MEMO

To:
Lisa Dernbach, P.G., C.E.G., C.H.G.
California Regional Water Quality Control Board, Lahontan Region (RWQCB)

Copies:
Anne Holden, RWQCB
Iain Baker, PG&E

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From:
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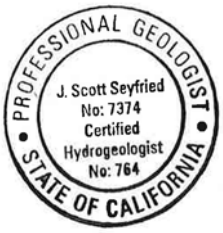

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Date:
November 7, 2014

Subject:
Plan for Enhancement of Lower Aquifer Remedy (Installation of EX-37)
PG&E Hinkley Compressor Station, Hinkley, California

1.0 Introduction

This memorandum is submitted to the California Regional Water Quality Control Board, Lahontan Region (RWQCB) to present a plan to improve the effectiveness of the current extraction system for remediation of hexavalent chromium (Cr[VI]) in the Lower Aquifer at the Hinkley Compressor Station in Hinkley, California. The extent of Cr(VI) in the Lower Aquifer along with monitoring and Upper Aquifer extraction wells is shown on Figure 1. This memo presents a summary of Lower Aquifer remedial implementation to date, followed by a description of the proposed scope of work for installation of a new extraction well that targets extraction from both the Upper Aquifer and the Lower Aquifer.

2.0 Lower Aquifer Remedial Implementation and Effectiveness Evaluation

The plume map for Cr(VI) in the Lower Aquifer for the Third Quarter 2014 was presented on Figure 5-3 of the October 30, 2014 *Third Quarter 2014 Groundwater Monitoring Report and Domestic Well Sampling Results* (Third Quarter GMP Report, CH2M Hill, 2014) and is attached here for reference. Results of groundwater monitoring indicate that the combined remedial actions listed below have effectively reduced the potential for horizontal migration of chromium-impacted groundwater within the Lower Aquifer, and reduced the potential for downward migration of chromium-impacted groundwater from the Upper Aquifer into the Lower Aquifer. For example, the concentration of chromium in four of the five Lower Aquifer monitoring wells with current chromium concentrations above 3.1/3.2 micrograms per liter (µg/L) was lower during the Third Quarter of 2014 than the historical maximum concentrations at these wells. Reduced lateral and vertical migration of chromium-impacted groundwater in the Lower Aquifer is

achieved by the following measures, which are focused near MW-23C and MW-92C, where chromium has been detected at the highest concentrations in the Lower Aquifer:

- Focused groundwater extraction in Upper Aquifer wells EX-29 and EX-30 (shown on Figure 1). The Upper Aquifer chromium is believed to have entered the Lower Aquifer in this general area when the Lower Aquifer supply wells (Ryken-8 and Ryken-9) (Figure 1) were in operation until August 2011.

- Upper Aquifer groundwater extraction for irrigation supply at the Agricultural Treatment Units (ATUs) and Northwest Extraction Area (EX-16, EX-20, and EX-21). This creates a large area of drawdown in Upper Aquifer as shown on Figures 3-1 and 3-2 of the Third Quarter GMP Report, attached here for reference (CH2M Hill, 2014). Drawdown of the Upper Aquifer has enhanced upward vertical gradients from the Lower Aquifer toward the Upper Aquifer.

- Providing alternative water supply source from supply wells PGE-14, FW-01, and FW-02 (upgradient of the chromium plume) to remove the need for pumping Lower Aquifer supply wells (Ryken-8 and Ryken-9, shown on Figure 1) on an ongoing basis. Pumping from the Lower Aquifer supply wells Ryken-8 and Ryken-9 appears to have been the primary driving force drawing Upper Aquifer chromium into the Lower Aquifer.

Figure 5-6 excerpted from the September 30, 2014 *Semiannual Remediation Status and Final Cleanup Effectiveness Report* (CH2M Hill and ARCADIS, 2014), and attached here for reference, shows hydrographs for selected Upper and Lower Aquifer well pairs demonstrating that the vertical hydraulic gradient has been reversed in response to the remedial actions listed above and is primarily upward from the Lower Aquifer toward the Upper Aquifer. This hydraulic reversal is shown by higher groundwater elevations in Lower Aquifer wells (MW-21C, MW-23C, MW-34, and MW-55C) compared with groundwater elevations in Upper Aquifer wells (MW-21A, MW-21B, MW-23B, MW-55A, and MW-55B).

The extent of Cr(VI) in the Lower Aquifer remains contained with limited horizontal movement of existing Cr(VI), as evidenced by steady to decreasing concentration trends in the majority of the Lower Aquifer groundwater monitoring wells. Groundwater elevation data collected from the Lower Aquifer are consistent with these concentration trends (see Lower Aquifer groundwater elevation map, Figure 3-4 in the Third Quarter GMP report, included here for reference).

Recently, Cr(VI) concentrations increased at monitoring wells MW-92C and MW-100C, located within the area of elevated Cr(VI) concentrations. The current concentration at MW-92C (24.0 µg/L) is more than 50 percent less than the historical maximum concentration from August 2011 (41.8 µg/L), measured shortly after pumping from the Lower Aquifer supply wells was significantly reduced. The Cr(VI) concentration at MW-100C during Second and Third Quarter of 2014 (19 µg/L) were the highest reported to date at that well.

The recent increases in Cr(VI) concentrations at MW-100C may have been influenced by potential hydraulic impacts resulting from extraction from nearby Upper Aquifer extraction well EX-26 on Lower Aquifer groundwater elevations. Analysis of groundwater elevations in the Lower Aquifer near EX-26

indicates that extraction from EX-26 results in drawdown within the Lower Aquifer toward that well, which may have resulted in migration of Cr(VI) to the vicinity of well MW-100C (Figure 3-4 from the Third Quarter GMP report).

A hydrograph of two Upper Aquifer/Lower Aquifer well pairs is shown on Figure 2 before and after a period with no extraction at EX-26. The top hydrograph shows pressure transducer data for the MW-23B/MW-23C well pair. Consistent upward gradients from Lower Aquifer well MW-23C towards Upper Aquifer well MW-23B (MW-23C higher in elevation than MW-23B) are seen with limited response to changes in Upper Aquifer extraction at EX-26. However, as shown on the bottom hydrograph of Figure 2, groundwater extraction from EX-26 results in a hydraulic response in the Lower Aquifer at MW-100C, while also drawing down Upper Aquifer monitoring well PZ-02. Drawing down Lower Aquifer water levels at MW-100C with Upper Aquifer extraction in this area could potentially be inducing flow from an area of higher concentration (south near MW-92C), towards well MW-100C. As such, extraction from EX-26 may have resulted in localized migration of Cr(VI)-affected Lower Aquifer groundwater to the north, resulting in the increase in Cr(VI) concentrations in MW-100C. Given that the well EX-26 is screened above the Blue Clay, these data indicate that the Blue Clay in the vicinity of EX-26 is not sufficiently thick and/or continuous to function as a hydraulic aquitard that separates the Upper from the Lower Aquifer. Rather, in the vicinity of EX-26, extraction from above the Blue Clay has a direct hydraulic expression in the Lower Aquifer. This observation is consistent with lithologic data in this portion of the site, which indicates that the Blue Clay is encountered only intermittently and when encountered, is found to be relatively thin (less than a few feet thick).

