Ground-Water Monitoring Ten-Year Report

July 10, 1998 to July 10, 2008

Primm Valley Golf Club
PRMA Land Development Company
Ivanpah Valley, California

May 2009

Prepared for:
San Bernardino County
Planning Department
California

Prepared by

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A. EXECUTIVE SUMMARY

This ground-water monitoring ten-year report, for the period of July 10, 1998 to July 10, 2008, has been prepared on behalf of the PRMA Land Development Company for the Primm Valley Golf Club (PVGC).

B. INTRODUCTION

This ten-year ground-water monitoring report, for the period of July 10, 1998 to July 10, 2008, has been prepared on behalf of the PRMA Land Development Company for the PVGC in Ivanpah Valley, California. This report addresses the Conditions of Approval set forth by the San Bernardino County, California Planning Department Staff Report, A)CUP/94-0033/DN1009-729N IVANPAH/S1/09183CF1, Planning Commission Hearing, March 9, 1995 and subsequent discussions with the Planning Department staff. Specific to ground-water monitoring is condition number 10, sections (g and h) which specify the requirements for a five-year report. In addition, these sections were included as part of the Revised Ground-Water Monitoring Plan, PRMA Land Development Company, Primm Valley Golf Club, Ivanpah Valley, California, September 1999. This ten-year ground-water monitoring report is submitted to fulfill condition 10, sections g and h, plus include the most current ground-water monitoring results.. Furthermore, the revised monitoring plan (1999) proposed increasing the amount of ground-water withdrawal from 1,500 acre-feet per year to 1,800 acre-feet per year. San Bernardino County's approval letter for the revised monitoring plan is provided in Appendix A.

The eight-year ground-water monitoring report submitted in September 2006 made recommendations to establish significance criteria and mitigation measures. On February 14, 2007 by way of an interoffice memorandum, San Bernardino County used those recommendations to establish "Groundwater extraction significance criteria [for the] Primm Valley Golf Club." Those significance criteria are address in this report.

The PVGC consists of approximately 496 acres of land adjacent to Interstate 15 approximately 40 miles northeast of Baker, California and about four miles southwest of the Nevada - California border in the southern Ivanpah Valley, California (Figure 1). Land use consists of a 300-acre turf golf course complex, with two 18-hole golf courses, club house, golf academy and maintenance area. Ground-water withdrawal is permitted at 1,800 acre feet annually (afa), with a maximum daily use of 3.5 million gallons. Three water-supply wells on the property accommodated water requirements through July 10, 1998. The PRMA Land Development Company acquired the Colosseum wells, Colosseum Well #1 and Colosseum Well #2 (Figure 1) in May 1998. After all necessary governmental approvals, these wells began delivering water to the golf course in late July 1998. The old pumps in the PVGC wells were removed and replaced in May, 2000, and new well head encasements were set in place. New monitoring point elevations were surveyed coincident with the subsidence survey in July 2000.

This report is structured to address all ground-water monitoring stipulations and significance criteria set forth by the San Bernardino County Planning Department.

C. BACKGROUND

Currently the PVGC is supplied by two offsite wells, Colosseum Wells #1 and #2 (Figure 1). These wells were originally constructed to supply water to the Colosseum Gold Mine operation west of the PVGC. Prior to supplying water to the PVCG, these wells were dormant since approximately 1993. Colosseum Well #1 is constructed to a depth of 566 feet with 14-inch steel casing and is screened between 290 and 556 feet below land surface (bls). Colosseum Well #2 is constructed to a depth of 693 feet bls with 14-inch steel casing and is screened between 350 and 674 feet bls. Currently both Colosseum Wells #1 and #2 are equipped with 200-hp line-shaft turbine pumps. The Colosseum Wells supply approximately 1,800 AFA to the PVGC.

Three back-up ground-water-supply wells are located on the golf course property. These wells are designated wells PVGC #7, PVGC #8, and PVGC #9 (Figure 1). Well PVGC #7 is constructed with 14 inch steel casing set to a depth of 695 feet bls, with a screened interval from 345 feet to 685 feet bls. PVGC #7 is equipped with a 125-hp line-shaft turbine pump. Well PVGC #8 is constructed with 14 inch steel casing set to a depth of 695 feet bls, with a screened interval from 345 feet to 585 feet bls. The cased interval between 585 feet to 685 feet bls has been sealed with cement grout. PVGC #8 is equipped with a 100-hp line-shaft turbine pump. Well PVGC #9 is 460 feet deep with a screened interval from 290 feet to 450 feet bls. PVGC #9 is equipped with a 75-hp line-shaft turbine pump. PVGC #7 and PVGC #8 are used in the event of an emergency only, to provide a temporary supply of water until the regular supply can be reinstated and during over-seeding operations in the fall. They are not in regular operation. PVGC #9 TDS values are above the established significance criteria for water quality. Therefore, this well is only used during purge events for water quality sampling.

Five monitoring wells are used to monitor affects from PVGC's water-supply wells and the Ivanpah Valley alluvial aquifer system. Three of the five monitoring wells were existing when monitoring began and the remaining two were subsequently constructed (Figure 1).

Three of the monitoring wells have been previously constructed and are varying distances and directions from the PVGC property. The first of these monitoring sites has been designated the Yates Well by the Bureau of Land Management (BLM) (Figure 1). It is located approximately 2.6 miles southeast of the southernmost PVGC water-supply well, Colosseum Well #2. Yates Well is constructed with 8-inch steel casing, with a reported depth of 120 feet bls. Yates Well is equipped with a low discharge wind powered piston pump. Stock watering is the limited use for this well (California Dept. of Water Resources, Bulletin 91-21). The BLM is the owner of Yates well. We have requested permission from the BLM to use this well as a monitoring point.

The second offsite well has been designated the Stateline Well by the BLM (Figure 1). It is located approximately 2 miles south of the southernmost PVGC water-supply well, Colosseum Well #2. Stateline Well is constructed with 6-inch steel casing, with a reported depth of 300 feet bls. Stateline Well is equipped with a low discharge wind powered piston pump. Stock watering was the use for this well in the past, however the windmill structure is not currently operational (California Dept. of Water Resources, Bulletin 91-21). The BLM is the owner of Stateline Well. We have requested permission from the BLM to use this well as a monitoring point.

