10/08 | 3.8 | 1,454,334 | 34,627 | | Average injection rate decreased from 5.1 to 3.8 gpm. |
| Injection 08 Haeffner | 650 | 713 | 365 | 12/10/08 | see note | 4,788 | 114 | | Well does not accept water very well. Inject approx. 150 gallons once every two weeks. |
| | | | **Pump Depth** | | **Average Pump Rate (gpm)** | | | **Gas Totals (mcf)** | |
| Recovery 1 Kittleson | 715 | 705 | 686 | 12/8/08 | 19.10 | 17,807,244 | 423,982 | 10,744 | Average pumping rate increased from 14.6 to 19.10 |
| Recovery 3 PEI | 625 | 591 | 575 | 12/8/08 | 1 (see note) | 850,962 | 20,261 | 796 | Intermittent pumping at 4 gpm. Rate over 24 hrs is approx 1 gpm. Shut-in 8/25/10. |
| Recovery 4 Barrett | 500 | 484 | 463 | 2/10/09 | (see note) | 3,528 | 84 | 390 | Last pump date 4/8/09 |
| Recovery 5 Masters | 847 | 847 | 822 | 12/24/09 | 6.2 | 3,064,782 | 72,971 | 1,444 | Shut-in well 12/3/10 due to no gas flow. |
| Rohr 04-10 | 2243 | 2219 | 2090 | 8/6/10 (see note) | 28 | 4,341,624 | 103,372 | | Vermejo water supply for Phase 2 MIMMP. |

**Table 2a: Monthly Injectate Water Quality – Oct & Nov (grabbed at Injection 05 Rohr)**

| Date | Fluoride mg/L | Boron µg/L | Dissolved Methane µg/L |
|---|---|---|---|
| 10/11/10 | 0.27 | 71 | 380 |
| 11/10/10 | 0.4 | 75 | 240 |

**Table 2b: Monthly Dissolved Gas in Recovery Water – Oct & Nov (in µg/l)**

| | 10/11/2010 | 11/10/2010 |
|---|---|---|
| Recovery 1 Dissolved Gas | 8,800 | 8,400 |
| Recovery 3 Dissolved Gas | 22,000 | |
| Recovery 5 Dissolved Gas | 16,000 | 10,000 |
| Rohr 04-10 Dissolved Gas | 22,000 | 14,000 |

| | |
|---|---|
| **Dissolved Methane in Produced Water to RO (wt. ave. Rec 1, Rec 5, Rohr 04-10)** | **11,528 µg/L** |
| **Dissolved Methane Average at Injection 05 Rohr as a Percentage of Weighted Average of Dissolved Methane in Recovery Wells** | **2.1%** |

# Table 3
## Domestic Well Water Quality For Selected Wells Inside the Remediation Ring
## Before and After the Initiation of Phase 2

| Constituent | Smith, WW | | | Coleman, V WW | | | | | Derowitsch, D WW | | | | | Hopke, B WW | | | | | | Houghtling, J WW | | Masters, T WW* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mg/L except pH | 7/9/2007 | 7/20/2010 | 10/13/2010 | 6/20/2007 | 11/10/2007 | 12/4/2008 | 5/9/2009 | 10/20/2010 | 9/18/2007 | 11/12/2007 | 12/8/2008 | 1/15/2009 | 10/12/2010 | 9/17/2007 | 10/17/2007 | 11/11/2007 | 12/29/2008 | 6/22/2009 | 10/12/2010 | 7/21/2010 | 10/14/2010 | 6/29/2009 | 10/11/2010 |
| Antimony Dissolved | | | | | | | | | | | 0 | | | | | | | | | | | | |
| Antimony Total | | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Antimony Total Rec | | | | | 0 | | | | | 0 | | 0 | | | | 0 | 0 | | | | | | |
| Arsenic Dissolved | | | | | | | | | | | 0 | | | 0 | | | | | | | | | |
| Arsenic Total | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arsenic Total Rec | | | | | 0 | | | | | 0 | | 0 | | | | 0 | 0 | | | | | | |
| Barium Dissolved | | | | | | | | | | | 0 | | | 0 | | | | | | | | | |
| Barium Total | 0 | 0.0429 | 0.032 | | 0.0592 | 0.048 | 0.054 | 0.085 | 0 | 0.0597 | | 0.0593 | 0.059 | | 0 | 0 | 0.0385 | 0.023 | 0.022 | 0.0245 | 0 | 0.052 | 0.028 |
| Barium Total Rec | | | | | 0.0592 | | | | | 0.0597 | | 0.0593 | | | | 0 | 0.0385 | | | | | | |
| Beryllium Dissolved | | | | | | | | | | | 0 | | | | | | | | | | | | |
| Beryllium Total | | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Beryllium Total Rec | | | | | 0 | | | | | 0 | | 0 | | | | 0 | 0 | | | | | | |
| Bicarbonate As CaCO3 | 83 | 97.7 | 65 | 153 | | 154 | 148 | 60 | 190 | | 200 | 206 | 200 | 155 | 130 | | 146 | 138 | 140 | 81.8 | 81 | 78.6 | 100 |
| Bicarbonate Pot Diss | | | | | | | 148 | | | | | | | | | | | 138 | | | | | |
| Boron Dissolved | | | | | | | | | | | 0 | | | 0 | | | | | | | | | |
| Boron Total | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Boron Total Rec | | | | | 0 | | | | | 0 | | 0 | | | | 0 | 0 | | | | | | |
| Cadmium Dissolved | | | | | | | | | | | 0 | | | 0 | | | | | | | | | |
| Cadmium Total | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0.00051 | 0 | 0 | 0 | 0 | 0 |
| Cadmium Total Rec | | | | | 0 | | | | | 0 | | 0 | | | | 0 | 0 | | | | | | |
| Calcium Dissolved | 4.8 | | 4.9 | 4.2 | | 2.6 | 0 | 4.9 | | | 3.2 | | 5.3 | 12.1 | | | | | 7.1 | | 7.4 | | |
| Calcium Total | 4.8 | | | | | 2.6 | 0 | | 6 | | | | | | 11 | | 0 | 7.5 | | | | 3.9 | 1.9 |
| Calcium Total Rec | | | | | | | | | | | | 3.79 | | | | | 0 | | | | | | |
| Carbonate As CaCO3 | 0 | 11.7 | 42 | 0 | | 5.01 | 0 | 0 | 0 | | 0 | 9.2 | 12 | 0 | 0 | | 0 | | 0 | 0 | 12 | | |
| Carbonate Pot Diss | | | | | | | 0 | | | | | | | | | | | 0 | | | | 21.8 | 23 |
| Chromium Dissolved | | | | | | | | | | | 0 | | | 0 | | | | | | | | | |
| Chromium Total | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0.00236 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Chromium Total Rec | | | | | 0 | | | | | 0 | | 0.00236 | | | | 0 | 0 | | | | | | |
| Cobalt Dissolved | | | | | | | | | | | 0 | | | | | | | | | | | | |
| Copper Dissolved | | | | | | | | | | | 0 | | | 0.0496 | | | | | | | | | |
| Copper Total | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0.013 | 0.578 | 0.357 | 0.037 | 0 | | 0 | 0 | 0 |
| Copper Total Rec | | | | | 0 | | | | | 0 | | 0 | | | | 0.578 | 0.357 | | | | | | |
| Fluoride | 7 | 4.8 | 5.1 | 9.88 | | 9.5 | 10.4 | 9.08 | 4.3 | | 4.3 | 5.1 | 4.2 | 4 | 3.8 | | 6.9 | 5.6 | 4 | 6.2 | 6 | 5.2 | 4.1 |
| Iron Dissolved | | | 0 | | | | | 0 | | | 0 | | 0 | 0 | | | | | 0 | | 0 | | 0 |
| Iron Total | 0 | | 0.18 | | 0.922 | 0 | 0 | 0 | 0.15 | 0.519 | | 0 | 0 | | 0 | 0 | 0.233 | 0 | 0 | | 2.6 | 0.38 | 0.14 |
| Iron Total Rec | | | | | 0.922 | | | | | 0.519 | | 0 | | | | 0 | 0.233 | | | | | | |
| Lead Dissolved | | | | | | | | | | | 0 | | | 0 | | | | | | | | | |
| Lead Total | 0.00061 | | 0 | | 0.00106 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0.00149 | 0 | 0 | | 0 | 0 | 0 |
| Lead Total Rec | | | | | 0.00106 | | | | | 0 | | 0 | | | | 0 | 0.00149 | | | | | | |
| Magnesium Dissolved | | | 0 | 0.04 | | | | 0 | | | 0 | | 0.63 | 0 | | | | | 0 | | 0 | | 0 |
| Magnesium Total | 0 | | | | | 0 | 0 | | 0 | | | 0.114 | | | 0 | | 0.325 | 0.16 | | | | 0 | |
| Magnesium Total Rec | | | | | | | | | | | | 0.114 | | | | | 0.325 | | | | | | |
| Manganese Dissolved | | | 0 | | | | | 0 | | | 0 | | 0 | 0 | | | | | 0 | | 0 | | 0 |
| Manganese Total | 0 | | 0 | | 0.0213 | 0 | 0 | 0 | 0.012 | 0.0131 | | 0 | 0 | | 0 | 0 | 0.0214 | 0 | 0 | | 0.041 | 0 | 0 |
| Manganese Total Rec | | | | | 0.0213 | | | | | 0.0131 | | 0 | | | | 0 | 0.0214 | | | | | | |
| Mercury Total | | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Molybdenum Dissolved | | | | | | | | | | | 0 | | | | | | | | | | | | |
| Molybdenum Total | | | 0 | | 0.00668 | 0 | 0.0059 | 0 | 0 | 0 | | 0 | 0 | | 0.0014 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Molybdenum Total Rec | | | | | 0.00668 | | | | | 0 | | 0 | | | | 0 | 0 | | | | | | |
| Nickel Dissolved | | | | | | | | | | | 0 | | | | | | | | | | | | |
| Nickel Total | | 0 | 0 | | 0 | 0 | 0 | 0 | | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Nickel Total Rec | | | | | 0 | | | | | 0 | | 0 | | | | 0 | 0 | | | | | | |

## Table 3 (Cont.)
## Domestic Well Water Quality For Selected Wells Inside the Remediation Ring
## Before and After the Initiation of Phase 2

| Constituent | Smith, WW | | | Coleman, V WW | | | | | Derowitsch, D WW | | | | | Hopke, B WW | | | | | | Houghtling, J WW | | Masters, T WW* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mg/L except pH | 7/9/2007 | 7/20/2010 | 10/13/2010 | 6/20/2007 | 11/10/2007 | 12/4/2008 | 5/9/2009 | 10/20/2010 | 9/18/2007 | 11/12/2007 | 12/8/2008 | 1/15/2009 | 10/12/2010 | 9/17/2007 | 10/17/2007 | 11/11/2007 | 12/29/2008 | 6/22/2009 | 10/12/2010 | 7/21/2010 | 10/14/2010 | 6/29/2009 | 10/11/2010 |
| pH | 8.53 | 8.87 | 8.87 | | | 8.82 | 8.75 | 8.62 | 8.36 | | 8.53 | 9 | 8.57 | 6.8 | 8.33 | | 8.04 | 8.45 | 8.48 | 8.97 | 8.92 | 9.19 | 9.29 |
| Potassium Dissolved | | | 0 | 0.4 | | | | | | | 1.1 | | 0 | 0 | | | | | 0 | | 0 | | 0 |
| Potassium Total | 0 | | | | | 0.31 | 0.36 | | 1.1 | | | 0.539 | | | 2.1 | | | 0.71 | | | | 0.39 | |
| Potassium Total Rec | | | | | | | | | | | | 0.539 | | | | | 6.56 | | | | | | |
| Selenium Dissolved | | | | | | | | | | | 0 | | | 0 | | | | | | | | | |
| Selenium Total | 0 | 0 | 0 | | 0 | 0.002 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0.00098 | 0 | 0 | 0 |
| Selenium Total Rec | | | | | 0 | | | | | 0 | | 0 | | | | 0 | 0 | | | | | | |
| Silver Dissolved | | | | | | | | | | | 0 | | | 0 | | | | | | | | | |
| Silver Total | 0 | | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 |
| Silver Total Rec | | | | | 0 | | | | | 0 | | 0 | | | | 0 | 0 | | | | | | |
| Sodium Dissolved | | | 120 | 113 | 132 | | | 150 | | | 150 | | 150 | 123 | | | | | 150 | | 140 | | 110 |
| Sodium Total | 110 | 116 | 120 | | 132 | 110 | 110 | | 150 | 195 | | 168 | | | 120 | 156 | 153 | 140 | | 279 | | 120 | |
| Sodium Total Rec | | | | | 132 | | | | | 195 | | 168 | | | | 156 | 153 | | | | | | |
| Strontium Dissolved | | | | | | | | | | | 0.11 | | | | | | | | | | | | |
| Strontium Total | | | 0.12 | | 0 | 0 | 0 | 0.13 | | 0.129 | | 0.116 | 0.12 | | | 0.284 | 0.309 | 0.19 | 0.2 | | 0.18 | 0.11 | 0.051 |
| Strontium Total Rec | | | | | 0 | | | | | 0.129 | | 0.116 | | | | 0.284 | 0.309 | | | | | | |
| Sulfate | 140 | 110 | 110 | 32.7 | | 25.7 | 48.6 | 193 | 110 | | 79 | 65.5 | 49 | 138 | 140 | | 128 | 99.4 | 120 | 125 | 150 | 122 | 67 |
| Thallium Dissolved | | | | | | | | | | | 0 | | | | | | | | | | | | |
| Thallium Total | | 0 | 0 | | 0 | 0 | 0 | | 0 | 0 | | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thallium Total Rec | | | | | 0 | | | | | 0 | | 0 | | | | 0 | 0 | | | | | | |
| Total Alkalinity As CaCO3 | 83 | 109 | 110 | | | 159 | 148 | 60 | 190 | | 210 | 215 | 210 | 155 | 130 | | 146 | 138 | 140 | 81.8 | 93 | 100 | 130 |
| Total Alkalinity Pot Diss | | | | | | | 148 | | | | | | | | | | | 138 | | | | | |
| Total Dissolved Solids | 390 | 360 | 370 | | | 273 | 322 | 390 | 530 | | 440 | 431 | 380 | 445 | 400 | | 414 | 384 | 400 | 356 | 0 | 342 | 250 |
| Total Suspended Solids | | 10.5 | 10 | | | 0 | 0 | 0 | | | | 0 | 0 | | | | 0 | 0 | 0 | 0 | 52 | 7.5 | 0 |
| Zinc Dissolved | | | | | | | | | | | 0 | | | | | | | | | | | | |
| Zinc Total | | | 0 | | 0.0123 | 0 | 0 | 0 | | 0.0102 | | 0 | 0 | | 0 | 0.0387 | 0 | 0.018 | 0.12 | | 0.031 | 0 | 0 |
| Zinc Total Rec | | | | | 0.0123 | | | | | 0.0102 | | 0 | | | | 0.0387 | 0 | | | | | | |

* Sample collected in 2010 is from Recovery 5 Masters well formerly the Masters water well
Inidcates value was used from Total or Total Recoverable for comparison purposes
Indicates value exceeds primary water quality regulatory value
Inidcates values exceeds secondary water quality regulatory value

**Table 4**
**Domestic Well Water Quality For Selected Wells Within One Mile of the Remediation Ring**
**Before and After the Initiation of Phase 2**

| Constituent | Burge, K WW | | | Kerman, T WW | | | | McPherson, P WW | | | Goodwin, R WW | | | Wolahan, WW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mg/L except pH | 12/18/2008 | 6/9/2009 | 11/11/2010 | 9/18/2007 | 12/4/2008 | 7/8/2009 | 11/11/2010 | 12/4/2008 | 6/3/2009 | 11/17/2010 | 12/15/2008 | 6/29/2009 | 11/16/2010 | 11/16/2010 |
| Antimony Dissolved | 0 | | | | | | | | | | | | | |
| Antimony Total | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Antimony Total Rec | 0 | | | | | | | | | | | | | |
| Arsenic Dissolved | 0 | | | | | | | | | | | | | |
| Arsenic Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Arsenic Total Rec | 0 | | | | | | | | | | | | | |
| Barium Dissolved | 0 | | | | | | | | | | | | | |
| Barium Total | 0.019 | 0.021 | 0.02 | 0 | 0.031 | 0.035 | 0.036 | 0.034 | 0.029 | 0.039 | 0.04 | 0.042 | 0.04 | 0.015 |
| Barium Total Rec | 0.019 | | | | | | | | | | | | | |
| Beryllium Dissolved | 0 | | | | | | | | | | | | | |
| Beryllium Total | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Beryllium Total Rec | 0 | | | | | | | | | | | | | |
| Bicarbonate As CaCO3 | 210 | | 220 | 130 | 148 | | 130 | 72.2 | | 73 | 217 | 213 | 220 | 50 |
| Bicarbonate Pot Diss | | 206 | | | | 143 | | | 73 | | | 213 | | |
| Boron Dissolved | 0 | | | | | | | | | | | | | |
| Boron Total | 0 | 0 | 0.032 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Boron Total Rec | 0 | | | | | | | | | | | | | |
| Cadmium Dissolved | 0 | | | | | | | | | | | | | |
| Cadmium Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Cadmium Total Rec | 0 | | | | | | | | | | | | | |
| Calcium Dissolved | 74 | | 90 | | | | 3.3 | | | 51 | | | 15 | 5.9 |
| Calcium Total | 0 | 0 | | 2.8 | 2.9 | 3.5 | 3.3 | 23 | 0 | 51 | 14 | 15 | 15 | |
| Calcium Total Rec | 0 | | | | | | | | | | | | | |
| Carbonate As CaCO3 | 0 | | 0 | 23 | 7.21 | | 17 | 0 | | 0 | 0 | | 5.2 | 5 |
| Carbonate Pot Diss | | 0 | | | | 7.51 | | | 0 | | | 0 | | |
| Chromium Dissolved | 0 | | | | | | | | | | | | | |
| Chromium Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0049 | 0 | 0 | 0 |
| Chromium Total Rec | 0 | | | | | | | | | | | | | |
| Cobalt Dissolved | 0 | | | | | | | | | | | | | |
| Copper Dissolved | 0 | | | | | | | | | | | | | |
| Copper Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Copper Total Rec | 0 | | | | | | | | | | | | | |
| Fluoride | 0.59 | 0.81 | 0.58 | 3.5 | 4.9 | 4.9 | 3.9 | 6 | 5.9 | 3.7 | 1.7 | 1.5 | 0.94 | 6.1 |
| Iron Dissolved | 0 | | 0 | | | | 0 | | | 0 | | | 0 | 0 |
| Iron Total | 0.568 | 0.79 | 0.52 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Iron Total Rec | 0.568 | | | | | | | | | | | | | |
| Lead Dissolved | 0.00013 | | | | | | | | | | | | | |
| Lead Total | 0.00258 | 0.0031 | 0.0046 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Lead Total Rec | 0.00258 | | | | | | | | | | | | | |
| Magnesium Dissolved | 15 | | 18 | | | | 0 | | | 0.53 | | | 1.3 | 0 |
| Magnesium Total | 14.3 | 14 | | 0 | 0 | 0 | 0 | 0.15 | 0.18 | 0.53 | 1.4 | 1.3 | 1.3 | |
| Magnesium Total Rec | 14.3 | | | | | | | | | | | | | |
| Manganese Dissolved | 0.083 | | 0.078 | | | | 0 | 0 | 0 | 0 | | | 0.021 | 0 |
| Manganese Total | 0.0966 | 0.072 | 0.084 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.033 | 0.041 | 0.022 | 0 |
| Manganese Total Rec | 0.0966 | | | | | | | | | | | | | |
| Mercury Total | 0 | 0 | 0 | | 0 | 0 | 0 | 0.006 | 0.0053 | 0 | 0 | 0 | 0 | 0 |

**Table 4 (Cont.)**
**Domestic Well Water Quality For Selected Wells Within One Mile of the Remediation Ring**
**Before and After the Initiation of Phase 2**

| Constituent | Burge, K WW | | | Kerman, T WW | | | | McPherson, P WW | | | Goodwin, R WW | | | Wolahan, WW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| mg/L except pH | 12/18/2008 | 6/9/2009 | 11/11/2010 | 9/18/2007 | 12/4/2008 | 7/8/2009 | 11/11/2010 | 12/4/2008 | 6/3/2009 | 11/17/2010 | 12/15/2008 | 6/29/2009 | 11/16/2010 | 11/16/2010 |
| Molybdenum Dissolved | 0.0018 | | | | | | | | | | | | | |
| Molybdenum Total | 0 | 0 | 0 | 0 | 0.006 | 0.0065 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0.021 |
| Molybdenum Total Rec | 0 | | | | | | | | | | | | | |
| Nickel Dissolved | 0 | | | | | | | | | | | | | |
| Nickel Total | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | | 0 | 0 | 0 | 0 |
| Nickel Total Rec | 0 | | | | | | | | | | | | | |
| pH | 7.82 | | 7.68 | 8.84 | 8.91 | 8.91 | 8.97 | 8.29 | 8.16 | 8.01 | 8.12 | 8.09 | 8.27 | 8.99 |
| Potassium Dissolved | 1.7 | | 0 | | | | 0 | | | | | | 3.4 | 0 |
| Potassium Total | 0.796 | 0.75 | | 0 | 3.7 | 2.5 | | 0.49 | 0.49 | 0 | 3.4 | 2 | 3.4 | |
| Potassium Total Rec | 0.796 | | | | | | | | | | | | | |
| Selenium Dissolved | 0 | | | | | | | | | | | | | |
| Selenium Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Selenium Total Rec | 0 | | | | | | | | | | | | | |
| Silver Dissolved | 0 | | | | | | | | | | | | | |
| Silver Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Silver Total Rec | 0 | | | | | | | | | | | | | |
| Sodium Dissolved | 110 | | 120 | | | | 150 | | | 180 | | | 180 | 140 |
| Sodium Total | 108 | 120 | | 120 | 150 | 150 | 150 | 140 | 140 | 180 | 210 | 200 | 180 | |
| Sodium Total Rec | 108 | | | | | | | | | | | | | |
| Strontium Dissolved | 1.8 | | | | | | | | | | | | | |
| Strontium Total | 1.77 | 1.7 | 2.1 | | 0.11 | 0.11 | 0.1 | 0.51 | 0.46 | 1 | 0.6 | 0.62 | 0.61 | 0.14 |
| Strontium Total Rec | 1.77 | | | | | | | | | | | | | |
| Sulfate | 240 | 236 | 260 | 130 | 151 | 152 | 150 | 230 | 226 | 390 | 206 | 208 | 190 | 190 |
| Thallium Dissolved | 0 | | | | | | | | | | | | | |
| Thallium Total | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Thallium Total Rec | 0 | | | | | | | | | | | | | |
| Total Alkalinity As CaCO3 | 210 | | 220 | 150 | 155 | | 150 | 72.2 | | 73 | 217 | | 220 | 55 |
| Total Alkalinity Pot Diss | | 206 | | | | 150 | | | 73 | | | 213 | | |
| Total Dissolved Solids | 640 | 640 | 660 | 420 | 416 | 440 | 410 | 486 | 490 | 670 | 582 | 568 | 540 | 380 |
| Total Sulfide | 0.5 | 1.5 | | | 0 | 0 | | 0 | 0 | | 0.5 | 0 | | |
| Total Suspended Solids | 0 | 0 | 0 | | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Zinc Dissolved | 0.025 | | | | | | | | | | | | | |
| Zinc Total | 0 | 0 | 0 | | 0.034 | 0.025 | 0 | 0 | 0 | 0 | 0.039 | 0.017 | 0 | 0 |
| Zinc Total Rec | 0 | | | | | | | | | | | | | |

Inidcates value was used from Total or Total Recoverable for comparison purposes
Indicates value exceeds primary water quality regulatory value
Inidcates values exceeds secondary water quality regulatory value

| Table 5: Sampling of Dissolved Gases in Water Wells (results received from Oct/Nov 2010 sampling) | | | | | |
|---|---|---|---|---|---|
| | **Well** | **Sample Date** | **Analyte** | **Results (In ug/l)** | **Comments** |
| **Mitigation Wells** | Injection 05 Rohr | 10/11/10 | Ethane | 0.66 | RO treated Injection Water |
| | Injection 05 Rohr | 10/11/10 | Ethylene | ND | RO treated Injection Water |
| | Injection 05 Rohr | 10/11/10 | Methane | 380 | RO treated Injection Water |
| | Injection 05 Rohr | 11/10/10 | Ethane | 0.27 | RO treated Injection Water |
| | Injection 05 Rohr | 11/10/10 | Ethylene | ND | RO treated Injection Water |
| | Injection 05 Rohr | 11/10/10 | Methane | 240 | RO treated Injection Water |
| | Recovery 1 Kittleson | 10/11/10 | Ethane | 7.1 | Phase 2 water to RO |
| | Recovery 1 Kittleson | 10/11/10 | Ethylene | ND | Phase 2 water to RO |
| | Recovery 1 Kittleson | 10/11/10 | Methane | 8800 | Phase 2 water to RO |
| | Recovery 1 Kittleson | 11/10/10 | Ethane | 5.1 | Phase 2 water to RO |
| | Recovery 1 Kittleson | 11/10/10 | Ethylene | ND | Phase 2 water to RO |
| | Recovery 1 Kittleson | 11/10/10 | Methane | 8400 | Phase 2 water to RO |
| | Recovery 3 PEI | 10/11/10 | Ethane | 16 | Grabbed during Phase 2 |
| | Recovery 3 PEI | 10/11/10 | Ethylene | ND | Grabbed during Phase 2 |
| | Recovery 3 PEI | 10/11/10 | Methane | 22000 | Grabbed during Phase 2 |
| | Recovery 5 Masters | 10/11/10 | Ethane | 4.6 | Grabbed during Phase 2 |
| | Recovery 5 Masters | 10/11/10 | Ethylene | ND | Grabbed during Phase 2 |
| | Recovery 5 Masters | 10/11/10 | Methane | 16000 | Grabbed during Phase 2 |
| | Recovery 5 Masters | 11/10/10 | Ethane | 4.2 | Grabbed during Phase 2 |
| | Recovery 5 Masters | 11/10/10 | Ethylene | ND | Grabbed during Phase 2 |
| | Recovery 5 Masters | 11/10/10 | Methane | 10000 | Grabbed during Phase 2 |
| **Monitored Wells Within 1 Mile of Mitigation** | Hopke, B | 10/12/10 | Ethane | 8.6 | raw - hydrant |
| | Hopke, B | 10/12/10 | Ethylene | ND | raw - hydrant |
| | Hopke, B | 10/12/10 | Methane | 6600 | raw - hydrant |
| | Houghtling, J | 10/14/10 | Ethane | 14 | raw- well head |
| | Houghtling, J | 10/14/10 | Ethylene | ND | raw- well head |
| | Houghtling, J | 10/14/10 | Methane | 21000 | raw- well head |
| | Kerman, T WW | 11/11/10 | Ethane | ND | Hydrant on North side of home |
| | Kerman, T WW | 11/11/10 | Ethylene | ND | Hydrant on North side of home |
| | Kerman, T WW | 11/11/10 | Methane | ND | Hydrant on North side of home |
| | McPherson, P | 11/17/10 | Ethane | ND | |
| | McPherson, P | 11/17/10 | Ethylene | ND | |
| | McPherson, P | 11/17/10 | Methane | 4.4 | |
| | Smith | 10/13/10 | Ethane | 14 | |
| | Smith | 10/13/10 | Ethylene | ND | |
| | Smith | 10/13/10 | Methane | 18000 | |
| | Bergman | 10/20/10 | Ethane | 0.96 | raw- not filtered |
| | Bergman | 10/20/10 | Ethylene | ND | raw- not filtered |
| | Bergman | 10/20/10 | Methane | 1900 | raw- not filtered |
| | Burge, K | 11/11/10 | Ethane | 0.41 | Hydrant East of well |
| | Burge, K | 11/11/10 | Ethylene | ND | Hydrant East of well |
| | Burge, K | 11/11/10 | Methane | 740 | Hydrant East of well |
| | Coleman, V | 10/20/10 | Ethane | 14 | raw- not filtered |

| Table 5: Sampling of Dissolved Gases in Water Wells (results received from Oct/Nov 2010 sampling) | | | | | |
|---|---|---|---|---|---|
| | **Well** | **Sample Date** | **Analyte** | **Results (In ug/l)** | **Comments** |
| | Coleman, V | 10/20/10 | Ethylene | ND | raw- not filtered |
| | Coleman, V | 10/20/10 | Methane | 16000 | raw- not filtered |
| | Deroswitch, D | 10/12/10 | Ethane | 4.6 | |
| | Deroswitch, D | 10/12/10 | Ethylene | ND | |
| | Deroswitch, D | 10/12/10 | Methane | 2300 | |
| **Monitored River Ridge Ranch Wells Outside Mitigation** | Goodwin, R WW | 11/16/10 | Ethane | ND | |
| | Goodwin, R WW | 11/16/10 | Ethylene | ND | |
| | Goodwin, R WW | 11/16/10 | Methane | 2.4 | |
| | Wolahan, E | 11/15/10 | Ethane | ND | Hydrant on South side of house |
| | Wolahan, E | 11/15/10 | Ethylene | ND | Hydrant on South side of house |
| | Wolahan, E | 11/15/10 | Methane | 200 | Hydrant on South side of house |
| **CBM Wells** | Rohr 04-10 | 10/11/10 | Ethane | ND | Phase 2 |
| | Rohr 04-10 | 10/11/10 | Ethylene | ND | Phase 2 |
| | Rohr 04-10 | 10/11/10 | Methane | 22000 | Phase 2 |
| | Rohr 04-10 | 11/10/10 | Ethane | 1.8 | Phase 2 |
| | Rohr 04-10 | 11/10/10 | Ethylene | ND | Phase 2 |
| | Rohr 04-10 | 11/10/10 | Methane | 14000 | Phase 2 |

ND = Not Detected

**Table 6**
**Water Well Measurements for the November 2010 Monthly Report**

| Permit Number | Name | Sampling Start Date | Last Sample | Samples Since Last Monthly Report | History (Last Updated with May 2010 Monthly Report) | If sampled, comparison of results from this period to last period |
|---|---|---|---|---|---|---|
| **Wells Within Approximately One Mile of Pumping and Injection System or of Special Interest** | | | | | | |
| 238689 | Angely | 7/5/07 | 12/8/10 | 11/3/10, 12/8/10 | Methane detected at levels >100 % LEL and above 10% CH4 by volume until approximately 4/9/08, then began dropping and reached approximately 0 by 5/28/08. Have remained at or near 0 except for jump in December 2008, March 2009 and November 2009 readings. | • % LEL decreased from 3 to 0<br>• CH4% volume decreased from 0.15 to 0<br>• O2% volume remained unchanged at 20.9<br>• CO and H2S remain unchanged at 0 ppm |
| 257994 | Barrett | 7/12/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | Methane detected at levels >100 % LEL and above 10% CH4 by volume. Levels have dropped since March 2009 but remain above 0 except for an occasional 0 reading. Occasionally (October 6, 2009 and March 16, 2010) higher levels of methane are observed. | • % LEL increased from 0 to 57 with a high of >100 noted on several occasions<br>• CH4% volume increased from 0 to 2.85 with a high of 88 noted on 11/4/10<br>• O2% decreased from 20.9 to 20.7 with a low of 19 noted on 11/2/10 and 11/12/10<br>• CO and H2S remained unchanged at 0 ppm with a H2S high of 3.5 noted on 11/12/10 and a light odor of H2S noted on 11/22/10 |
| 244403 | Bergman | 7/6/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | The methane has been variable with higher and lower values until 11/28/07 and then mostly levels at >100 %LEL and greater than 10% CH4 by volume until September 2009 when levels began to show wider variances in %LEL and CH4 of between >100 and 13.00 and as low as 0 in February 2010. | • % LEL increased from 80 to >100<br>• CH4% volume increased from 4 to 12 with a high of 25 noted on 11/4/10<br>• O2% increased from 15 to 17 with a high of 20 noted on 11/22/10 and 11/30/10<br>• CO and H2S remained unchanged at 0 ppm with a CO high of 9 and an H2S high of 1, both noted on 11/11/10 |
| 181278 | Bounds | 7/12/07 | 12/8/10 | 11/3/10, 12/8/10 | Readings from this wellhead have been consistently at or above 100 %LEL with levels of CH4% by volume near 100. This wellhead has also shown fairly consistent low levels of H2S until 6/25/08 when H2S readings became more variable with less H2S present in general. | • % LEL remained unchanged at 100<br>• CH4% volume decreased from 100 to 21<br>• O2% increased from 4.2 to 13.1<br>• CO remained unchanged at 0<br>• H2S remained unchanged at 0 ppm |
| 169043 | Burge | 3/20/09 | 12/7/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10, 12/7/10 | Methane detected at levels >100 % LEL and above 10% CH4 by volume until approximately 1/17/08, then began dropping through 3/14/08 and have remained at or near 0 since that time except for a single high reading on 7/2/08 and detectable methane on 10/1 and 10/6/09. | No change from previous measurements with 0% LEL, no detectable methane, O2% volume at 20.9 and CO and H2S at 0 ppm. O2 % volume decreases of 19.3 and 14.2 were noted on 11/2/10 and 11/4/10, respectively. |
| 267694 | Coleman | 7/5/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | Methane detected at wellhead at levels >100 % LEL and above 5% CH4 by volume until approximately 8/15/07, then began dropping with no methane detected since 10/30/07. Well vent has shown more variable and generally higher readings than the wellhead. | At the wellhead no change from previous measurements with 0% LEL, no detectable methane; O2% volume at 20.9 and CO and H2S at 0 ppm.<br>At the well vent:<br>• % LEL increased from 0 to 18 with a high of >100 noted on several occasions<br>• CH4% volume increased from 0 to 0.90 with a high of 30 noted on 11/4/10 and 11/11/10<br>• O2% decreased from 20.9 to 20.8 with a low of 0 noted on 111/30/10<br>• CO and H2S remained unchanged at 0 ppm |
| 235516 | Colorado Switzer | 7/12/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | No methane has ever been detected at this wellhead. | No change from previous measurements with 0% LEL, no detectable methane, O2% volume at 20.9 and CO and H2S at 0 ppm. |

**Table 6**
**Water Well Measurements for the November 2010 Monthly Report**

| Permit Number | Name | Sampling Start Date | Last Sample | Samples Since Last Monthly Report | History (Last Updated with May 2010 Monthly Report) | If sampled, comparison of results from this period to last period |
|---|---|---|---|---|---|---|
| 255929 | Conley | 7/11/07 | 12/6/10 | 1/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | No methane has ever been detected at this wellhead. | No change from previous measurements with 0% LEL, no detectable methane, O2% volume at 20.9 and CO and H2S at 0 ppm. |
| 260097 | Dee | 7/5/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | No methane has ever been detected at this wellhead. A potentially erroneous reading of 5%LEL occurred on 7/30/09 with no detectable methane. | No change from previous measurements with 0% LEL, no detectable methane, O2% volume at 20.9 and CO and H2S at 0 ppm. |
| 252931 | Derowitsch | 7/6/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | Methane detected at wellhead at levels approximately 100 % LEL and mostly above 5% CH4 by volume until approximately 9/4/07, then methane levels dropped to 0 and have remained at or near 0 since that time. Both the well vent and cistern have historically shown very low to 0 levels of methane.<br>Late September to December 2009 readings at the well vent indicated levels of methane although the wellhead and cistern showed no detectable methane during that time period. | At the wellhead and well vent no change from previous measurements with 0% LEL, no detectable methane, O2% volume at 20.9 and CO and H2S at 0 ppm.<br>At the cistern:<br>• % LEL remained unchanged at 0 with a high of >100 noted on 11/4/10 and 11/12/10<br>• CH4% volume remained unchanged at 0 with a high of 5 noted on 11/4/10, 11/11/10, and 11/12/10<br>• O2% remained unchanged at 20.9 with a low of 20.8 noted on 11/4/10, 11/11/10, and 11/12/10<br>• CO remained unchanged at 0<br>• H2S remained unchanged at 0 ppm with a high of 15.5 noted on 11/4/10 and a light odor noted on 11/15/10 and 12/6/10 |
| 235515 | English | 8/16/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/16/10, 11/22/10, 12/6/10 | No methane has ever been detected at this wellhead. | No change from previous measurements at the wellhead and cistern with 0% LEL, no detectable methane, O2% at 20.9 and no CO or H2S. |
| 16861-F | Golden Cycle Land | 7/12/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | Readings initially showed methane at 100% LEL and greater than 20% by volume CH4, but dropped to 0 by 9/24/07 and remained at 0 (with two readings above 0 on 11/16/07 and 4/23/08) until 10/20/08. Starting 10/20/08 methane was once again detected at higher values along with CO at high levels and showings of H2S. | • %LEL remained unchanged at >100<br>• CH4% volume increased 39 to 66 with a high of 100 noted on 11/30/10<br>• O2% remained unchanged at 0<br>• CO decreased from 150 to 125 with a high of 239 on 11/15/10<br>• H2S decreased from 8.5 to 5.5 with a low of 3.5 on 11/12/10 |
| 253317 | Gonzalez | 7/12/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | No methane has ever been detected at this wellhead. | No change from previous measurements at the wellhead with 0% LEL, no detectable methane, O2% at 20.9 and no CO or H2S. |

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**Water Well Measurements for the November 2010 Monthly Report**