3.0 Recommendation for New Extraction Well EX-37

Based on these observations, extraction of groundwater from both the Upper Aquifer and Lower Aquifer is recommended near MW-92C, where Cr(VI) has been detected at the highest concentrations within the Lower Aquifer. Lithologic data collected from borings in the vicinity of the proposed location and groundwater levels measured with pressure transducers, indicate that the Blue Clay is either not present, or is thin where present. Under these conditions, the Blue Clay does not function as an effective aquitard separating the Lower and Upper Aquifers, and extraction across both units is recommended to remove Cr(VI) affected groundwater without inducing downward gradients toward the Lower Aquifer.

New groundwater extraction well, EX-37 (Figure 1) is planned for installation during in the second half of November to enhance the existing remedial actions for the Lower Aquifer. EX-37 will be screened across the saturated alluvium forming the Upper Aquifer, through any Blue Clay that is present at this location, and across the weathered bedrock sediments comprising the thin (generally less than 10 feet) Lower Aquifer in this area. This southerly location and screening into the weathered bedrock is designed to enhance capture of Cr(VI) in the Lower Aquifer where concentrations are highest near MW-92C. The MW-92C location was also selected, rather than near MW-100C and EX-26 further to the north, so that the potential undesired effect of drawing existing Lower Aquifer chromium further north towards MW-100C would not occur. In addition, the extraction rate at EX-26 has been reduced and will continue to operate at a reduced rate to improve horizontal hydraulic gradients in the Lower Aquifer to further reduce northward movement of Cr(VI).

EX-37 will be installed using a sonic drill rig. It is anticipated that a 10-inch diameter borehole will be advanced to the weathered bedrock/bedrock interface. Soil cores will be collected near-continuously. EX-37 will be constructed of 6-inch Schedule 80 PVC casing and 6-inch stainless steel screen. The specific screened interval will be determined during the installation process based on lithologic information collected from soil cores. The well screen will be surrounded by a silica sand pack to two feet above the top of the screen interval, followed by 3 feet of fine-grained silica transition sand, and then overlain by approximately 100 feet of Portland cement grout. Actual screen depths, lengths, slot sizes, and backfill materials may vary based on field findings and lithology during construction. Upon completion of well installation, Well Completion Reports will be prepared and submitted to the California Department of Water Resources.

Water extracted from EX-37 may be applied to Agricultural Treatment Units (ATUs), such as the Ranch or Desert View Dairy (DVD) ATUs, or sent south to the South Central Re-injection Area In Situ Reactive Zone. The plans for piping that will connect EX-37 with the piping network that extends to these remedial systems is in progress and will be shared with the RWQCB prior to installation.

Pumping from Lower Aquifer supply wells Ryken-8 and Ryken-9 will continue to be reduced (or cease altogether) by supplying freshwater to the DVD from extraction wells PGE-14, FW-01, and/or FW-02 and eventually new wells FW-03 and FW-04 (south of the compressor station). In addition to adding a new extraction well, groundwater extraction at Upper Aquifer wells EX-29 and EX-30 and other wells in the area will continue. These efforts, combined with additional Upper Aquifer groundwater extraction in the greater area, are expected to continue to generate upward hydraulic gradients near the DVD and MW-23C to prevent further migration of Upper Aquifer chromium into the Lower Aquifer and continue to reduce chromium mass in the Lower Aquifer.

References

CH2M Hill. 2014. *Third Quarter 2014 Groundwater Monitoring Report and Domestic Well Sampling Results, Site-wide Groundwater Monitoring Program.* Pacific Gas and Electric Company. Hinkley Compressor Station. Hinkley, California. October 30.

CH2M Hill and ARCADIS. 2014. *Semiannual Remediation Status and Final Cleanup Effectiveness Report (January through June 2014)*, PG&E Compressor Station, Hinkley, California. September 30.

Figures

Figure 1 Extent of Chromium in Lower Aquifer and Proposed Location of EX-37

Figure 2 Hydrographs for Upper/Lower Aquifer Well Pairs

Attachments

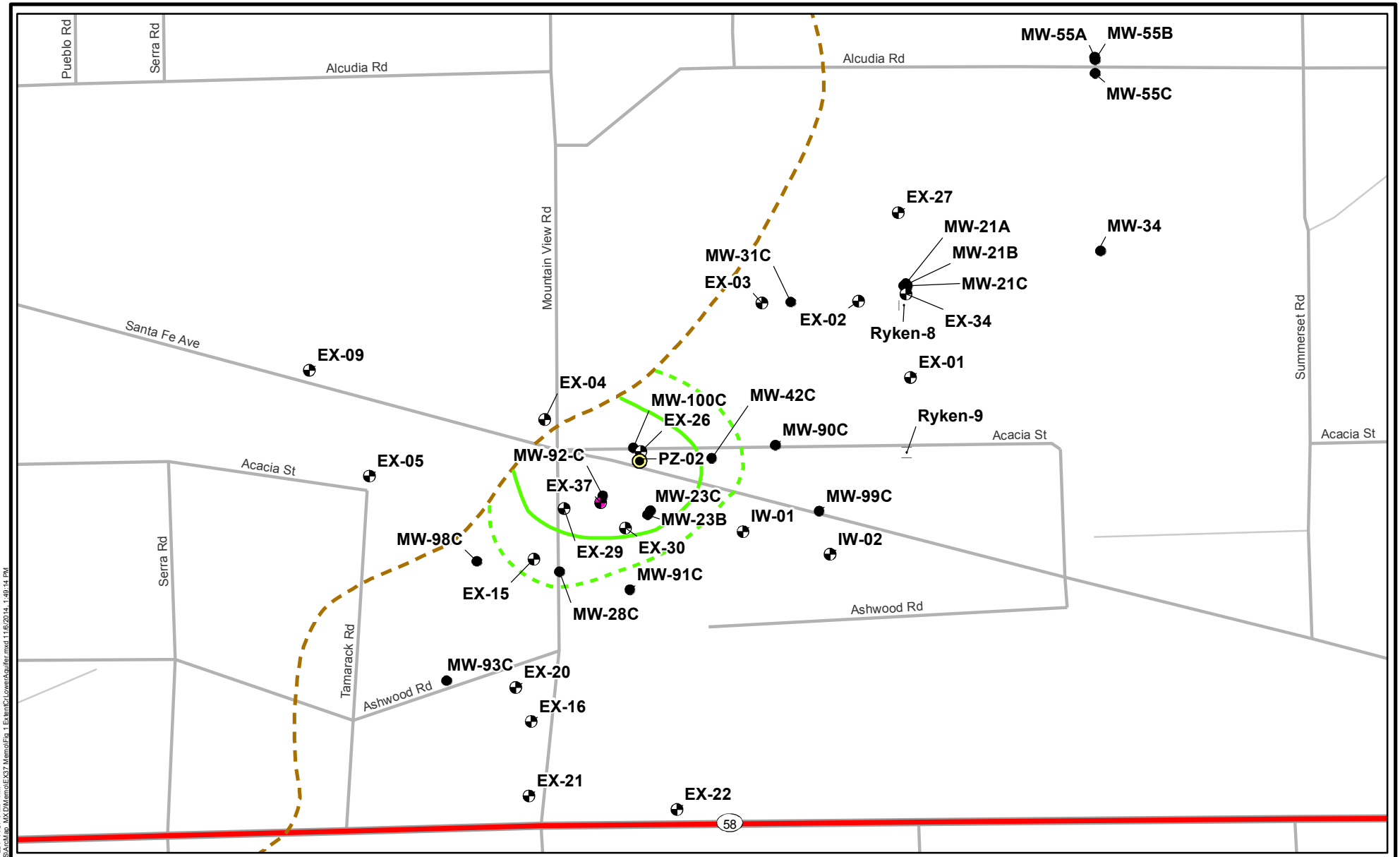
Figure 5-3 Chromium Results for Lower Aquifer Groundwater Monitoring and Domestic wells, Third Quarter 2014 (CH2M Hill, 2014)