The third offsite well has been designated M-8 by PRMA Land Development Company (Figure 1). It is located approximately 3 miles north of the northernmost PVGC water-supply well, PVGC #9. M-8 is constructed with 4-inch PVC casing, with a screened interval from 125 feet to 230 feet bls. M-8 is equipped with a low discharge submersible pump. M-8 is a dedicated monitoring well for PRMA Land Development Company water-supply wells WP-5 and WP-6 near the state line of California and Nevada.

Although Well M-8 is included in the monitoring plan, any change in ground-water level or water quality shown by this well would most likely be attributed to pumping for the development at Primm (Wells WP-5 and WP-6).

Of the two new monitoring wells, the first is located approximately 2 miles west of the Colosseum Wells and is designated M-13 (Figure 1). This location is the up-gradient monitoring well as stipulated in the Conditions of Approval, condition 10. (c), and assumes a regional ground-water flow that approximates a west to east direction. This location was selected for its presumed ability to detect effects from PVGC water-supply wells' ground-water withdrawal. The depth to ground-water at M-13 is 668 feet bls. This well was completed in April of 2003, and is constructed as a 6-inch Schedule 80 PVC cased well that is approximately 750 feet deep and screened from total depth to 530 feet bls. A submersible pump has been installed for water quality sampling.

The second new monitoring well is located approximately 0.5 miles west of water-supply well PVGC # 8 and is designated M-14. This is down-gradient from the Colosseum Wells, assuming a regional ground-water flow that approximates a west to east direction (Figure 1). This site was selected to optimize both ground-water elevation and water-quality monitoring capabilities. The depth to ground-water at M-14 is 233 feet bls. This well was completed in March of 2004, and is constructed as a 6-inch Schedule 80 PVC cased well that is approximately 300 feet deep and screened from total depth to 190 feet bls. A submersible pump has been installed for water quality sampling.

D. GROUND-WATER MONITORING, ANNUAL REPORT DATA

The Revised Ground-Water Monitoring Plan, PRMA Land Development Company, Primm Valley Golf Club, Ivanpah Valley, California, September, 1999 (Plan) includes information on the monitoring requirements for each of the PVGC water-supply wells as

well as the surrounding monitoring wells. Please refer to the Plan for the detailed requirements of ground-water monitoring and additional information that has not been presented herein.

1. Water-Level Measurements

Water-level measurements were recorded in the three PVGC back-up wells, PVGC #7, PVGC #8, and PVGC #9; the two PVGC ground-water supply wells, Colosseum #1 and Colosseum #2; monitoring wells M-8, M-13 and M-14; and offsite wells, Yates well and Stateline well (Figure 1, Table 1). Yates and Stateline wells are owned by the BLM. Permission to use these wells as monitoring points has been sought but has yet to be secured.

Results from pre-pumping water-level measurements were recorded after the PVGC water-supply wells were completed in August, September, and October, 1995, and are shown in Table 1, as well as the other monitoring points' initial water levels. Once annually, in December of each year, water levels measured in water-supply wells PVGC #7, PVGC #8, PVGC #9, Colosseum #1, and Colosseum #2 are recorded after allowing the water in the wells to recover to a static condition and a potentiometric map is prepared (Figures 2a-2i). The quarterly water-level values for the PVGC water-supply wells and the offsite monitoring wells are shown in Table 1. Annual December water levels are given in this section.

Well PVGC #7

Annual static water level measurements (elevations are above mean sea level (AMSL)) in Well PVGC #7 from the annual reports are as follows: Initially 2,519.57 in (August) 1995; 2,515.76 in 1998; 2,515.39 in 1999; 2,514.55 in 2000; 2,514.56 in 2001; 2,514.06 in 2002; 2513.51 in 2003; 2513.20 in 2004; 2,512.76 in 2005; 2,512.33 in 2006; and 2,511.91 in 2007.

Well PVGC #8

Well PVGC #8 annual static water level measurements AMSL from the annual reports are as follows: Initially 2,520.51 in (September) 1995; 2,513.00 in 1998; 2,514.57 in 1999; 2,512.99 in 2000; 2,513.53 in 2001; 2,513.58 in 2002; 2513.21 in 2003; 2512.97 in 2004; 2,512.58 in 2005; 2,512.03 in 2006; and 2,511.53 in 2007.

Well PVGC #9

Well PVGC #9 annual static water level measurements AMSL from the annual reports are as follows: Initially 2,519.84 in (October) 1995; 2,513.49 in 1998; 2,515.58 in 1999; 2,512.38 in 2000; 2,513.34 in 2001; 2,512.89 in 2002; 2512.63 in 2003; 2513.64 in 2004; 2,511.99 in 2005; 2,511.27 in 2006; and 2,510.95 in 2007.

Colosseum Well #1

Colosseum Well #1 annual static water level measurements AMSL from the annual reports are as follows: Initially 2,518.20 in (September) 1997; 2,500.08 in 1999; 2,509.30 in 2000; 2,506.34 in 2001; 2,507.23 in 2002; 2505.29 in 2003; 2505.75 in

2004; 2,505.45 in 2005; 2,504.02 in 2006; and 2,503.37 in 2007. No measurement was taken in December 1998. The well head was surveyed in September 2000, and potentiometric surface elevations previous to that date were determined retroactively using said survey data.

Colosseum Well #2

Colosseum Well #2 annual static water level measurements AMSL from the annual reports are as follows: Initially 2,519.33 in (September) 1997; 2,518.60 in 1999; 2,523.26 in 2000; 2,507.58 in 2001; 2,506.76 in 2002; 2508.41 in 2003; 2507.87 in 2005; 2,506.26 in 2005; 2,506.72 in 2006; and 2,506.64 in 2007. No measurement was taken in December 1998. The well head was surveyed in September 2000, and potentiometric surface elevations previous to that date were determined retroactively using said survey data.