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|---|---|---|---|---|---|---|
| 256504 | Hopke | 7/5/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | Readings consistently measure methane at >100% LEL and at values of CH4% by volume fairly consistently above 20 until late 2009 when levels dropped to between 10 and 20. The well has shown an overall slow decline in CH4 % by volume over time. H2S also has shown a decline over time such that most recent readings have been at or slightly above 0. No methane has ever been detected at the cistern. | At the wellhead:<br>• % LEL remained unchanged at >100<br>• CH4% volume increased from 15 to 16 with a high of 70 on 11/30/10<br>• O2% volume increased from 14.3 to 16 with a high of 17.9 noted on 11/12/10<br>• CO remained unchanged at 0 ppm H2S remained at 0 with a high of 50 noted on 11/2/10 and a light odor noted on 11/12/10, 11/15/10, 11/22/10<br>At the cistern: no changes from previous measurements with 0% LEL, no detectable methane, O2% volume at 20.9 and CO and H2S at 0 ppm. |
| 236272 | Houghtling | 7/6/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | Methane levels at this wellhead have been consistently >100% LEL with CH4% by volume fairly consistently above 20 with an occasional lower values (but not 0).<br>No methane has ever been detected at the cistern. | At the wellhead:<br>• % LEL remained unchanged at >100<br>• CH4% volume increased from 80 to 100<br>• O2% volume decreased from 1 to 0<br>• CO and H2S remained unchanged at 0<br>At the cistern: no changes from previous measurements with 0% LEL, no detectable methane, O2% volume at 20.9 and CO and H2S at 0 ppm. |
| 35292 | Kerman/Hanson | 7/6/07 | 12/3/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | Values at this wellhead have been at or near 0 with two readings of >100% LEL and greater than 5% by volume CH4 on 12/2/08 and 12/22/08 and detectable methane readings in July, August and December 2009.<br>No methane has ever been detected at the cistern. | No change from at the wellhead or cistern with 0% LEL, no detectable methane, O2% at 20.9 and no CO2 or H2S. |
| | Lively 10-02 | 12/22/2008 | 12/8/10 | 12/8/10 | Readings from this well started with mostly 0 to low levels of methane but have been moving upward with late 2009 readings showing detectable levels more consistently with some readings as high as >100 % LEL. CH4% volume remains below 5%. Some non detectable readings still also occur with early 2010 showing lower overall readings and many non detect readings. | • % LEL increased from 0 to 15<br>• CH4% increased from 0 to 0.75<br>• O2% increased from 20 to 20.7<br>• CO increased from 0 to 500<br>• H2S increased from 0 to 10.5 |
| 222539 | Lively | 7/6/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane, O2% at 20.9 and no CO2 or H2S. |
| 16861-F | Masters #1 | 8/13/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | No methane has ever been detected at this wellhead. | No change from previous measurements with 0% LEL, no detectable methane, O2% volume at 20.9 and CO and H2S at 0 ppm. |
| 271136 | May | 7/12/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane, O2% at 20.9 and no CO2 or H2S. |

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|---|---|---|---|---|---|---|
| 84108-A | McPherson | 7/6/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane, O2% at 20.9 and no CO2 or H2S. |
| 84106 | Rohr | 7/06/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane, O2% at 20.9 and no CO2 or H2S. |
| 123144 | Searle | 7/11/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/12 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane, O2% at 20.9 and no CO2 or H2S. |
| 239657 | Smith | 7/5/07 | 12/6/10 | 11/2/10, 11/4/10, 11/11/10, 11/12/10, 11/15/10, 11/19/10, 11/22/10, 11/24/10, 11/30/10, 12/3/10, 12/6/10 | Detectable methane in early readings with % LEL at 100 or greater and % by volume of CH4 at up to 100. Began showing some variability in readings on 9/9/07 eventually decreasing until levels at 0 beginning 5/5/08. Three readings since that time on 5/21/08, 10/27/08 and 7/13/09 have shown >100% LEL and CH4 % by volume at or above 5. October 2009 reading showed low levels (18% LEL and 0.9% CH4 by volume). | At the well head and cistern no change from previous measurements with 0% LEL, no detectable methane, O2% volume at 20.9 and CO and H2S at 0 ppm.<br>At the well vent:<br>• % LEL remained unchanged at >100<br>• CH4% volume decreased from 22 to 12 with a high of 30 noted on 11/4/10<br>• O2% volume increased from 14 to 16 with a high of 20.6 noted on 11/19/10<br>• CO and H2S remained unchanged at 0 ppm |
| | BLM 15-12 | 6/1/09 | 12/7/10 | 12/7/10 | Detectable methane with >100% LEL and CH4 % volume of greater than 70 and limited O2% volume. | • % LEL remained unchanged at >100<br>• CH4% volume increased from 45 to 95<br>• O2% volume remained unchanged at 0<br>• CO remained unchanged at 0 ppm<br>• H2S increased from 0 to 3 |
| **Wells Within or in Close Proximity to River Ridge Ranch Subdivision** | | | | | | |
| 249362 | Andexler | 9/9/07 | 12/8/10 | 12/8/10 | Several readings (3/25/09, 7/30/09 and October 2009) have shown less the 0.25% CH4 methane, otherwise no detectable methane. | No change from last measurement with 0% LEL, no detectable methane, O2% at 20.9 and no CO2 or H2S. |
| 215706 | Brice | 7/12/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 248680 | Campbell | 8/14/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 20783 | Goemmer Cattle | 7/12/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane, O2% at 20.9 and no CO2 or H2S. |
| 258815 | Goodwin | 7/12/07 | 11/16/10 | 11/16/10 | Readings have shown methane levels at or near 0 with no readings above 0 from late January 2009 through October 2009. November 2009 through February showed 2010 showed low levels of methane. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |

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|---|---|---|---|---|---|---|
| 249181 | Hentschel | 9/9/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 259122 | Higgins | 9/26/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 269435 | Hoppe (formerly Goacher) | 7/11/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 264581 | Ireland | 7/12/07 | 12/8/10 | 12/8/10 | Typically no methane, but methane has been detected on 12/2/08, 12/22/08, and 1/6/09 with 100% or greater LEL and 5% by volume CH4. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| | Lang | 10/29/07 | 7/28/08 | None | No methane has ever been detected at this wellhead. | Sampling attempted 12/8/10 but gate was locked. |
| 93386 | Lowry | 7/12/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane, O2% at 20.9 and no CO2 or H2S. |
| 250369 | Martin | 7/12/07 | 10/22/10 | None | No methane has ever been detected at this wellhead. | Sampling attempted 12/8/10 but gate was locked. |
| 248862 | Meyer | 8/14/07 | 12/7/10 | 12/7/10 | Methane levels generally at >100% LEL and CH4 % by volume of greater than 5. Readings were a bit variable with some lower methane levels until 5/22/08 and then became consistently >100% LEL and CH4% by volume greater than 5. | • % LEL remained unchanged at >100<br>• CH4% volume increased from 25 to 27<br>• O2% volume increased from 15.5 to 16.5<br>• CO and H2S remained unchanged at 0 ppm |
| 192203 | Rankins | 7/12/07 | 6/21/10 | None | No methane has ever been detected at this wellhead. | Sampling attempted 12/8/10 but gate was locked. |
| 276994 | Rhodes | 9/9/08 | 12/8/10 | 12/8/10 | Slight LEL (5%) reported 7/30/09, but no methane detected. No methane has been detected previously or since at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 274468 | Roloff | 9/9/07 | 8/7/10 | None | No methane had ever been detected at this wellhead except for low levels detected in the 8/25/09 measurement. | Sampling attempted 912/8/10 but gate was locked. |
| 254577 | Ryerson | 9/9/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 246775 | Sharp | 9/9/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 267695 | Speh | 9/4/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | • % LEL increased from 0 to 5<br>• CH4% volume increased from 0 to 0.25<br>• O2% volume decreased from 20.9 to 20.8<br>• CO and H2S remained unchanged at 0 ppm |
| 230572 | Willis | 7/11/07 | 12/7/10 | 12/7/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 240947 | Wolahan | 7/12/07 | 11/15/10 | 11/15/10 | No detectable methane except 5/21/08, 1/27/09 and 2/9/09 with levels at 5% LEL and 0.25% by volume CH4. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| **City Ranch and Other Properties** | | | | | | |
| | Andreatta/ Carsella | 8/14/07 | 3/17/10 | None | No methane has ever been detected at this wellhead. | Not measured during this reporting period. |
| 197472 | Bartlett | 8/15/07 | 12/3/10 | 12/3/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |

**Table 6**
**Water Well Measurements for the November 2010 Monthly Report**

| Permit Number | Name | Sampling Start Date | Last Sample | Samples Since Last Monthly Report | History (Last Updated with May 2010 Monthly Report) | If sampled, comparison of results from this period to last period |
|---|---|---|---|---|---|---|
| 210526 | Bruington | 8/7/07 | 12/8/10 | 12/8/10 | From start of reading to November 2009 wellhead readings have shown consistent levels of methane at >100% LEL and CH4 % by volume at greater than 50. Since November 2009 overall %LEL and CH4% volume have decreased. With no detectable methane in March 16, 2010 reading.<br>Some CO and H2S readings in mid to late 2008 but current readings have shown little to no CO and H2S. No methane has ever been detected at the cistern. | • % LEL decreased from 20 to 12<br>• CH4% volume decreased from 1 to 0.60<br>• O2% volume increased from 18.5 to 20<br>• CO remained unchanged at 0 ppm<br>• H2S increased from 0 to 1.5 |
| 220100 | Cordova | 10/30/07 | 12/8/10 | 12/8/10 | Initial readings were variable with readings as low as 0 and as high as >100% LEL and greater the 5% CH4 by volume. After 3/14/08 mostly readings at 0 with some readings at levels slightly above 0. Since March 2009 no detectable methane. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 191079 | Brian Dale | 8/15/07 | 12/8/10 | 12/8/10 | Variability between 0 and >100% LEL and 5% or greater CH4 by volume until 11/14/08 and since that time no methane has been detected. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 193092 | Degan | 8/25/08 | 12/8/10 | 12/8/10 | Initial readings were variable between 0 and >100% LEL and 5% by volume CH4. From 2/17/09 to March 2010 there was no detectable methane. | • % LEL increased from 0 to 5<br>• CH4% volume increased from 0 to 0.25<br>• O2% volume decreased from 20.9 to 20<br>• CO remained unchanged at 0 ppm<br>• H2S increased from 0 to 1 |
| | Dernell | 8/15/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 258651 | Gonzalez | 5/22/08 | 12/3/10 | 12/3/10 | Methane readings were >100% LEL and CH4 % by volume mostly above 20. From 4/9/09 to 7/13/09 values were reduced with % LEL below 50 and CH4 % by volume below 3. From 7/30/09 reading to present values are variable with >100 for one or more readings and then reduced to as low as 0 for one or more readings.<br>There has been no detectable methane at the cistern. | • % LEL increased from 0 to 5<br>• CH4% volume increased from 0 to 0.25<br>• O2% volume decreased from 20.9 to 20.6<br>• CO and H2S remained unchanged at 0 |
| | Haupt #1 | 6/1/09 | 12/7/10 | 12/7/10 | Until December 2009 all readings but one have shown % LEL at >100 with CH4 % by volume at 11 or less. Beginning with December 2009 reading there have been several large variations in readings ranging from >100 to 0 %LEL and 5 to 0 %CH4 by volume. | • % LEL remained unchanged at >100<br>• CH4% volume increased from 5 to 22<br>• O2% volume increased from 0 to 14.4<br>• CO and H2S remained unchanged at 0 ppm |
| 203536 | Hurley | 8/2/07 | 12/7/10 | 12/7/10 | Readings have fairly consistently shown >100% LEL and CH4 % by volume between 10 and 50 with several much lower readings, most recently in July and October 2009 and March 2010. H2S has also been measured, but starting around 9/08 values have been reduced to at or near 0 ppm. | • % LEL remained at >100<br>• CH4% volume remained unchanged at 16<br>• O2% volume increased from 11.5 to 20.1<br>• CO and H2S remained unchanged at 0 ppm |

**Table 6**
**Water Well Measurements for the November 2010 Monthly Report**

| Permit Number | Name | Sampling Start Date | Last Sample | Samples Since Last Monthly Report | History (Last Updated with May 2010 Monthly Report) | If sampled, comparison of results from this period to last period |
|---|---|---|---|---|---|---|
| 205195 | Johnson | 8/15/07 | 12/8/10 | 12/8/10 | Readings have shown mostly low values of methane (% LEL less than 20 and CH4 % by volume less than 1) with 0 values. The number of non detectable methane reading has shown a general increase since late 2008. | • % LEL increased from 0 to 5<br>• CH4% volume increased from 0 to 0.25<br>• O2% volume decreased from 20.9 to 20.2<br>• CO rand H2s remained unchanged at 0 ppm |
| 193520X | McEntee | 8/2/07 | 12/6/10 | 12/6/10 | Initially methane was detected at this wellhead at values of >100% LEL and greater than 10% by volume CH4. Starting 1/28/08 values dropped to at or near 0 with only one higher value on 2/17/09 (>100% LEL and 5% By volume CH4). Mostly no detectable methane since that time with two low level detections; one on 4/22/09 and one on 10/20/09. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 191345 | Pennington | 8/7/09 | 12/8/10 | 12/8/10 | Four readings have occurred at this well; showing detectable methane at levels of >100% LEL and CH4% by volume at 15 or less except for 10/20/09 reading which showed lower methane levels (25% LEL and 1.25% CH4 by volume).. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 121013 | Schafer | 8/15/07 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 248983 | Tobyas | 8/3/07 | 12/7/10 | 9/17/10, 12/7/10 | Historically this wellhead has shown wide variance between 0 and higher methane values of >100% LEL and greater than 5% by volume CH4 with no discernable long term trends. | • % LEL increased from 87 to >100<br>• CH4% volume increased from 5 to 13 with a high of 16 noted on 9/17/10<br>• O2% volume decreased from 17.7 to 17.5 with a high of 18.5 noted on 9/17/10<br>• CO volume remained at 0<br>• H2S decreased from 1.5 to 0 with a light odor noted on 9/17/10 |
| **Silver Spurs Ranch** | | | | | | |
| 268180 | Billstrand | 8/12/08 | 10/20/10 | None | No methane has been detected at this wellhead except for low readings on 5/6/09 and 1/10/10. | Sampling attempted 12/8/10 but gate was locked. |
| 215807 | Brown | 12/8/08 | 12/7/10 | 12/7/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 222294 | Cramer | 8/3/07 | 12/8/10 | 12/8/10 | Most methane readings have been at or near 0 with periodic higher readings. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 192509 | Eddleman, Paul | 1/17/08 | 12/7/10 | 12/7/10 | Readings mostly above >100% LEL and 5% by volume CH4 until 9/23/08 and then levels dropped to mostly 0 until 1/26/09. Since 1/26/09 readings have shown wide variability between low to 0 methane and >100% LEL and greater than 5% by volume methane. Since 6/9/09 methane levels have been more consistently higher. | • % LEL increased from 0 to >100<br>• CH4% volume increased from 0 to 20<br>• O2% volume decreased from 20.9 to 16.25<br>• CO volume increased from 0 to 10<br>• H2S increased from 0 to 0.5 |
| 226536 | Eddleman, Todd | 1/17/08 | 12/8/10 | 9/20/10, 10/20/10, 12/8/10 | Methane readings have been widely variable from 0 to >100% LEL and 5% by volume CH4. | • % LEL increased 0 to >100<br>• CH4% volume increased from 0 to 19<br>• O2% volume decreased from 20.9 to 19.8<br>• CO volume remained at 0<br>• H2S increased from 0 to 3 |

**Table 6**
**Water Well Measurements for the November 2010 Monthly Report**

| Permit Number | Name | Sampling Start Date | Last Sample | Samples Since Last Monthly Report | History (Last Updated with May 2010 Monthly Report) | If sampled, comparison of results from this period to last period |
|---|---|---|---|---|---|---|
| 221465 | Evenden | 8/2/07 | 12/8/10 | 12/8/10 | Methane readings have generally been at or near 0 with no detectable methane since 3/24/09 and one higher reading on 1/12/09 (>100% LEL and 5% by volume methane). | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| | Fischer | 1/26/09 | 12/8/10 | 12/8/10 | Only two readings have detected low levels of methane (2/17/09 and 2/18/10), other readings have not detected methane. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 214145A | Fitzner | 11/18/08 | 12/8/10 | 12/8/10 | Methane levels have been generally at 0 but occasionally shows wide swings to >100 % LEL and 5 % CH4 by volume. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 31935 | Garza-Vela | 1/30/08 | 12/5/10 | 12/5/10 | Generally there is 0 to low methane levels except for an occasional low level reading. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 196372 | Geiselbrecht | 8/12/08 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 246350 | Gumpert | 7/29/08 | 12/8/10 | 12/8/10 | Methane readings have been widely variable with most readings either 0 or >100% LEL and 5% by volume CH4. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 196371 | Lyon | 8/15/07 | 12/8/10 | 12/8/10 | Between 2007 and mid-2009 most methane readings have been at or near 0 with higher values of >100% LEL and 5% by volume CH4 on 5/22/08 and 4/22/09. Beginning in June of 2009 methane has been more regularly detected. | • % LEL increased from 0 to >100<br>• CH4% volume increased from 0 to 13<br>• O2% volume decreased from 18.8 to 6.4<br>• CO remained unchanged at 0<br>• H2S increased from 0 to 3 |
| 271524-A | Modlish | 1/30/08 | 12/8/10 | 12/8/10 | Most methane readings have been at or near 0 with higher values of >100% LEL and 5% by volume CH4 on 10/21/08 and 5/20/09. | No change from last measurement with 0% LEL, ,O2% at 20.9 and no CO2 or H2S, except that O2% volume decreased from 20.9 to 14.8 |
| 28093MH | Morine | 9/10/08 | 12/8/10 | 12/8/10 | Only on reading above 0 has been detected at this wellhead. This reading occurred 1/12/09 and showed 5% LEL and 0.25% by volume CH4. | • % LEL remained unchanged at 0<br>• CH4% volume remained unchanged at 0<br>• O2% volume decreased from 20.9 to 16.4<br>• CO volume remained at 0<br>• H2S increased from 0 to 1.5 |
| 35227MH | Morris | 10/8/08 | 12/8/10 | 12/8/10 | Methane readings swing widely between 0 and 100 % LEL and 0.00 and 5.00 % CH$ by volume. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 190327 | Palmer | 8/12/08 | 12/8/10 | 12/8/10 | No methane was ever been detected at this wellhead until low levels were detected in 10/19/09 and 11/6/09 readings and again on 1/19/2010. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 197128 | Roberts | 4/08/08 | 12/8/10 | 12/8/10 | Methane readings have historically been widely variable from 0 to >100% LEL and 5% by volume CH4. | No change from last measurement with 0% LEL, O2% at 20.9 and no CO2 or H2S, except that O2% volume decreased from 20.9 to 18.8 |
| 271748 | Sample | 3/10/08 | 12/8/10 | 12/8/10 | Until July 2009 most of the readings from this wellhead have been no or low levels of detectable methane with higher readings on 5/22/08, 6/3/08, and 5/20/09. More consistent methane readings have occurred beginning in July 2009. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |

**Table 6**
**Water Well Measurements for the November 2010 Monthly Report**

| Permit Number | Name | Sampling Start Date | Last Sample | Samples Since Last Monthly Report | History (Last Updated with May 2010 Monthly Report) | If sampled, comparison of results from this period to last period |
|---|---|---|---|---|---|---|
| 192144 | Snow | 8/2/07 | 12/8/10 | 12/8/10 | No measurable methane until 10/4/07, then widely variable levels ranging from 0 to >100% LEL and 5% by volume CH4 with no discernable trends. | • % LEL increased from 0 to >100<br>• CH4% volume increased from 0 to 5<br>• O2% volume decreased from 20.9 to 14.5<br>• CO remained unchanged at 0 ppm<br>• H2S increased from 0 to 3 |
| 213070 | Stephens | 8/12/08 | 12/8/10 | 12/8/10 | No methane had ever been detected at this wellhead except for low levels detected on 10/19/09. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 261753 | Wahl | 8/5/09 | 8/7/10 | None | No methane has ever been detected at this wellhead. | Sampling attempted 12/8/10 but gate was locked. |
| 234839 | Waltz | 8/12/08 | 12/8/10 | 12/8/10 | No methane has ever been detected at this wellhead. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 234836 | White, Jim | 1/4/08 | 12/8/10 | 12/8/10 | Methane levels have been widely variable between no detectable methane and methane levels at >100% LEL and 5% by volume CH4 with no discernable trends.<br>No methane has ever been detected at the cistern. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 219376 | White, Orlie | 8/2/07 | 12/8/10 | 12/8/10 | Methane values historically at low to 0 with higher values on 5/22/08 and from 9/10/08 to 10/29/08. Four detectable methane readings in 2009; on 3/26, 9/29, 10/19 and 12/17. In 2010 detectable methane appears to be increasing. | • % LEL increased from 0 to >100<br>• CH4% volume increased from 0 to 7<br>• O2% volume decreased from 20.9 to 3.3<br>• CO remained unchanged at 0 ppm<br>• H2S increased from 0 to 2 |
| **Black Hawk Ranch** | | | | | | |
| 218719 | Goza | 1/14/09 | 12/9/10 | 12/9/10 | No methane has ever been detected at this wellhead except for 1/19/10 and 3/1710 readings. | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 206745 | Harbecke | 6/11/10 | 12/9/10 | 12/9/10 | | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |
| 235757 | Klein, Phyllis | 10/14/10 | 12/8/10 | 12/8/10 | | No change from last measurement with 0% LEL, no detectable methane,O2% at 20.9 and no CO2 or H2S. |

**Table 7**
**Methane Readings Schedule**
**(9 August 2010)**

| Landowner | Subdivision | Water Level | Cistern | Bi-Monthly | Monthly | Quarterly | Bi-Weekly |
|---|---|---|---|---|---|---|---|
| **Monitoring Within 1 Mile Radius or of Special Interest** | | | | | | | |
| **Kathy Dee** | River Ridge | | | | | | X |
| **R. Gonzalez** | River Ridge | | | | | | X |
| **McPherson** | River Ridge | | | | | | X |
| **Rohr** | River Ridge | | | | | | X |
| **Houghtling** | River Ridge | | X | | | | X |
| **Kent Smith** | River Ridge | | X | | | | X |
| **Bergman** | River Ridge | | | | | | X |
| **Lively** | River Ridge | | | | | | X |
| **Kerman** | River Ridge | | X | | | | X |
| **Conley** | River Ridge | | | | | | X |
| **Searle** | River Ridge | | | | | | X |
| **Derowitsch** | River Ridge | | X | | | | X |
| **Colorado-Switzer** | River Ridge | | | | | | X |
| **English** | River Ridge | | X | | | | X |
| **Golden Cycle Land (Goemmer)** | River Ridge | | | | | | X |
| **Burge** | La Veta Pines | | | | | | X |
| **Barrett** | River Ridge | | | | | | X |
| **Hopke** | River Ridge | | X | | | | X |
| **Masters #1** | River Ridge | | | | | | X |
| **Coleman** | River Ridge | | | | | | X |
| **BLM 15-12** | La Veta Pines | | | | X | | |
| **Lively 10-02** | River Ridge | | | X | | | |

| Table 7<br>Methane Readings Schedule<br>(9 August 2010) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Landowner** | **Subdivision** | **Water Level** | **Cistern** | **Bi-Monthly** | **Monthly** | **Quarterly** | **Bi-Weekly** |
| **River Ridge Ranch** | | | | | | | |
| **Wolahan** | River Ridge | | X | | X | | |
| **Martin** | River Ridge | | | | X | | |
| **Speh** | River Ridge | | | | X | | |
| **Lang** | River Ridge | | X | | | X | |
| **Roloff** | River Ridge | X | | | X | | |
| **Hoppe (Goacher)** | River Ridge | | | | X | | |
| **May** | River Ridge | | | | | | X |
| **Brice** | River Ridge | | | | X | | |
| **Goodwin** | River Ridge | | X | | X | | |
| **Ireland** | River Ridge | | | | X | | |
| **Andexler** | River Ridge | | X | | X | | |
| **Sharp** | River Ridge | | X | | X | | |
| **Ryerson** | River Ridge | X | | | X | | |
| **Meyers** | River Ridge | | | X | | | |
| **Hentschel** | River Ridge | | | | X | | |
| **Rankins** | River Ridge | | | | | X | |
| **Lowry** | River Ridge | | | | | X | |
| **Goemmer Cattle** | River Ridge | | | | | X | |
| **Higgins** | River Ridge | X | | | X | | |
| **Campbell** | River Ridge | | | | X | | |
| **Rhodes** | River Ridge | | | | X | | |
| **City Ranch** | | | | | | | |
| **T. Gonzalez** | City Ranch | X | X | X | | | |
| **Hurley** | City Ranch | X | X | | X | | |
| **Tobyas** | City Ranch | | | X | | | |

| Table 7<br>Methane Readings Schedule<br>(9 August 2010) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Landowner** | **Subdivision** | **Water Level** | **Cistern** | **Bi-Monthly** | **Monthly** | **Quarterly** | **Bi-Weekly** |
| **Dale** | City Ranch | | | | X | | |
| **McEntee** | City Ranch | | | | X | | |
| **Johnson** | City Ranch | | X | | X | | |
| **Cordova** | City Ranch | | | X | | | |
| **Dernell** | City Ranch | | | | X | | |
| **Schaefer** | City Ranch | | | | | X | |
| **Bruington** | City Ranch | | X | X | | | |
| **Bartlett** | City Ranch | | | | | X | |
| **Pennington – Birkman** | City Ranch | | | | X | | |
| **HAUPT #1** | City Ranch | | | | X | | |
| **Deagan** | City Ranch | | | | | X | |
| **Bear Creek/Silver Spurs** | | | | | | | |
| **Andreatta/Carsella** | Bear Creek | | | | X | | |
| **Orlie White** | Silver Spurs | X | | | X | | |
| **Evenden** | Silver Spurs | | | | X | | |
| **Roberts** | Silver Spurs | | | | X | | |
| **Snow** | Silver Spurs | X | | | X | | |
| **Cramer** | Silver Spurs | X | X | | X | | |
| **Lyon** | Silver Spurs | | | | X | | |
| **Jim White** | Silver Spurs | | X | | X | | |
| **Garza-Vela** | Silver Spurs | | | | X | | |
| **Modlish** | Silver Spurs | | | | X | | |
| **Todd Eddleman** | Silver Spurs | | | | X | | |
| **Paul Eddleman** | Silver Spurs | | | | X | | |
| **Sample** | Silver Spurs | | X | | X | | |
| **Billstrand** | Silver Spurs | | | | X | | |

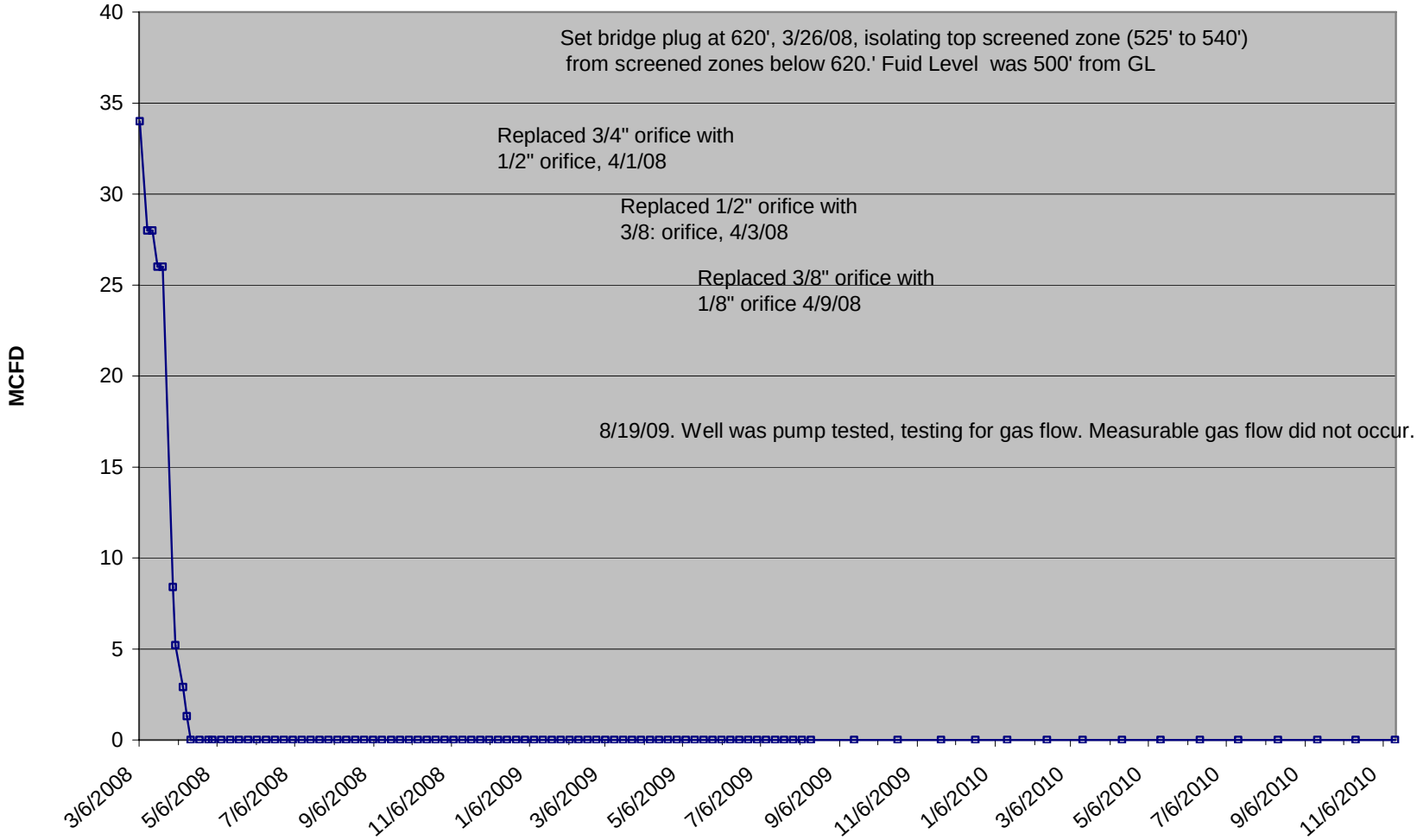
| Table 7<br>Methane Readings Schedule<br>(9 August 2010) | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Landowner** | **Subdivision** | **Water Level** | **Cistern** | **Bi-Monthly** | **Monthly** | **Quarterly** | **Bi-Weekly** |
| **Waltz** | Silver Spurs | | | | X | | |
| **Stephens** | Silver Spurs | | | | X | | |
| **Palmer (G/S)** | Silver Spurs | | | | X | | |
| **Geoselbrecht** | Silver Spurs | | | | X | | |
| **Morine** | Silver Spurs | | | | X | | |
| **Morris** | Silver Spurs | | | | | X | |
| **Brown** | Silver Spurs | X | | | X | | |
| **Fitzner** | Silver Spurs | | | | X | | |
| **Fischer** | Silver Spurs | | | | | X | |
| **Wahl** | Silver Spurs | | | | X | | |
| **Black Hawk Ranch** | | | | | | | |
| **Goza** | Black Hawk | | | | X | | |

**Rohr will be checked Quarterly with Rankin, Lowry, and Goemmer Cattle.**
**John Fischer location is a mine vent. If possible vent will be monitored with RMLD quarterly.**

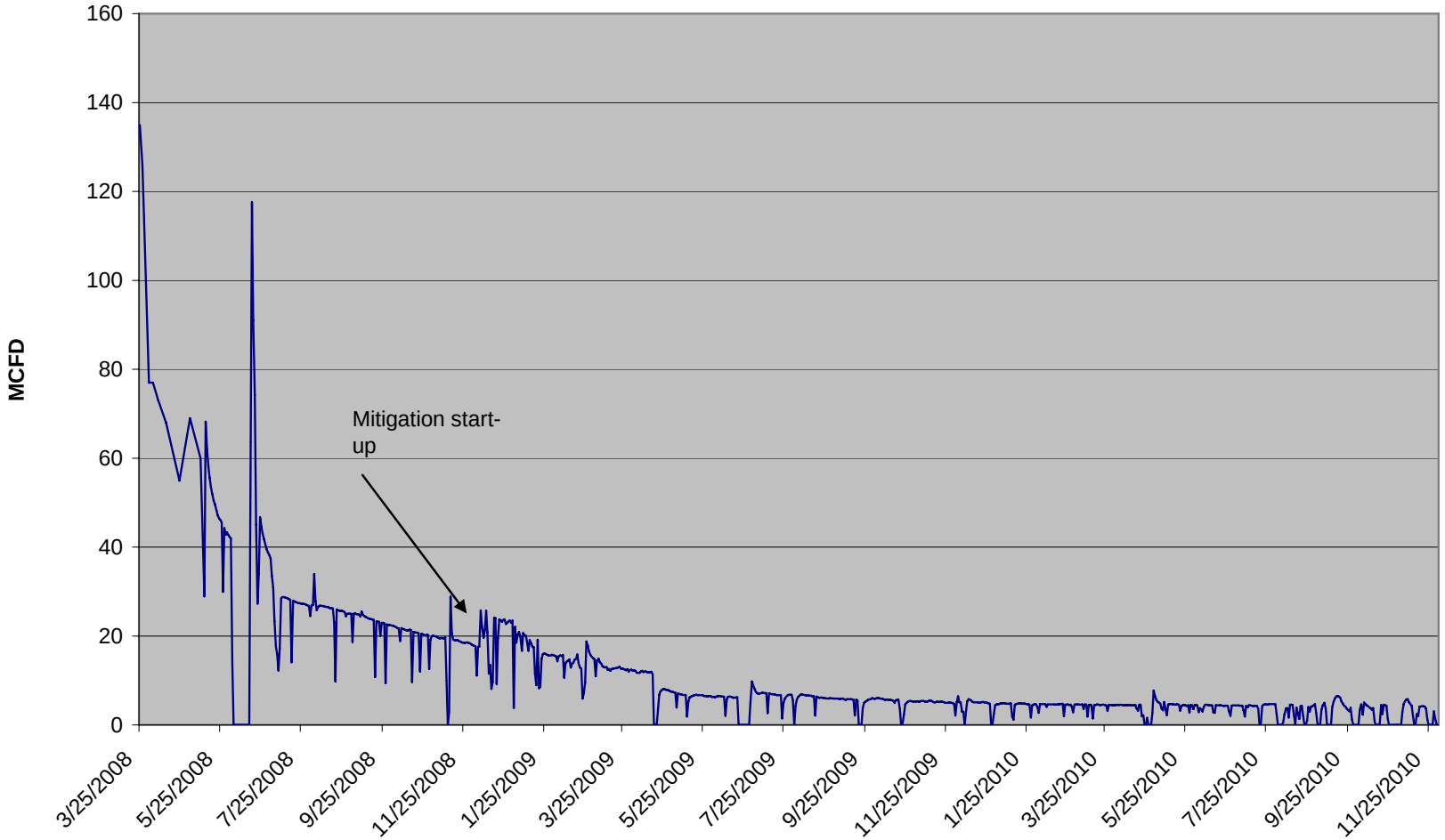
| Table 8<br>Residences Receiving Water | |
|---|---|
| | |
| Jerry Angely | Has received water provided by PEI |
| Kent Smith | Has received water provided by PEI |
| Alan Cramer | Has received water provided by PEI |
| Tom Gonzales | Has received water provided by PEI |
| Spencer/Carol Snow | Has received water provided by PEI |
| Bruington | Has received water provided by PEI |
| Todd Eddleman | Has received water provided by PEI |
| Paul Eddleman | Has received water provided by PEI |
| Jim White | Has received water provided by PEI |
| Edward Lyon | Has received water provided by PEI |
| Donald Sharp | Has received water provided by PEI |
| Edward Johnson | Has received water provided by PEI |
| Richard McEntee | Has received water provided by PEI |
| P.C. Roberts | Has received water provided by PEI |
| Ireland-Murphy | Has received water provided by PEI |
| Keith Lightcap | Has received water provided by PEI |
| Bounds | To date has not received water provided by PEI |
| Houghtling | Added to the list in January 2010 |
| Betty and Katherine Morris | Added to the list in September 2010 |

**Attachment 1**
**Gas Flow in Monitoring Well POCI 55, Recovery 1 Kittleson,**
**Recovery 3 PEI and Recovery 4 Barrett**

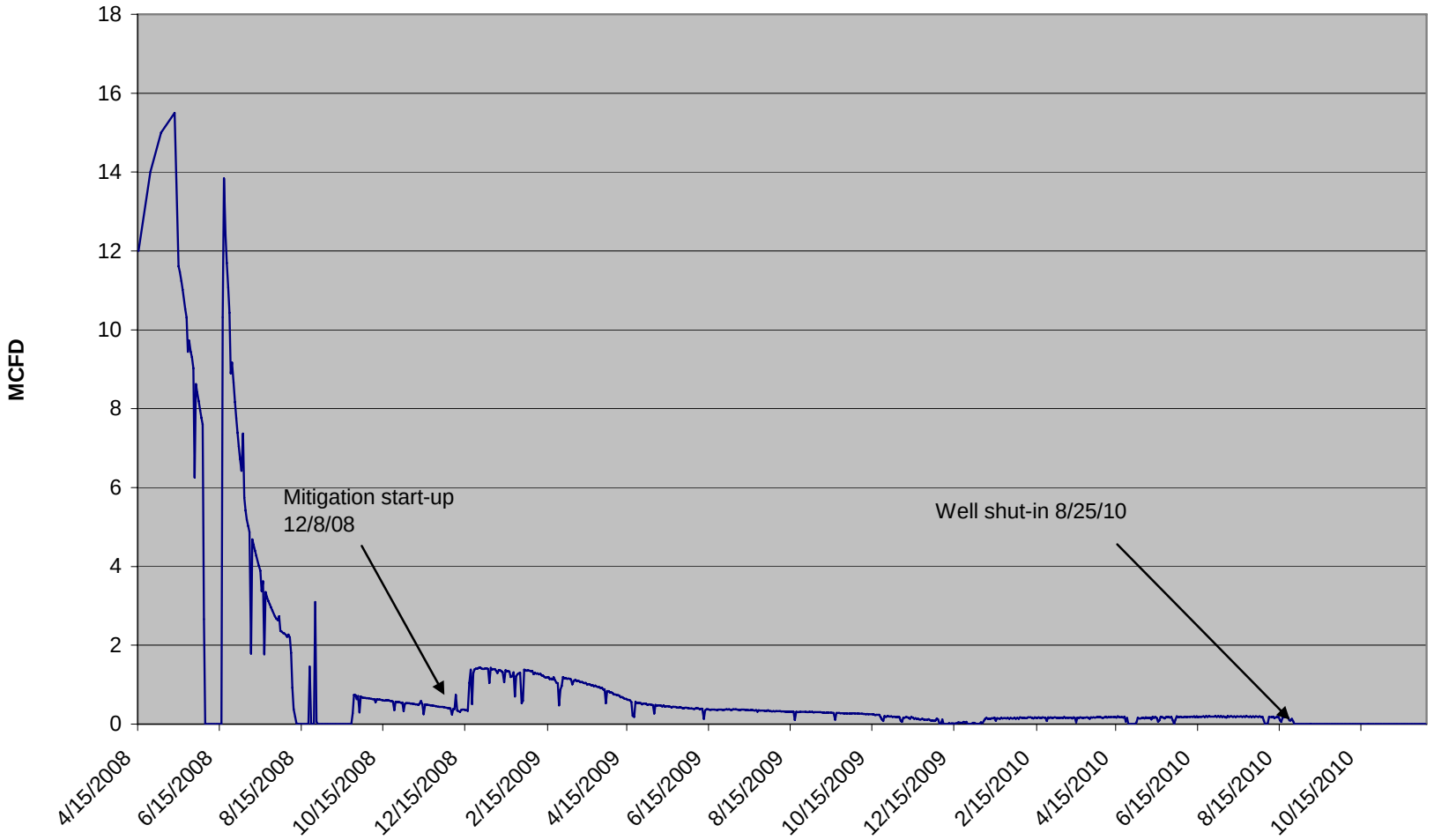
## POCI 55 MW Gas Flow from 3/6/08 to 11/15/10