Figure 3-1 Groundwater Elevations in the Shallow Zone of the Upper Aquifer, South Hinkley Valley, Third Quarter 2014 (CH2M Hill, 2014)

Figure 3-2 Groundwater Elevations in the Deep Zone of the Upper Aquifer, South Hinkley Valley, Third Quarter 2014 (CH2M Hill, 2014)

Figure 5-6 Lower/Upper Aquifer Groundwater Elevations and Pumping Rates, January 2010 to June 30, 2014 (CH2M Hill and ARCADIS, 2014)

Figure 3-4 Groundwater Elevations in the Lower Aquifer and Bedrock, Third Quarter 2014 (CH2M Hill, 2014)



Legend

- Monitoring Well
- Extraction Well
- Proposed Extraction Well
- Inactive Supply Wells Ryken-8 and 9
- Piezometer
- Approximate outline of Cr(VI) and Cr(T) in Lower Aquifer exceeding 3.1 and 3.2 µg/L
- Approximate 10 µg/L outline of Cr(VI) or Cr(T) concentrations in Lower Aquifer, Third Quarter 2014
- Approximate extent of blue clay layer forming lower aquifer. The blue clay layer is thin and leaky in portions of the western extent

Note:
µg/L = micrograms per liter
Cr(VI) = hexavalent chromium
Cr(T) = total dissolved chromium

N

0 950 1,900

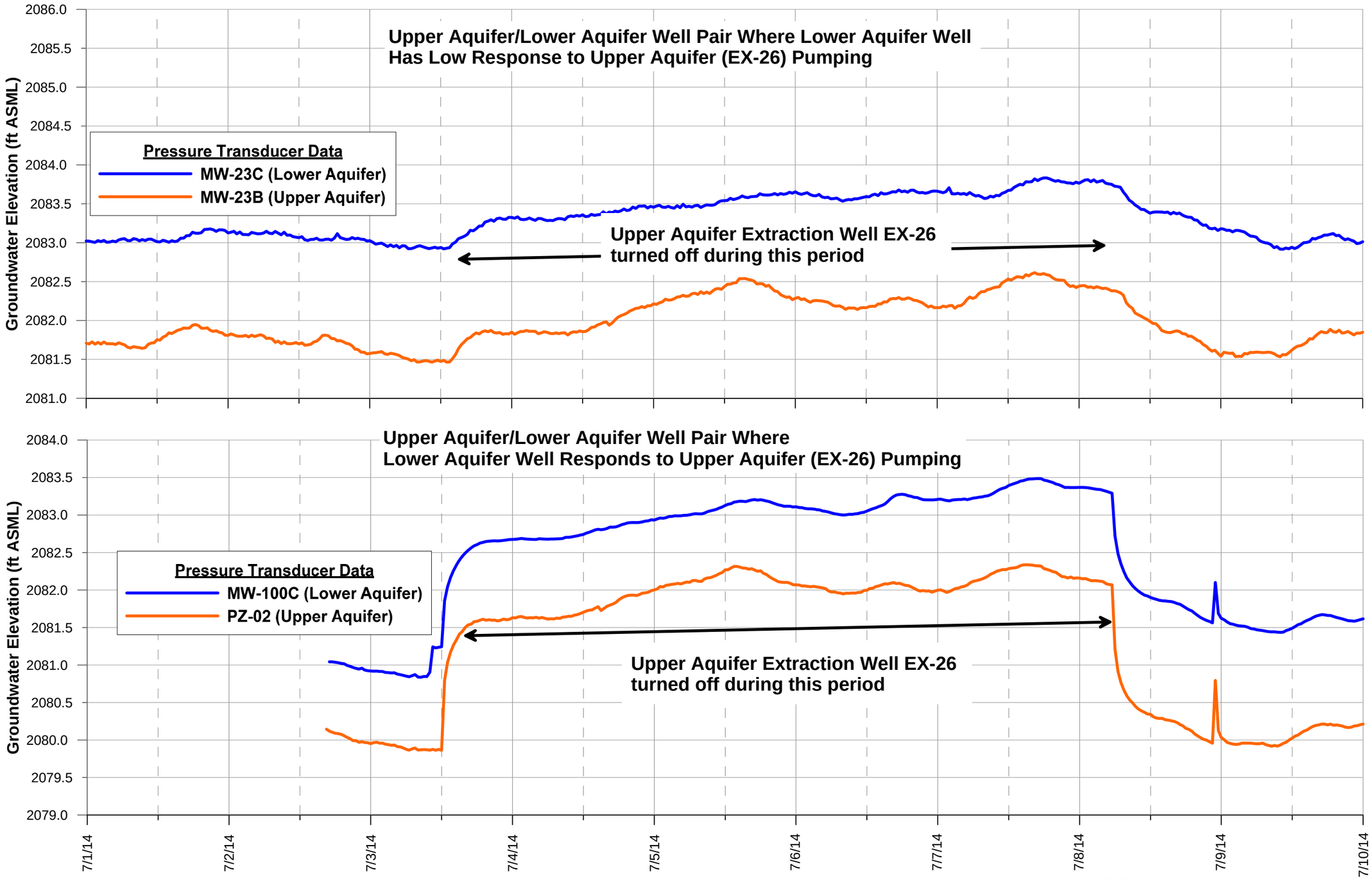
SCALE IN FEET

PACIFIC GAS AND ELECTRIC COMPANY
HINKLEY, CALIFORNIA

EXTENT OF CHROMIUM IN LOWER AQUIFER AND PROPOSED LOCATION OF EX-37

ARCADIS

FIGURE 1



Notes
1) ft. ASML: Feet Above Mean Sea-Level
2) Groundwater levels measured with pressure transducers recording data at 30 minute intervals.