Well M-8

Well M-8 has not been surveyed. With no reference well head elevation, depth-to-ground-water data are not used in potentiometric surface analyses for this well. The annual static water level measurements from the annual reports are as follows: Initially 103.3 feet below land surface (bls) in (September) 1995; 104.9 feet bls in 1998; 106.4 feet bls in 1999; 107.0 feet bls in 2000; 106.8 feet bls in 2001; 107.0 feet bls in 2002; 108.5 feet bls in 2003; 109.2 feet bls in 2004; 109.2 feet bls in 2005; 108.8 in 2006; and 108.3 in 2007.

Well M-13

Well M-13 has not been surveyed. With no reference well head elevation, depth-to-ground-water data are not used in potentiometric surface analyses for this well. The annual static water level measurements from the annual reports are as follows: Initially 667.21 feet below land surface (bls) in (December) 2006 and 668.10 feet bls in 2007.

Well M-14

Well M-14 has not been surveyed. With no reference well head elevation, depth-to-ground-water data are not used in potentiometric surface analyses for this well. The annual static water level measurements from the annual reports are as follows: Initially 233.18 feet below land surface (bls) in (December) 2006 and 233.65 feet bls in 2007.

Stateline Well

Stateline well annual static water level measurements AMSL from the annual reports are as follows: Initially 2,524.44 in (October) 1995; 2,522.90 in 1998; 2,522.26 in 1999; 2,521.40 in 2000; 2,520.59 in 2001; 2,520.26 in 2002; 2519.60 in 2003; 2519.17 in 2004; 2,518.66 in 2005; 2,518.21 in 2006; and 2,517.72 in 2007.

Yates Well

Yates well annual static water level measurements AMSL from the annual reports are as follows: Initially 2,522.00 in (October) 1995; 2,521.18 in 1998; 2,520.84 in

1999; 2,520.11 in 2000; 2,520.07 in 2001; 2,519.67 in 2002; 2519.25 in 2003; 2518.91 in 2004; 2,518.64 in 2005; 2,518.29 in 2006; and 2,517.90 in 2007.

Potentiometric surface changes from June 1998 to June 2008 are shown on Figure 3 and discussed in Section E.1.

2. Field-Chemistry Measurements

Ground-water sample collection for field chemistry testing was from the three PVGC back-up wells, PVGC #7, PVGC #8, PVGC #9; the two PVGC ground-water supply wells, Colosseum Well #1 and Colosseum Well #2; water-supply wells WP-5, WP-6; and monitoring wells M-8, M-13, and M-14 (Figures 4a-4k; Table 1). Electrical conductivity (EC) measurements are used to monitor changes in ground-water chemistry over time.

PVGC #7

Water-quality measurements taken in water-supply well PVGC #7 show an initial EC value of 2,023 µmhos/cm in October 1995; a value of 2,595 µmhos/cm in June 1998; a value of 2,750 µmhos/cm in June 1999; a value of 2,289 µmhos/cm in June 2000; a value of 2,327 µmhos/cm in June 2001; a value of 2,073 µmhos/cm in June 2002; a value of 2,520 µmhos/cm in June 2003; a value of 2,080 µmhos/cm in June 2004; a value of 2,387 µmhos/cm in June 2005; a value of 2,430 µmhos/cm in June 2006; a value of 2,166 µmhos/cm in June 2007; and a value of 2,143 µmhos/cm in June 2008 (Table 1). The highest field EC measurement recorded was in September 1999 at 2,940 µmhos/cm.

PVGC #8

Water-quality measurements taken in water-supply well PVGC #8 show an initial EC value of 1,498 µmhos/cm in September 1996; a value of 1,557 µmhos/cm in June 1998; a value of 1,673 µmhos/cm in March 1999; a value of 1,620 µmhos/cm in June 2000, a value of 1,575 µmhos/cm in June 2001; a value of 1,593 µmhos/cm in March 2002; a value of 1,529 µmhos/cm in March 2003; a value of 1,484 µmhos/cm in June 2004; a value of 1,468 µmhos/cm in June 2005; a value of 1,474 µmhos/cm in June 2006; a value of 1,422 µmhos/cm in June 2007; and a value of 1,604 µmhos/cm in June 2008 (Table 1). Due to a broken pump, the well was not sampled in June 1999 or in June 2002. The highest field EC measurement recorded was in December 1998 at 1,763 µmhos/cm.

PVGC #9

Water-quality measurements taken in water-supply well PVGC #9 show an initial EC value of 545 µmhos/cm in January 1997; a value of 687 µmhos/cm in June 1998; a value of 745 µmhos/cm in June 2000; a value of 803 µmhos/cm in June 2001; a value of 703 µmhos/cm in June 2002; a value of 779 µmhos/cm in June 2003; a value of 817 µmhos/cm in June 2004; a value of 875 µmhos/cm in June 2005; a value of 917 µmhos/cm in June 2006; a value of 638 µmhos/cm in June 2007; and a value of 1,152 µmhos/cm in June 2008 (Table 1). Due to a broken pump no the well

was not sampled in June 1999. The highest field EC measurement recorded was in June 2008 at 1,152 µmhos/cm.

Colosseum Well #1

Water-quality measurements taken in water-supply well Colosseum Well #1 show an initial EC value of 590 µmhos/cm in September 1998; a value of 626 µmhos/cm in June 1999; a value of 590 µmhos/cm in June 2000; a value of 604 µmhos/cm in June 2001; a value of 631 µmhos/cm in June 2002; a value of 633 µmhos/cm in June 2003; a value of 626 µmhos/cm in June 2004; a value of 613 µmhos/cm in June 2005; a value of 665 µmhos/cm in June 2006; a value of 691 µmhos/cm in June 2007; and a value of 724 µmhos/cm in July 2008 (Table 1). The highest field EC measurement recorded was in July 2008 at 724 µmhos/cm.