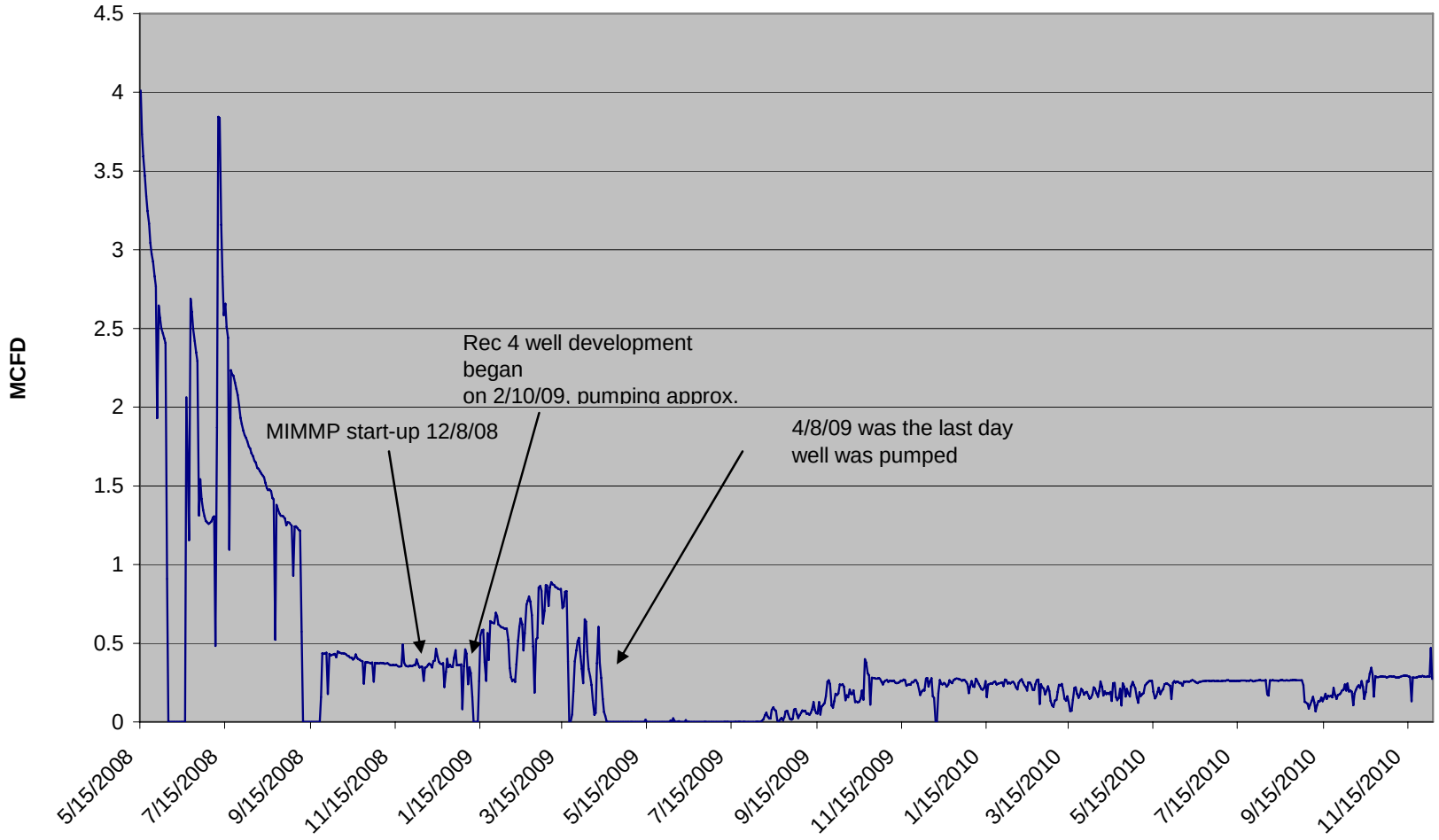
**Recovery 1 Kittleson Gas Flow**
**from 3/25/08 to 12/2/10**



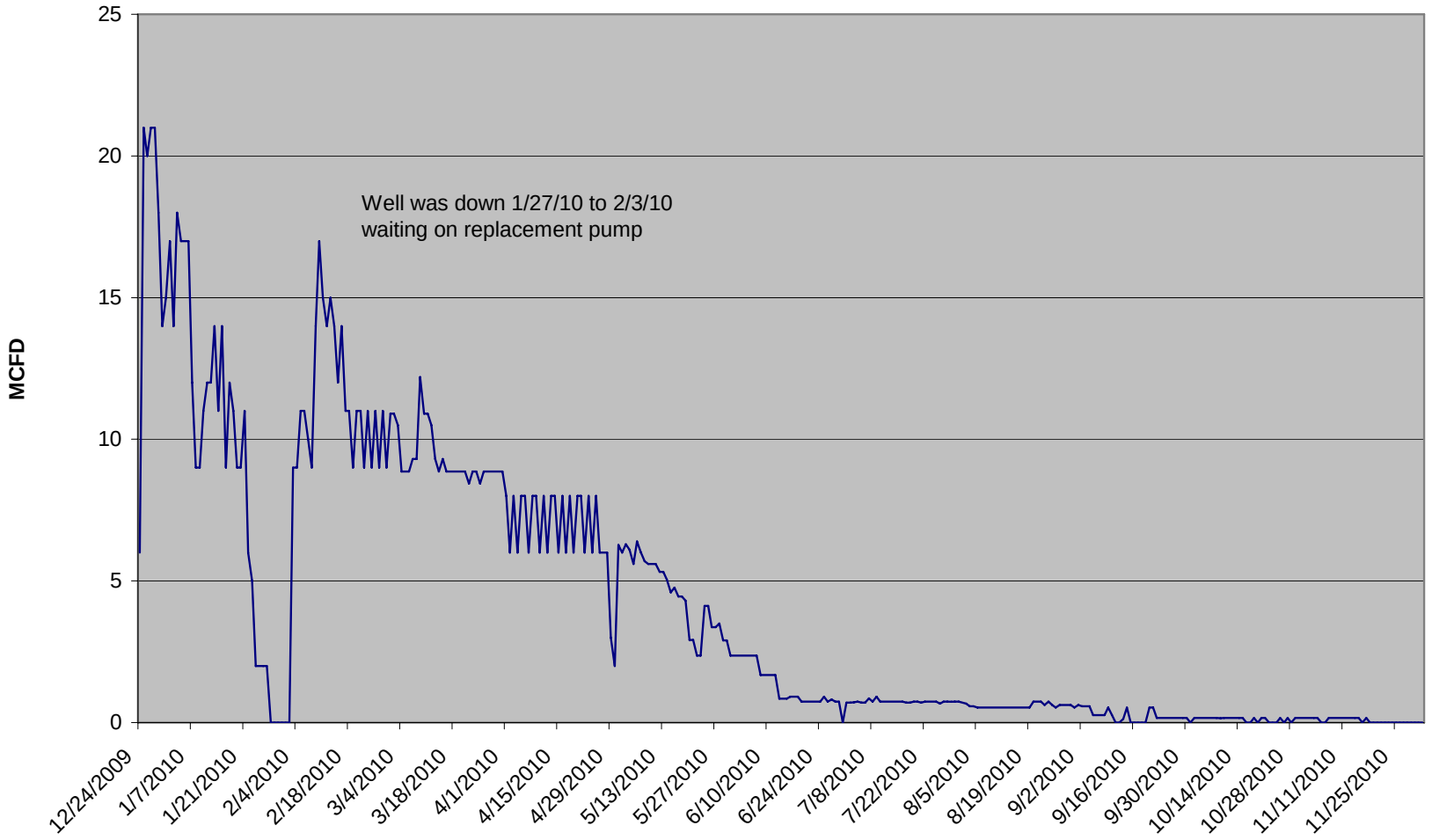
**Recovery 3 PEI Gas Flow**
**from 4/15/08 to 12/2/10**



**Recovery 4 Barrett Gas Flow**
**from 5/15/08 to 12/2/10**

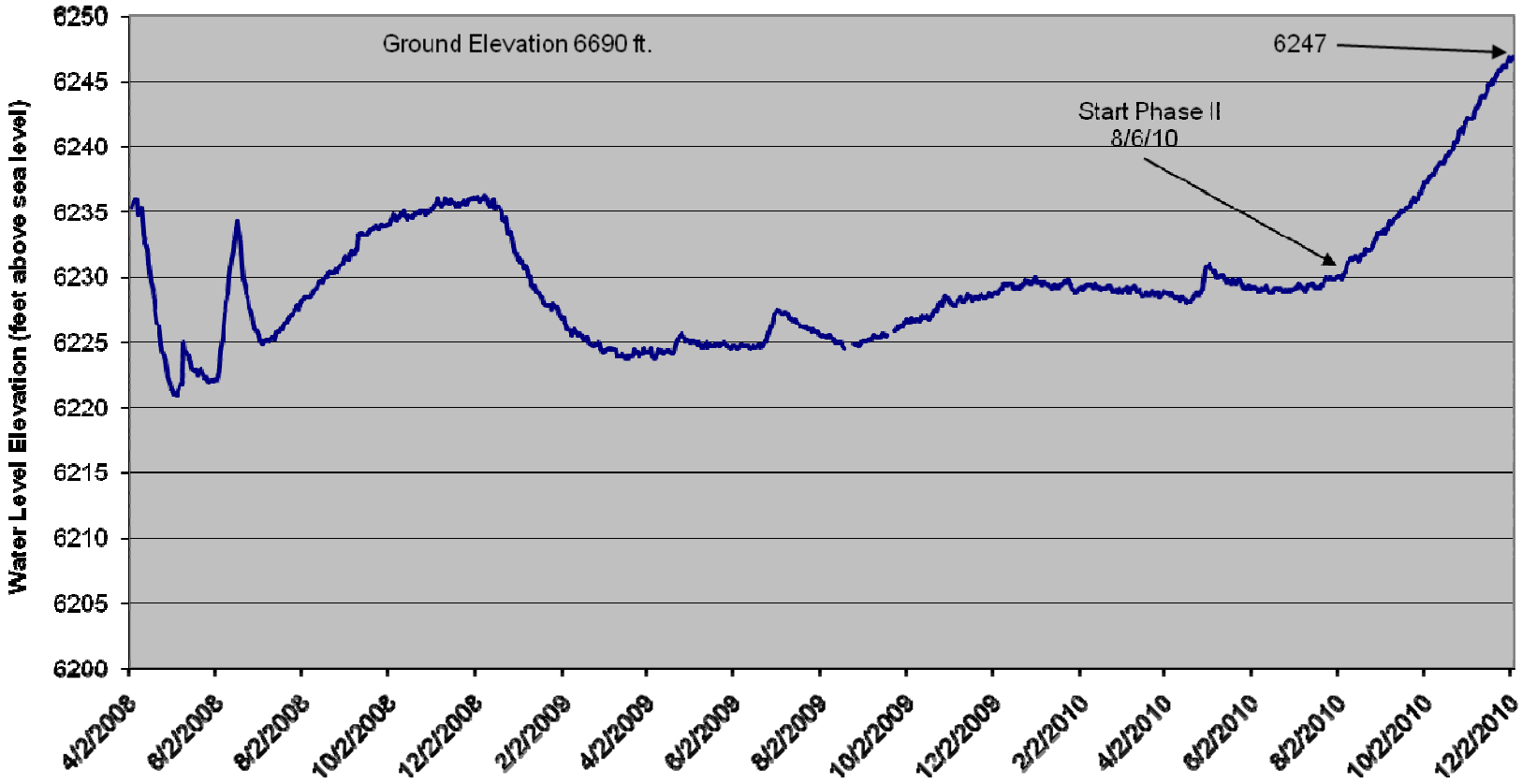


**Recovery 5 Masters Gas Flow (Masters WW 257113) from 12/24/09 to 12/2/10**

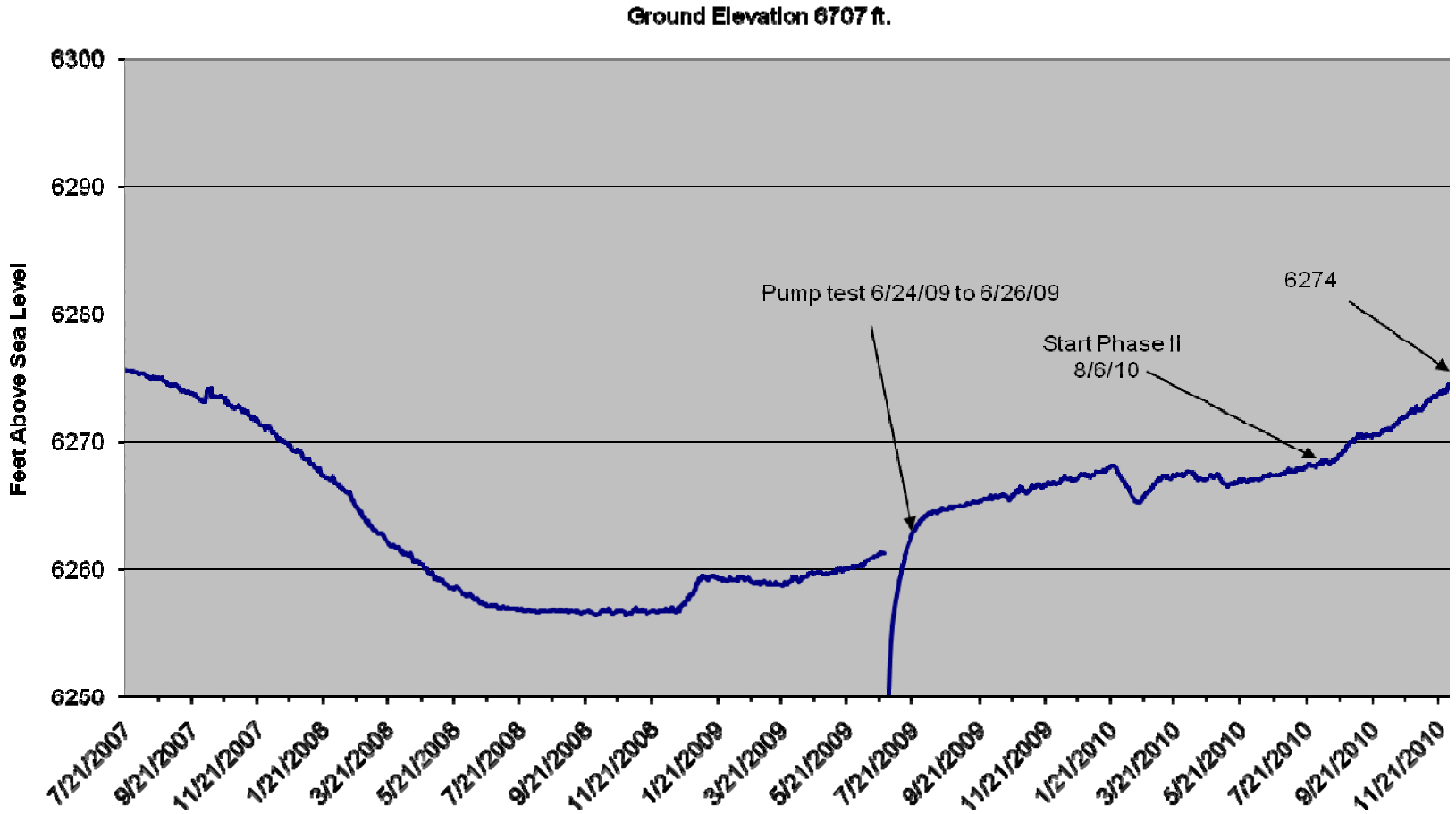


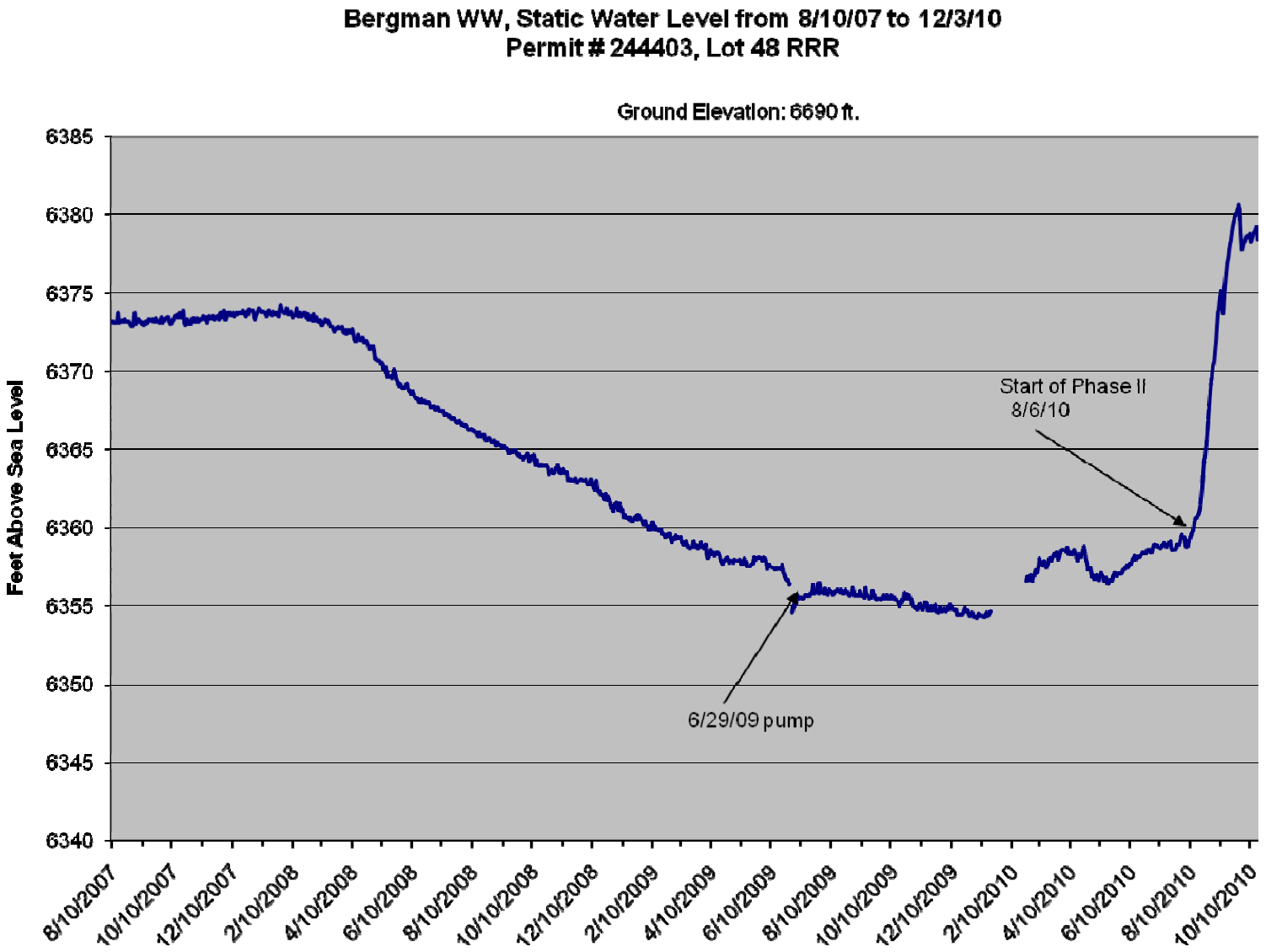
**Attachment 2**
**Graphs of Pressure and Fluid Level Data From**
**POCI 55, Barrett, Bergman, Bruington, Coleman, Evenden, Garza-Vela and Meyer**

**POCI 55 Monitor Well,**
**Static Water Level Elevation**
**from 4/2/08 to 12/3/10**
**Permit # 275819**
**Lot 55 RRR, SE SW Sec 3 29S 67W, GL elev. 6690'**

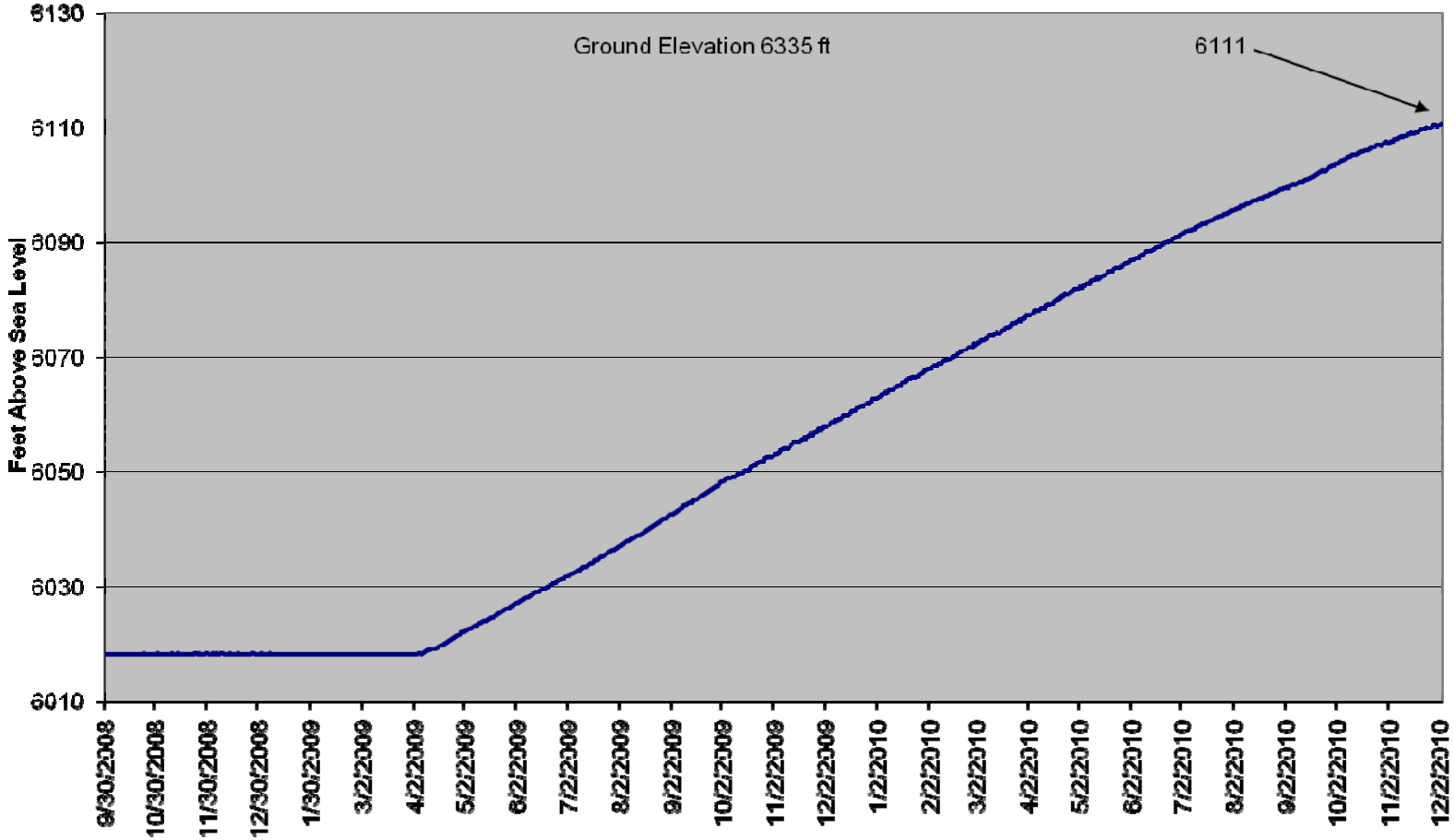


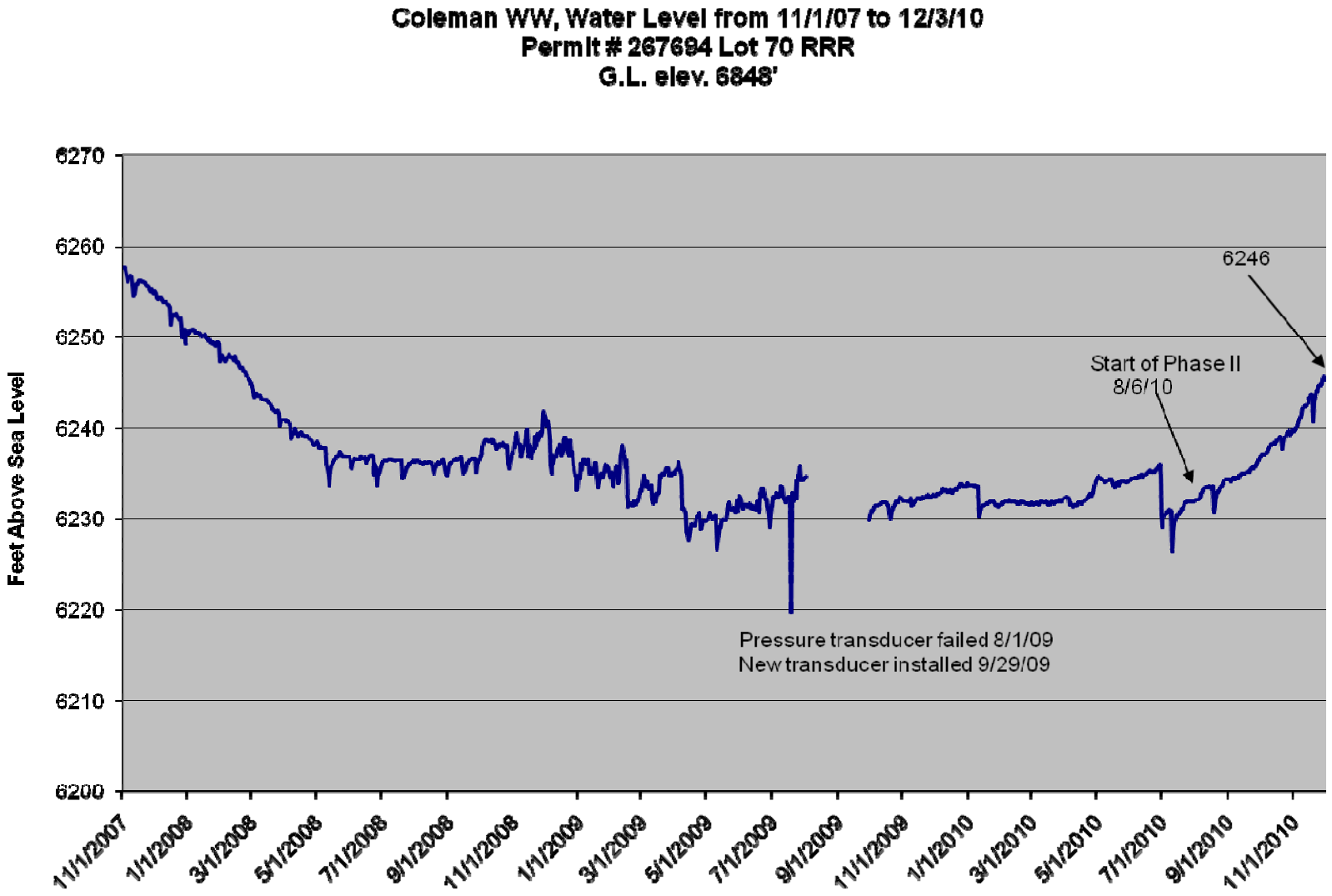
**Barrett WW**
**Static Water Level from 7/21/07 to 12/3/10**
**Permit # 257994**
**Lot 57 RRR**



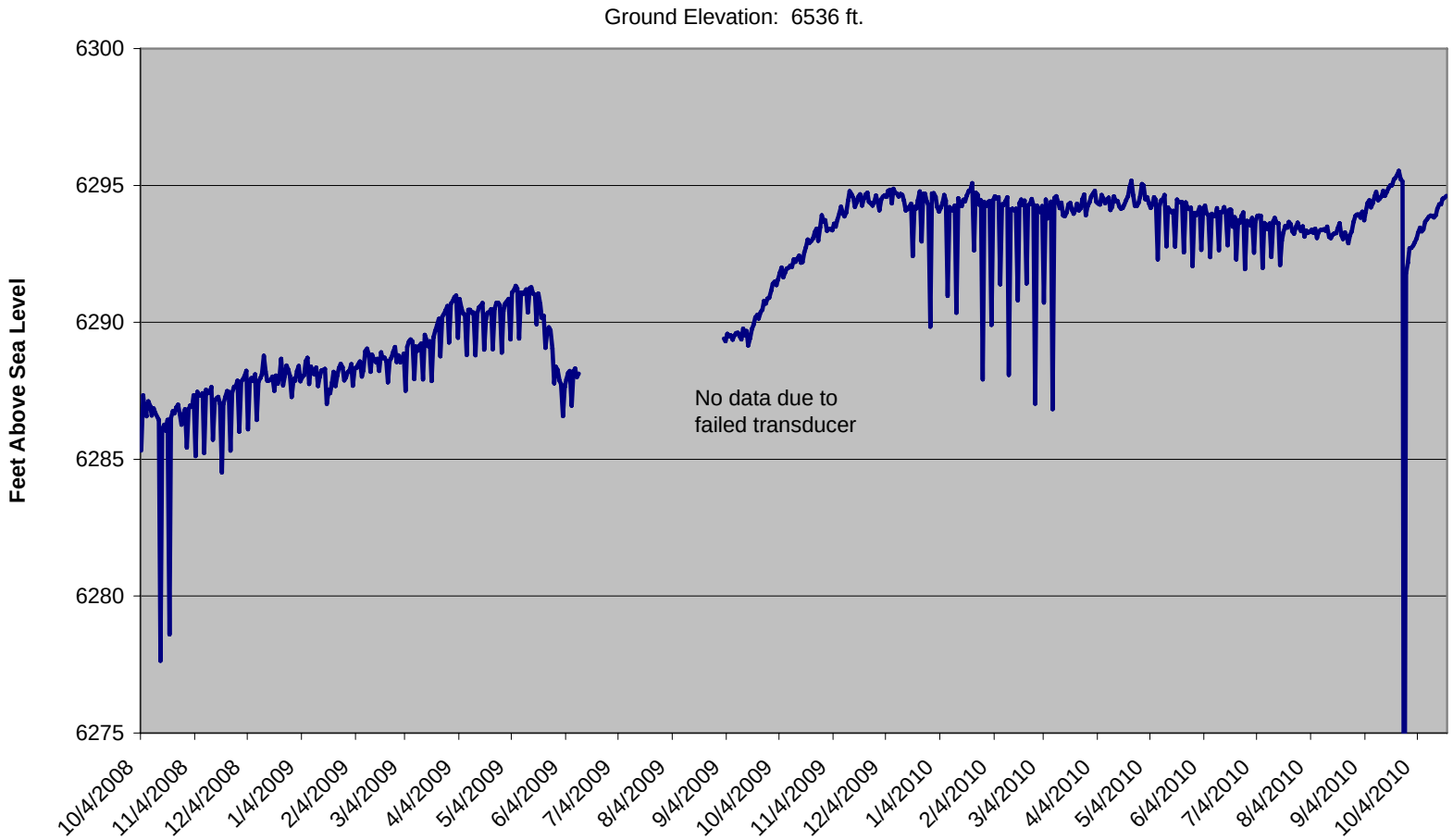

Bergman WW, Static Water Level from 8/10/07 to 12/3/10
Permit # 244403, Lot 48 RRR
Ground Elevation: 6690 ft.
Feet Above Sea Level
6385
6380
6375
6370
6365
6360
6355
6350
6345
6340
Start of Phase II
8/6/10
6/29/09 pump
8/10/2007
10/10/2007
12/10/2007
2/10/2008
4/10/2008
6/10/2008
8/10/2008
10/10/2008
12/10/2008
2/10/2009
4/10/2009
6/10/2009
8/10/2009
10/10/2009
12/10/2009
2/10/2010
4/10/2010
6/10/2010
8/10/2010
10/10/2010

**Brulington WW, Permit # 210526, City Ranches Lot 15**
**Static Water Level**
**from 9/30/08 to 12/3/10**

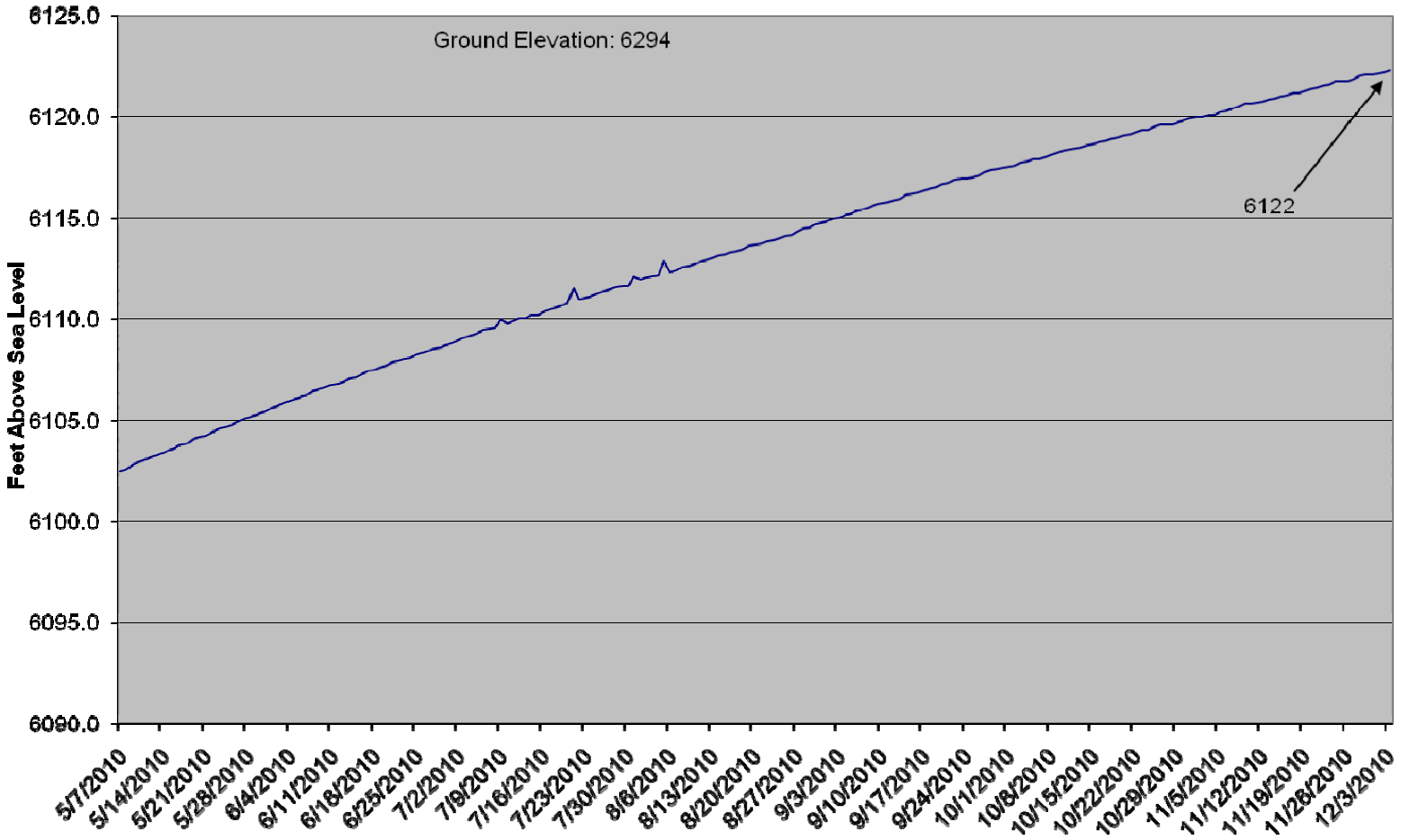



Coleman WW, Water Level from 11/1/07 to 12/3/10
Permit # 267694 Lot 70 RRR
G.L. elev. 6848'
Feet Above Sea Level
6270
6260
6250
6240
6230
6220
6210
6200
6246
Start of Phase II
8/6/10
Pressure transducer failed 8/1/09
New transducer installed 9/29/09
11/1/2007
1/1/2008
3/1/2008
5/1/2008
7/1/2008
9/1/2008
11/1/2008
1/1/2009
3/1/2009
5/1/2009
7/1/2009
9/1/2009
11/1/2009
1/1/2010
3/1/2010
5/1/2010
7/1/2010
9/1/2010
11/1/2010