FIGURE 2
HYDROGRAPHS FOR UPPER/LOWER AQUIFER WELL PAIRS
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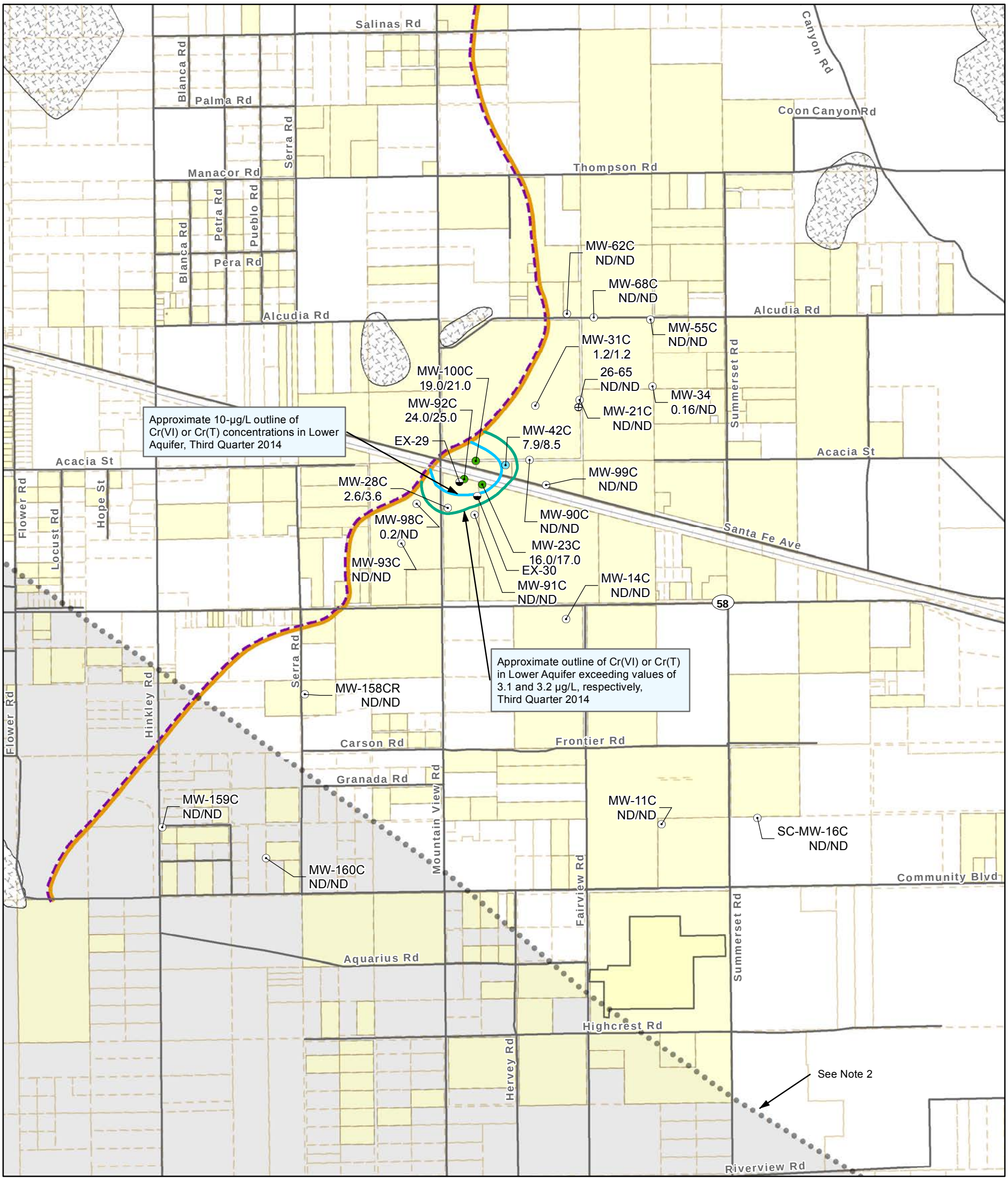


- ⊙ Lower Aquifer groundwater monitoring well
- ⊕ Water supply well completed in Lower Aquifer with Third Quarter 2014 sampling results
- ◒ Agricultural supply well
- Bedrock exposed at ground surface
- Approximate western limit of the Blue Clay Aquitard. The Blue Clay Aquitard is thin, sandy or absent in portions of its western extent.
- Approximate location of Lockhart Fault; fault trace is inferred, and there is no surface expression (Stamos et al., 2001)
- PG&E-owned property
- PG&E Compressor Station

ABBREVIATIONS:

µg/L	micrograms per liter
Cr(VI)	hexavalent chromium
Cr(T)	total dissolved chromium
ND	not detected
PG&E	Pacific Gas and Electric Company

Groundwater Cr(VI) concentrations in monitoring wells:

- Greater than 10 µg/L
- 3.1 to 10 µg/L
- ⊙ Less than 3.1 µg/L or ND

MW-23C	Well ID
16.0/17.0	Cr(VI)/Cr(T) concentrations in µg/L; maximum of primary and duplicate samples during Third Quarter 2014 sampling.
EX-29	Upper Aquifer wells for Lower Aquifer remediation.

N

0 1,000 2,000

Feet

NOTE:

1. Chromium concentration contours are based on July through September 2014 sampling of groundwater monitoring wells completed in the Lower Aquifer (saturated zone below the blue clay aquitard). Where the blue clay is not present, all saturated deposits above bedrock are part of the Upper Aquifer.
2. Pursuant to the Lahontan Regional Water Quality Control Board's letter *Review of Chromium Plume Maps, Third Quarter 2013 Groundwater Monitoring Report and Agreement with Northern Investigation Concept* dated December 12, 2013, groundwater monitoring wells are not used for chromium contouring if they are located in the areas southwest of the Lockhart Fault and on or east of Dixie Road.

FIGURE 5-3
CHROMIUM RESULTS FOR LOWER AQUIFER GROUNDWATER MONITORING AND DOMESTIC WELLS, THIRD QUARTER 2014

THIRD QUARTER 2014 GROUNDWATER MONITORING REPORT AND DOMESTIC WELL RESULTS
SITE-WIDE GROUNDWATER MONITORING PROGRAM
PACIFIC GAS AND ELECTRIC COMPANY
HINKLEY COMPRESSOR STATION
HINKLEY, CALIFORNIA

CH2MHILL

Area of 1-foot Contours

West Hinkley Valley Average Groundwater Gradient: 0.0071 feet/foot
Groundwater Velocity Estimate Range: 0.02 to 0.96 feet/day
Average Groundwater Velocity Estimate: 0.29 feet/day or 107 feet per year

East Hinkley Valley Average Groundwater Gradient: 0.0030 feet/foot
Groundwater Velocity Estimate Range: 0.02 to 5.34 feet/day
Average Groundwater Velocity Estimate: 1.64 feet/day or 600 feet per year

Mountain General Fault

Lockhart Fault

Palma Rd
Manacor Rd
Petra Rd
Pueblo Rd
Serra Rd
Bianca Rd
Pera Rd
Thompson Rd
Coon Canyon Rd
Alcudia Rd
Park Ave
Acacia St
Mulberry Ave
Hope St
Locust Rd
Sycamore St
Valley Wells Rd
Santa Fe Ave
Summerset Rd
Dixie Rd
Kinski Rd
Minor Rd
Carson Rd
Granada Rd
Pioneer Rd
Catskill Rd
Flower Rd
Mountain View Rd
Aquarius Rd
Highcrest Rd
Hervey Rd
Fairview Rd
Community Blvd
Riverview Rd