Colosseum Well #2

Water-quality measurements taken in water-supply well Colosseum Well #2 show an initial EC value of 570 µmhos/cm in September 1998; a value of 604 µmhos/cm in June 1999; a value of 569 µmhos/cm in June 2000; a value of 575 µmhos/cm in June 2001; a value of 573 µmhos/cm in June 2002; a value of 576 µmhos/cm in June 2003; a value of 562 µmhos/cm in June 2004; a value of 559 µmhos/cm in June 2005; a value of 579 µmhos/cm in June 2006; a value of 599 µmhos/cm in June 2007; and a value of 577 µmhos/cm in July 2008 (Table 1). The highest field EC measurement recorded was in September 2002 at 612 µmhos/cm.

WP-5

Water-quality measurements taken in Whiskey Pete's water-supply well WP-5 show an initial EC value of 738 µmhos/cm in September 1997; a value of 706 µmhos/cm in June 1998; a value of 820 µmhos/cm in June 1999; a value of 758 µmhos/cm in June 2000, a value of 775 µmhos/cm in March 2001; a value of 801 µmhos/cm in June 2002; a value of 844 µmhos/cm in June 2003; a value of 846 µmhos/cm in June 2004; a value of 844 µmhos/cm in June 2005; a value of 887 µmhos/cm in June 2006; a value of 940 µmhos/cm in June 2007; and a value of 966 µmhos/cm in June 2008 (Table 1). Water-quality measurements were not taken in WP-5 in June 2001, due to a broken pump. The highest field EC measurement recorded was in June 2008 at 966 µmhos/cm.

WP-6

Water-quality measurements taken in Whiskey Pete's water-supply well WP-6 show an initial EC value of 1,099 µmhos/cm in September 1997; a value of 1,037 µmhos/cm in June 1998; a value of 1,159 µmhos/cm in June 1999; a value of 1,121 µmhos/cm in June 2000; a value of 1,158 µmhos/cm in June 2001; a value of 1,178 µmhos/cm in June 2002; a value of 1,155 µmhos/cm in June 2003; a value of 1,288 µmhos/cm in June 2004; a value of 1,180 µmhos/cm in June 2005; a value of 1,278 µmhos/cm in June 2006; a value of 1,350 µmhos/cm in June 2007; and a value of 1,410 µmhos/cm in June 2008 (Table 1). The highest field EC measurement recorded was in June 2008 at 1,410 µmhos/cm.

M-8

Water-quality measurements taken in Whiskey Pete's monitoring well M-8 show an initial EC value of 4,270 µmhos/cm in September 1997; a value of 4,280 µmhos/cm in June 1998; a value of 4,587 µmhos/cm in June 1999; a value of 4,355 µmhos/cm in June 2000; a value of 4,510 µmhos/cm in July 2001; a value of 4,483 µmhos/cm in June 2002; a value of 4,640 µmhos/cm in June 2003; a value of 4,417 µmhos/cm in June 2004; a value of 4,377 µmhos/cm in June 2005; a value of 4,210 µmhos/cm in June 2006; a value of 4,183 µmhos/cm in June 2007; and a value of 4,010 µmhos/cm in June 2008 (Table 1). The highest field EC measurement recorded was in September 2001 at 4,700 µmhos/cm.

M-13

Water-quality measurements taken in PVGC up-gradient offsite well M-13 show an initial EC value of 626 µmhos/cm in December of 2006; a value of 661 µmhos/cm in June 2007; and a value of 648 µmhos/cm in June 2008 (Table 1). The highest field EC measurement recorded was in June 2007 at 661 µmhos/cm.

M-14

Water-quality measurements taken in PVGC up-gradient offsite well M-14 show an initial EC value of 594 µmhos/cm in December of 2006; a value of 594 µmhos/cm in June 2007; and a value of 604 µmhos/cm in June 2008 (Table 1). The highest field EC measurement recorded was in March 2007 at 612 µmhos/cm.

3. Water-Quality Laboratory Analyses

Annual ground-water samples were collected in July of each year for laboratory analysis of general minerals from three PVGC back-up wells, PVGC #7, PVGC #8, PVGC #9; the two PVGC ground-water supply wells, Colosseum #1 and Colosseum #2; water-supply wells WP-5, WP-6; and monitoring wells M-8, M-13, and M-14 (Table 2, Appendix B).

PVGC #7

Laboratory analysis of TDS in water-supply well PVGC #7 shows a value of 1,530 mg/L in July 1998; a value of 1,610 mg/L in July 1999; a value of 1,580 mg/L in July 2000; a value of 1,460 mg/L in July 2001; a value of 1,300 mg/L in July 2002; a value of 1,500 mg/L in July 2003; a value of 1,300 mg/L in July 2004; a value of 1,400 mg/L in July 2005; a value of 1,500 mg/L in August 2006; a value of 1,400 mg/L in July 2007; and a value of 1,300 mg/L in July 2008.

PVGC #8

PVGC #8 shows a value of 940 mg/L of TDS in July 1998; a value of 940 mg/L in July 2000; a value of 868 mg/L in July 2001; a value of 930 mg/L in July 2004; a value of 870 mg/L in July 2005; a value of 860 mg/L in August 2006; a value of 900

mg/L in July 2007; and a value of 940 mg/L in July 2008. Well PVGC #8 was not sampled in July 1999, July 2002, or July 2003 due to a broken pump at those times.

PVGC #9

PVGC #9 shows a value of 450 mg/L of TDS in July 1998; a value of 410 mg/L in July 2000; a value of 500 mg/L in July 2001; a value of 400 mg/L in July 2002; a value of 470 mg/L in July 2003; a value of 510 mg/L in July 2004; a value of 540 mg/L in July 2005; a value of 590 mg/L in August 2006; a value of 390 mg/L in July 2007; and a value of 720 mg/L in July 2008. Well PVGC #9 was not sampled in July 1999 due to a broken pump.

Colosseum Well #1

Water supply well Colosseum Well #1 shows a value of 350 mg/L of TDS in July 1999; a value of 380 mg/L in July 2000; a value of 380 mg/L in July 2001; a value of 360 mg/L in July 2002; a value of 380 mg/L in July 2003; a value of 380 mg/L in July 2004; a value of 420 mg/L in July 2005; a value of 380 mg/L in July 2006; a value of 450 mg/L in July 2007; and a value of 450 mg/L in July 2008.