**Garza WW, Water Level from 10/3/08 to 10/20/10**
**Permit # 206886, Lot 60 Silver Spurs Ranch**

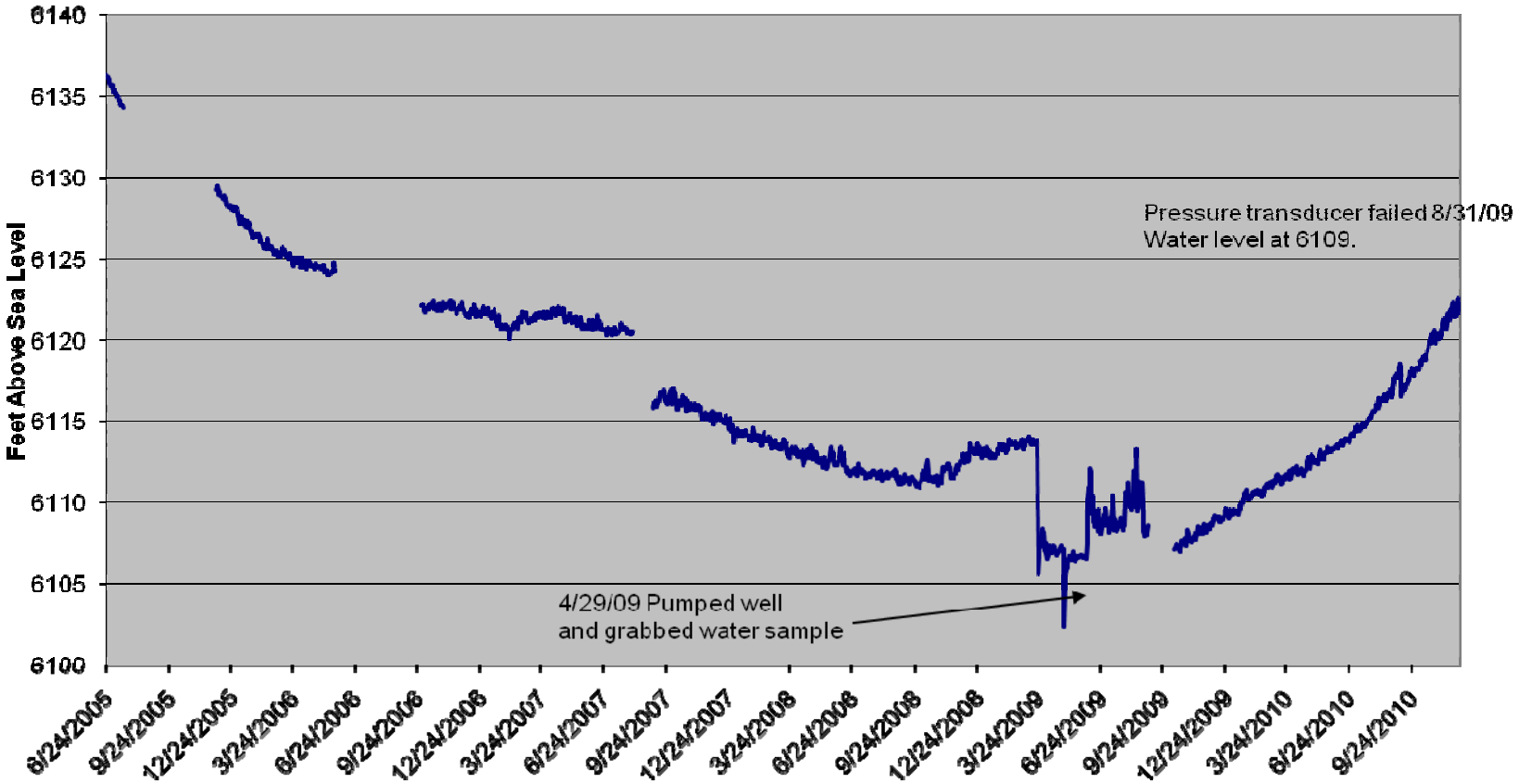


**T. Gonzales WW, Permit #285651, City Ranches Lot 79A**
**Static Water Level from 5/7/10 to 12/3/10**



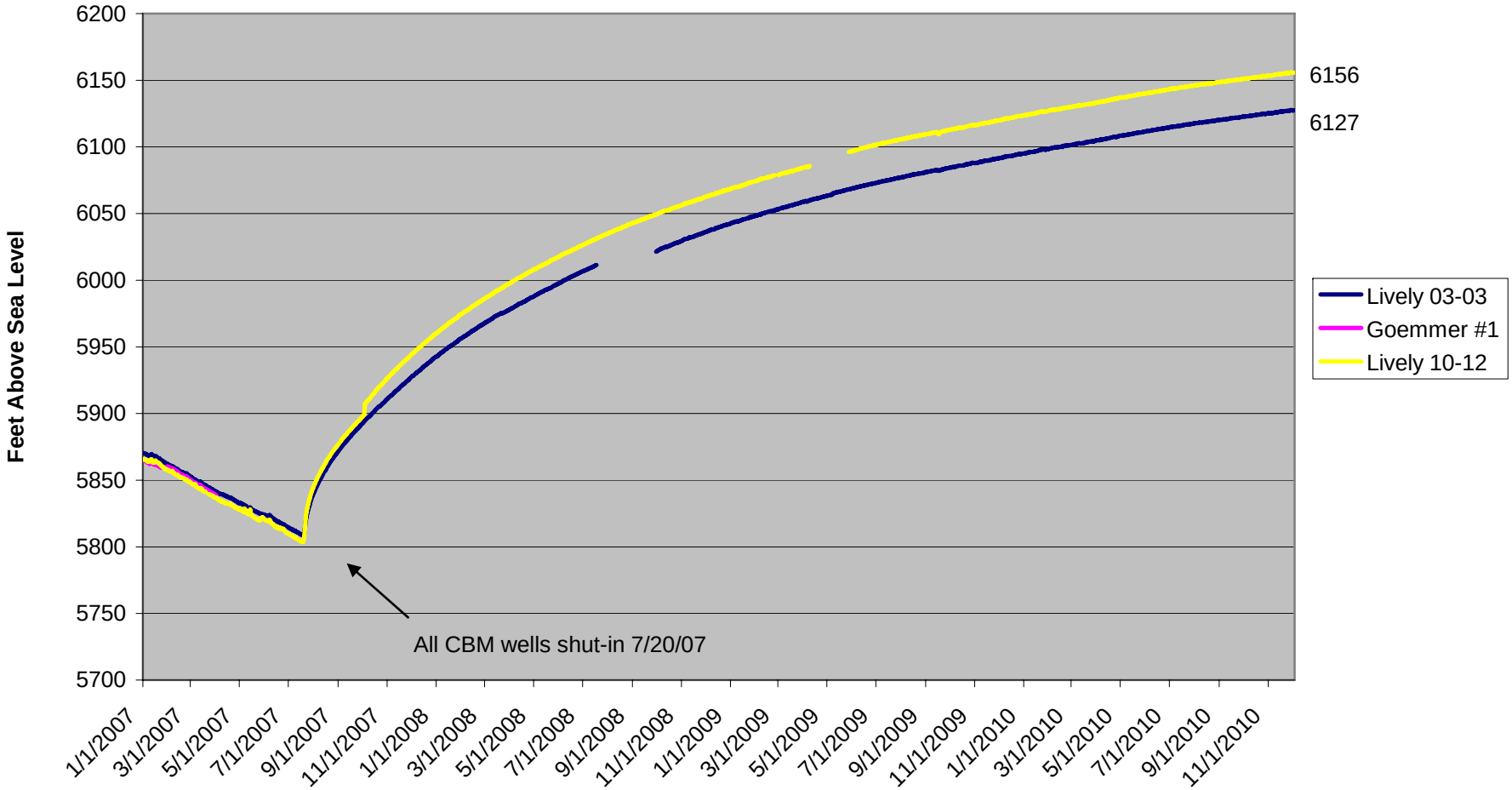
**Meyer WW Permit # 248862**
**Static Water Level**
**from 6/24/05 to 12/3/10**

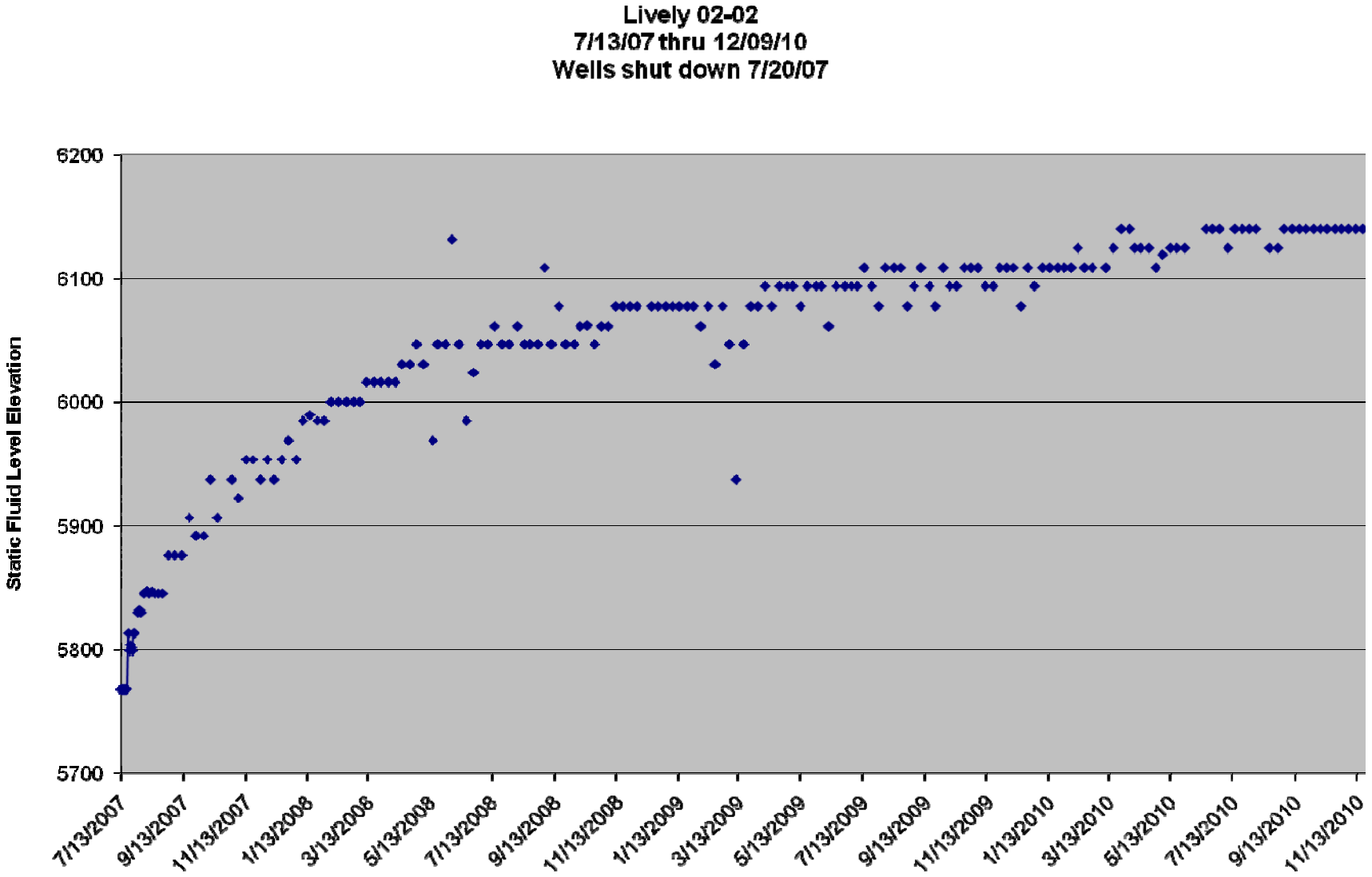
**Ground Elevation: 6575 ft.**

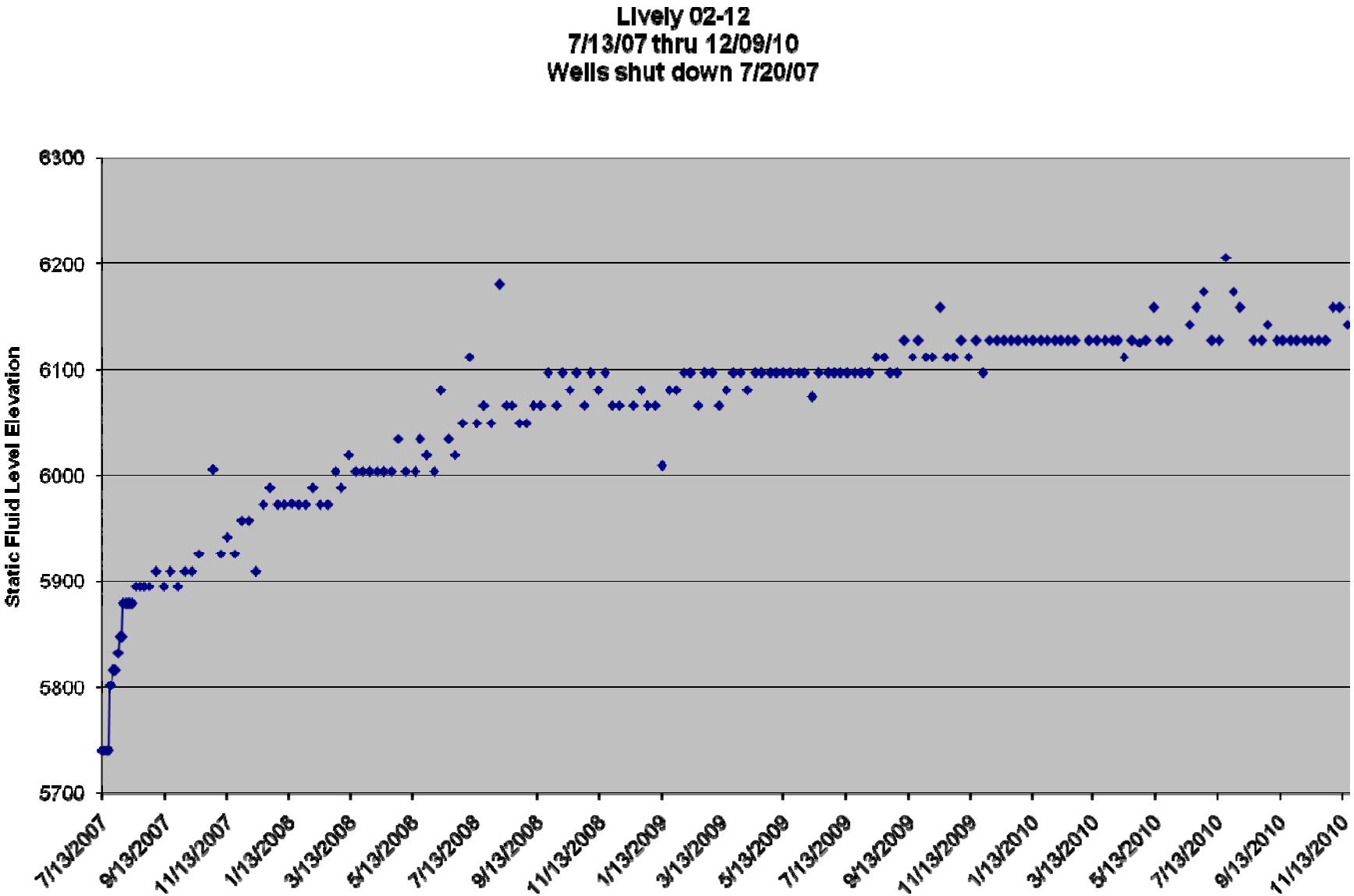


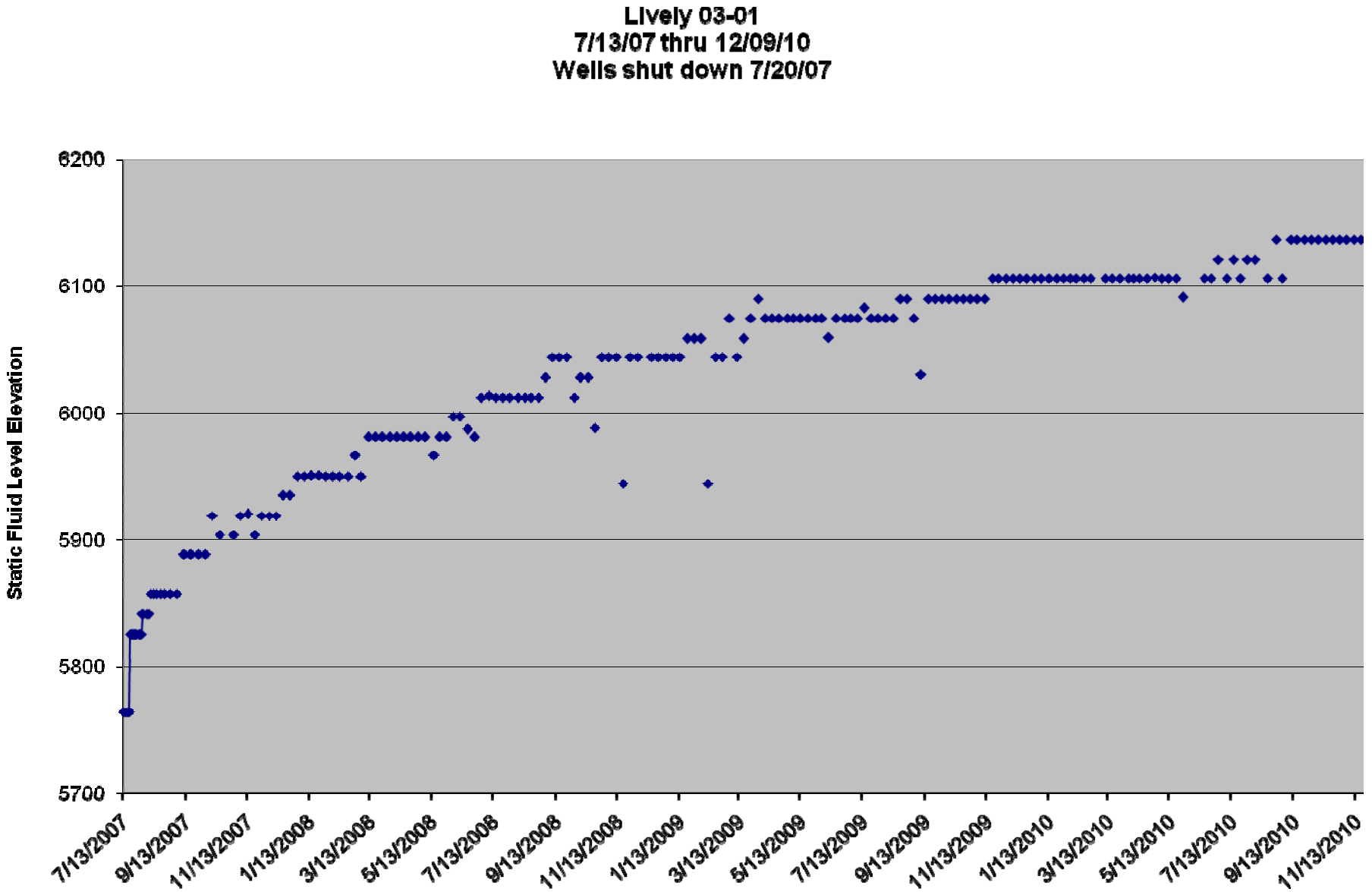
**Attachment 3**
**Fluid Levels in Petroglyph Production Wells**

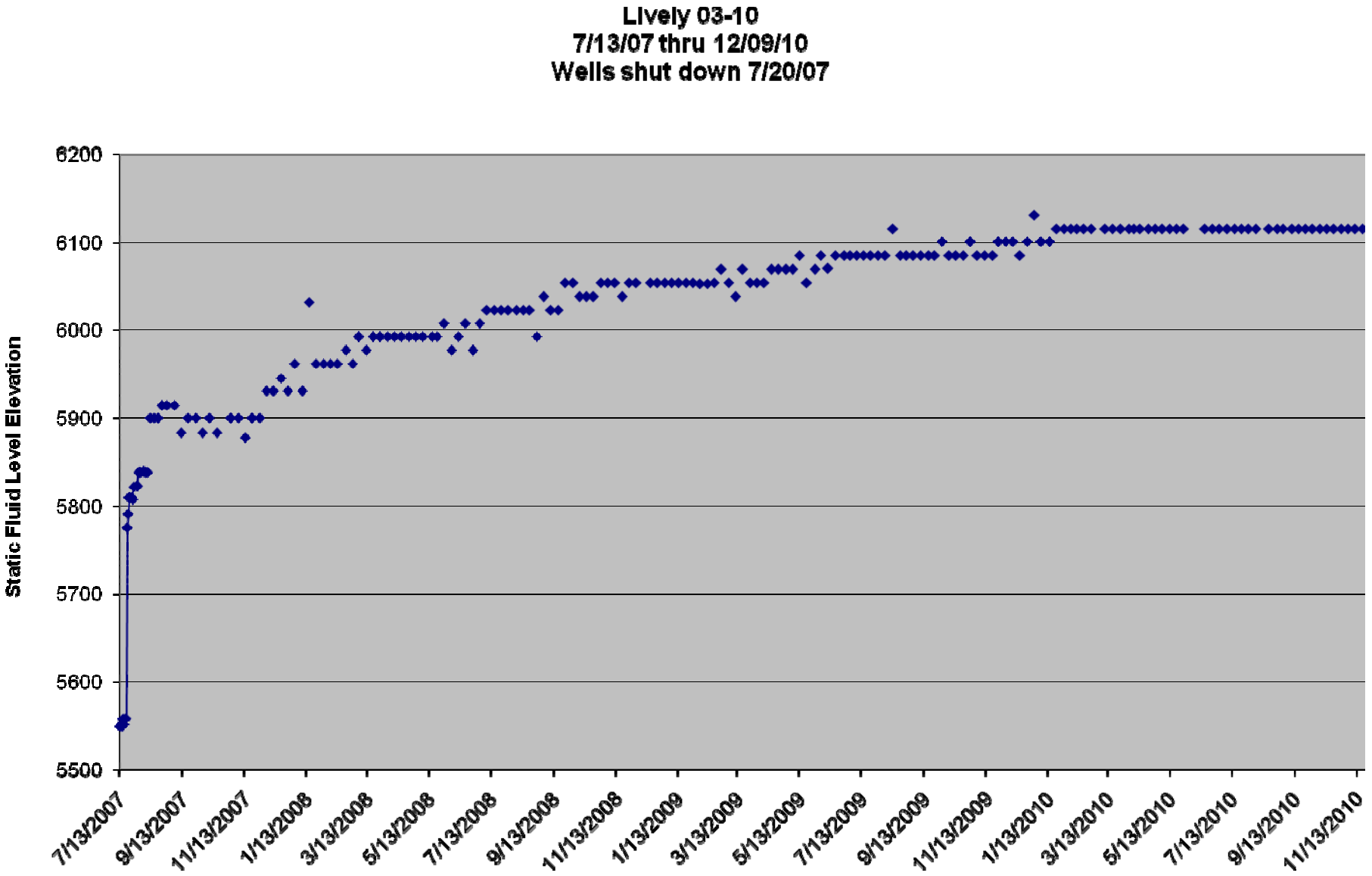
**Vermejo/Trinidad Monitor Wells**
**Static Water Level**
**from 1/1/07 to 12/03/10**



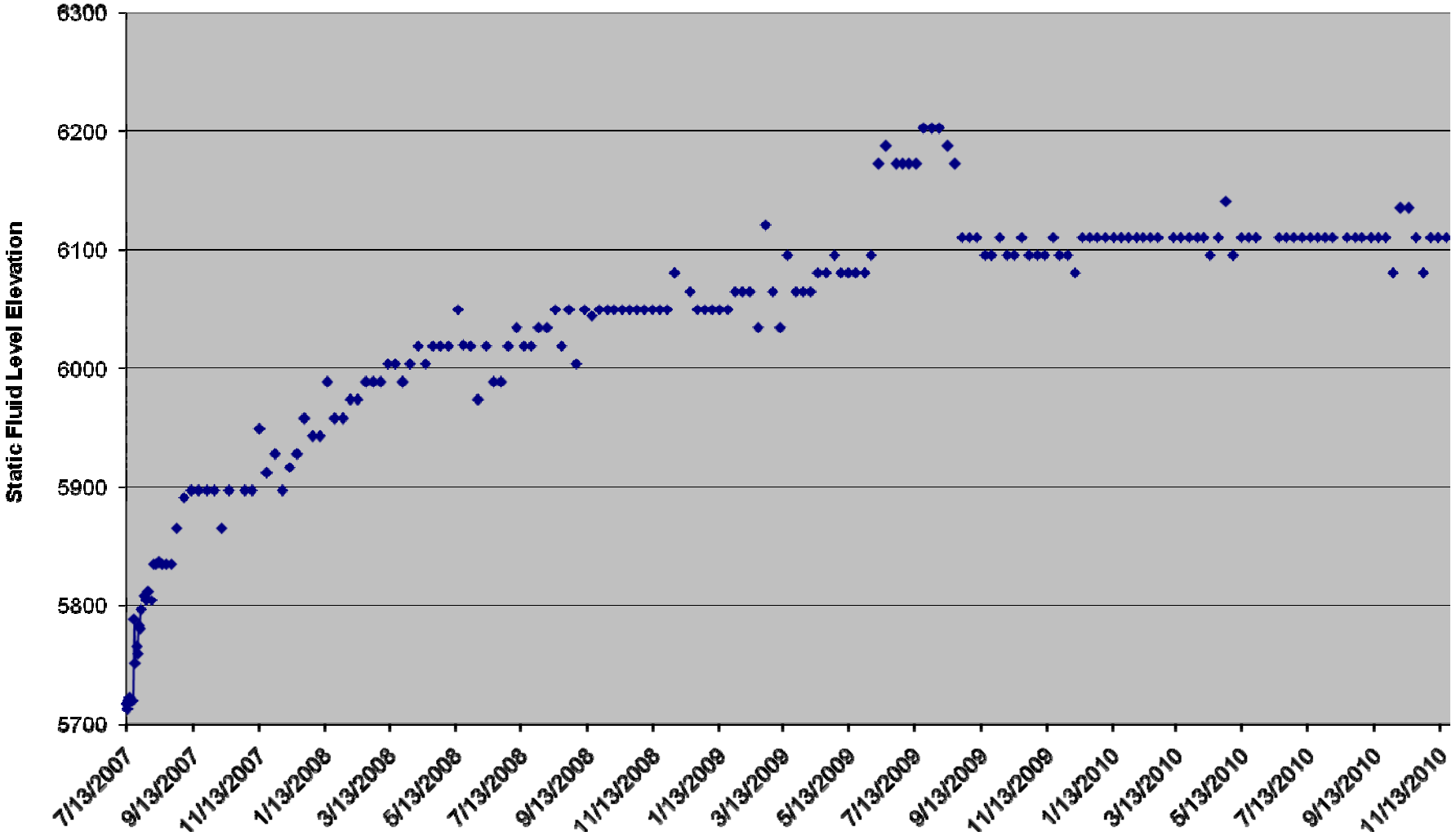

Lively 02-02
7/13/07 thru 12/09/10
Wells shut down 7/20/07
Static Fluid Level Elevation
6200
6100
6000
5900
5800
5700
7/13/2007
9/13/2007
11/13/2007
1/13/2008
3/13/2008
5/13/2008
7/13/2008
9/13/2008
11/13/2008
1/13/2009
3/13/2009
5/13/2009
7/13/2009
9/13/2009
11/13/2009
1/13/2010
3/13/2010
5/13/2010
7/13/2010
9/13/2010
11/13/2010

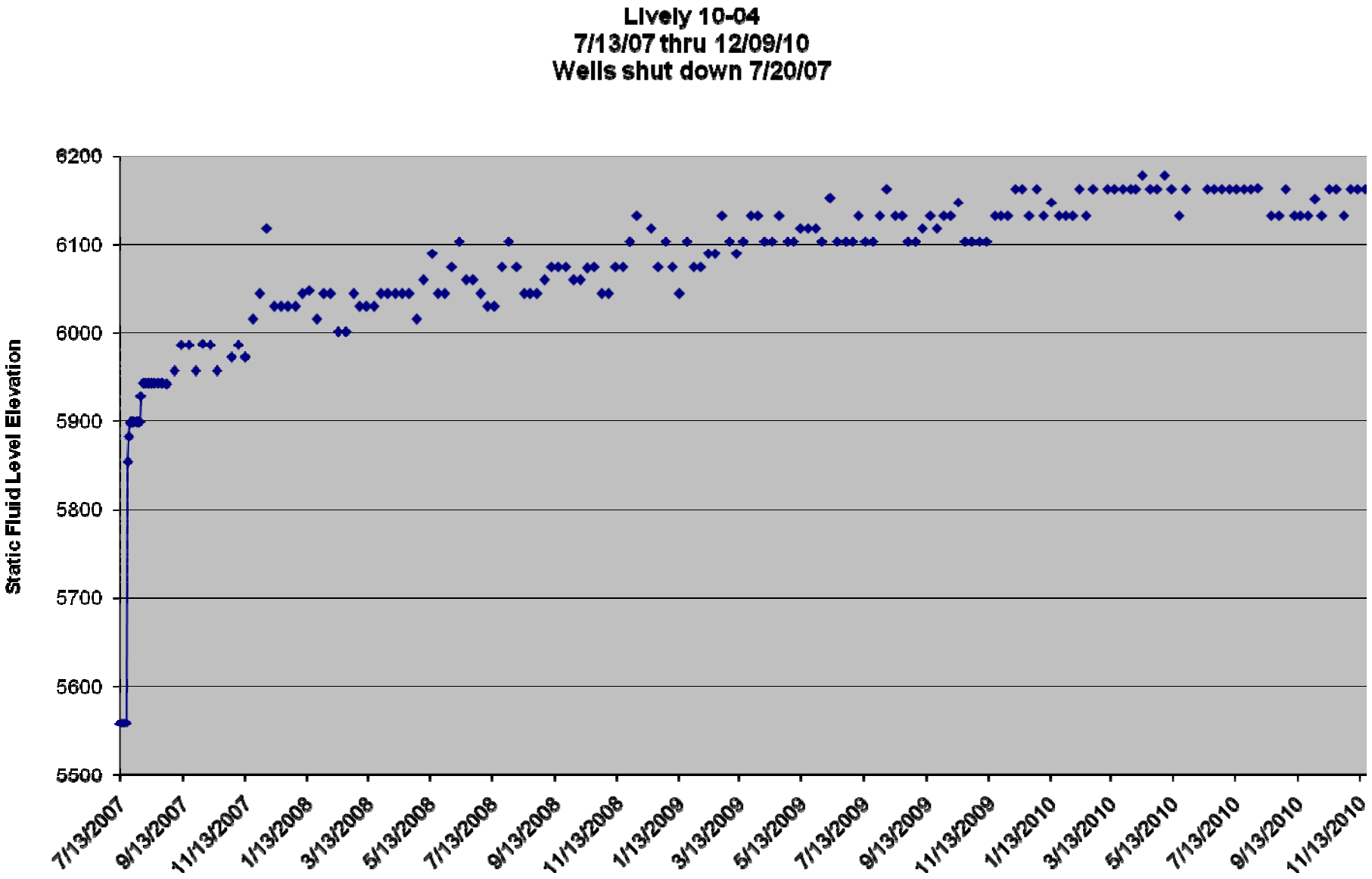

Lively 02-12
7/13/07 thru 12/09/10
Wells shut down 7/20/07
Static Fluid Level Elevation
6300
6200
6100
6000
5900
5800
5700
7/13/2007
9/13/2007
11/13/2007
1/13/2008
3/13/2008
5/13/2008
7/13/2008
9/13/2008
11/13/2008
1/13/2009
3/13/2009
5/13/2009
7/13/2009
9/13/2009
11/13/2009
1/13/2010
3/13/2010
5/13/2010
7/13/2010
9/13/2010
11/13/2010

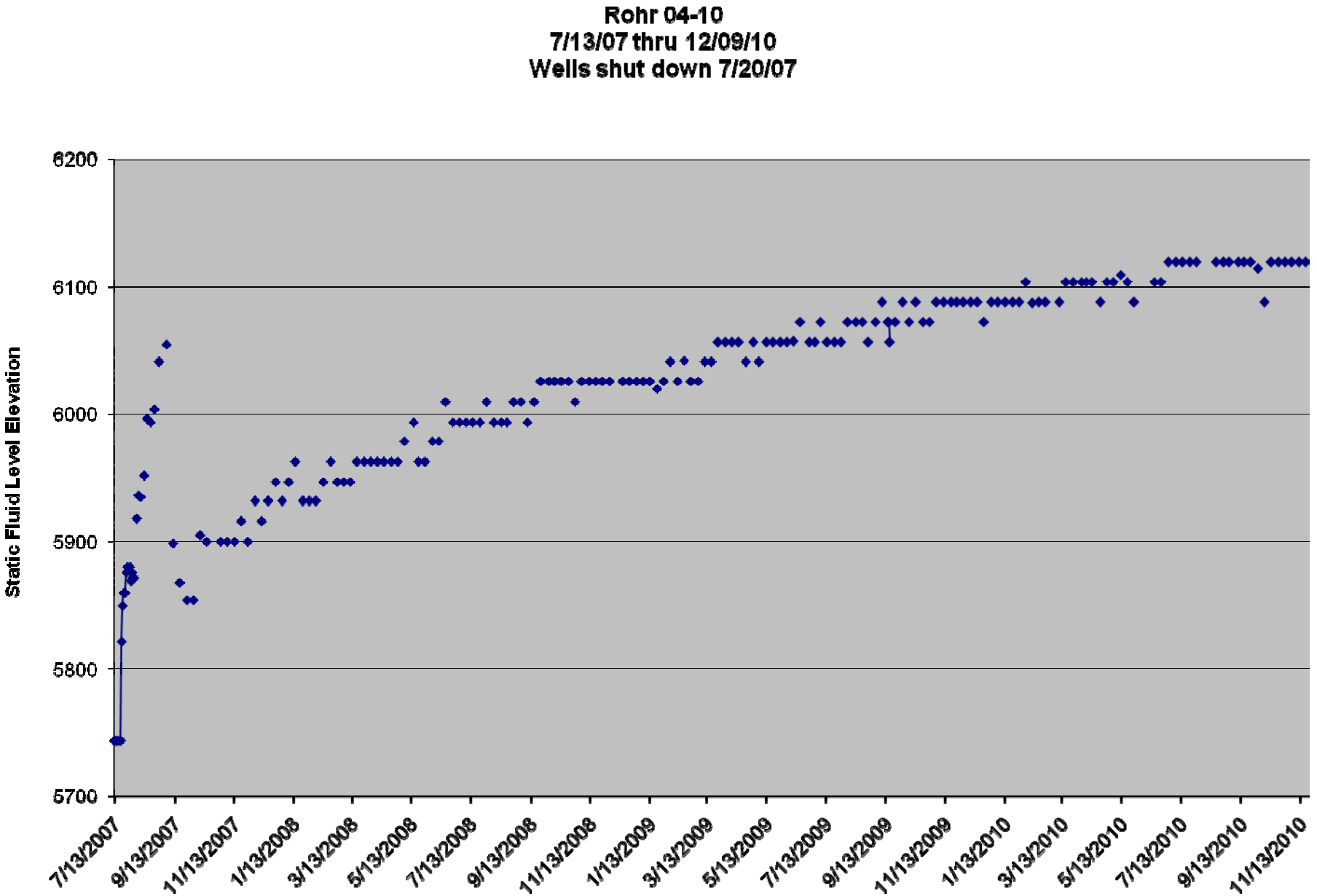

Lively 03-01
7/13/07 thru 12/09/10
Wells shut down 7/20/07
Static Fluid Level Elevation
6200
6100
6000
5900
5800
5700
7/13/2007
9/13/2007
11/13/2007
1/13/2008
3/13/2008
5/13/2008
7/13/2008
9/13/2008
11/13/2008
1/13/2009
3/13/2009
5/13/2009
7/13/2009
9/13/2009
11/13/2009
1/13/2010
3/13/2010
5/13/2010
7/13/2010
9/13/2010
11/13/2010


Lively 03-10
7/13/07 thru 12/09/10
Wells shut down 7/20/07
Static Fluid Level Elevation
6200
6100
6000
5900
5800
5700
5600
5500
7/13/2007
9/13/2007
11/13/2007
1/13/2008
3/13/2008
5/13/2008
7/13/2008
9/13/2008
11/13/2008
1/13/2009
3/13/2009
5/13/2009
7/13/2009
9/13/2009
11/13/2009
1/13/2010
3/13/2010
5/13/2010
7/13/2010
9/13/2010
11/13/2010

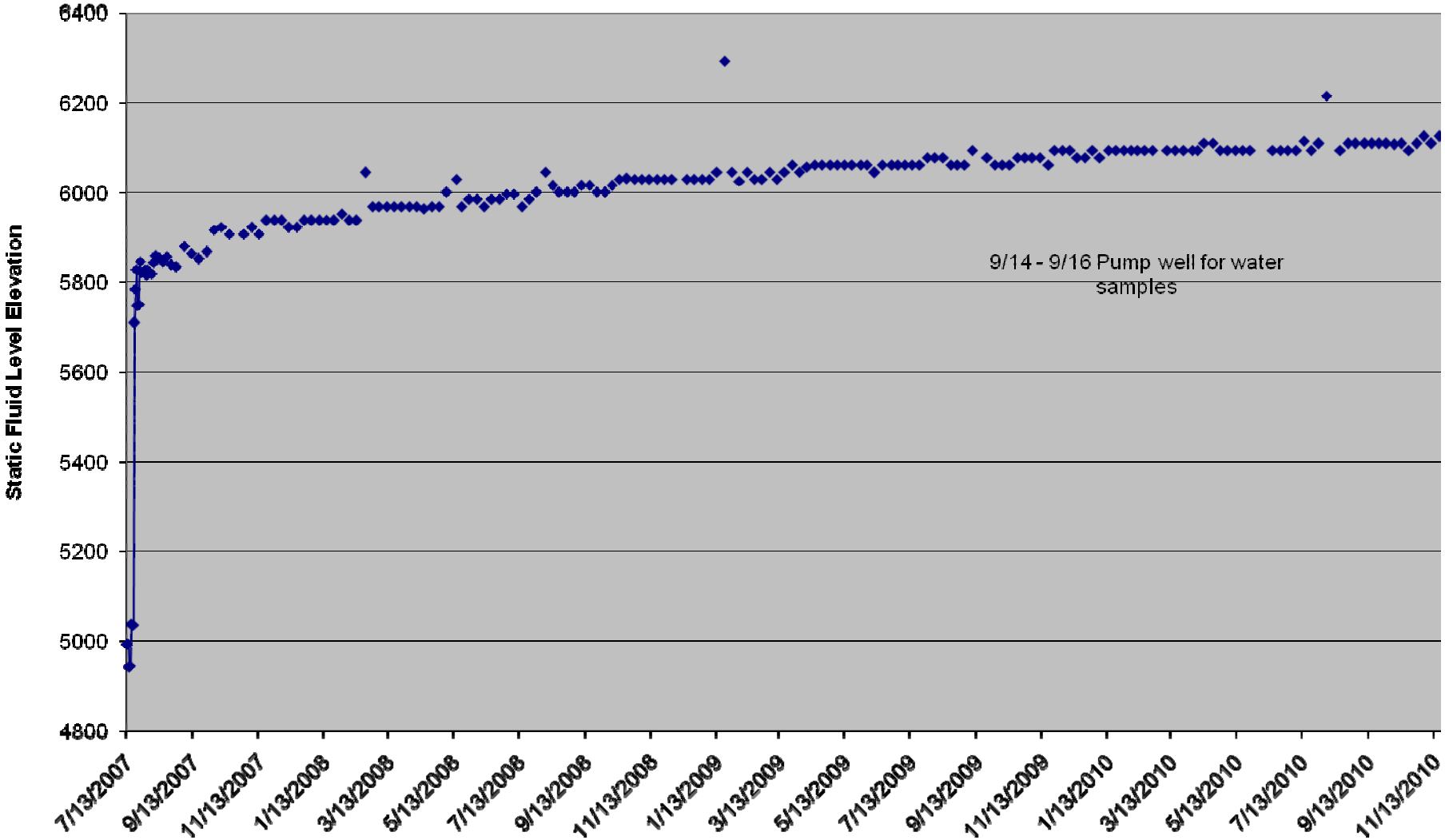
**Lively 03-12**
**7/13/07 thru 12/09/10**
**Wells shut down 7/20/07**