Gorman North
Gorman South
Cottrell
Yang
Ranch

MW-172S1 2,074.79
MW-171S 2,076.88
MW-117S1 2,075.64
MW-117S2 2,075.82
EX-32
MW-128S1 2,078.03
MW-128S2 2,078.32
MW-107S 2,078.95
MW-94S 2,078.95
MW-85S 2,079.44
MW-84S* 2,078.70
MW-127S1 2,077.68
MW-70S* 2,080.64
G-1R
PZ-04* 2,079.25
PZ-05* 2,078.76
PZ-06* 2,077.96
EX-35
G-2R
MW-79S* 2,079.89
MW-97S 2,079.84
MW-72S* 2,079.10
MW-80S* 2,080.19
MW-112S 2,084.35
MW-96S 2,085.54
MW-83S* 2,082.43
MW-89S* 2,080.04
MW-129S 2,078.04
MW-69S* 2,081.80
MW-71S* 2,078.01
EX-33
EX-31
G-5R
MW-170S* 2,083.52
MW-63* 2,084.87
EX-25
C-01
MW-55S* 2,081.89
MW-68S* 2,082.49
C-03
DW-03* 2,083.37
C-04
C-02
Y-01
MW-32S* (2,085.08)
MW-87S* 2,086.23
Y-02
Y-03
DW-02* 2,086.81
MW-29* 2,087.59
MW-82S* 2,089.87
MW-81S 2,088.68
MW-101S 2,085.07
EX-10 2,090.52
EX-09
MW-47A* 2,088.63
PZ-03 2086.55
EX-03
MW-21A* 2,075.35
EX-34
EX-04
MW-109* 2,083.28
EX-26
PZ-09 2079.57
EX-01
DW-01 2,081.19
MW-50S* 2,087.50
MW-88S* 2,089.18
MW-86S* 2,082.53
MW-114S 2,092.30
MW-110S 2,095.24
MW-115S 2,107.06
MW-59 2,091.10
MW-148S 2,091.84
MW-203S 2,100.53
MW-164S 2,094.75
MW-147S* 2,092.50
IN-01
MW-58* 2,093.94
IN-05
EX-05
MW-201S* 2,093.72
MW-168S 2,093.11
IN-02
MW-66A* 2,090.78
EX-15
EX-29
IW-01
IW-02
EX-30
IW-03
PZ-08* 2,082.70
MW-41S* 2,089.11
MW-202S* 2,094.72
IN-06
MW-45A* 2,087.67
MW-121S* 2,094.50
EX-36
MW-108S 2,085.22
MW-22A2* 2,082.13
CA-MW-602 2,087.70
EX-20
EX-16
MW-165S 2,096.26
MW-169S1 2,094.28
CA-MW-601 2,087.34
PZ-01A* 2,097.00
MW-49S 2,094.37
MW-199S1 2,108.52
MW-190S1 2,112.90
MW-187S1 2,108.38
IN-03R
MW-54* 2,093.47
MW-169S2* 2,094.53
MW-76S* 2,089.09
EX-22
CA-MW-603 2,088.36
IN-04
58
MW-14A 2,088.87
CA-MW-505 2,092.55
CA-MW-508S 2,093.46
SC-MW-09S 2,099.89
MW-116S 2,102.47
CA-MW-405S 2,095.75
CA-MW-510S 2,095.02
CA-MW-501S 2,089.98
SC-MW-08S 2,100.67
MW-44A 2,089.32
EX-21
MW-61 2,090.19
CA-MW-303S 2,097.01
CA-MW-409S 2,097.46
CA-MW-401 2,091.95
CA-MW-308 2,098.79
MW-192S 2,110.71
MW-167S1 2,122.37
MW-74D 2,097.39
CA-MW-301 2,094.34
CA-MW-310S 2,099.27
MW-145S 2,106.31
MW-158S* 2,099.66
CA-MW-107S 2,101.08
SC-MW-06S 2,103.10
MW-103S 2,111.43
MW-155S 2,097.46
CA-MW-305 2,098.46
SC-MW-05S 2,104.02
MW-146S 2,112.51
CA-MW-302S 2,096.60
SC-MW-04S 2,105.74
MW-159S 2,131.90
CA-MW-304 2,097.16
SC-MW-16S 2,106.92
MW-143S 2,111.41
MW-16 2,105.42
MW-178S 2,102.71
MW-180RS 2,104.00
SC-MW-03S 2,106.84
MW-160D 2,130.11
MW-73S 2,112.95
SC-MW-23S 2,107.27
SC-MW-15S 2,108.10
SC-MW-12S 2,106.74
SA-MW-11S 2,109.88
SC-MW-02S 2,108.47
MW-149S 2,118.06
SC-MW-13S 2,104.48
SA-MW-10S 2,110.32
MW-144S 2,114.75
SA-MW-20S 2,110.65
MW-67A 2,113.09
SA-MW-18S 2,111.08
SA-SM-01S 2,111.09
SA-MW-24S 2,112.26
MW-51 2,123.41
SA-MW-16S 2,114.54
SA-MW-25S 2,112.19
MW-150S1 2,123.83
SA-SM-08S 2,119.33
SA-SM-11S 2,114.40
MW-177S 2,126.28
MW-39 2,119.32
MW-181S 2,126.47
MW-17 2,121.16
MW-53 2,126.96
BW-01S 2,119.65
MW-78S (2,119.31)
MW-77S* 2,124.67
MW-163S 2,149.05

2075 2080 2085 2090 2095 2100 2105 2110 2115 2120 2125 2130 2135 2140 2145

LEGEND:
- Monitoring well
- Active groundwater extraction well
- Inactive groundwater extraction well
- Freshwater injection well
- Potentiometric elevation contours (dashed where inferred)
- General groundwater flow direction
- Average Groundwater Gradient
- Approximate limit of saturated alluvium
- Estimated capture zone in shallow zone of Upper Aquifer based on July/August 2014 groundwater level measurements
- In Situ Reactive Zone
- Agricultural Treatment Units
- Approximate location of fault trace is inferred and there is no surface expression (Stamos et al., 2001)
- County parcels

NOTES:
1. Groundwater elevation contours represent the hydraulic gradient in the shallow zone of the Upper Aquifer. The shallow wells of nested completions (wells designated "A" or "S") were preferentially used for contouring. In all cases, the screened interval of the well was taken into account.
2. Groundwater level measurements for wells without an asterisk"*" are manual water level measurements collected between July 1 and August 7, 2014. Groundwater elevations marked with an asterisk "*" are the averages of pressure transducer data collected at 30-minute intervals from July 1 through 31, 2014.

WORKS CITED:
Stamos, C.L., P. Martin, T. Nishikawa, and B.F. Cox. 2001. *Simulation of Ground-Water Flow in the Mojave River Basin, California.* U.S. Geological Survey Water-Resources Investigations Report 01-4002, Version 3. Prepared in cooperation with the Mojave Water Agency.