Colosseum Well #2

Colosseum Well #2 shows a value of 340 mg/L of TDS in July 1999; a value of 350 mg/L in July 2000; a value of 320 mg/L in July 2001; a value of 330 mg/L in July 2002; a value of 330 mg/L in July 2003; a value of 330 mg/L in July 2004; a value of 380 mg/L in July 2005; a value of 360 mg/L in July 2006; a value of 330 mg/L in July 2007; and a value of 350 mg/L in July 2008.

WP-5

Whiskey Pete's water-supply well WP-5 shows a value of 470 mg/L of TDS in July 1998; a value of 460 mg/L in July 1999; a value of 480 mg/L in July 2000; a value of 470 mg/L in July 2002; a value of 510 mg/L in July 2003; a value of 540 mg/L in July 2004; a value of 520 mg/L in July 2005; and a value of 540 mg/L in July 2006; a value of 480 mg/L in July 2007; and a value of 560 mg/L in July 2008. Well WP-5 was not sampled for analysis in July 2001, due to a broken pump in that well.

WP-6

Whiskey Pete's water-supply well WP-6 shows a value of 640 mg/L of TDS in July 1998; a value of 650 mg/L in July 1999; a value of 680 mg/L in July 2000; a value of 670 mg/L in July 2001; a value of 650 mg/L in July 2002; a value of 680 mg/L in July 2003; a value of 720 mg/L in July 2004; a value of 730 mg/L in July 2005; a value of 730 mg/L in July 2006; a value of 720 mg/L in July 2007; and a value of 760 mg/L in July 2008.

M-8

Laboratory analyses of water samples from monitoring well M-8 show a value of 2,520 mg/L of TDS in July 1998; a value of 2,700 mg/L in July 1999; a value of 2,640 mg/L in July 2000; a value of 2,630 mg/L in July 2001; a value of 2,700 mg/L in July 2002; a value of 2,470 mg/L in July 2003; a value of 2,500 mg/L in July

2004; a value of 2,400 mg/L in August 2006; a value of 2,300 mg/L in August 2007; and a value of 2,300 mg/L in July 2008. Well M-8 was not sampled for analysis in July 2005, due to a broken pump in that well.

M-13

Laboratory analyses of water samples from monitoring well M-13 show a value of 404 mg/L in August 2004; 370 mg/L in September 2006; a value of 380 mg/L in August 2007; and a value of 340 mg/L in July 2008.

M-14

Laboratory analyses of water samples from monitoring well M-14 show a value of 323 mg/L in June 2003; a value of 326 mg/L in August 2004; a value of 360 mg/L in September 2006; a value of 360 mg/L in August 2007; and a value of 330 mg/L in July 2008.

To assure laboratory integrity, two samples (duplicates) were collected annually from a single monitoring point; one sample was analyzed by the usual laboratory and the second sample was analyzed by an independent laboratory. Both laboratories analyzed for identical constituents. Results from the two laboratories varied somewhat each year (Table 2). In July 1998, PVGC's water-supply well PVGC #7 had duplicate samples collected. There was a 3% TDS variation, with an average variation of 5% for all reported constituents. In July 1999, Whisky Pete's water-supply well WP 6 had duplicate samples collected. There was a 2% TDS variation, with an average variation of 6% for all reported constituents. In July 2000, PVGC's water-supply well Colosseum Well #1 had duplicate samples collected. There was a 12% TDS variation, with an average variation of 5% for all reported constituents. In July 2001, PVGC's water-supply well PVGC #8 had duplicate samples collected. There was an 8% TDS variation, with an average variation of 8% for all reported constituents. In July 2002, PVGC's water-supply well Colosseum Well #2 had duplicate samples collected. There was a 32% TDS variation, with an average variation of 3% for all reported constituents. In July 2003, Whiskey Pete's monitoring well M-8 had duplicate samples collected. There was a 1% TDS variation, with an average variation of 12% for all reported constituents. In July 2004, PVGC monitoring well PVGC #7 had duplicate samples collected. There was an 11% TDS variation, with an average variation of 9% for all reported constituents. In August 2005, PVGC water-supply well Colosseum Well #1 had duplicate samples collected. There was a 6% TDS variation, with an average variation of 21% for all reported constituents. In August 2006, PVGC water-supply well PVGC #8 had duplicate samples collected. There was a 6% TDS variation, with an average variation of 23% for all reported constituents. In August 2007, PVGC water-supply well Colosseum Well #1 had duplicate samples collected. There was a 10% TDS variation, with an average variation of 15% for all reported constituents. In August 2008, PVGC water-supply well Colosseum Well #2 had duplicate samples collected. There was a 14% TDS variation, with an average variation of 4% for all reported constituents. The average variances of the laboratory results appear to be within acceptable tolerances, for most samples.

E. MULTIYEAR GROUND-WATER TRENDS

In addition to the year-to-year changes in ground-water level and quality, it is necessary to analyze ground-water trends over longer periods of time. The Ground-Water Monitoring Plan includes requirements for the analysis of multiyear trends in the five-year report.

1. Water-Level Measurements

All PVGC pumping wells are shut off in December and the water levels are allowed to recover to a static level before measuring. Thus, a comparison of the annual December static water-level values is possible (Figures 2a-2i; Figure 3; Table 1).

PVGC #7

The static water level measurements for the PVGC water-supply well PVGC #7 indicate an overall decline in the potentiometric surface of 6.81 feet between Fall 1995 and December 2005. The annual static water level measurements show that the initial decline upon start-up of pumping from this well, 3.81 feet by December 1998, tapered off and became a more gradual decline in static water level by December 1999. There was an additional 0.37 feet of decline from 1998 to 1999 and a 0.77 feet of decline from 1999 to 2000. Once continuous pumping from this well ceased, the water level began to recover and increased in the well, up 0.01 feet from December 2000 to December 2001. There was a 0.57 feet drop in the static water level from December 2001 to December 2002 and most recently there was a drop of 0.44 feet between December 2004 and December 2005.