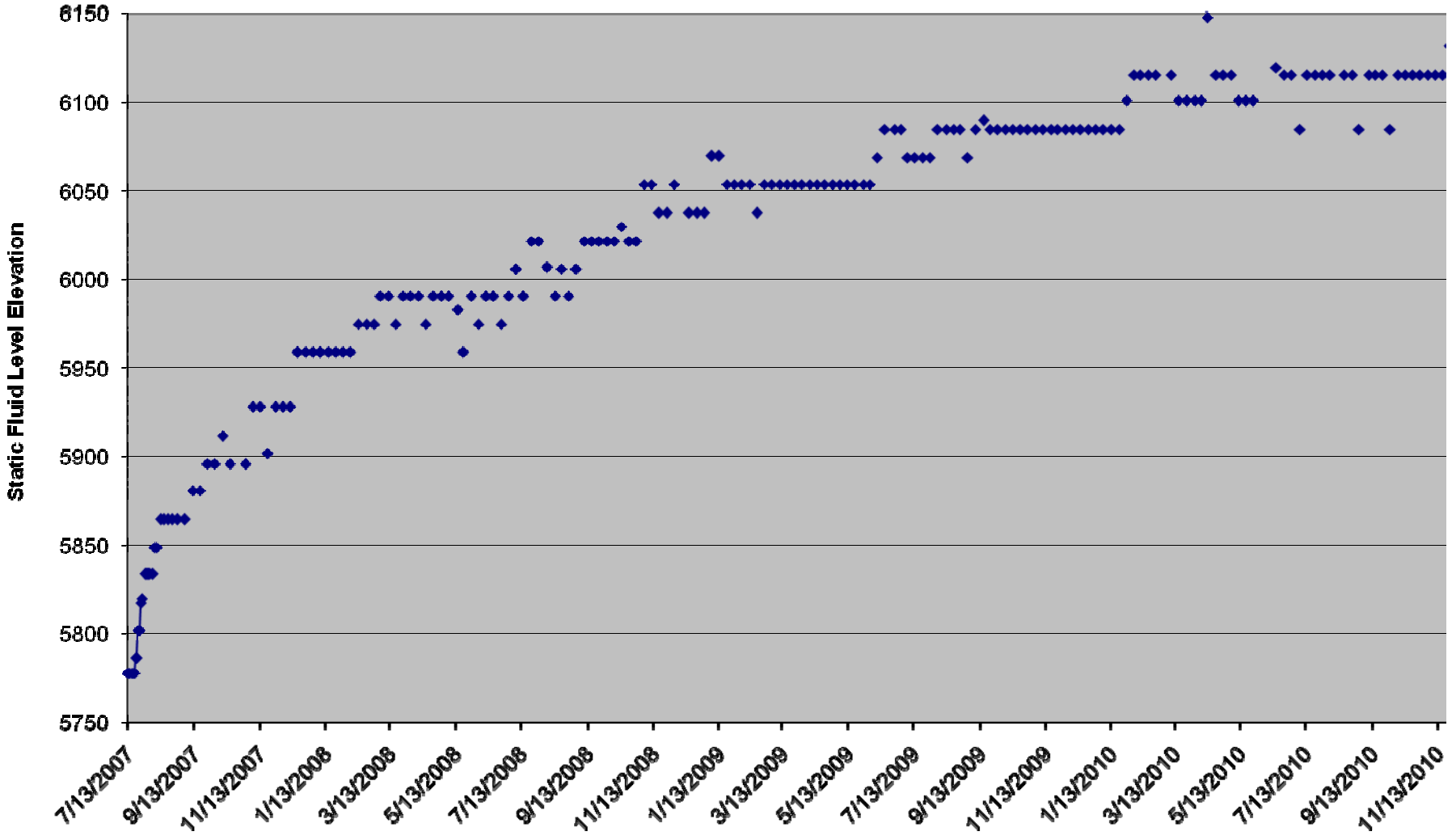

Lively 10-04
7/13/07 thru 12/09/10
Wells shut down 7/20/07
Static Fluid Level Elevation
6200
6100
6000
5900
5800
5700
5600
5500
7/13/2007
9/13/2007
11/13/2007
1/13/2008
3/13/2008
5/13/2008
7/13/2008
9/13/2008
11/13/2008
1/13/2009
3/13/2009
5/13/2009
7/13/2009
9/13/2009
11/13/2009
1/13/2010
3/13/2010
5/13/2010
7/13/2010
9/13/2010
11/13/2010


Rohr 04-10
7/13/07 thru 12/09/10
Wells shut down 7/20/07
Static Fluid Level Elevation
6200
6100
6000
5900
5800
5700
7/13/2007
9/13/2007
11/13/2007
1/13/2008
3/13/2008
5/13/2008
7/13/2008
9/13/2008
11/13/2008
1/13/2009
3/13/2009
5/13/2009
7/13/2009
9/13/2009
11/13/2009
1/13/2010
3/13/2010
5/13/2010
7/13/2010
9/13/2010
11/13/2010

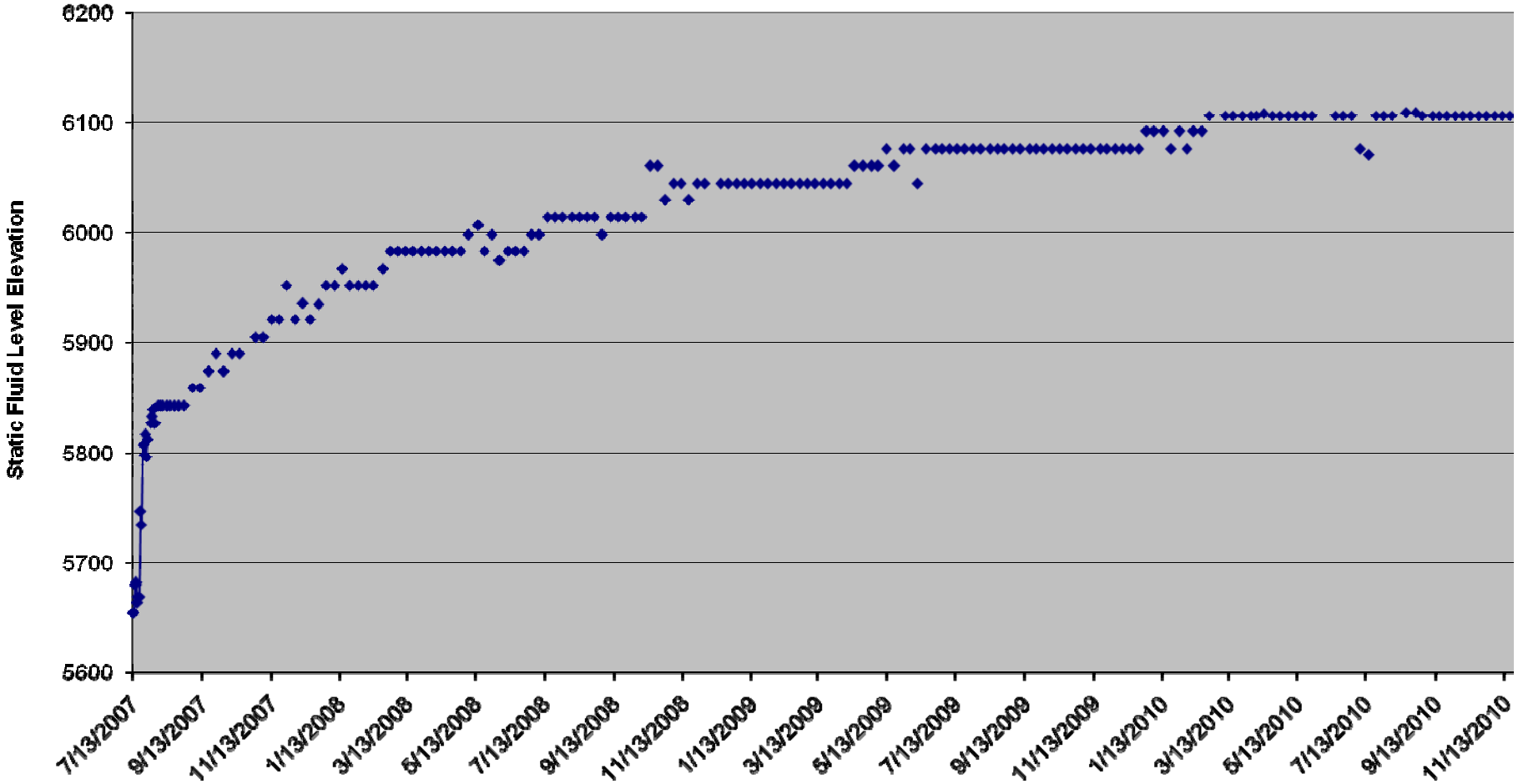
**Rohr 09-10**
**7/13/07 thru 12/09/10**
**Wells shut down 7/20/07**



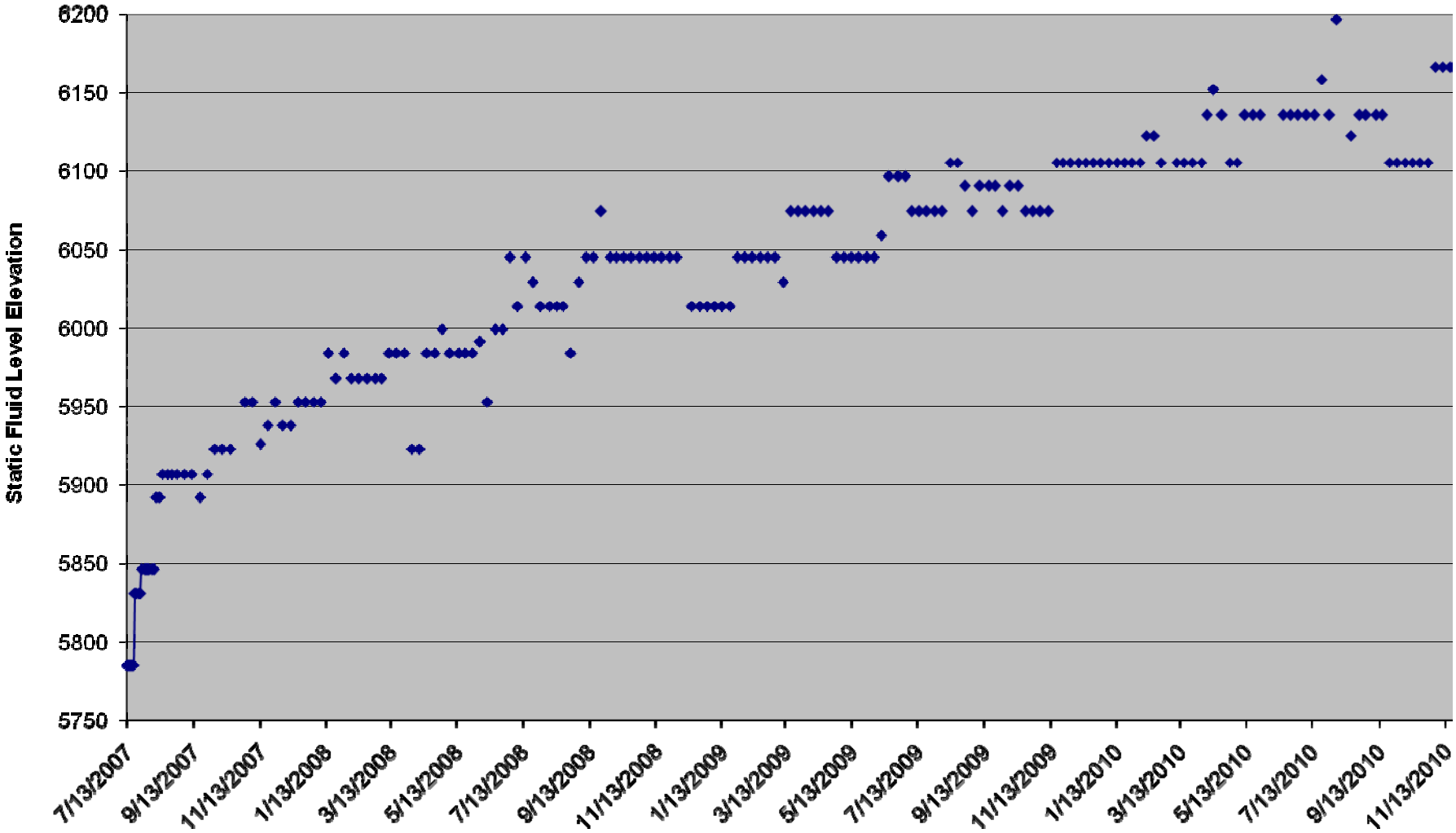
**State 36-02**
**7/13/07 thru 12/09/10**
**Wells shut down 7/20/07**



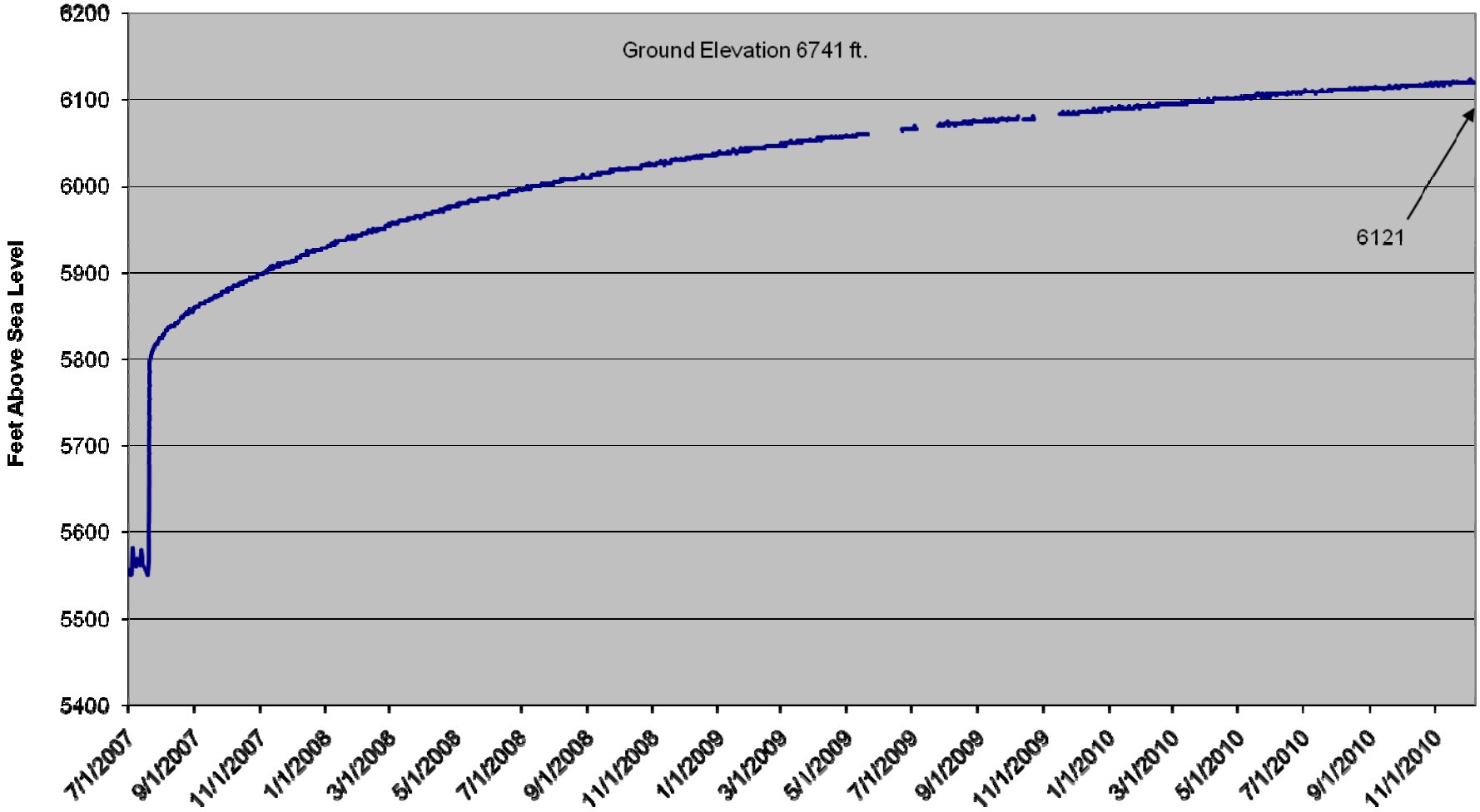
**State 36-05**
**7/13/07 thru 12/09/10**
**Wells shut down 7/20/07**



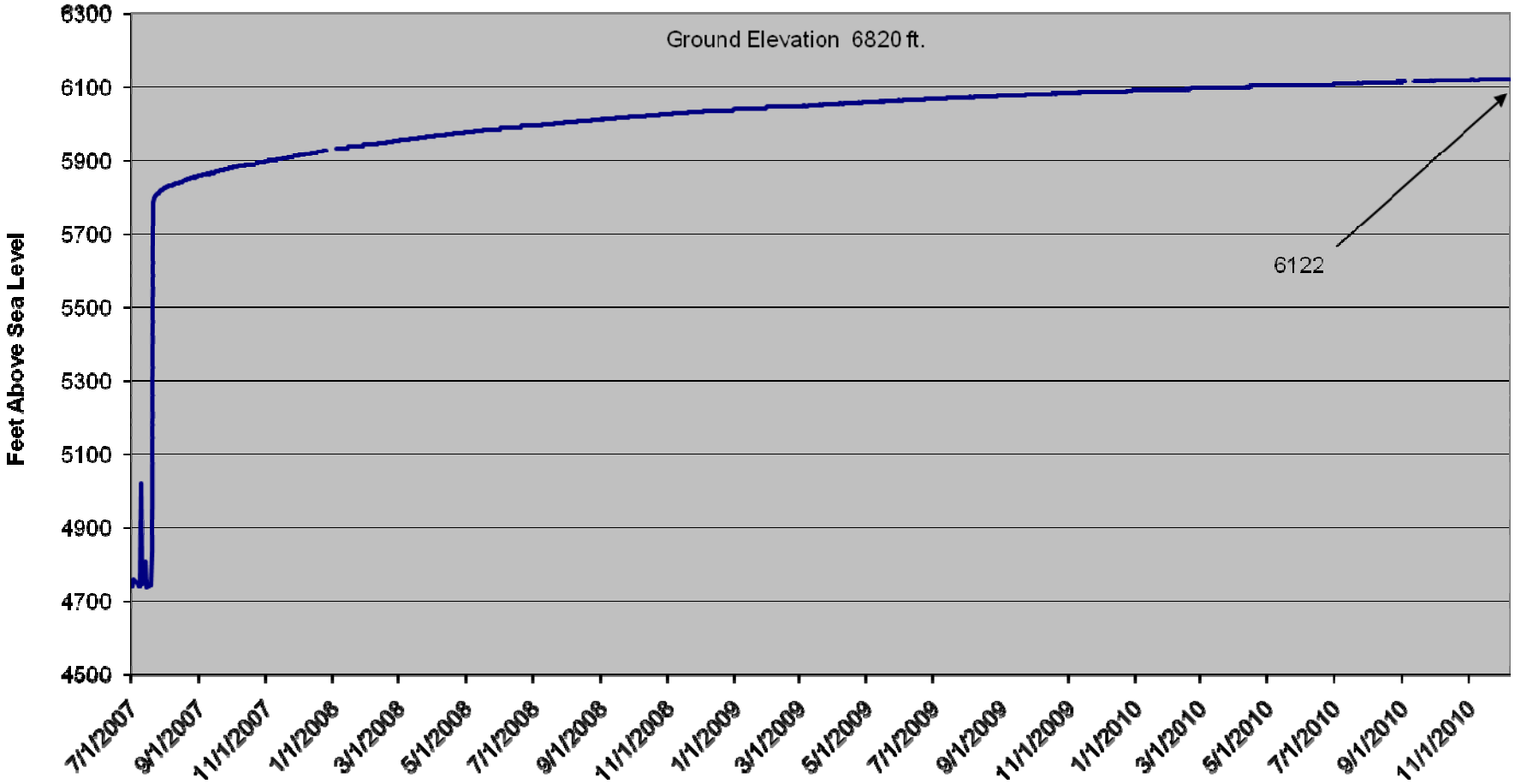
**State 36-11**
**7/13/07 thru 12/09/10**
**Wells shut down 7/20/07**



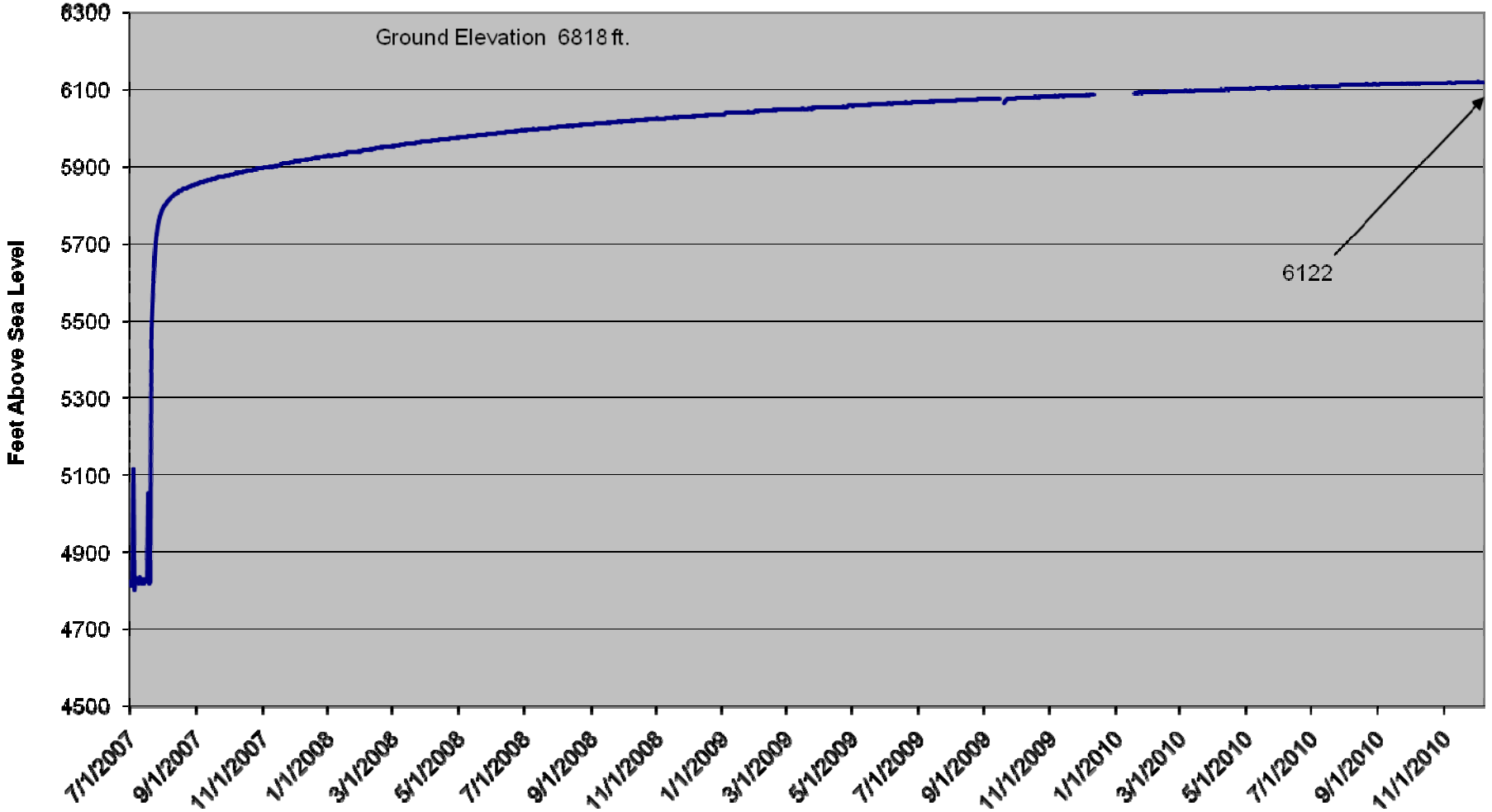
**Rohr 04-14 CBM Well**
**Static Water Level**
**from 7/1/07 to 12/7/10**
**Well shut-In 7/20/07**



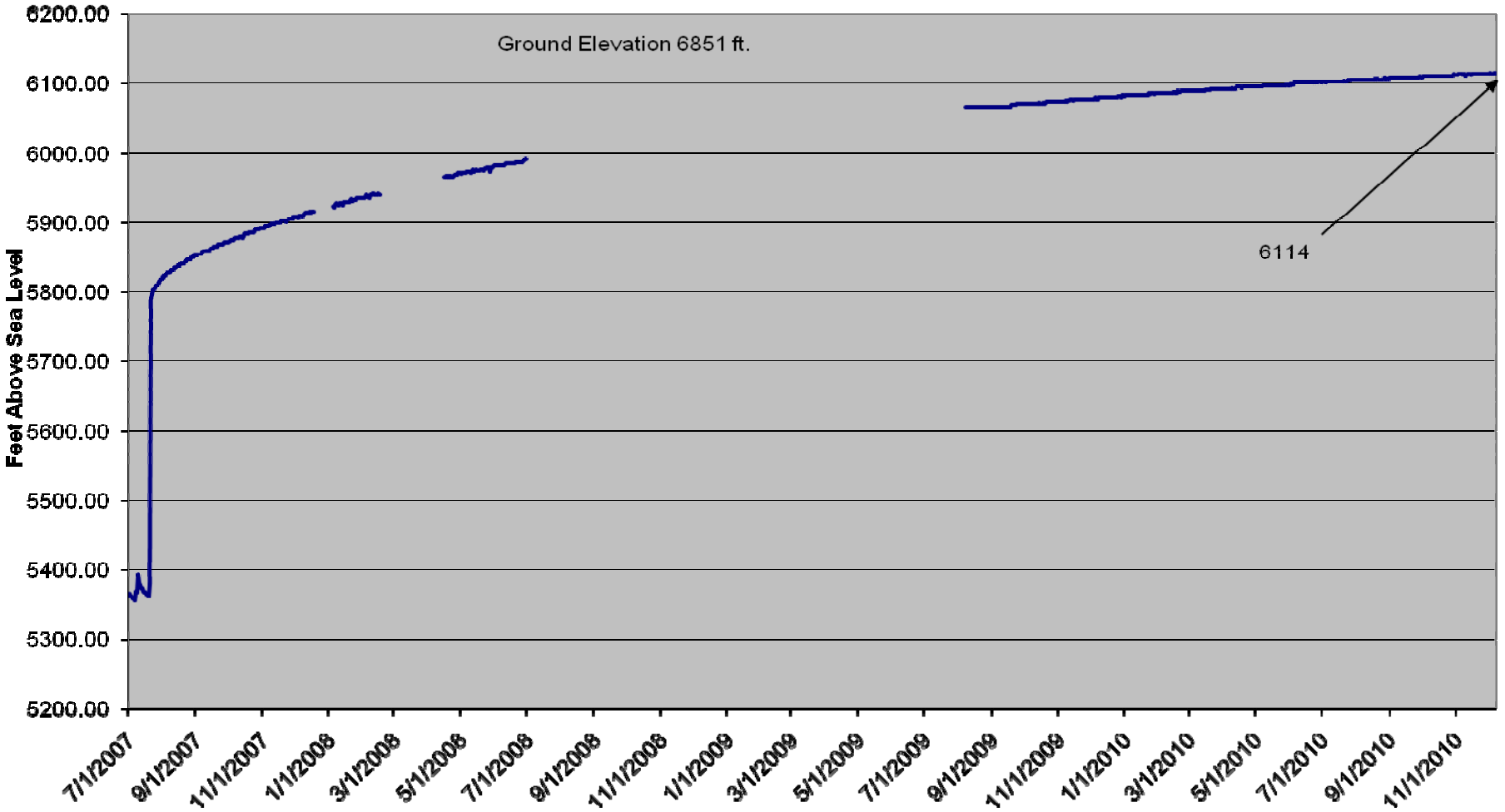
**Rohr 08-01 CBM Well**
**Static Water Level**
**from 7/1/07 to 12/7/10**
**Well shut-in 7/20/07**



**Rohr 09-04 CBM Well**
**Static Water Level**
**from 7/1/07 to 12/7/10**
**Well shut-In 7/20/07**

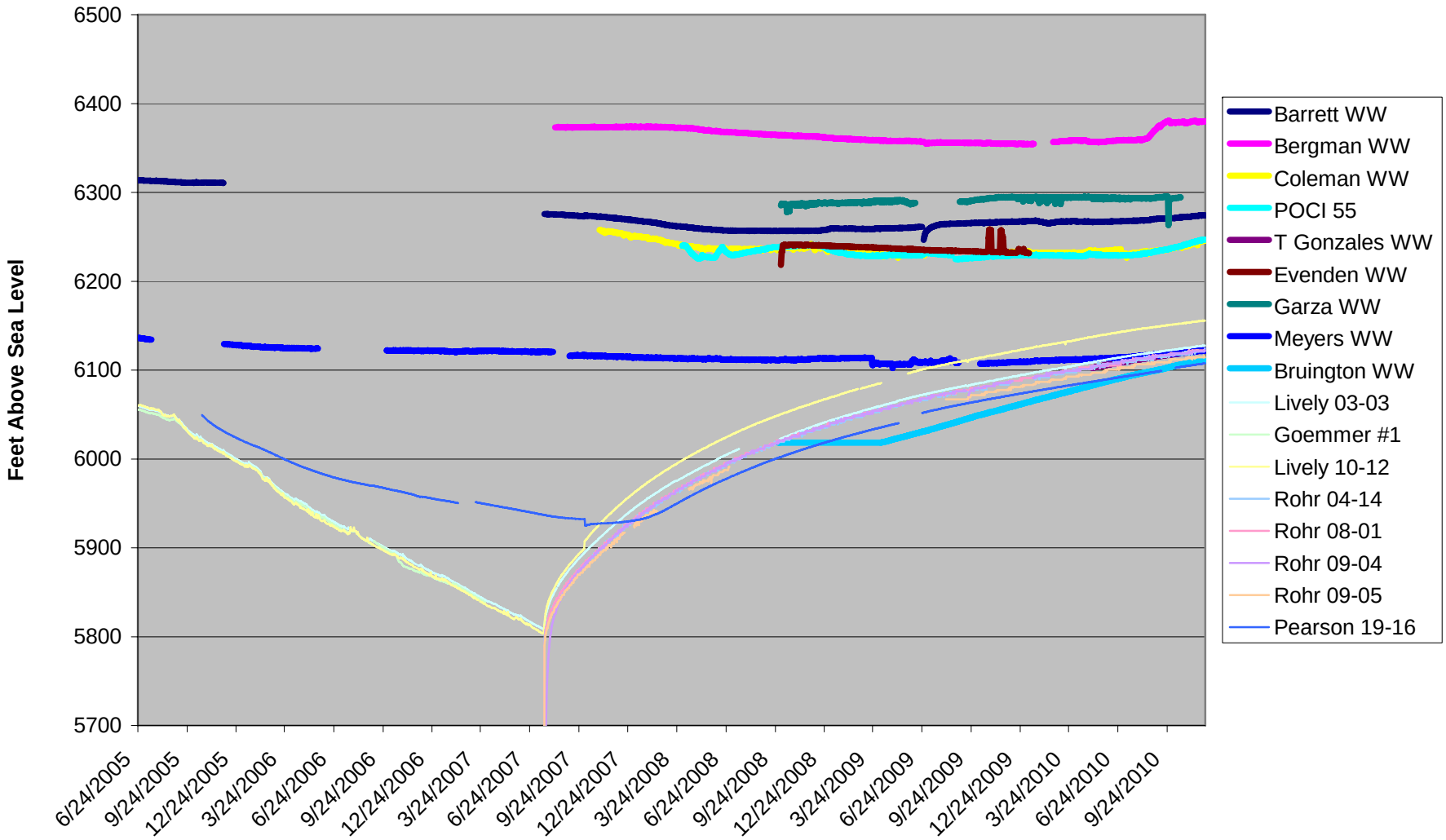


**Rohr 09-05 CBM Well Static Water Level**
**from 7/1/07 to 12/7/10**
**Well shut-in 7/20/07**



**Attachment 4**
**Comparison of Fluid Levels in Production Wells and Private Wells**

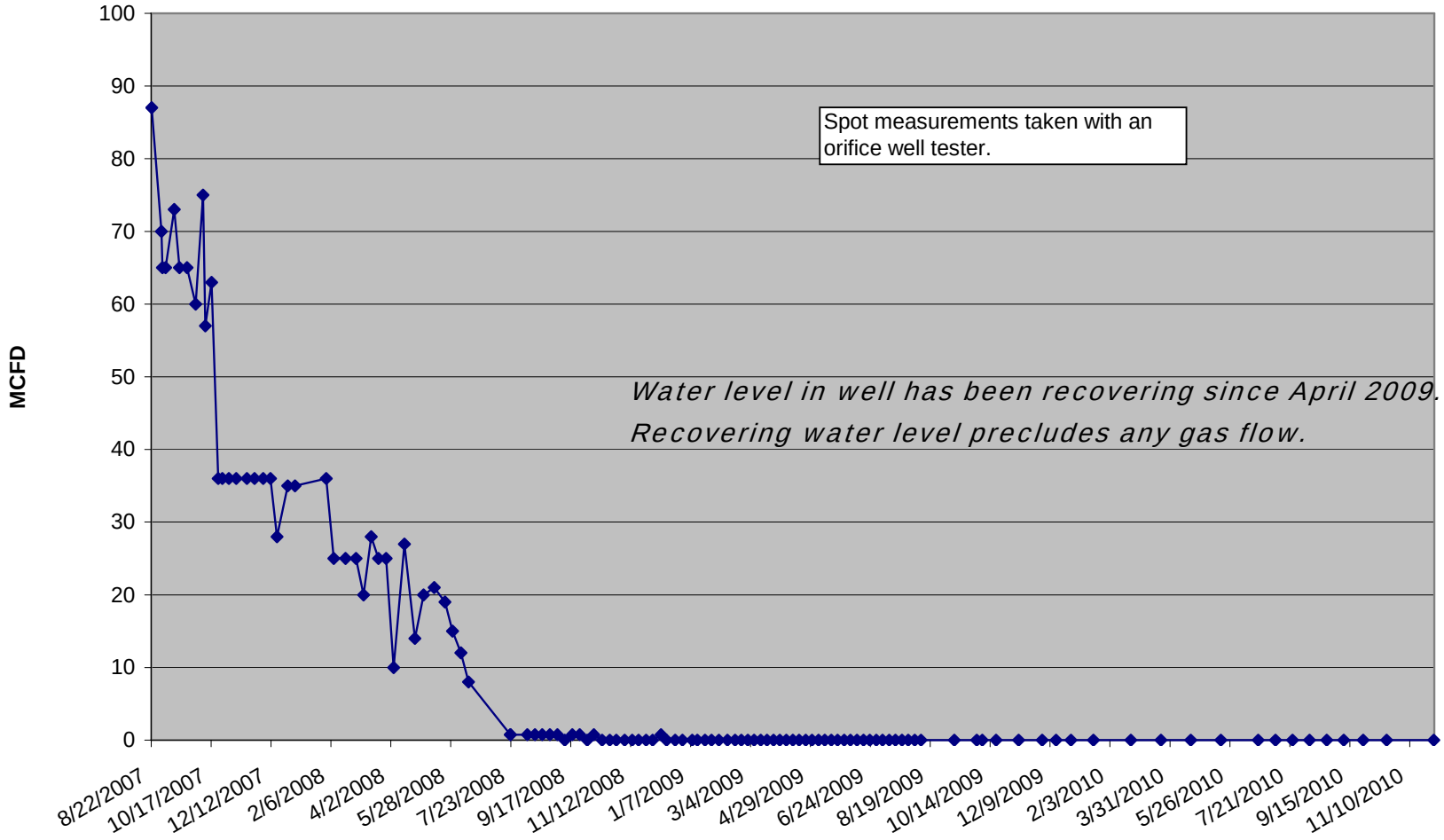
## CBM and Domestic WW,
## Water Levels from 6/24/05 to 12/3/10