MW-163S Well ID
(2149.08) Groundwater elevation not used for contouring

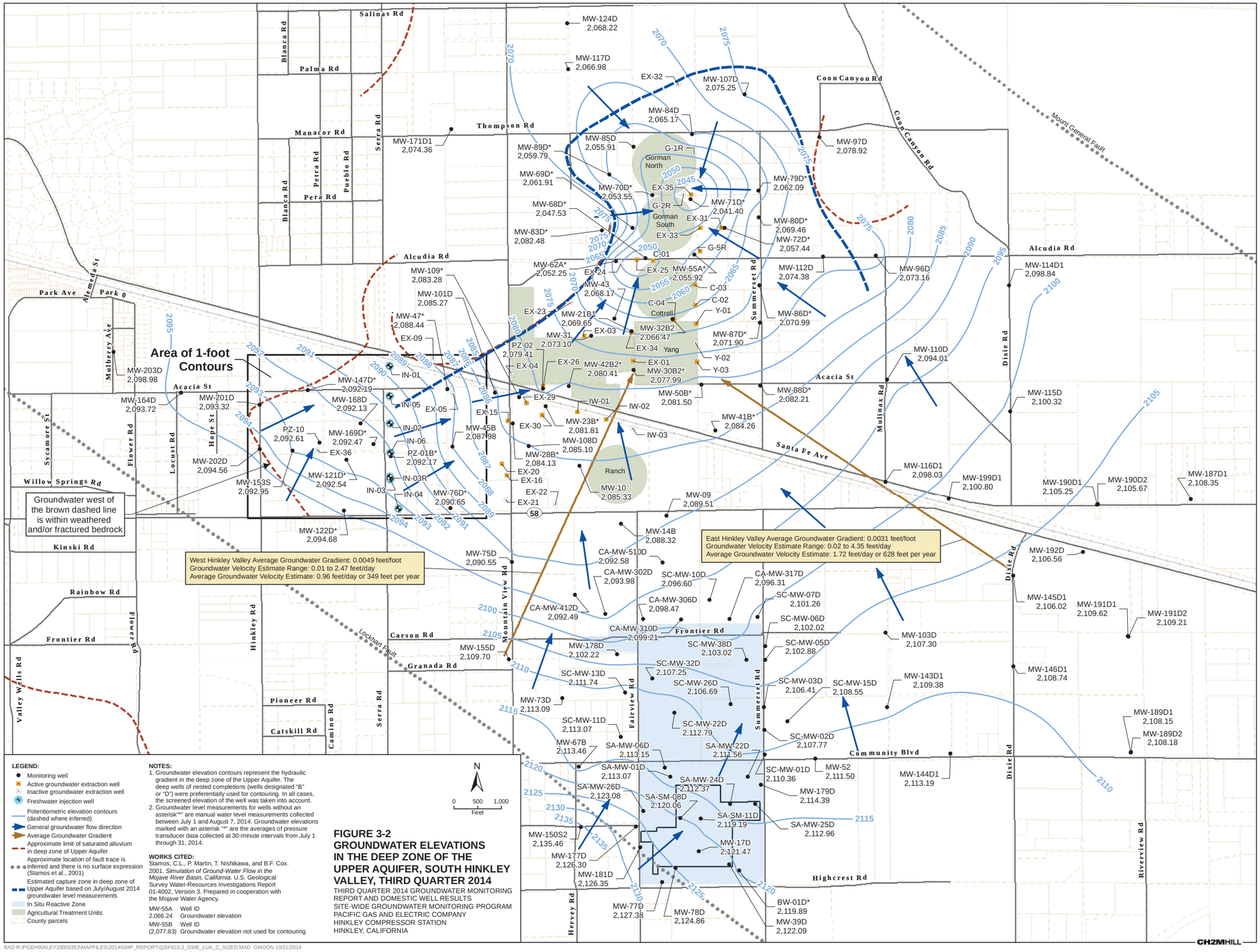
N
0 500 1,000
Feet

FIGURE 3-1
GROUNDWATER ELEVATIONS IN THE SHALLOW ZONE OF THE UPPER AQUIFER, SOUTH HINKLEY VALLEY, THIRD QUARTER 2014

THIRD QUARTER 2014 GROUNDWATER MONITORING REPORT AND DOMESTIC WELL RESULTS
SITE-WIDE GROUNDWATER MONITORING PROGRAM
PACIFIC GAS AND ELECTRIC COMPANY
HINKLEY COMPRESSOR STATION
HINKLEY, CALIFORNIA

CH2MHILL

BAO R:\PGE\HINKLEY20000353\MAPFILES\2014\GMP_REPORT\Q3\FIG3-1_GWE_UUA_C_SIZED.MXD GMOON 10/21/2014



LEGEND:

- Monitoring well
- Active groundwater extraction well
- Inactive groundwater extraction well
- Freshwater injection well
- Potentiometric elevation contours (dashed where inferred)
- General groundwater flow direction
- Average Groundwater Gradient
- Approximate limit of saturated alluvium in deep zone of Upper Aquifer
- Approximate location of fault trace is inferred and there is no surface expression (Stamos et al., 2001)
- Estimated capture zone in deep zone of Upper Aquifer based on July/August 2014 groundwater level measurements
- In Situ Reactive Zone
- Agricultural Treatment Units
- County parcels

NOTES:

1. Groundwater elevation contours represent the hydraulic gradient in the deep zone of the Upper Aquifer. The deep wells of nested completions (wells designated "B" or "D") were preferentially used for contouring. In all cases, the screened elevation of the well was taken into account.
2. Groundwater level measurements for wells without an asterisk"*" are manual water level measurements collected between July 1 and August 7, 2014. Groundwater elevations marked with an asterisk "*" are the averages of pressure transducer data collected at 30-minute intervals from July 1 through 31, 2014.

WORKS CITED:

Stamos, C.L., P. Martin, T. Nishikawa, and B.F. Cox. 2001. *Simulation of Ground-Water Flow in the Mojave River Basin, California*. U.S. Geological Survey Water-Resources Investigations Report 01-4002, Version 3. Prepared in cooperation with the Mojave Water Agency.

MW-55A Well ID
2,066.24 Groundwater elevation
MW-55B Well ID
(2,077.83) Groundwater elevation not used for contouring

FIGURE 3-2
GROUNDWATER ELEVATIONS IN THE DEEP ZONE OF THE UPPER AQUIFER, SOUTH HINKLEY VALLEY, THIRD QUARTER 2014

THIRD QUARTER 2014 GROUNDWATER MONITORING REPORT AND DOMESTIC WELL RESULTS
SITE-WIDE GROUNDWATER MONITORING PROGRAM
PACIFIC GAS AND ELECTRIC COMPANY
HINKLEY COMPRESSOR STATION
HINKLEY, CALIFORNIA