PVGC #8

An overall static water level decline of 7.93 feet was measured at well PVGC #8 between Fall 1995 and December 2005. This well has experienced fluctuations in static water level consistent with the pumping schedule for the well. Water levels declined 7.51 feet through December 1998 due to regular pumping of the well. Water levels recovered 1.57 feet in 1999 during a period of non-pumping. A decline of 1.58 feet was recorded in December 2000, as pumping resumed for the majority of that year. Once the well was taken out of full-time service in 2001, the well began to recover again, with a rise in water level of 0.54 feet by December 2001. By December 2002, the water level had risen 0.05 feet. More recently the water level dropped 0.39 feet between December 2004 and December 2005.

PVGC #9

An overall static water level decline of 7.85 feet was measured at well PVGC #9 between Fall 1995 and December 2005. This well has also experienced fluctuations in static water level consistent with the pumping schedule for the well. Water levels declined 6.35 feet through December 1998 due to regular pumping of the well. Water levels recovered 2.09 feet in 1999 during a period of non-pumping. A decline

of 3.20 feet was recorded in December 2000, as pumping resumed for the majority of that year. Once the well was taken out of full-time service in 2001, the well began to recover again, with a rise in water level of 0.96 feet by December 2001. By December 2002, the water level had risen 0.45 feet. More recently the water level dropped 1.65 feet between December 2004 and December 2005.

Colosseum #1

The static water level measurements for the PVGC water-supply well Colosseum 1 indicate an overall decline in the potentiometric surface of 12.75 feet between Fall 1997 and December 2005. However, over the past three years of measurements there has been little change in static water level.

Colosseum #2

An overall static water level decline of 13.07 feet was measured at the PVGC water-supply well Colosseum Well #2 between Fall 1997 and December 2005. During the period between 2001 and 2003 water levels recovered approximately 1.5 feet then in subsequent years through 2005 water levels have declined approximately two feet.

The PVGC offsite monitoring wells show fairly consistent decline in static water levels between Fall 1995 and December 2005, with an overall decline of 5.3 feet recorded at well M-8, a 5.99-foot decline at Stateline well, and a 3.48-foot decline at Yates well.

Predicted water-level declines due to PVGC ground-water withdrawal, at a rate of 1,800 afa, were estimated for 30 years of pumping and at various distances from the PVGC ground-water withdrawal pumping center(s) (Broadbent, 1998). Comparison between these estimated values, which were adjusted to match the time period that the actual water-level change values were recorded, between Fall 1995 and June 2006, and the actual declines are summarized by the following results. The estimated decline for the Yates well was 3.08 feet while the actual decline was 3.48 feet. The estimated decline for Stateline well was 3.32 feet and the actual decline was 5.99 feet. The actual drawdown in the Yates wells is close to the predicted value and actual drawdown in the Stateline well is more than the predicted value, and this variation may reflect varied transmissivities in the region.

The ground-water flow direction appears to have maintained a northeasterly direction from Fall 1995 to December 2007 (Figures 2a-2j). The ground-water gradient in Fall 1995 was approximately 0.0004 and in December 2005 it was approximately 0.00055. This gradient was calculated using wells monitored by the Las Vegas Valley Water District (LVVWD). The wells used in the past were DRI A3-3 and the Murphy Well. The LVVWD has reported pumping around the DRI A3-3 Well for the past three years and report that the Murphy Well was plugged in June of 2005. Looking at the wells that have data, the JRS Well near Jean, Nevada and the NIPR&R Well south and west of Nipton, CA are wells in the general vicinity of the historic wells and wells that have historic and current data. The wells are approximately 22.7 miles apart and do not report nearby pumping. Appendix C

presents calculations for ground-water velocity using the new wells for the past five years. The estimate for velocity has increased from 16.75 ft/yr to 18.07 ft/yr.

2. Field-Chemistry Measurements

Increases and decreases in field Electrical Conductivity (EC) measurements are observed in all of the PVGC production wells, however these fluctuations vary between wells (Table 1; Figures 4a-4k; Figure 5; EC Graphs 2, 4, 6, 8, 10). Wells PVGC #7, PVGC #8, and PVGC #9 show an initial increase in EC during the time these wells were used as the main ground-water supply wells. After the Colosseum Wells became the main ground-water supply wells and PVGC #7, PVGC #8, and PVGC #9 were taken out of fulltime service, EC values in PVGC #7 and PVGC #8 decreased to near initial ground-water withdrawal values. However, EC values in PVGC #9 continued to increase. The continued EC increase in PVGC #9.is probably attributed to lingering effects from historic ground-water withdrawal. Review of EC measurements taken from Colosseum Wells #1 and #2 suggests a cyclic pattern that is most noticeable during the heavier pumping times of the summer and the fall. During times of less ground-water withdrawal in the winter and spring the EC values appear to stabilize and slightly decline. During times of higher amounts of ground-water withdrawal in late summer and fall EC values appear to increase.

PVGC #7

Water-quality measurements taken in water-supply well PVGC #7 show an initial increase in the EC values as pumping began. The EC values rose from an initial value of 2,023 µmhos/cm in October 1995 to a maximum value of 2,940 µmhos/cm in September 1999. Once the well was designated as only a back-up well and taken out of constant service the EC values began to decline from a most recent low value of 2,016µmhos/cm in December 2005 to a most recent high value of 2,430 µmhos/cm in June 2006. The EC values declined steadily to a value of 2,143 in June 2008. The increase and decrease pattern observed from EC values after PVGC #7 was designated as a backup well appears on a one and one-half to two-year cycle (Table 1, Graph 2).

PVGC #8

Water-quality measurements taken in water-supply well PVGC #8 show an initial increase in the EC values as pumping began. The EC values rose from an initial value of 1,498 µmhos/cm in September 1996 to a maximum value of 1,763 µmhos/cm in December 1998. Once the well was designated as only a back-up well and taken out of constant service the EC values began to decline, with a value 1,529 µmhos/cm in June 2003. This value has decreased steadily to approximately 1,474 µmhos/cm in June 2006 before increasing to 1,604 µmhos/cm in June 2008 (Table 1, Graph 4).