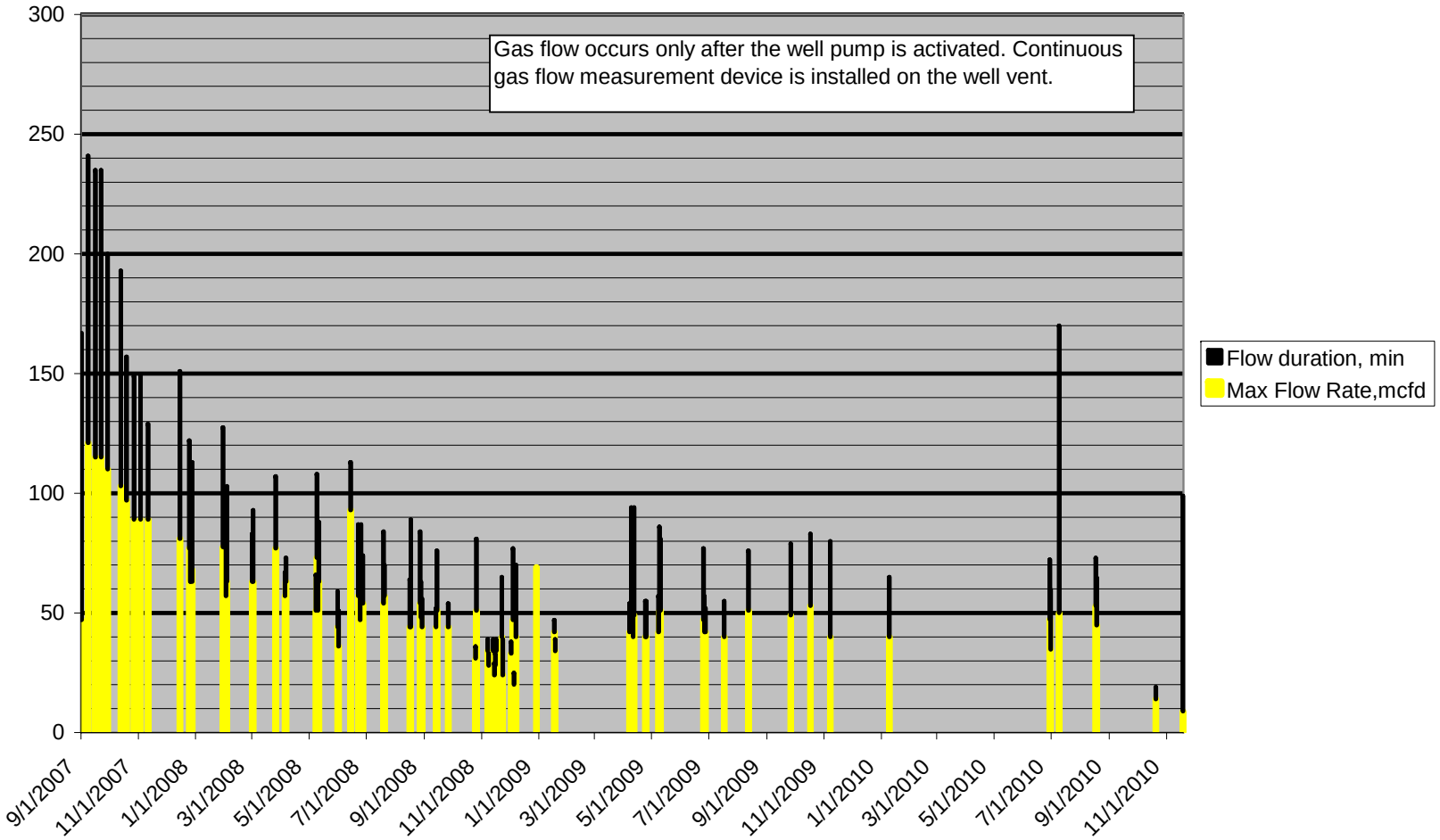
| Summary of Production Well Water Levels and Private Well Water Levels | | | | | | |
|---|---|---|---|---|---|---|
| **Well Name** | **Permit or API #** | **Ground Elevation ( ft above mean sea level)** | **Depth of Pressure Sensor (ft)** | **Formation** | **General Location** | **Well Status** |
| Barrett | 257994 | 6707 | 750 | Poison Canyon | In mitigation ring | non-active domestic well |
| Bergman | 244403 | 6690 | 400 | Poison Canyon | In mitigation ring | non-active domestic well |
| Coleman | 267694 | 6848 | 823 | Poison Canyon | In mitigation ring | active domestic well |
| Meyers | 248862 | 6575 | 600 | Raton | Outside 1 mile radius of mitigation ring | non-active domestic well |
| POCI 55 | 275819 | 6690 | 595 | Poison Canyon | In mitigation ring | monitor well |
| Bruington | 210526 | 6335 | 320 | Vermejo | City Ranch near outcrop | non-active domestic well |
| Evenden | 221465 | 6712 | 514 | Vermejo-Trinidad | Silver Spurs Ranch near outcrop | active domestic well |
| Garza | 206886 | 6536 | 288 | Trinidad | Silver Spurs Ranch near outcrop | active domestic well |
| Lively 03-03 | 222539 | 6647 | 995 | Trinidad | Within 1 mile radius of mitigation ring | Exploratory O&G well converted to water well (non-active) |
| Lively 10-12 | 55-06150 | 6825 | 1480 | Vermejo | In mitigation ring | CBM monitor well |
| Goemmer #1 | 16861-F | 6826 | 995 | Trinidad | In mitigation ring | Exploratory O&G well converted to water well (non-active) |
| Rohr 04-14 | 55-06291 | 6741 | 2186 | Vermejo-Trinidad | Within 1 mile radius of mitigation ring | Shut-in CBM well |
| Rohr 08-01 | 55-06292 | 6820 | 2365 | Vermejo-Trinidad | Within 1 mile radius of mitigation ring | Shut-in CBM well |
| Rohr 09-04 | 55-06290 | 6818 | 2273 | Vermejo-Trinidad | Within 1 mile radius of mitigation ring | Shut-in CBM well |
| Rohr 09-05 | 55-06289 | 6851 | 2285 | Vermejo-Trinidad | Within 1 mile radius of mitigation ring | Shut-in CBM well |
| Pearson 19-16 | 55-06293 | 6557 | 1000 | Vermejo | Outside 1 mile radius of mitigation ring | CBM monitor well |

**Attachment 5**
**Gas Flow Measurements at Bruington, Coleman, Angely, Bounds, and Smith**

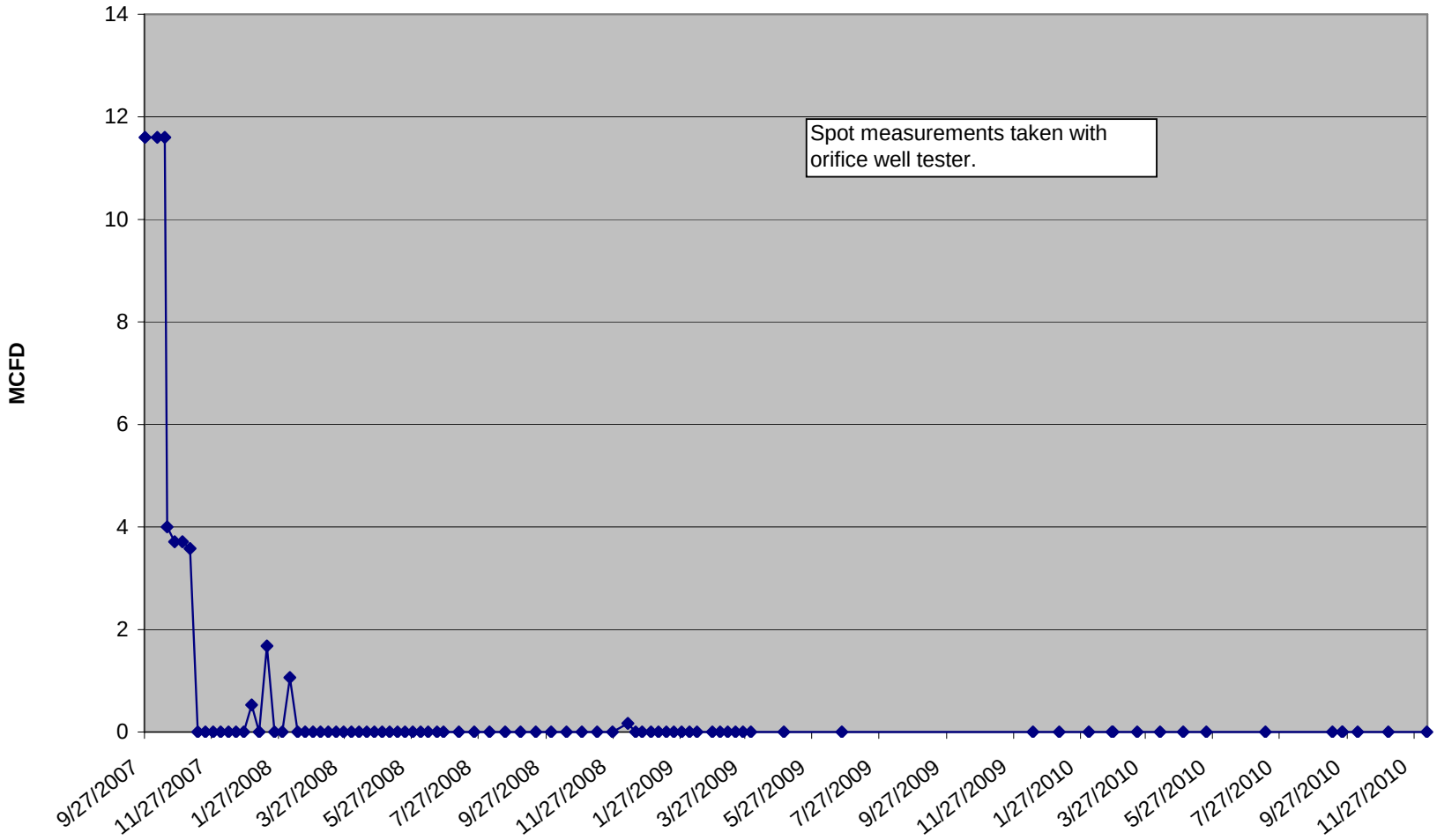
**Bruington WW # 210526 Measured Gas Flow**
**from 8/22/07 to 12/2/10**



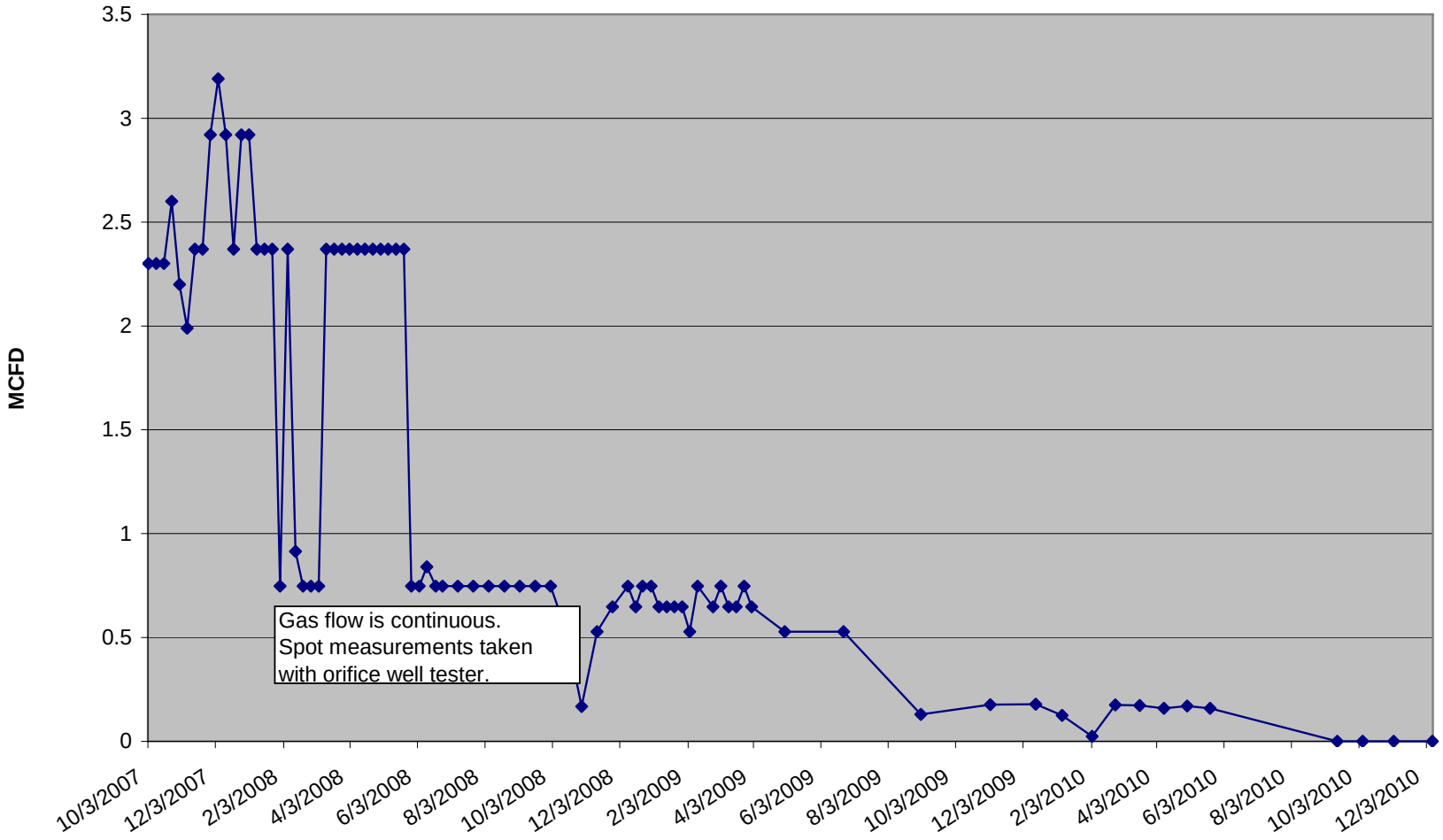
**Coleman WW #267294 Measured Gas Flow
from 9/1/07 to 11/18/10**



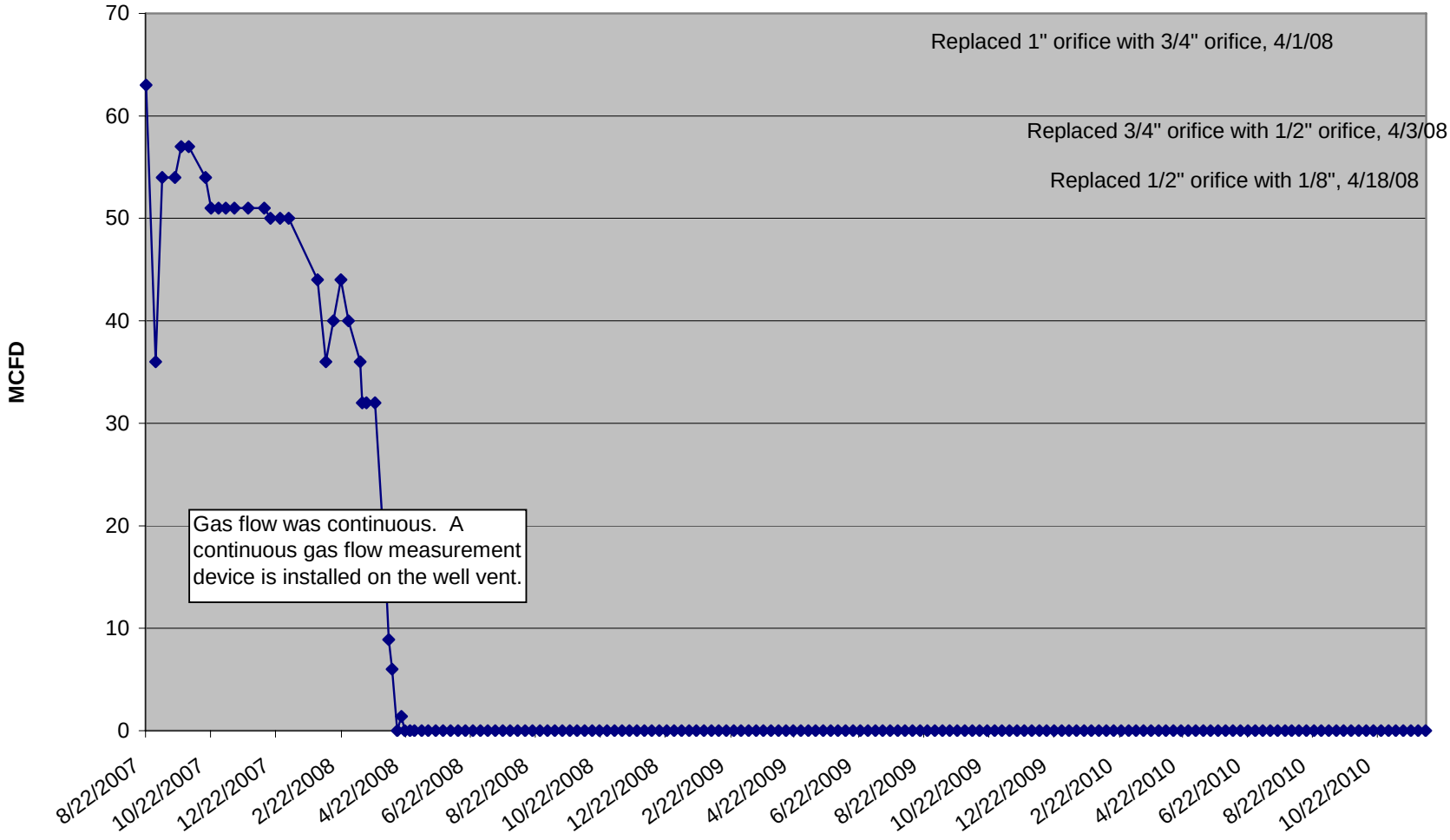
**Angely WW # 238689 Measured Gas Flow**
**from 9/27/07 to 12/8/10**



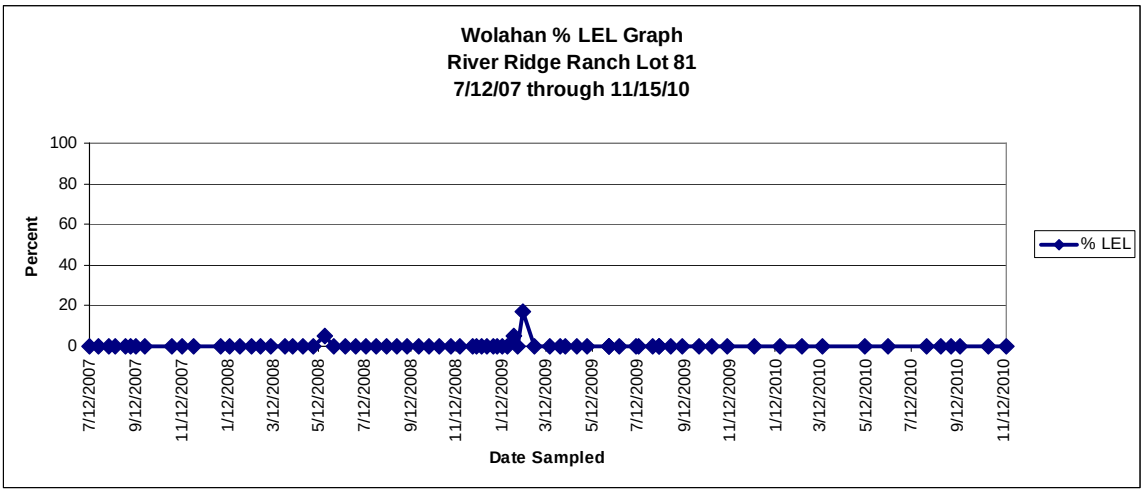
**Bounds WW #181278 Measured Gas Flow**
**from 10/3/07 to 12/8/10**

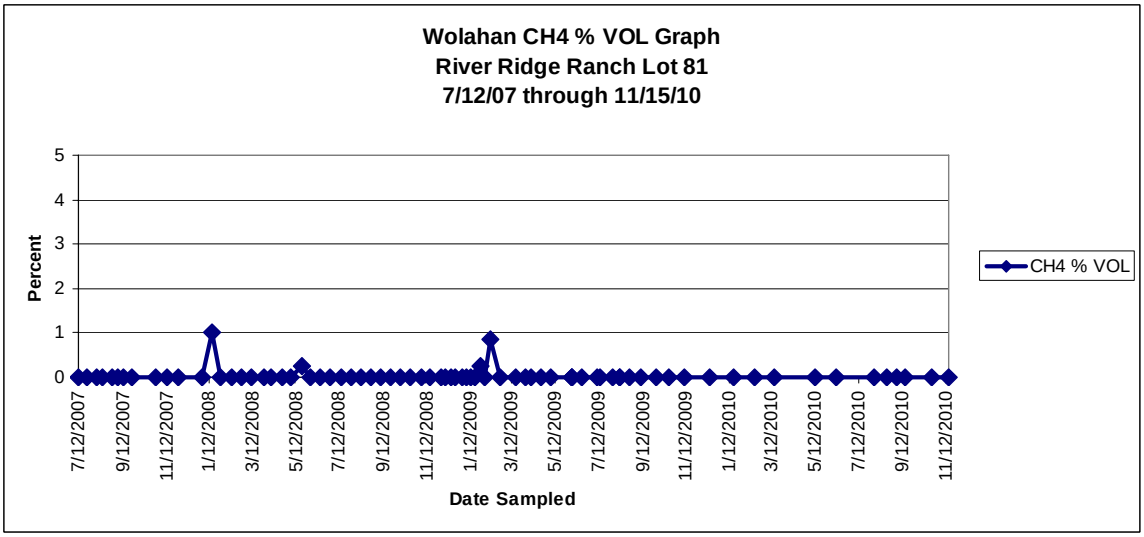


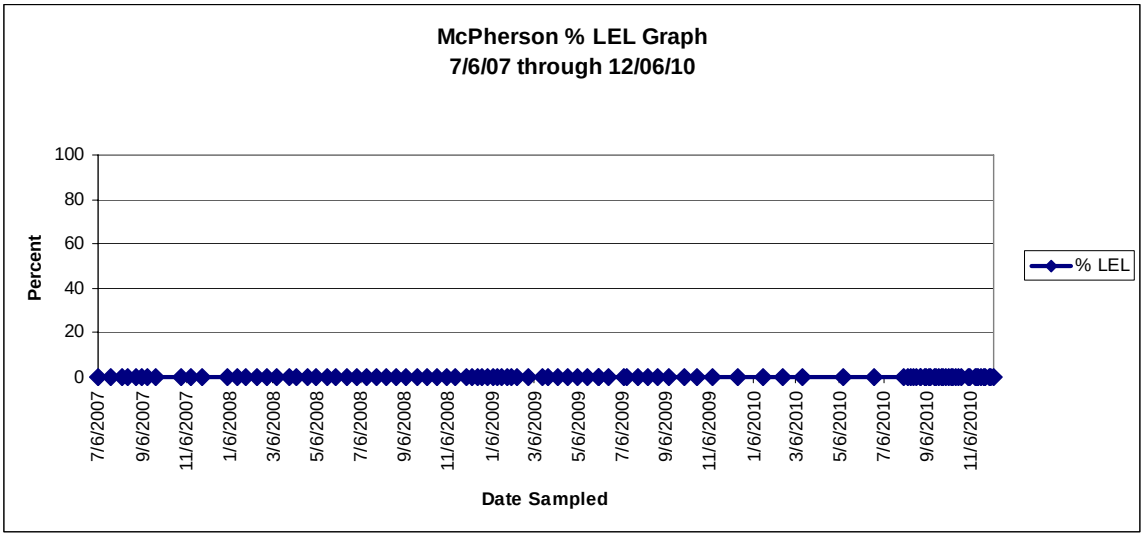
**Smith WW # 239657 Measured Gas Flow**
**from 8/22/07 to 12/6/10**

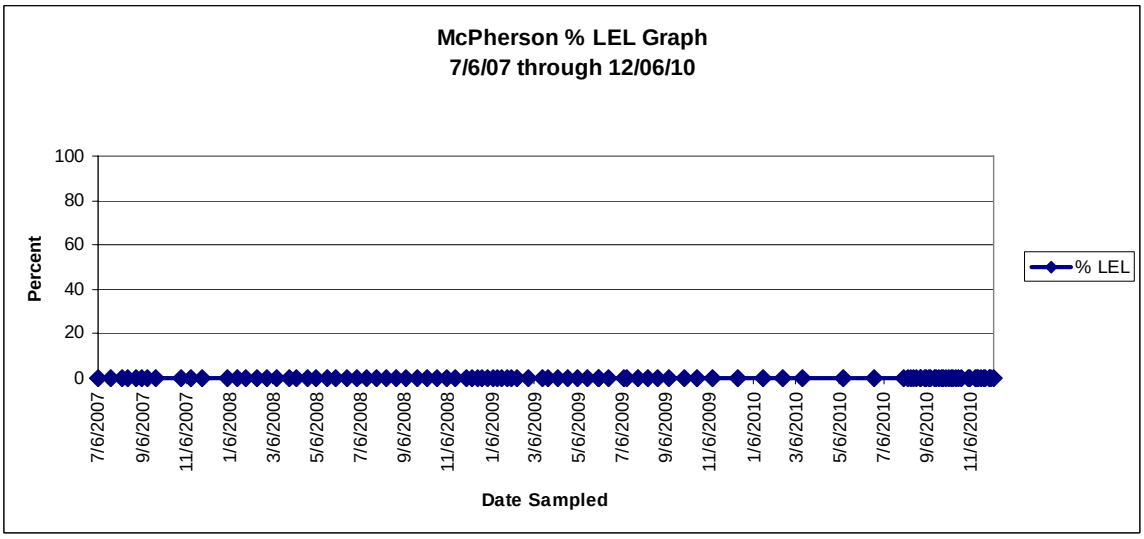


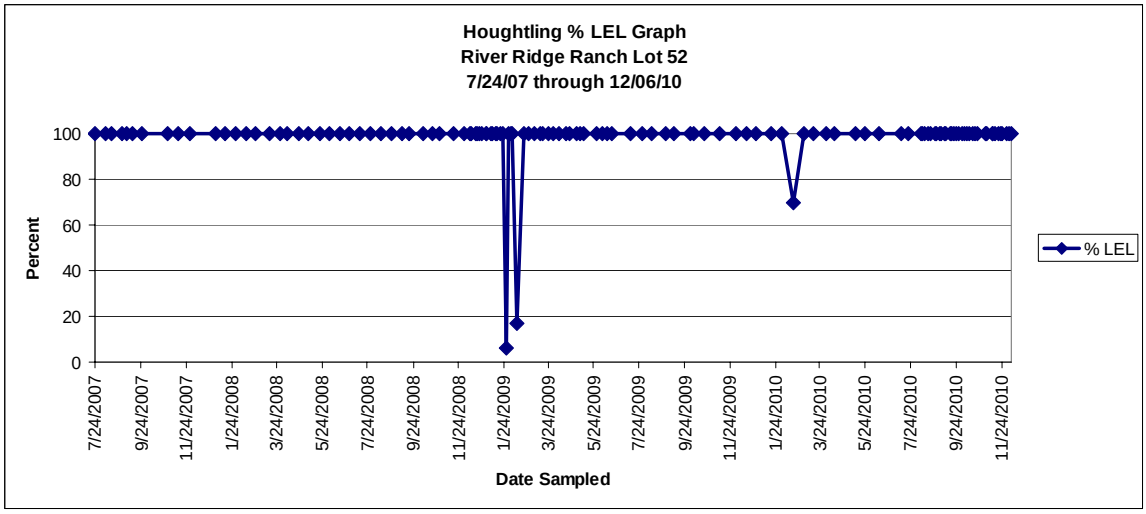
**Attachment 6**
**Gas Concentrations in**
**Private Water Wells near the Mitigation Project**

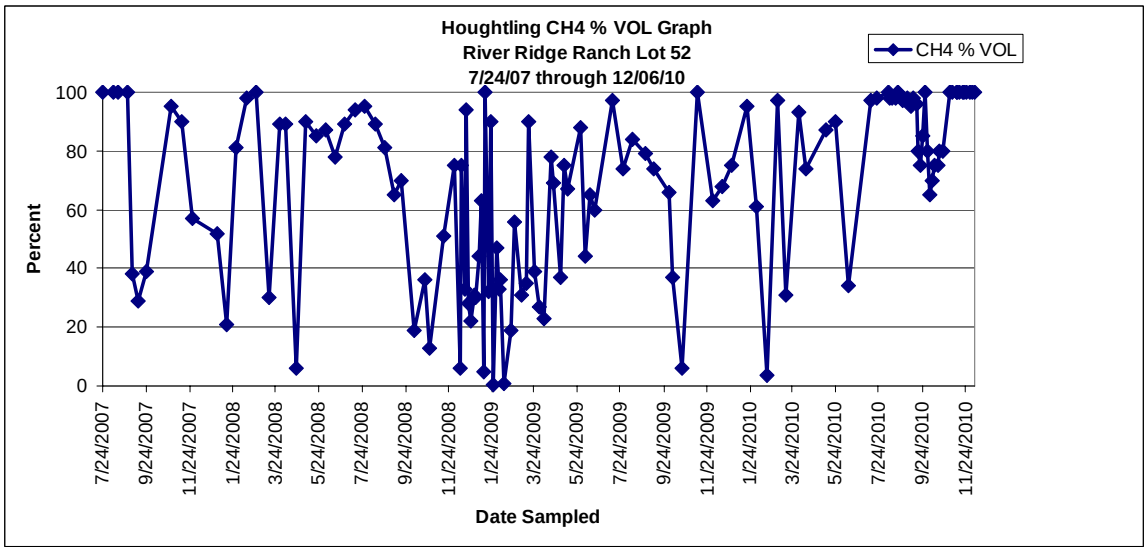

Wolahan % LEL Graph
River Ridge Ranch Lot 81
7/12/07 through 11/15/10
Percent
100
80
60
40
20
0
7/12/2007
9/12/2007
11/12/2007
1/12/2008
3/12/2008
5/12/2008
7/12/2008
9/12/2008
11/12/2008
1/12/2009
3/12/2009
5/12/2009
7/12/2009
9/12/2009
11/12/2009
1/12/2010
3/12/2010
5/12/2010
7/12/2010
9/12/2010
11/12/2010
Date Sampled
% LEL

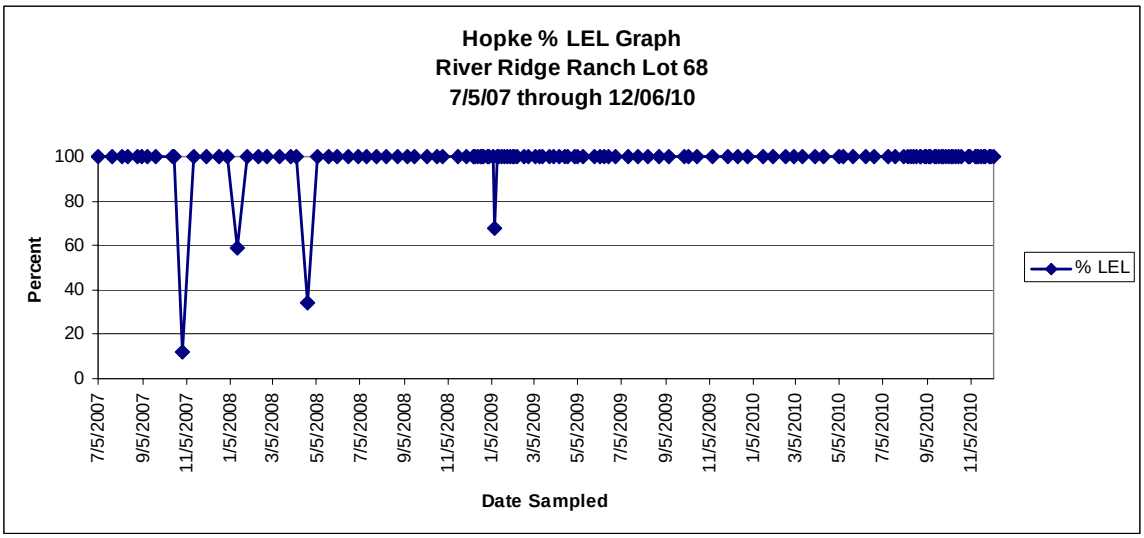

Wolahan CH4 % VOL Graph
River Ridge Ranch Lot 81
7/12/07 through 11/15/10
Percent
5
4
3
2
1
0
7/12/2007
9/12/2007
11/12/2007
1/12/2008
3/12/2008
5/12/2008
7/12/2008
9/12/2008
11/12/2008
1/12/2009
3/12/2009
5/12/2009
7/12/2009
9/12/2009
11/12/2009
1/12/2010
3/12/2010
5/12/2010
7/12/2010
9/12/2010
11/12/2010
Date Sampled
CH4 % VOL

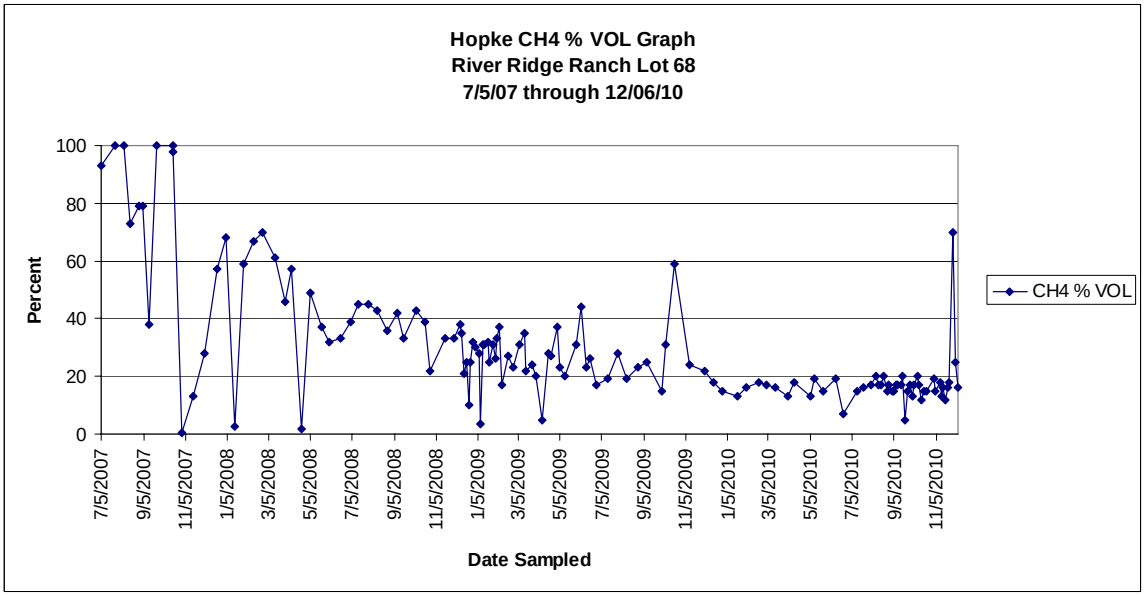

McPherson % LEL Graph
7/6/07 through 12/06/10
Percent
100
80
60
40
20
0
7/6/2007
9/6/2007
11/6/2007
1/6/2008
3/6/2008
5/6/2008
7/6/2008
9/6/2008
11/6/2008
1/6/2009
3/6/2009
5/6/2009
7/6/2009
9/6/2009
11/6/2009
1/6/2010
3/6/2010
5/6/2010
7/6/2010
9/6/2010
11/6/2010
Date Sampled
% LEL

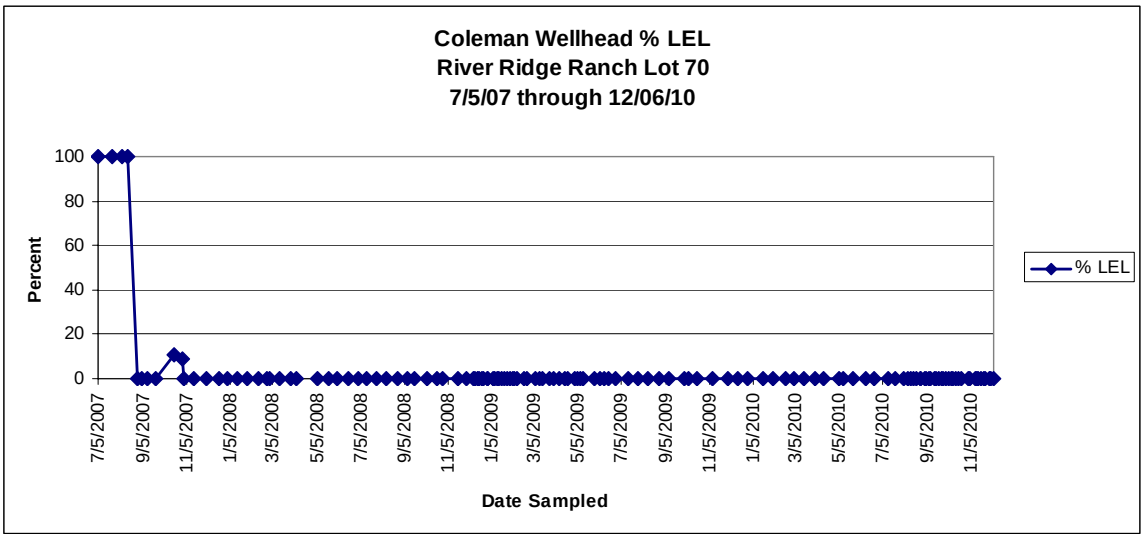

McPherson % LEL Graph
7/6/07 through 12/06/10
Percent
100
80
60
40
20
0
7/6/2007
9/6/2007
11/6/2007
1/6/2008
3/6/2008
5/6/2008
7/6/2008
9/6/2008
11/6/2008
1/6/2009
3/6/2009
5/6/2009
7/6/2009
9/6/2009
11/6/2009
1/6/2010
3/6/2010
5/6/2010
7/6/2010
9/6/2010
11/6/2010
Date Sampled
% LEL

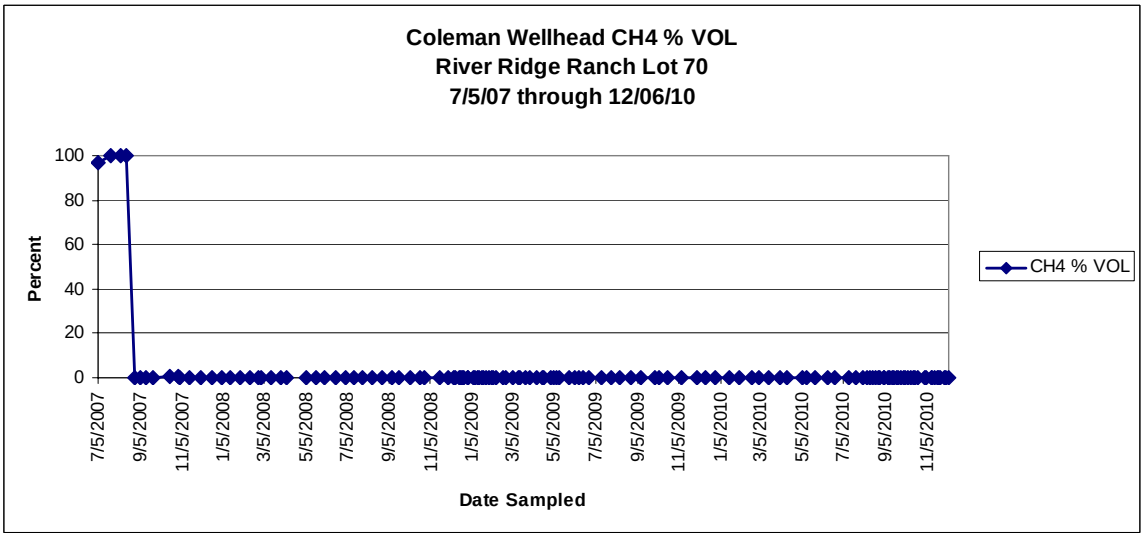

Houghtling % LEL Graph
River Ridge Ranch Lot 52
7/24/07 through 12/06/10
Percent
Date Sampled
% LEL
0
20
40
60
80
100
7/24/2007
9/24/2007
11/24/2007
1/24/2008
3/24/2008
5/24/2008
7/24/2008
9/24/2008
11/24/2008
1/24/2009
3/24/2009
5/24/2009
7/24/2009
9/24/2009
11/24/2009
1/24/2010
3/24/2010
5/24/2010
7/24/2010
9/24/2010
11/24/2010