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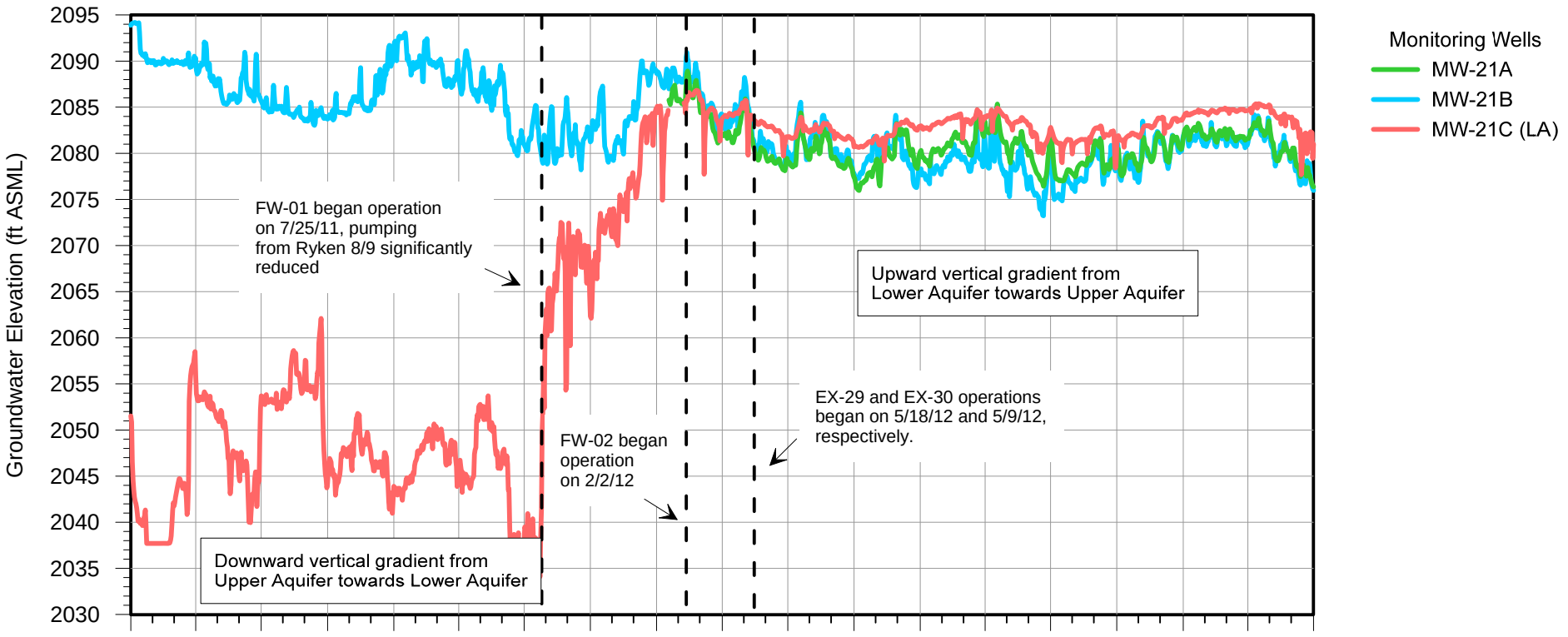
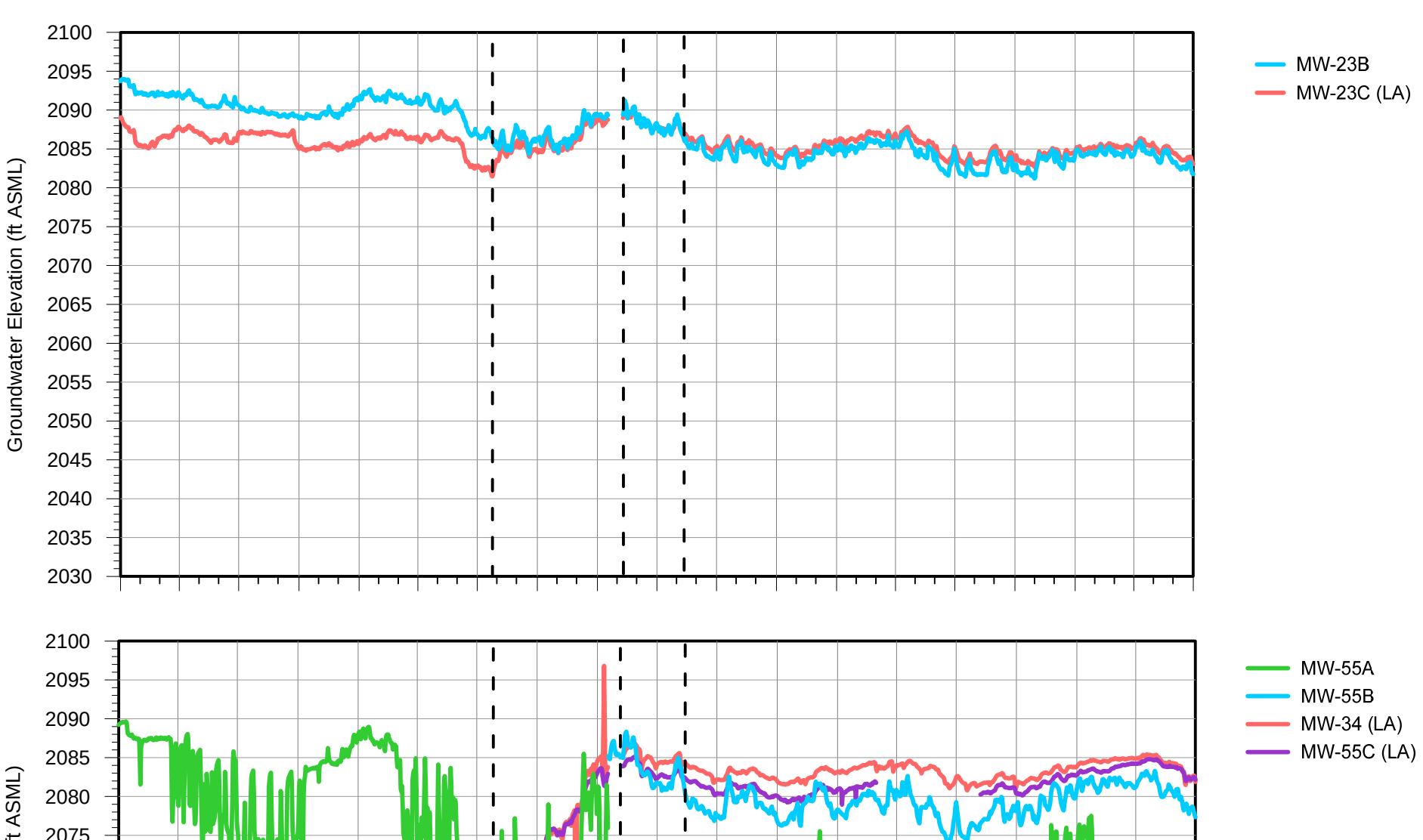
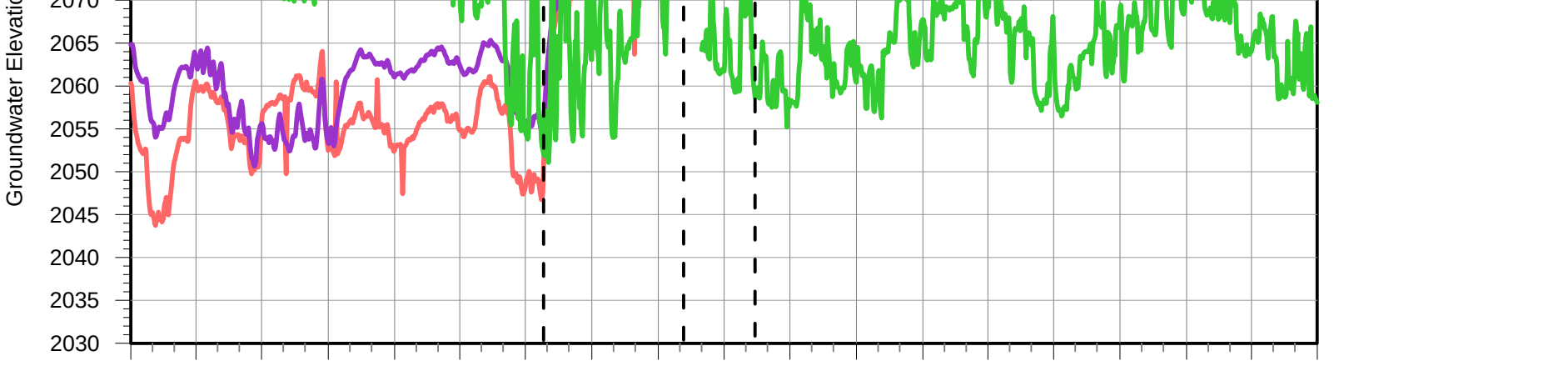
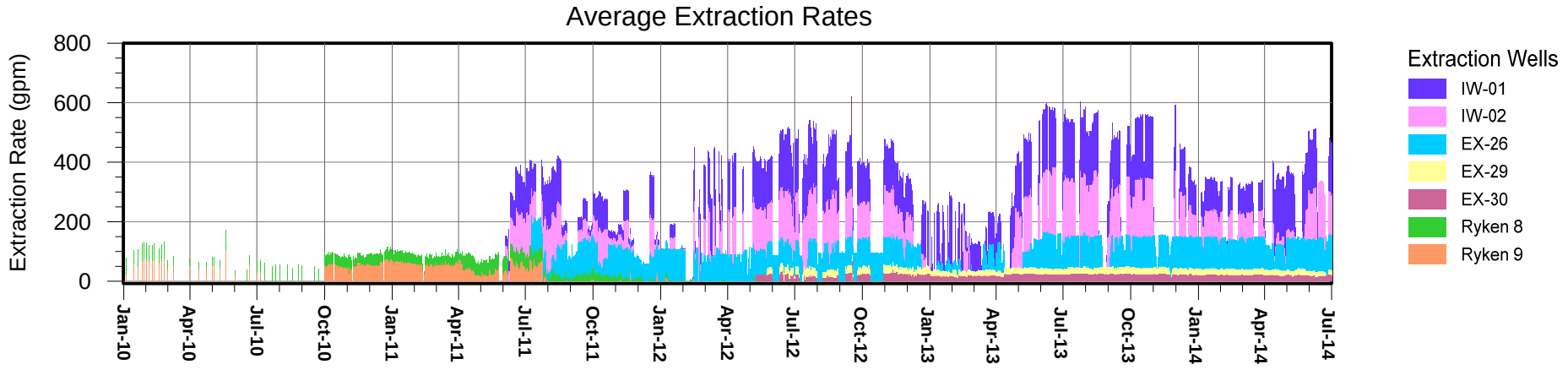
Pressure Transucer Data