PVGC #9

Water-quality measurements taken in water-supply well PVGC #9 show an initial increase in the EC values as pumping began. The EC values rose from an initial

value of 545 µmhos/cm in January 1997 to a maximum value of 1,010 µmhos/cm in March 2006. In June 2007 a decrease to 638 µmhos/cm was recorded, however this value may be an artifact of a broken cla-valve that may have allowed other well water access to this well. In June 2008 the EC value had increased to 1,152 µmhos/cm (Table 1, Graph 6).

Colosseum #1

Water-quality measurements taken in water-supply well Colosseum #1 show only slight variances in the EC values, with an annual cyclic pattern. While the initial pre PVGC ownership value of 640 µmhos/cm was recorded in August 1997, a PVGC project related value of 590 µmhos/cm was measured in September 1998. A value as low as 572 µmhos/cm was recorded in March 2000 with the highest field EC measurement recorded in September 2005 at 676 µmhos/cm. In June 2006 the value decreased to 665 µmhos/cm before increasing to the highest recorded measurement of 724 µmhos/cm in June 2008 (Table 1, Graph 8).

Colosseum #2

Water-quality measurements taken in water-supply well Colosseum #2 also show only slight variances in the EC values, with an annual cyclic pattern. The initial pre PVGC ownership value of 590 µmhos/cm was recorded in August 1997 and a PVGC project related value of 570 µmhos/cm was measured in September 1998. The EC value has dropped to as low as 492 in December 2005 with the highest field EC measurement recorded in March 2003 at 606 µmhos/cm. An EC value of 577 µmhos/cm was recorded in June 2008 (Table 1, Graph 10).

WP-5

No pre-pumping value has been recorded by PVGC for Whiskey Pete's water-supply well WP-5, as this water-supply well was brought into service prior to the start of the PVGC project. EC values have varied from a low of 649 µmhos/cm in March 1998 and gradually risen to a high of 966 µmhos/cm in June 2008 (Table 1, Graph 11).

WP-6

No pre-pumping value has been recorded by PVGC for Whiskey Pete's water-supply well WP-6, as this water-supply well was brought into service prior to the start of the PVGC project. EC values have varied from a low of 950 µmhos/cm in March 1998 to a high of 1,288 µmhos/cm in June 2004. EC values have gradually risen to a recorded high of 1,410 µmhos/cm in June 2008 (Table 1, Graph 12).

M-8

No pre-pumping value has been recorded by PVGC for monitoring well M-8, as this monitoring well was brought into service prior to the start of the PVGC project. EC values have varied from a low of 3,600 µmhos/cm in March 1998 to a high of 4,700 µmhos/cm in September 2001. An EC value of 4,010 µmhos/cm was recorded in June 2008. The levels have steadily dropped since the high value was recorded in 2001. EC values in monitoring well M-8 are mostly affected by water supply wells WP-5 and WP-6 (Table 1, Graph 13).

3. Water-Quality Laboratory Analyses

Table 2 shows the results from the annual laboratory analyses, from samples taken in July of each year. Comparing TDS results from the water-supply and monitoring wells there are various degrees of changes that are recognized between the annual samples and over the eight years of analyses. Slight TDS changes can also reflect normal laboratory variations.

PVGC #7

Laboratory analysis in water-supply well PVGC #7 shows an average change of 6% per year, with an initial increase in TDS through July 1999, then a gradual decrease through July 2002, a slight increase to a value of 1,500 mg/L in July 2006, and then another gradual decrease to 1,300 mg/L in July of 2008.

PVGC #8

PVGC #8 shows fairly constant TDS values, with a decrease in TDS in 2000 to 870 mg/L, and a return to the previous level of 940 mg/L in July 2001. Samples were not collected from PVGC #8 in 2002 and 2003 due to a broken pump. Decreases in TDS values continued in 2005 and 2006 with results of 870 mg/L and 860 mg/L, respectively. TDS values increased in 2007 to 900 mg/L and again in 2008 to 940 mg/L.

PVGC #9

PVGC #9 TDS values increased from 420 mg/L to 500 mg/L between 1997 and 2001 then decreased to 400 mg/L in 2002. After which, a steady TDS increase began in 2003 with a value of 470 mg/L to a value of 590 mg/L in 2006. TDS values decreased in 2007 to a value of 390 mg/L, however this value may be an artifact of a broken cla-valve that may have allowed other well water access to this well. In 2008 in TDS increased to 720 mg/L.

Colosseum #1

TDS values were relatively stable between 350 mg/L to 380 mg/L from 1997 to 2004, then increased to 420 mg/L in 2005. In 2006, the TDS values decreased to 380 mg/L before increasing to 450 mg/L in 2007 and 2008.

Colosseum #2

TDS values have been relatively stable from an initial value of 340 mg/L in 1999 to the current value of 350 mg/L in 2008.

WP-5

TDS values have been relatively stable and increased slightly from an initial value of 490 mg/L in 1999 to the current value of 560 mg/L in 2008.

WP#6

TDS values were stable and increased slightly from 640 mg/L to 680 mg/L between 1997 and 2003, respectively. In 2004 TDS values increased to 720 mg/L and have remained stable in 2008 with a value of 760 mg/L.

M-8

TDS values increased from 2,260 mg/L to 2,700 mg/L between 1997 and 2002, respectively. In 2003 TDS values decreased to 2,500 mg/L and have remained relatively stable with a 2008 value of 2,300 mg/L.

F. HIGH TDS GROUND-WATER MIGRATION

There are annual TDS fluctuations in most wells that were analyzed. However, over the ten-year period of record there have been increases, decreases, or stabilized TDS results that are evident from each well (Table 2). TDS values in water-supply wells PVGC #8, and Colosseum Well #2 and monitoring wells M-8 and M-14, have remained stable or have stabilized over the period of record. TDS values in water-supply wells PVGC #9, WP-5, WP-6 and Colosseum Well #1 have increased, whereas a decrease and stablization in TDS was observed in monitoring well M-13. A slight decrease in TDS was observed in water supply well PVGC #7.