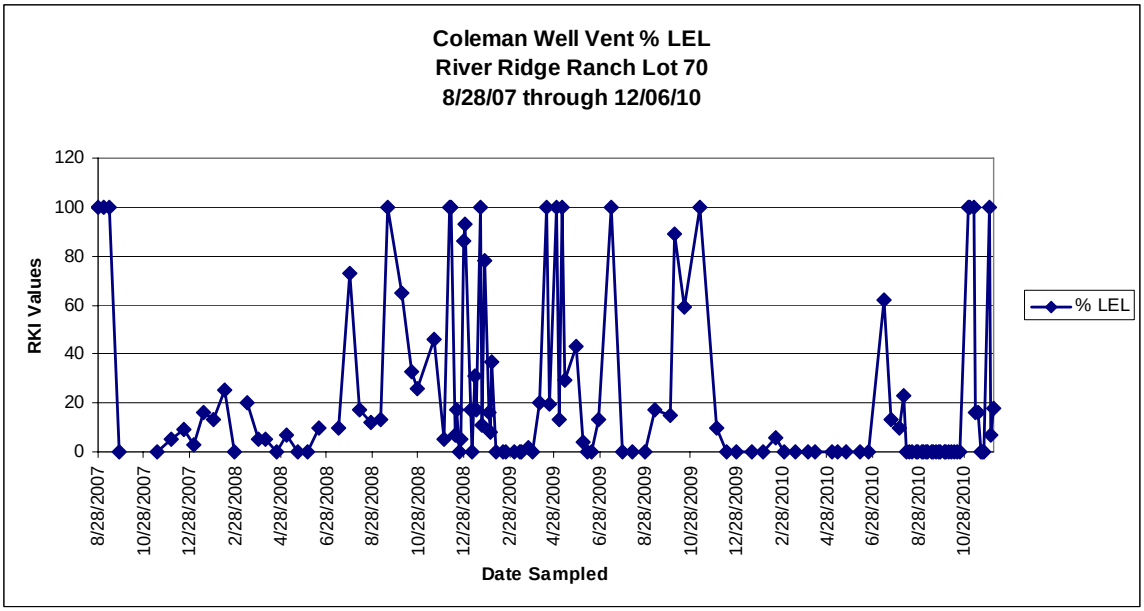

Houghtling CH4 % VOL Graph
River Ridge Ranch Lot 52
7/24/07 through 12/06/10
Percent
Date Sampled
CH4 % VOL
0
20
40
60
80
100
7/24/2007
9/24/2007
11/24/2007
1/24/2008
3/24/2008
5/24/2008
7/24/2008
9/24/2008
11/24/2008
1/24/2009
3/24/2009
5/24/2009
7/24/2009
9/24/2009
11/24/2009
1/24/2010
3/24/2010
5/24/2010
7/24/2010
9/24/2010
11/24/2010

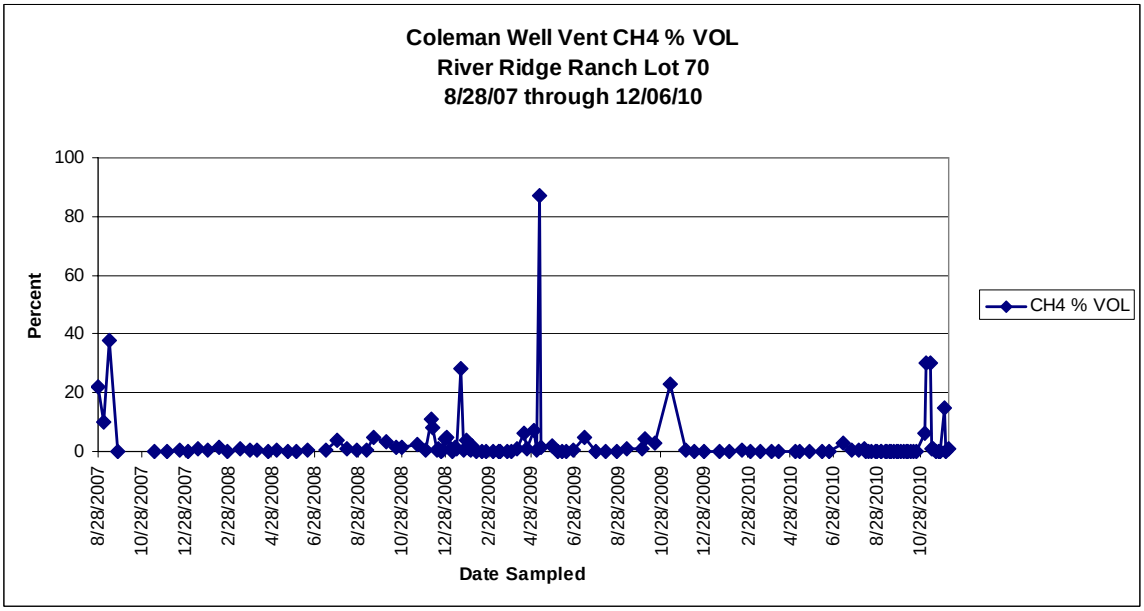

Hopke % LEL Graph
River Ridge Ranch Lot 68
7/5/07 through 12/06/10
Percent
100
80
60
40
20
0
7/5/2007
9/5/2007
11/5/2007
1/5/2008
3/5/2008
5/5/2008
7/5/2008
9/5/2008
11/5/2008
1/5/2009
3/5/2009
5/5/2009
7/5/2009
9/5/2009
11/5/2009
1/5/2010
3/5/2010
5/5/2010
7/5/2010
9/5/2010
11/5/2010
Date Sampled
% LEL

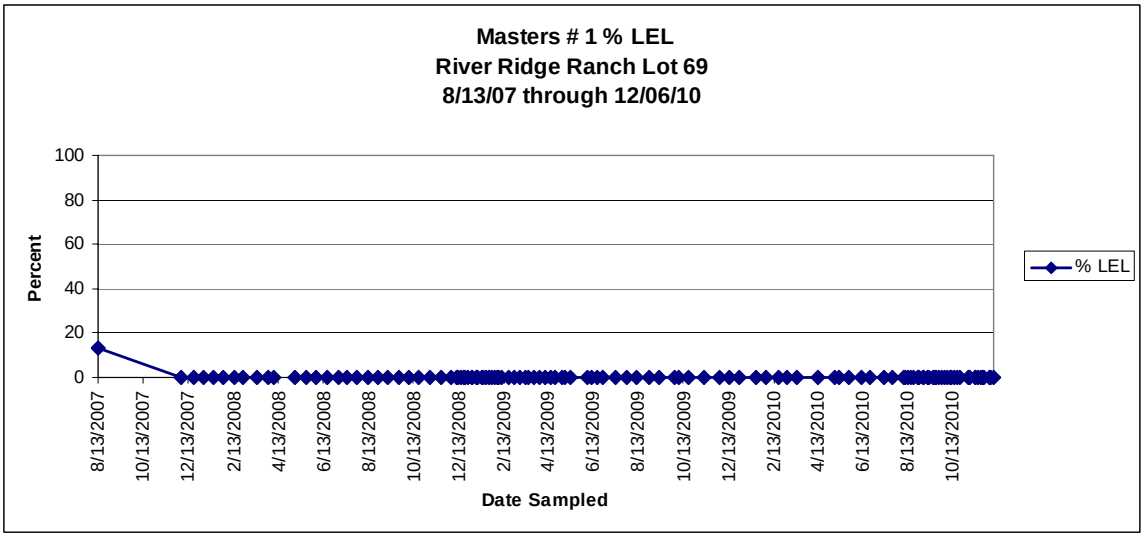

Hopke CH4 % VOL Graph
River Ridge Ranch Lot 68
7/5/07 through 12/06/10
Percent
100
80
60
40
20
0
7/5/2007
9/5/2007
11/5/2007
1/5/2008
3/5/2008
5/5/2008
7/5/2008
9/5/2008
11/5/2008
1/5/2009
3/5/2009
5/5/2009
7/5/2009
9/5/2009
11/5/2009
1/5/2010
3/5/2010
5/5/2010
7/5/2010
9/5/2010
11/5/2010
Date Sampled
CH4 % VOL

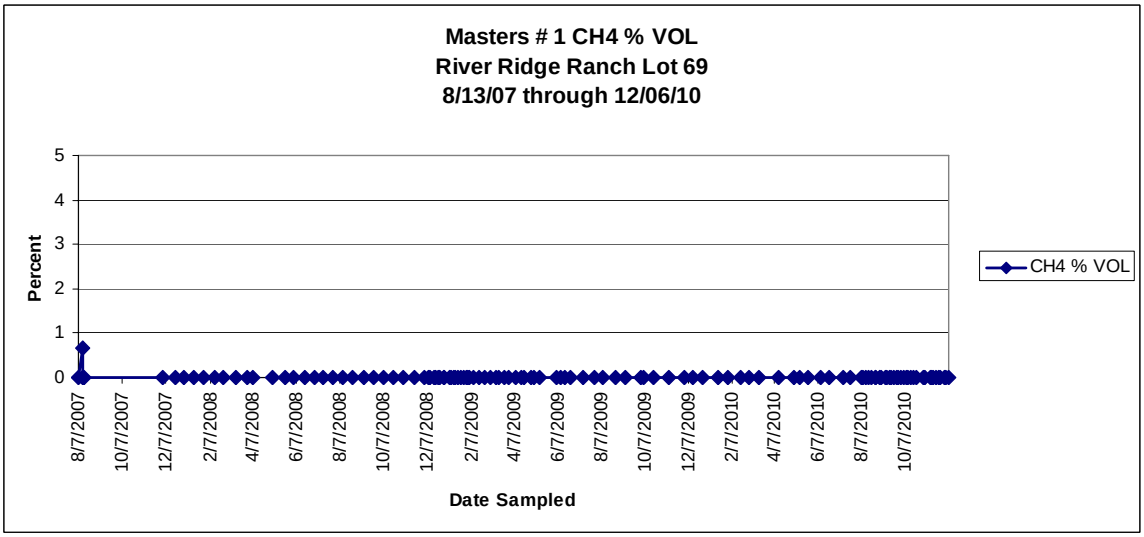

Coleman Wellhead % LEL
River Ridge Ranch Lot 70
7/5/07 through 12/06/10
Percent
100
80
60
40
20
0
7/5/2007
9/5/2007
11/5/2007
1/5/2008
3/5/2008
5/5/2008
7/5/2008
9/5/2008
11/5/2008
1/5/2009
3/5/2009
5/5/2009
7/5/2009
9/5/2009
11/5/2009
1/5/2010
3/5/2010
5/5/2010
7/5/2010
9/5/2010
11/5/2010
Date Sampled
% LEL

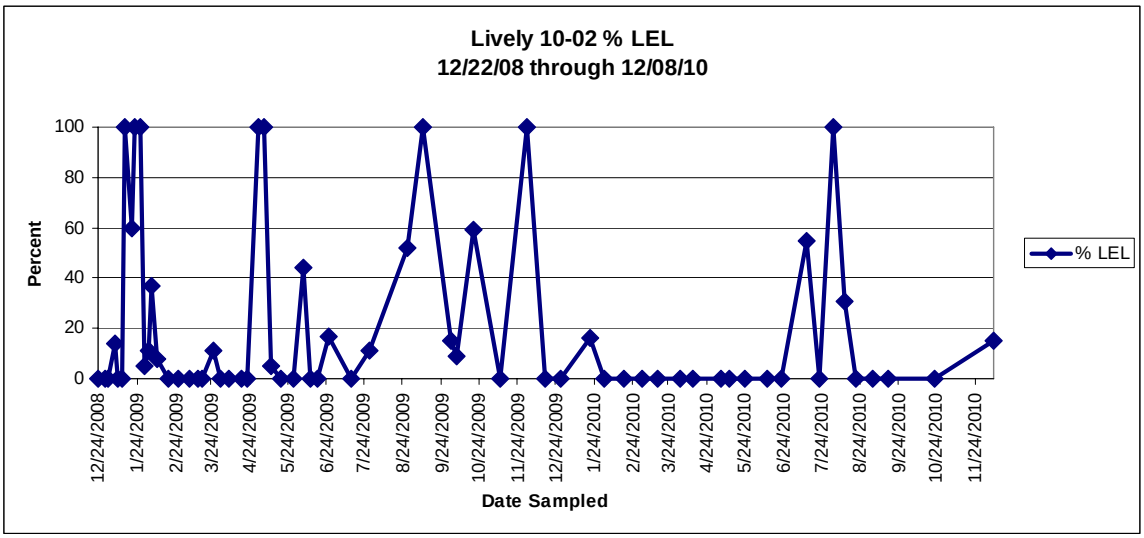

Coleman Wellhead CH4 % VOL
River Ridge Ranch Lot 70
7/5/07 through 12/06/10
Percent
100
80
60
40
20
0
7/5/2007
9/5/2007
11/5/2007
1/5/2008
3/5/2008
5/5/2008
7/5/2008
9/5/2008
11/5/2008
1/5/2009
3/5/2009
5/5/2009
7/5/2009
9/5/2009
11/5/2009
1/5/2010
3/5/2010
5/5/2010
7/5/2010
9/5/2010
11/5/2010
Date Sampled
CH4 % VOL

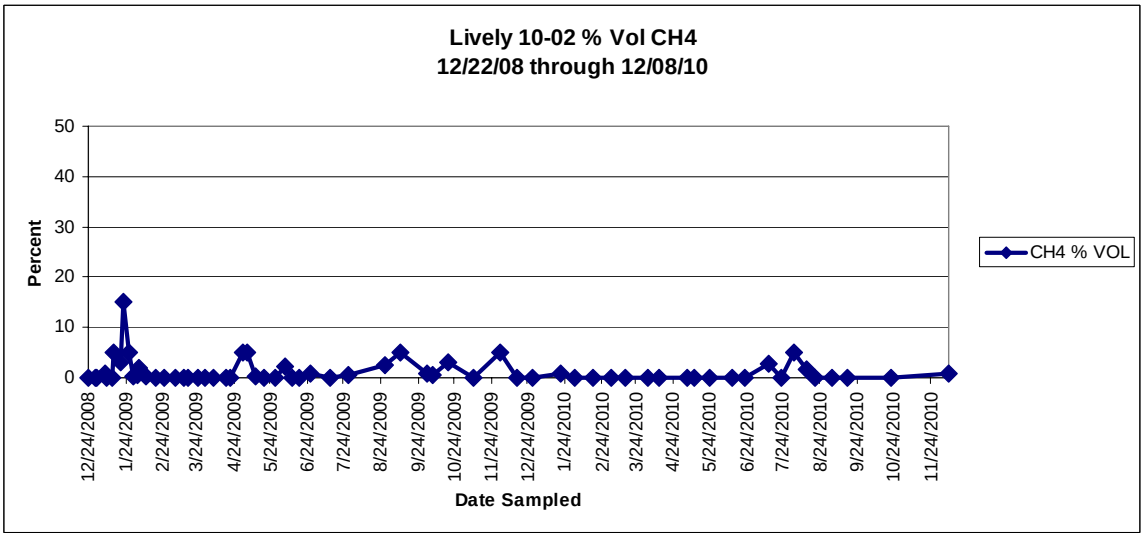

Coleman Well Vent % LEL
River Ridge Ranch Lot 70
8/28/07 through 12/06/10
RKI Values
120
100
80
60
40
20
0
8/28/2007
10/28/2007
12/28/2007
2/28/2008
4/28/2008
6/28/2008
8/28/2008
10/28/2008
12/28/2008
2/28/2009
4/28/2009
6/28/2009
8/28/2009
10/28/2009
12/28/2009
2/28/2010
4/28/2010
6/28/2010
8/28/2010
10/28/2010
Date Sampled
% LEL

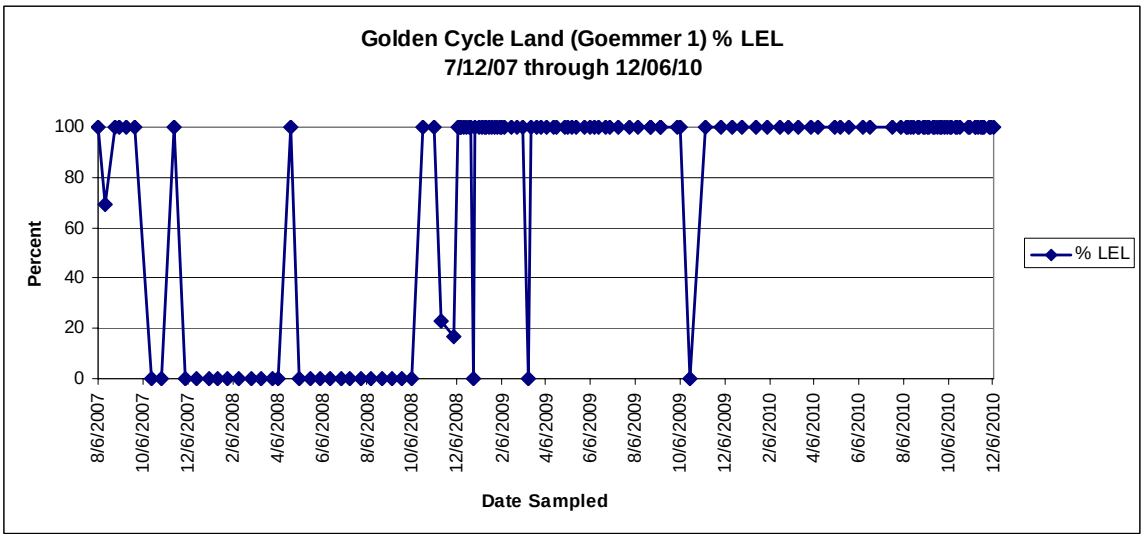

Coleman Well Vent CH4 % VOL
River Ridge Ranch Lot 70
8/28/07 through 12/06/10
Percent
100
80
60
40
20
0
8/28/2007
10/28/2007
12/28/2007
2/28/2008
4/28/2008
6/28/2008
8/28/2008
10/28/2008
12/28/2008
2/28/2009
4/28/2009
6/28/2009
8/28/2009
10/28/2009
12/28/2009
2/28/2010
4/28/2010
6/28/2010
8/28/2010
10/28/2010
Date Sampled
CH4 % VOL

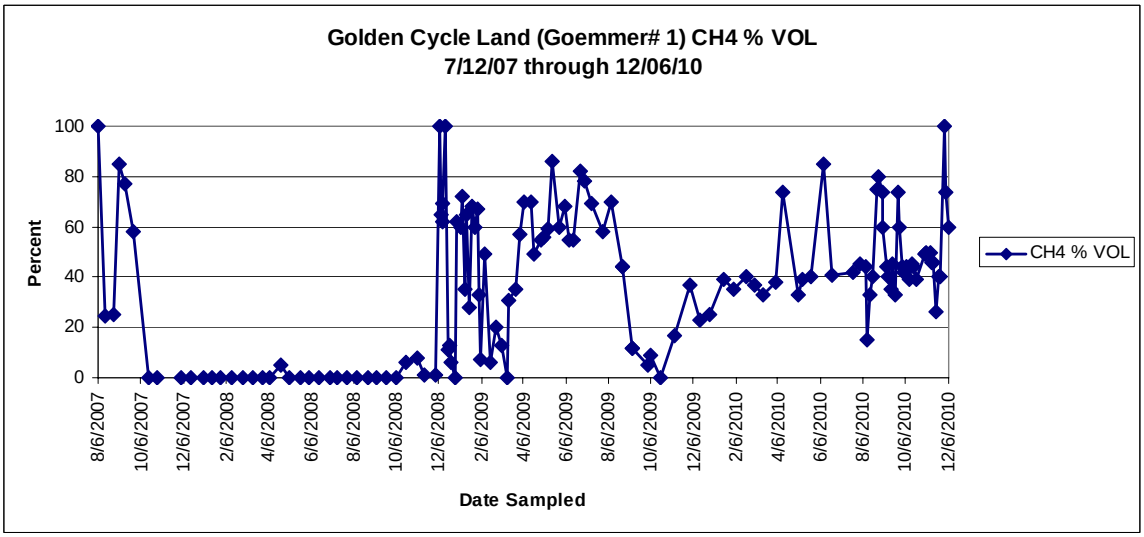

Masters # 1 % LEL
River Ridge Ranch Lot 69
8/13/07 through 12/06/10
Percent
100
80
60
40
20
0
8/13/2007
10/13/2007
12/13/2007
2/13/2008
4/13/2008
6/13/2008
8/13/2008
10/13/2008
12/13/2008
2/13/2009
4/13/2009
6/13/2009
8/13/2009
10/13/2009
12/13/2009
2/13/2010
4/13/2010
6/13/2010
8/13/2010
10/13/2010
Date Sampled
% LEL

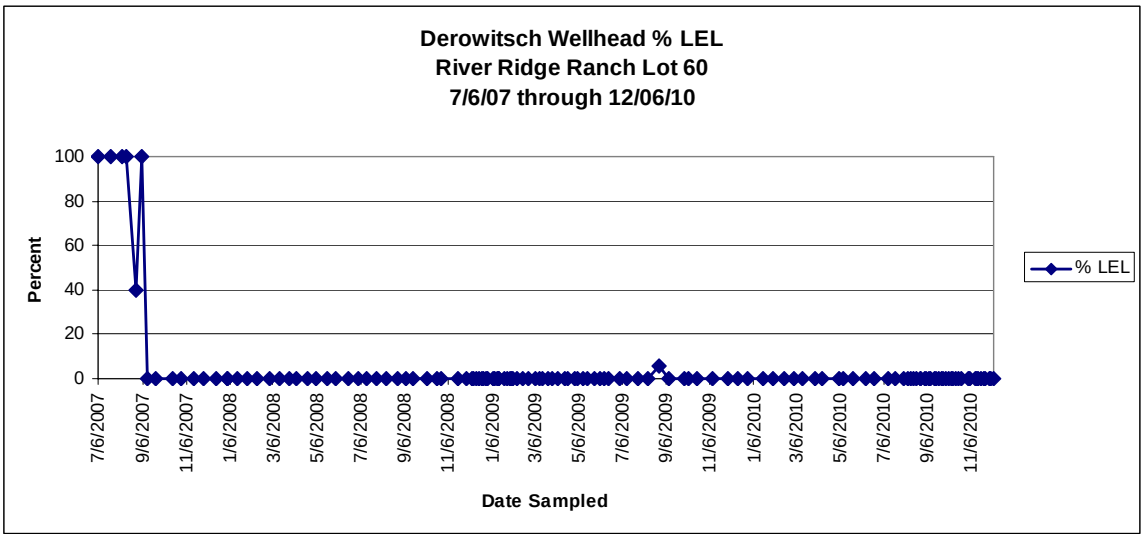

Masters # 1 CH4 % VOL
River Ridge Ranch Lot 69
8/13/07 through 12/06/10
Percent
5
4
3
2
1
0
8/7/2007
10/7/2007
12/7/2007
2/7/2008
4/7/2008
6/7/2008
8/7/2008
10/7/2008
12/7/2008
2/7/2009
4/7/2009
6/7/2009
8/7/2009
10/7/2009
12/7/2009
2/7/2010
4/7/2010
6/7/2010
8/7/2010
10/7/2010
Date Sampled
CH4 % VOL

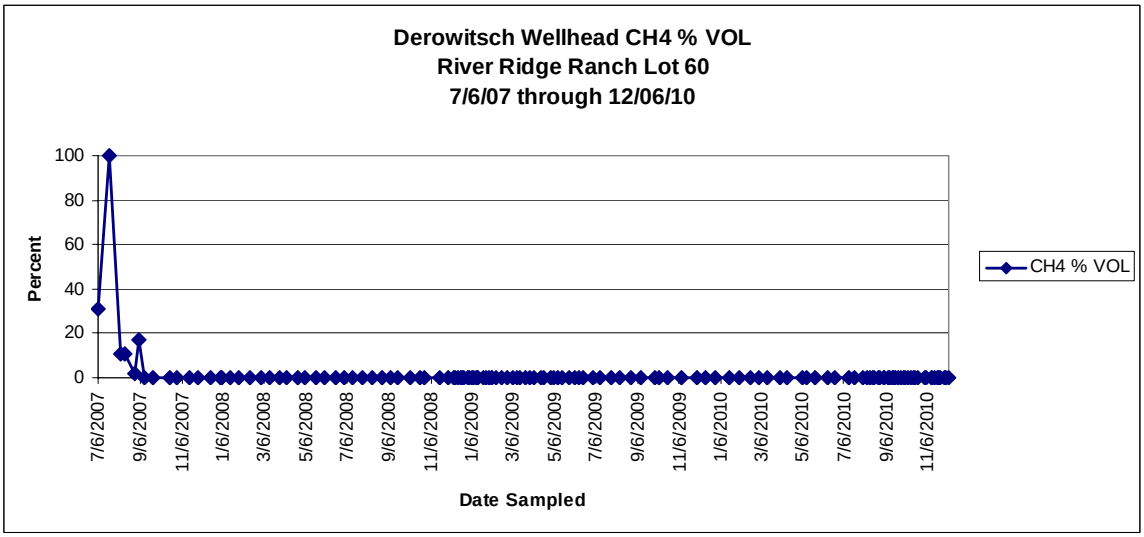

Lively 10-02 % LEL
12/22/08 through 12/08/10
Percent
Date Sampled
% LEL

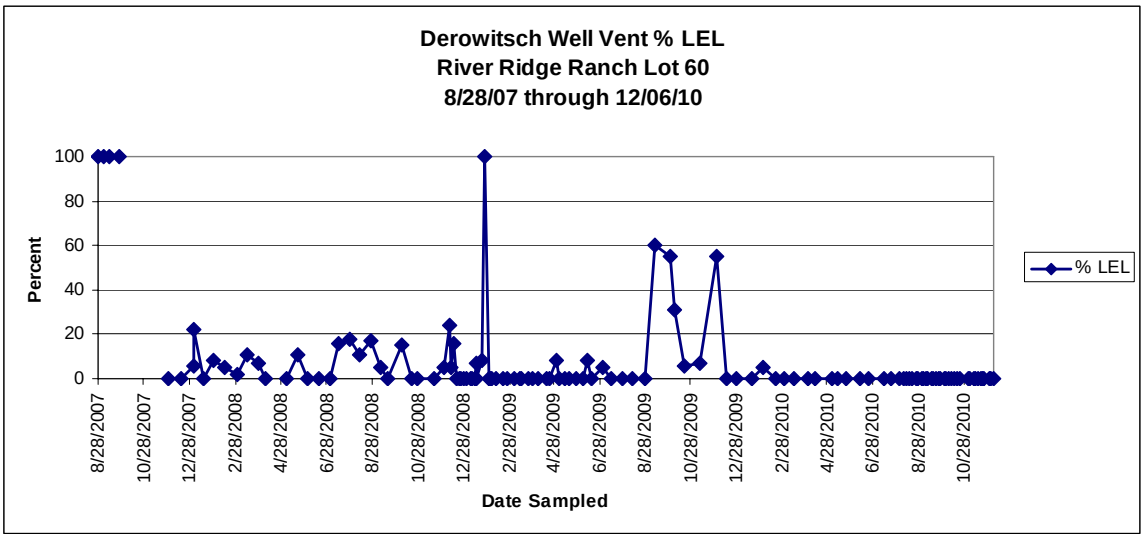

Lively 10-02 % Vol CH4
12/22/08 through 12/08/10
Percent
Date Sampled
CH4 % VOL

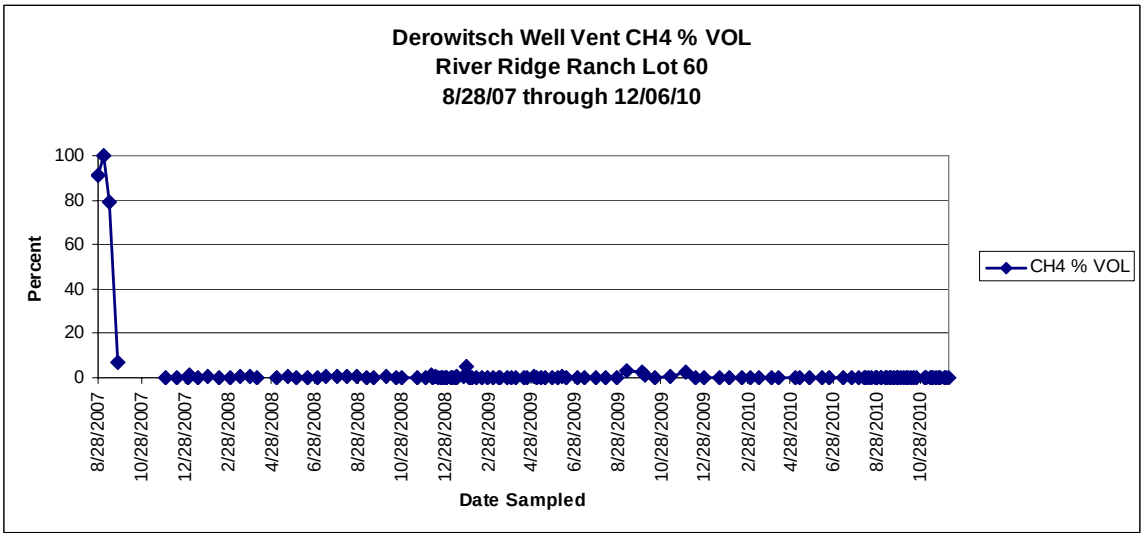

Golden Cycle Land (Goemmer 1) % LEL
7/12/07 through 12/06/10
Percent
Date Sampled
% LEL

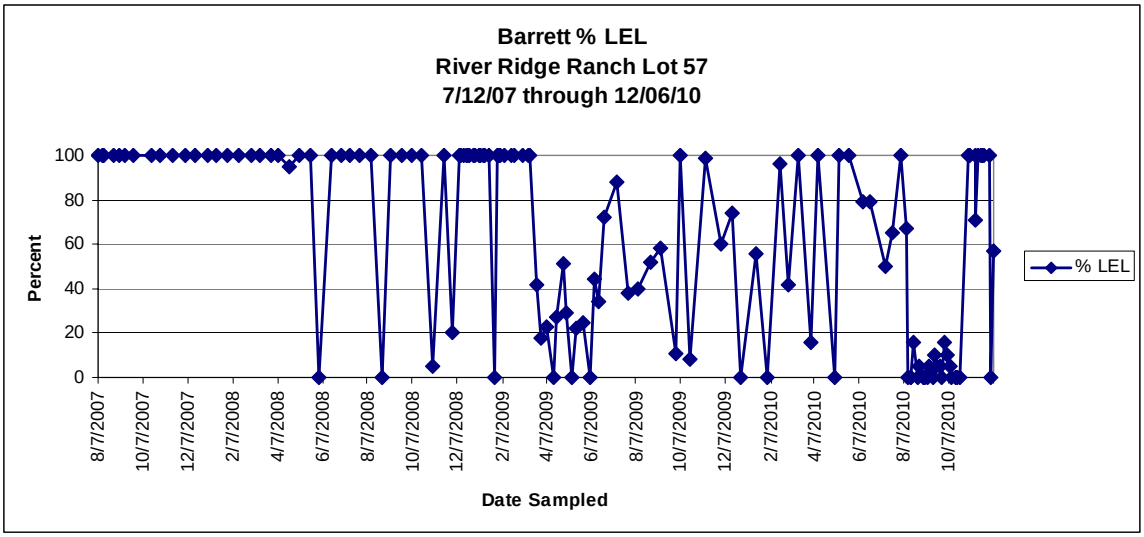

Golden Cycle Land (Goemmer# 1) CH4 % VOL
7/12/07 through 12/06/10
Percent
Date Sampled
CH4 % VOL

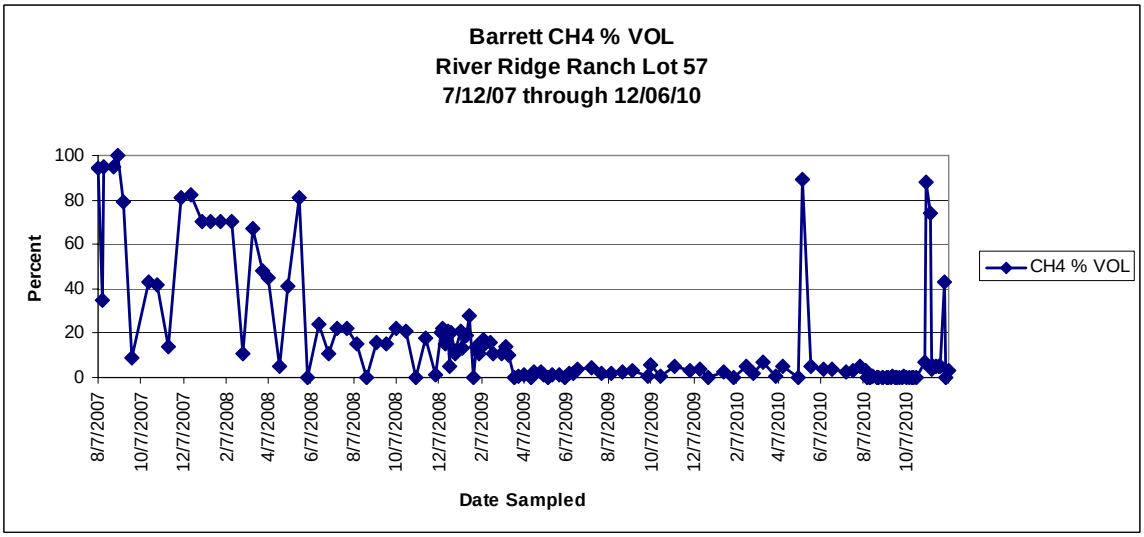

Derowitsch Wellhead % LEL
River Ridge Ranch Lot 60
7/6/07 through 12/06/10
Percent
100
80
60
40
20
0
7/6/2007
9/6/2007
11/6/2007
1/6/2008
3/6/2008
5/6/2008
7/6/2008
9/6/2008
11/6/2008
1/6/2009
3/6/2009
5/6/2009
7/6/2009
9/6/2009
11/6/2009
1/6/2010
3/6/2010
5/6/2010
7/6/2010
9/6/2010
11/6/2010
Date Sampled
% LEL

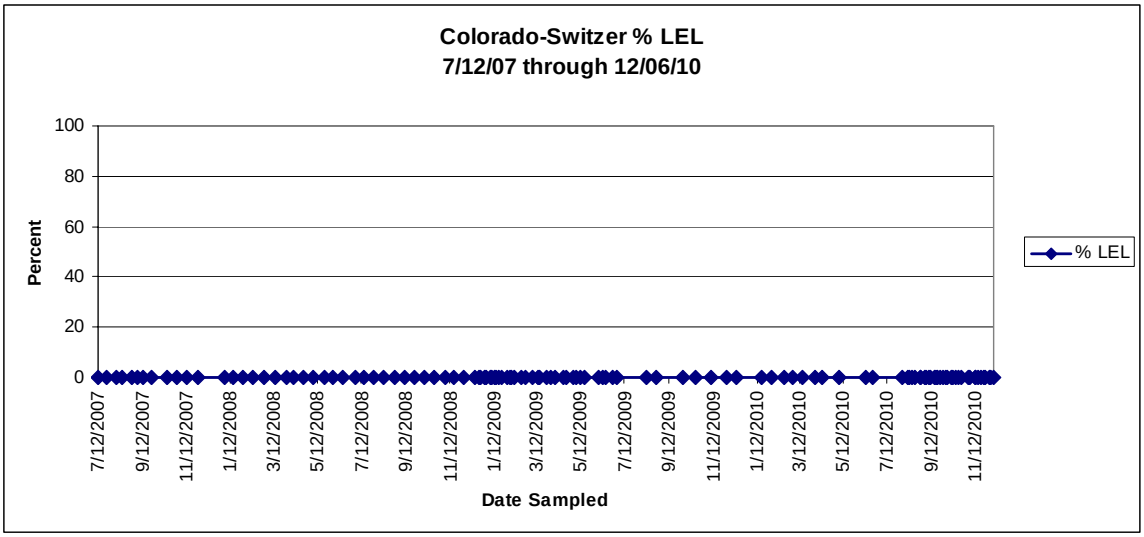

Derowitsch Wellhead CH4 % VOL
River Ridge Ranch Lot 60
7/6/07 through 12/06/10
Percent
100
80
60
40
20
0
7/6/2007
9/6/2007
11/6/2007
1/6/2008
3/6/2008
5/6/2008
7/6/2008
9/6/2008
11/6/2008
1/6/2009
3/6/2009
5/6/2009
7/6/2009
9/6/2009
11/6/2009
1/6/2010
3/6/2010
5/6/2010
7/6/2010
9/6/2010
11/6/2010
Date Sampled
CH4 % VOL