Average Extraction Rates

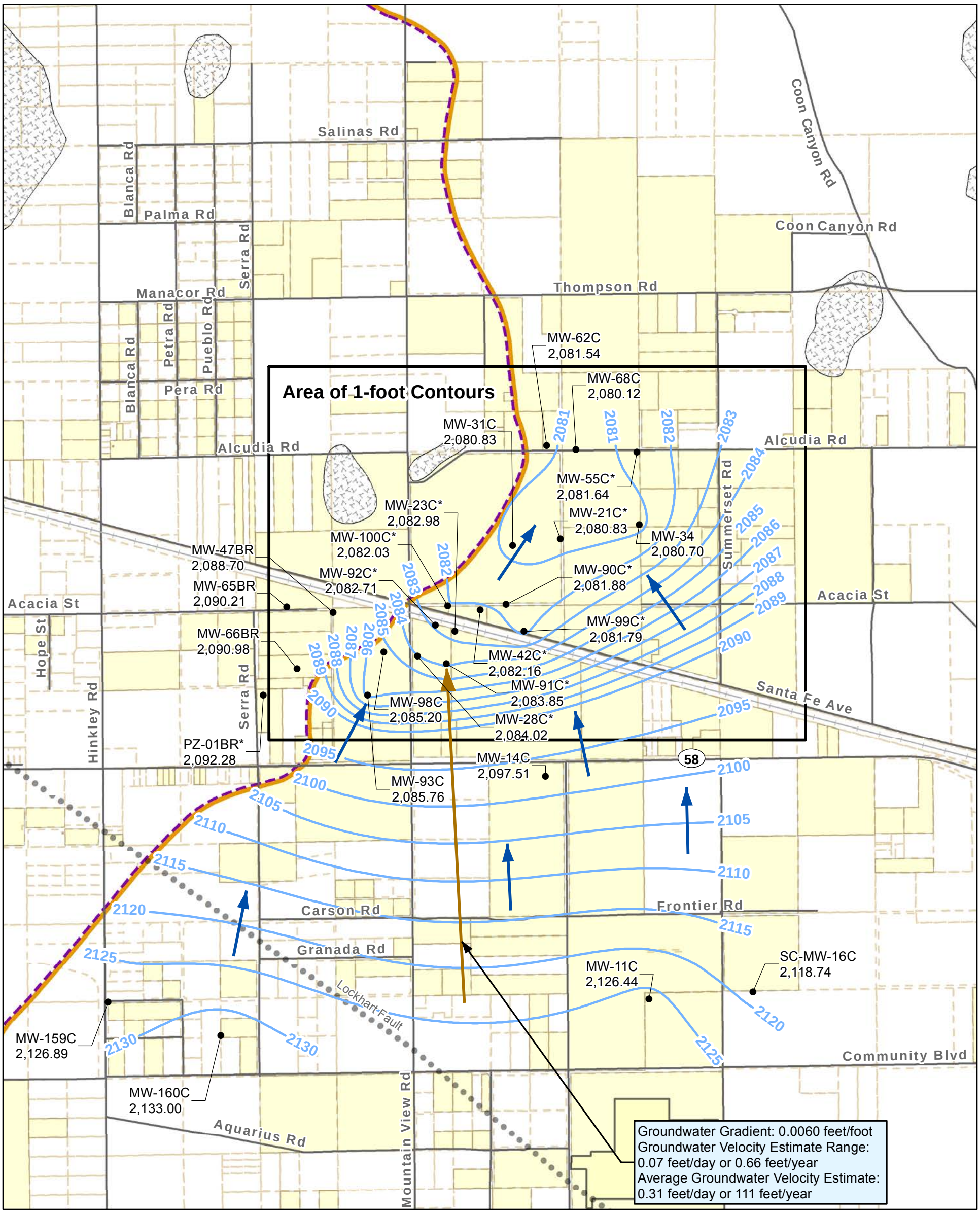


Notes:
1. Flow data are weekly averages from June 2010 through February 2012, and daily averages from February 12, 2012 to June 30, 2014.
2. Pressure transducer data was collected in 30-minute intervals.

Abbreviations:
ft AMSL = Feet Above Mean Sea Level
gpm = Gallons per minute
LA = Lower Aquifer

FIGURE 5-6
LOWER/UPPER AQUIFER GOUNDWATER ELEVATIONS AND PUMPING RATES, JANUARY 2010 TO JUNE 30, 2014
SEMIANNUAL REMEDIATION STATUS AND FINAL CLEANUP EFFECTIVENESS REPORT (JANUARY THROUGH JUNE 2014)
PACIFIC GAS & ELECTRIC COMPANY,
HINKLEY COMPRESSOR STATION,
HINKLEY CALIFORNIA

CH2MHILL



LEGEND:

- Monitoring Well
- Interpreted Groundwater Flow Direction
- Bedrock exposed at ground surface
- Approximate western limits of blue clay forming the Lower Aquifer. The blue clay aquitard is intermittently absent, thin, and sandy in portions of its western extent. Not all wells posted on the map in this area are screened below the blue clay aquitard.
- Approximate location of fault trace is inferred and there is no surface expression (Stamos et al., 2001)
- Potentiometric elevation contours (dashed where inferred)
- PG&E-owned property
- PG&E Compressor Station
- County Parcels

NOTES:

1. Groundwater level measurements for wells without an asterisk "*" are manual water level measurements collected between July 7 through 23, 2014. Groundwater elevations marked with an asterisk "*" are the averages of pressure transducer data collected at 30-minute intervals from July 1 through 31, 2014.
2. Groundwater contours are based on measurements from groundwater monitoring wells completed in the Lower Aquifer (saturated zone below the blue clay aquitard) or weathered bedrock where the blue clay is absent. Where the blue clay is not present, all saturated deposits are in hydraulic communication with the Upper Aquifer.

ABBREVIATIONS:

PG&E = Pacific Gas & Electric Company

MW-160C	Well ID
2,133.31	Groundwater elevation used for contouring

N

0 1,000 2,000

Feet

FIGURE 3-4
GROUNDWATER ELEVATIONS IN THE LOWER AQUIFER AND BEDROCK, THIRD QUARTER 2014

THIRD QUARTER 2014 GROUNDWATER MONITORING REPORT AND DOMESTIC WELL RESULTS
SITE-WIDE GROUNDWATER MONITORING PROGRAM
PACIFIC GAS & ELECTRIC COMPANY
HINKLEY COMPRESSOR STATION
HINKLEY, CALIFORNIA