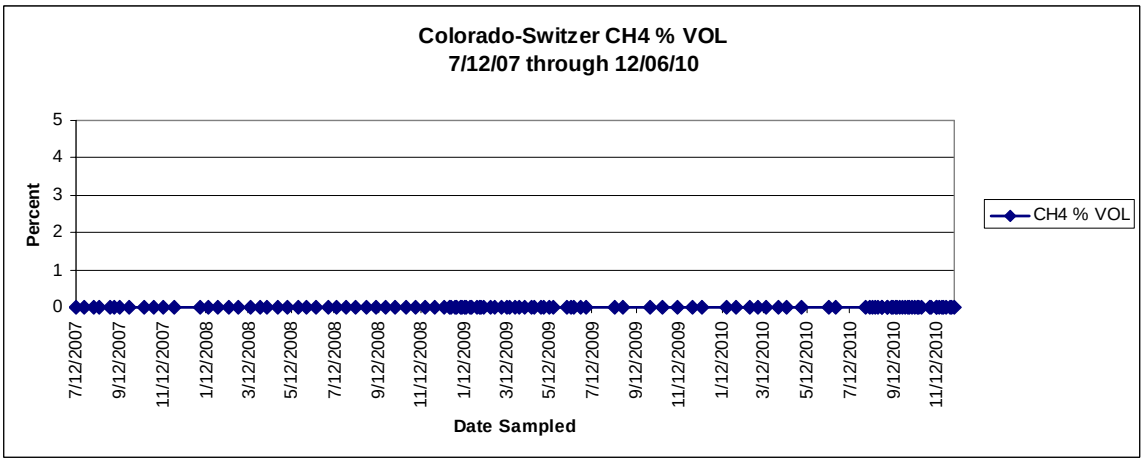

Derowitsch Well Vent % LEL
River Ridge Ranch Lot 60
8/28/07 through 12/06/10
Percent
100
80
60
40
20
0
8/28/2007
10/28/2007
12/28/2007
2/28/2008
4/28/2008
6/28/2008
8/28/2008
10/28/2008
12/28/2008
2/28/2009
4/28/2009
6/28/2009
8/28/2009
10/28/2009
12/28/2009
2/28/2010
4/28/2010
6/28/2010
8/28/2010
10/28/2010
Date Sampled
% LEL

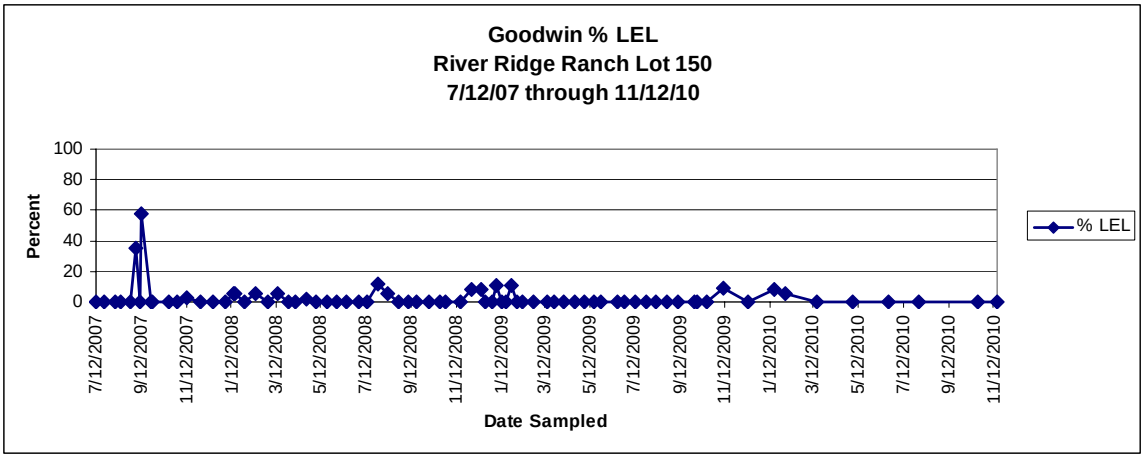

Derowitsch Well Vent CH4 % VOL
River Ridge Ranch Lot 60
8/28/07 through 12/06/10
Percent
100
80
60
40
20
0
8/28/2007
10/28/2007
12/28/2007
2/28/2008
4/28/2008
6/28/2008
8/28/2008
10/28/2008
12/28/2008
2/28/2009
4/28/2009
6/28/2009
8/28/2009
10/28/2009
12/28/2009
2/28/2010
4/28/2010
6/28/2010
8/28/2010
10/28/2010
Date Sampled
CH4 % VOL

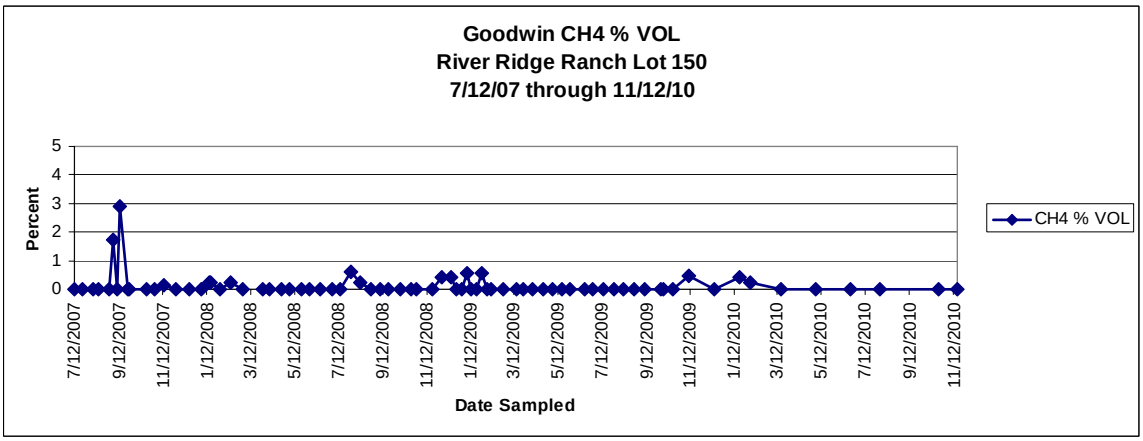

Barrett % LEL
River Ridge Ranch Lot 57
7/12/07 through 12/06/10
Percent
100
80
60
40
20
0
8/7/2007
10/7/2007
12/7/2007
2/7/2008
4/7/2008
6/7/2008
8/7/2008
10/7/2008
12/7/2008
2/7/2009
4/7/2009
6/7/2009
8/7/2009
10/7/2009
12/7/2009
2/7/2010
4/7/2010
6/7/2010
8/7/2010
10/7/2010
Date Sampled
% LEL

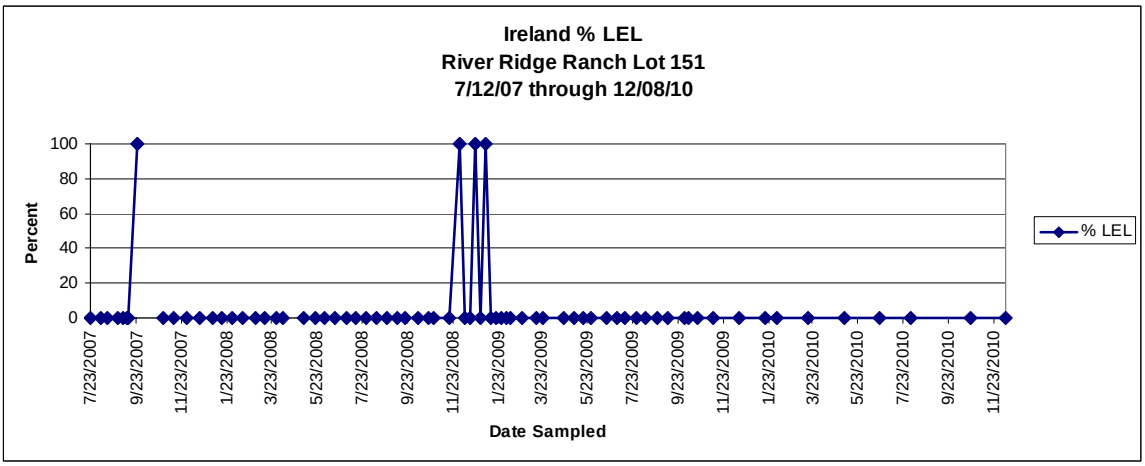

Barrett CH4 % VOL
River Ridge Ranch Lot 57
7/12/07 through 12/06/10
Percent
100
80
60
40
20
0
8/7/2007
10/7/2007
12/7/2007
2/7/2008
4/7/2008
6/7/2008
8/7/2008
10/7/2008
12/7/2008
2/7/2009
4/7/2009
6/7/2009
8/7/2009
10/7/2009
12/7/2009
2/7/2010
4/7/2010
6/7/2010
8/7/2010
10/7/2010
Date Sampled
CH4 % VOL

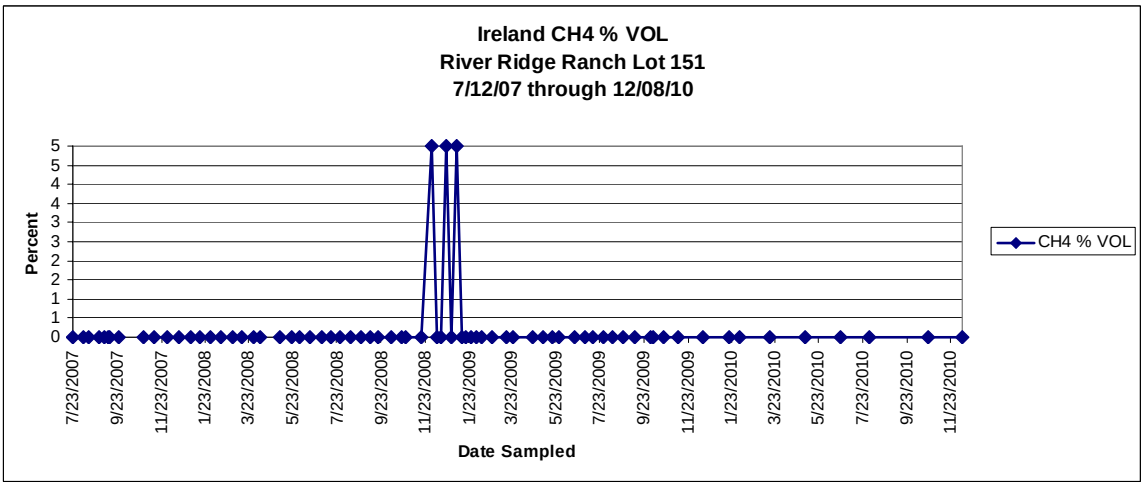

Colorado-Switzer % LEL
7/12/07 through 12/06/10
Percent
100
80
60
40
20
0
7/12/2007
9/12/2007
11/12/2007
1/12/2008
3/12/2008
5/12/2008
7/12/2008
9/12/2008
11/12/2008
1/12/2009
3/12/2009
5/12/2009
7/12/2009
9/12/2009
11/12/2009
1/12/2010
3/12/2010
5/12/2010
7/12/2010
9/12/2010
11/12/2010
Date Sampled
% LEL

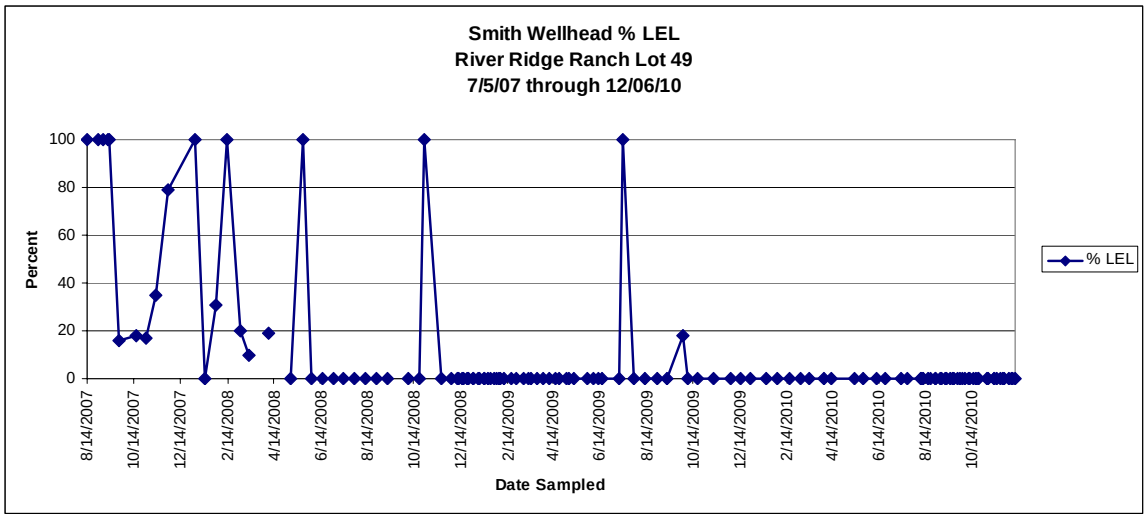

Colorado-Switzer CH4 % VOL
7/12/07 through 12/06/10
Percent
5
4
3
2
1
0
7/12/2007
9/12/2007
11/12/2007
1/12/2008
3/12/2008
5/12/2008
7/12/2008
9/12/2008
11/12/2008
1/12/2009
3/12/2009
5/12/2009
7/12/2009
9/12/2009
11/12/2009
1/12/2010
3/12/2010
5/12/2010
7/12/2010
9/12/2010
11/12/2010
Date Sampled
CH4 % VOL

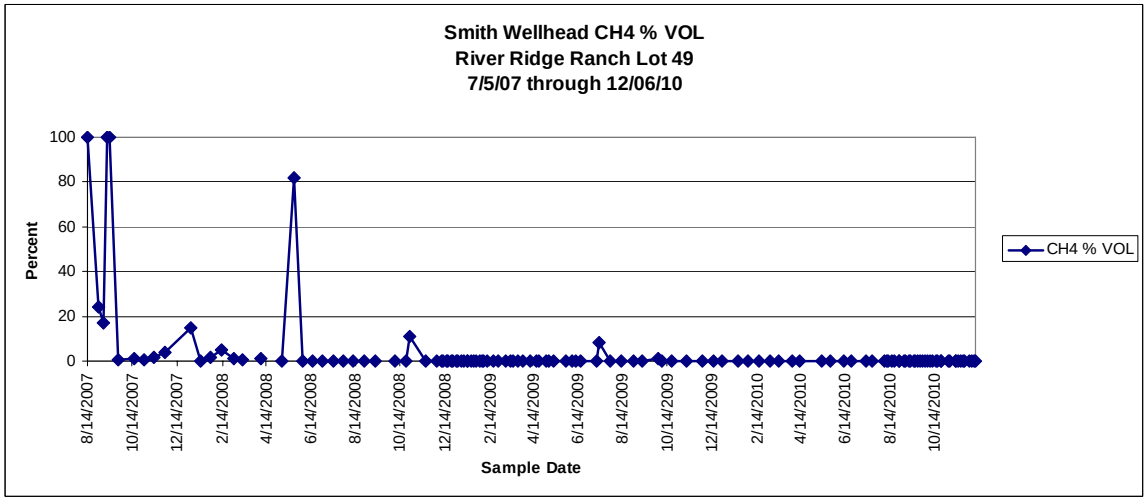

Goodwin % LEL
River Ridge Ranch Lot 150
7/12/07 through 11/12/10
Percent
100
80
60
40
20
0
7/12/2007
9/12/2007
11/12/2007
1/12/2008
3/12/2008
5/12/2008
7/12/2008
9/12/2008
11/12/2008
1/12/2009
3/12/2009
5/12/2009
7/12/2009
9/12/2009
11/12/2009
1/12/2010
3/12/2010
5/12/2010
7/12/2010
9/12/2010
11/12/2010
Date Sampled
% LEL

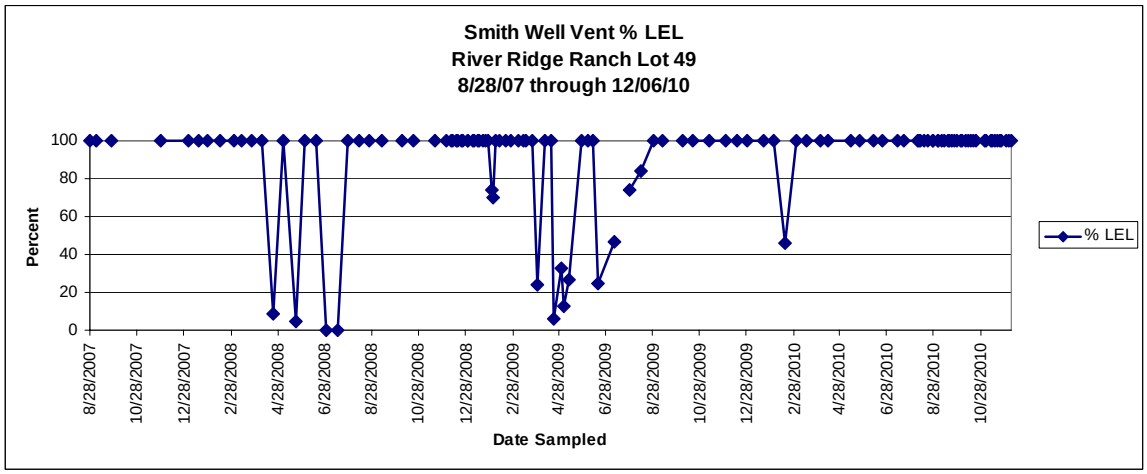

Goodwin CH4 % VOL
River Ridge Ranch Lot 150
7/12/07 through 11/12/10
Percent
5
4
3
2
1
0
7/12/2007
9/12/2007
11/12/2007
1/12/2008
3/12/2008
5/12/2008
7/12/2008
9/12/2008
11/12/2008
1/12/2009
3/12/2009
5/12/2009
7/12/2009
9/12/2009
11/12/2009
1/12/2010
3/12/2010
5/12/2010
7/12/2010
9/12/2010
11/12/2010
Date Sampled
CH4 % VOL

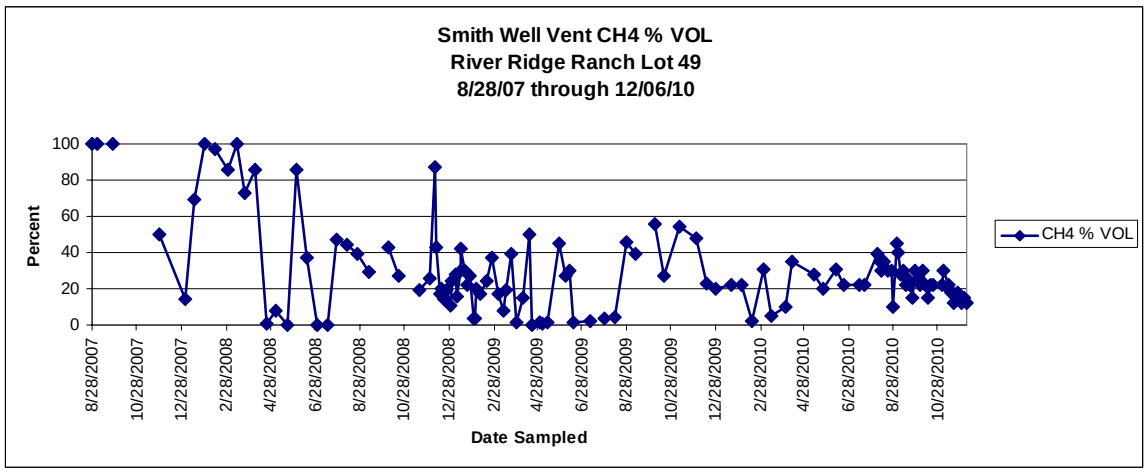

Ireland % LEL
River Ridge Ranch Lot 151
7/12/07 through 12/08/10
Percent
100
80
60
40
20
0
7/23/2007
9/23/2007
11/23/2007
1/23/2008
3/23/2008
5/23/2008
7/23/2008
9/23/2008
11/23/2008
1/23/2009
3/23/2009
5/23/2009
7/23/2009
9/23/2009
11/23/2009
1/23/2010
3/23/2010
5/23/2010
7/23/2010
9/23/2010
11/23/2010
Date Sampled
% LEL

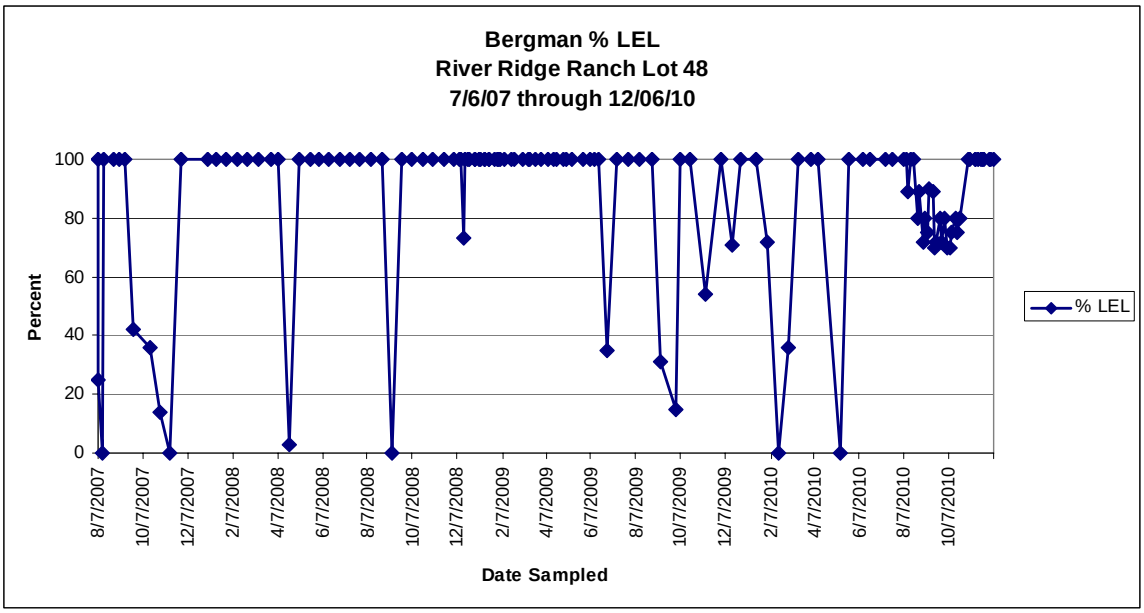

Ireland CH4 % VOL
River Ridge Ranch Lot 151
7/12/07 through 12/08/10
Percent
5
5
4
4
3
3
2
2
1
1
0
7/23/2007
9/23/2007
11/23/2007
1/23/2008
3/23/2008
5/23/2008
7/23/2008
9/23/2008
11/23/2008
1/23/2009
3/23/2009
5/23/2009
7/23/2009
9/23/2009
11/23/2009
1/23/2010
3/23/2010
5/23/2010
7/23/2010
9/23/2010
11/23/2010
Date Sampled
CH4 % VOL

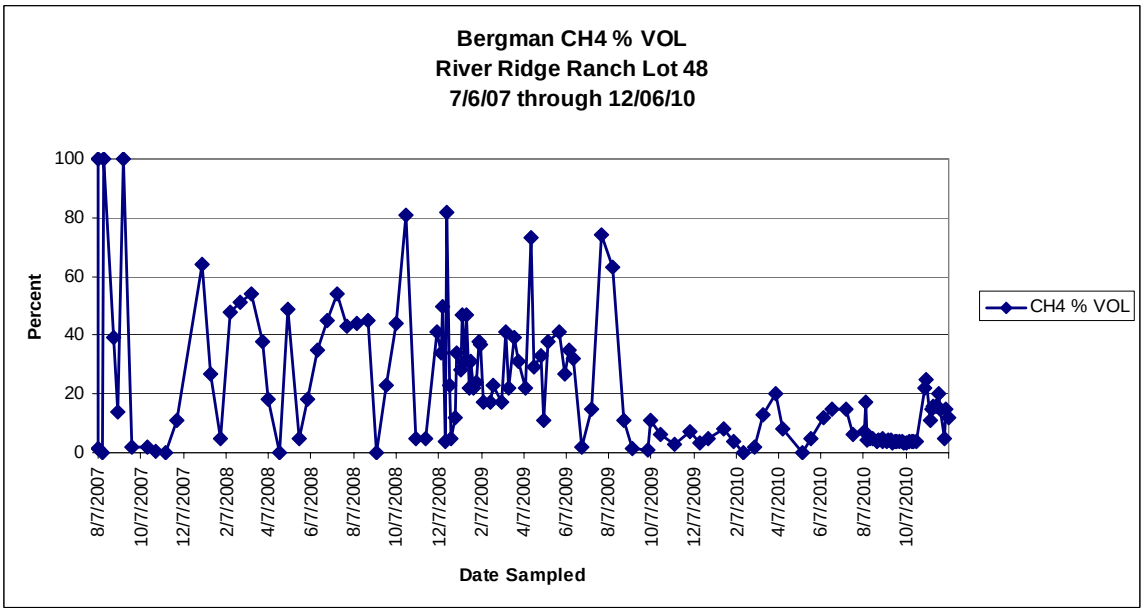

Smith Wellhead % LEL
River Ridge Ranch Lot 49
7/5/07 through 12/06/10
Percent
100
80
60
40
20
0
8/14/2007
10/14/2007
12/14/2007
2/14/2008
4/14/2008
6/14/2008
8/14/2008
10/14/2008
12/14/2008
2/14/2009
4/14/2009
6/14/2009
8/14/2009
10/14/2009
12/14/2009
2/14/2010
4/14/2010
6/14/2010
8/14/2010
10/14/2010
Date Sampled
% LEL

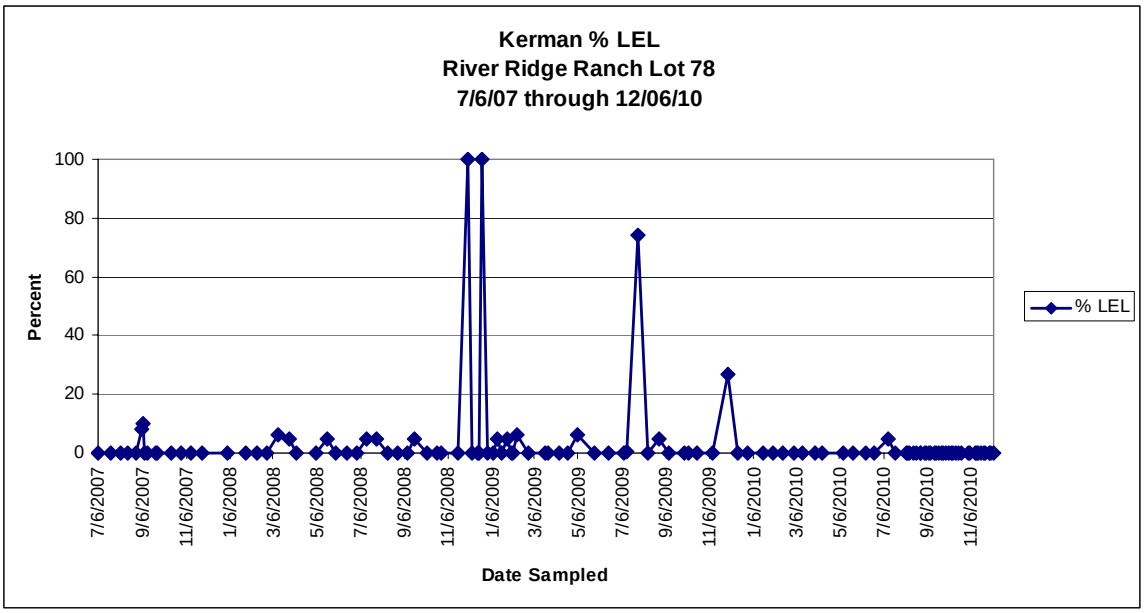

Smith Wellhead CH4 % VOL
River Ridge Ranch Lot 49
7/5/07 through 12/06/10
Percent
100
80
60
40
20
0
8/14/2007
10/14/2007
12/14/2007
2/14/2008
4/14/2008
6/14/2008
8/14/2008
10/14/2008
12/14/2008
2/14/2009
4/14/2009
6/14/2009
8/14/2009
10/14/2009
12/14/2009
2/14/2010
4/14/2010
6/14/2010
8/14/2010
10/14/2010
Sample Date
CH4 % VOL

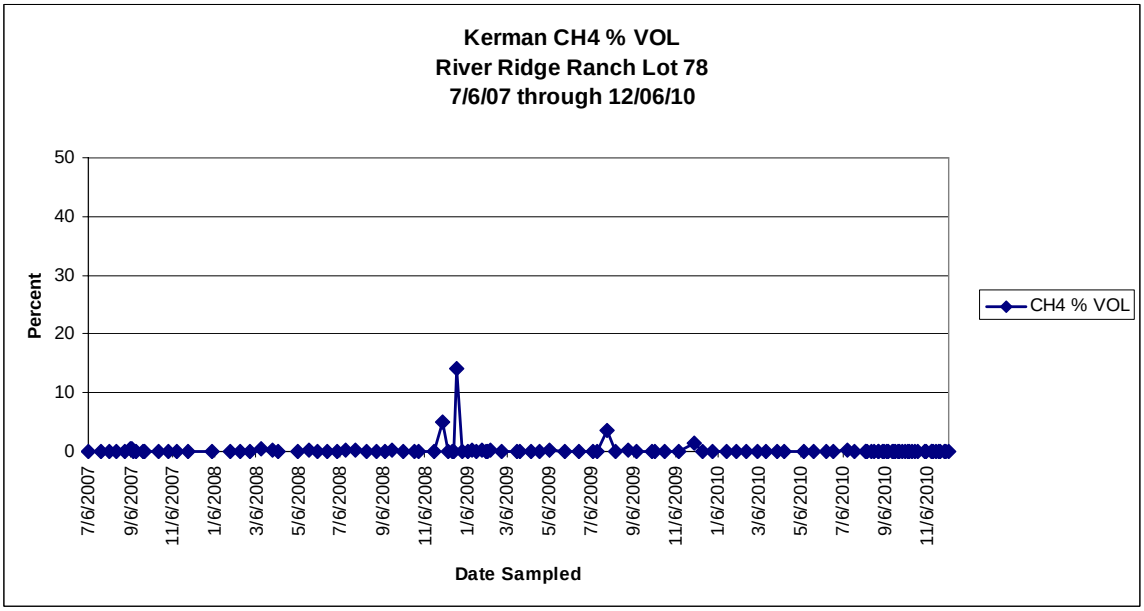

Smith Well Vent % LEL
River Ridge Ranch Lot 49
8/28/07 through 12/06/10
Percent
100
80
60
40
20
0
8/28/2007
10/28/2007
12/28/2007
2/28/2008
4/28/2008
6/28/2008
8/28/2008
10/28/2008
12/28/2008
2/28/2009
4/28/2009
6/28/2009
8/28/2009
10/28/2009
12/28/2009
2/28/2010
4/28/2010
6/28/2010
8/28/2010
10/28/2010
Date Sampled
% LEL

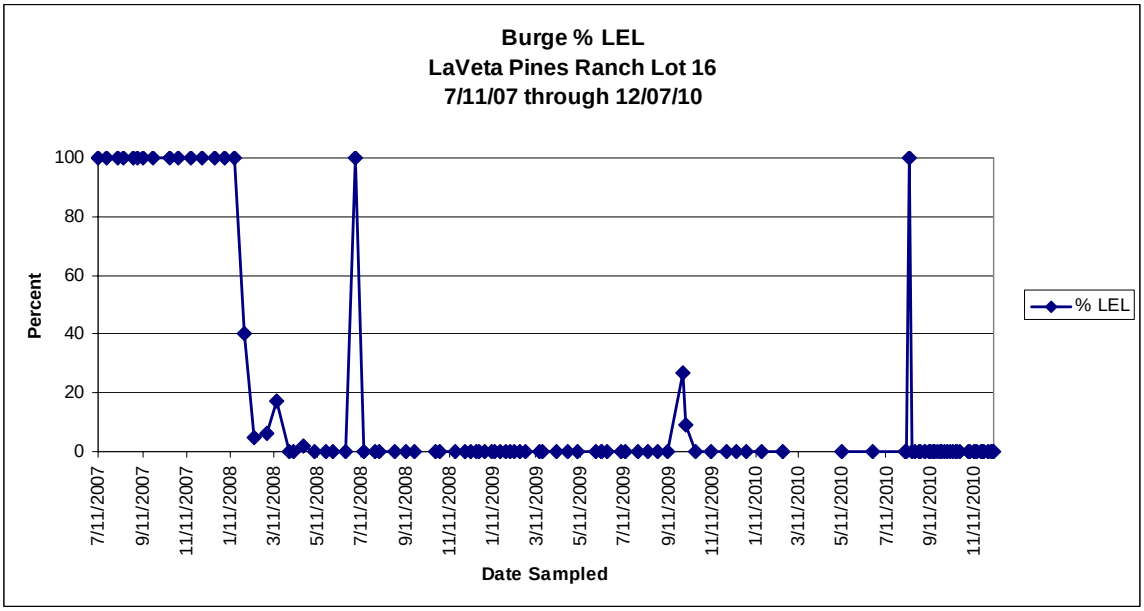

Smith Well Vent CH4 % VOL
River Ridge Ranch Lot 49
8/28/07 through 12/06/10
Percent
100
80
60
40
20
0
8/28/2007
10/28/2007
12/28/2007
2/28/2008
4/28/2008
6/28/2008
8/28/2008
10/28/2008
12/28/2008
2/28/2009
4/28/2009
6/28/2009
8/28/2009
10/28/2009
12/28/2009
2/28/2010
4/28/2010
6/28/2010
8/28/2010
10/28/2010
Date Sampled
CH4 % VOL

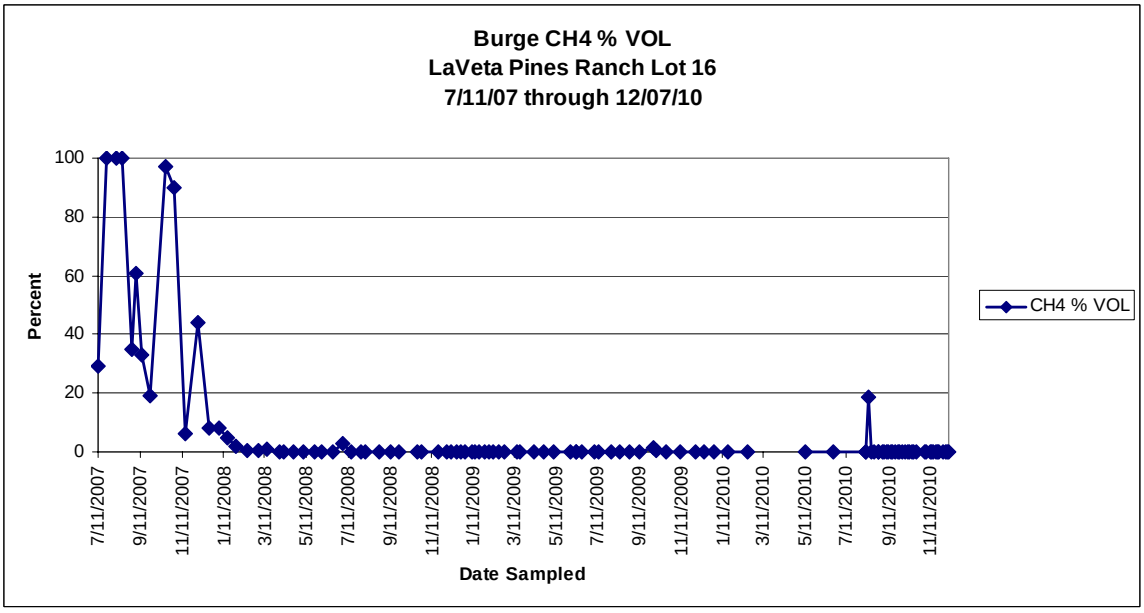

Bergman % LEL
River Ridge Ranch Lot 48
7/6/07 through 12/06/10
Percent
100
80
60
40
20
0
8/7/2007
10/7/2007
12/7/2007
2/7/2008
4/7/2008
6/7/2008
8/7/2008
10/7/2008
12/7/2008
2/7/2009
4/7/2009
6/7/2009
8/7/2009
10/7/2009
12/7/2009
2/7/2010
4/7/2010
6/7/2010
8/7/2010
10/7/2010
Date Sampled
% LEL


Bergman CH4 % VOL
River Ridge Ranch Lot 48
7/6/07 through 12/06/10
Percent
100
80
60
40
20
0
8/7/2007
10/7/2007
12/7/2007
2/7/2008
4/7/2008
6/7/2008
8/7/2008
10/7/2008
12/7/2008
2/7/2009
4/7/2009
6/7/2009
8/7/2009
10/7/2009
12/7/2009
2/7/2010
4/7/2010
6/7/2010
8/7/2010
10/7/2010
Date Sampled
CH4 % VOL


Kerman % LEL
River Ridge Ranch Lot 78
7/6/07 through 12/06/10
Percent
100
80
60
40
20
0
7/6/2007
9/6/2007
11/6/2007
1/6/2008
3/6/2008
5/6/2008
7/6/2008
9/6/2008
11/6/2008
1/6/2009
3/6/2009
5/6/2009
7/6/2009
9/6/2009
11/6/2009
1/6/2010
3/6/2010
5/6/2010
7/6/2010
9/6/2010
11/6/2010
Date Sampled
% LEL


Kerman CH4 % VOL
River Ridge Ranch Lot 78
7/6/07 through 12/06/10
Percent
50
40
30
20
10
0
7/6/2007
9/6/2007
11/6/2007
1/6/2008
3/6/2008
5/6/2008
7/6/2008
9/6/2008
11/6/2008
1/6/2009
3/6/2009
5/6/2009
7/6/2009
9/6/2009
11/6/2009
1/6/2010
3/6/2010
5/6/2010
7/6/2010
9/6/2010
11/6/2010
Date Sampled
CH4 % VOL


Burge % LEL
LaVeta Pines Ranch Lot 16
7/11/07 through 12/07/10
Percent
100
80
60
40
20
0
7/11/2007
9/11/2007
11/11/2007
1/11/2008
3/11/2008
5/11/2008
7/11/2008
9/11/2008
11/11/2008
1/11/2009
3/11/2009
5/11/2009
7/11/2009
9/11/2009
11/11/2009
1/11/2010
3/11/2010
5/11/2010
7/11/2010
9/11/2010
11/11/2010
Date Sampled
% LEL


Burge CH4 % VOL
LaVeta Pines Ranch Lot 16
7/11/07 through 12/07/10
Percent
100
80
60
40
20
0
7/11/2007
9/11/2007
11/11/2007
1/11/2008
3/11/2008
5/11/2008
7/11/2008
9/11/2008
11/11/2008
1/11/2009
3/11/2009
5/11/2009
7/11/2009
9/11/2009
11/11/2009
1/11/2010
3/11/2010
5/11/2010
7/11/2010
9/11/2010
11/11/2010
Date Sampled
CH4 % VOL