Increases in TDS are likely due to poor-quality ground-water being mobilized as stress is applied to the ground-water system during pumping, as observed in wells PVGC #9, WP-5, and WP-6. PVGC #9 continues to have increases in TDS. Backup wells PVGC #7 and PVGC #8, which have pumped little water since 2000, appear to have returned to the natural TDS background levels. Colosseum Wells #1 and #2 are the main water-supply wells for PVGC and their TDS values have remained relatively stable over their PVGC pumping record. The stable TDS values are probably a result of their location up gradient from the poor quality ground-water that can be associated with the finer grained deposits/aquifer on the valley floor of Ivanpah Valley.

As a result of water quality evaluations over the period of record high TDS ground-water migration does not appear to be a problem in the main PVGC water-supply wells, Colosseum Wells #1 and #2. Higher TDS ground-water migration is observed from backup well PVGC #9. However, this well has the lowest background TDS concentration of the three PVGC wells and is only used on a short-term basis to collect water quality samples. Some higher TDS ground-water migration is observed from Whiskey Pete's water supply wells WP-5 and WP-6. No higher TDS ground-water migration is currently observed from PVGC backup water supply wells PVGC #7 and PVGC #8.

G. NON-PROJECT GROUND-WATER DISCHARGES

Las Vegas Paving Company is currently repaving portions of Interstate 15 (I-15). They have set up a gravel plant with a small diameter (8 inch ?) production well at the Yates Well exit interchange approximately 1 mile from PVGC. The ground-water production is unknown and is assumed to only last the duration of the paving project. Added affect on PVGC monitoring points is unknown. Other then this well PVGC is not aware of any non-project ground-water discharges in the area. The PVGC maintenance staff monitors the irrigation system daily to minimize the amount of water necessary to operate the golf course.

H. ESTIMATE OF POTENTIAL CHANGES IN GROUND-WATER ELEVATION OVER TEN YEARS

As this is the Ten Year Report, new predictions of future water level declines need to be made. The predictions will be made under separate cover after consultation with the County and review of this monitoring report.

I. PVGC PUMPING RECORD AND SUMMARY

Totalizing meter readings were recorded for wells Colosseum #1, Colosseum #2, PVGC #7, PVGC #8, and PVGC #9. A summary of the annual pumping data is shown in Table 3. Historic metering problems at Colosseum Wells #1 and #2 were noticed and corrected in February 2001.

The total cumulative ground-water withdrawal from all of the PVGC water-supply wells for the one-year period of July 10, 1998 to July 10, 1999 was approximately 1,928 acre-feet. Water usage from July 10, 1999 to July 10, 2000 was approximately 1,960 acre-feet. Water usage from July 10, 2000 to July 10, 2001 was approximately 1,766 acre-feet. Water usage from July 10, 2001 to July 10, 2002 was approximately 1,784 acre-feet. Water usage from July 10, 2002 to July 10, 2003 was approximately 1,728 acre-feet. Water usage from July 10, 2003 to July 10, 2004 was approximately 1,680 acre-feet. Water usage from July 10, 2004 to July 10, 2005 was approximately 1,534 acre-feet. Water usage from July 10, 2005 to July 10, 2006 was approximately 1,589 acre-feet. Water usage from July 10, 2006 to July 10, 2007 was approximately 1,790 acre-feet. Water usage from July 10, 2007 to July 10, 2008 was approximately 1,648 acre-feet. The projected golf course needs for ground-water were 1,800 afa.

J. DEPRESSION FEATURES IN IVANPAH DRY LAKE

On the northern edge of Ivanpah Dry Lake in California, near Primm, Nevada, there are depressions (sinkholes) from approximately ten feet in diameter and three feet deep, to

numerous depressions three feet in diameter and two feet deep, to sublinear continuous and discontinuous fractures (fissures). They are concentrated in an area of approximately two acres. PVGC's closest main water supply well, Colosseum Well #1, is approximately five miles southwest of these features with Primm Casino water supply wells WP-5 and WP-6 an approximate distance of three miles. These features were initially recognized by the Bureau of Land Management (BLM) in November 2007.

Field observations, technical literature review, and air photo evaluations were performed in an effort to describe a mechanism(s) for these features development. There are a number of interpretations available to explain these features and it is suggested that the sinkholes are subsidence features based on their linear and semi-circular trend and their collapsed nature.

The cause of subsidence features is the collapse of underlying soils from either a natural or man-influenced process. The cause of collapsed soils is usually attributed to dissolution of minerals at depth by ground water, perched ground water, or surface water infiltration; from a drop or rise in the ground-water table; by surface loading; or a geologic structure(s) (a fault). A drop in ground water can be caused by drought conditions or from ground-water extraction (pumping) and a rise in ground water can be caused by increased ground-water recharge or a decrease in ground-water extraction.

To be definitive as to a direct cause from a specific mechanism for the development of these features is difficult. However, based on evaluation of available data these features appear to be associated with and caused by a natural desiccation phenomena. Desiccation polygons (mud cracks) have been recognized and mapped on Ivanpah Dry Lake as well as other playas in the Great Basin (Neal, et al, 1968). Air photo evaluation of the northern most portion of the Ivanpah Playa, west of Interstate 15 (I-15), document the existence of "Giant Desiccation Polygons." The formation of these desiccation polygons occurs as dehydration proceeds from the surface downward and penetrates the capillary fringe above the water table, shrinkage occurs, which ultimately results in rupture at depth that extends upward to the surface. This is a natural process for playas that posses a significant amount of clay and evaporite minerals. Dehydration of the clays to an almost dry condition such that the water content may exceed the mineral content can result in a major loss of volume, thus the collapse of overlying soils and fissure formation (Neal, et al, 1968).

The size of the features in question are probably a subset and pre curser to a larger Giant Desiccation Polygon that is in the process of development. Interestingly, these desiccation features have a slight raised rim of cracked soil that follows the outline of each newly formed sinkhole. The development of these features appears to follow a process similar to Gilgai formation (www.geocities.com/CapeCanaveral/9527/gilgailinks.htm) where there is an expansion and contraction of soils caused by changes in moisture that result in mounds and depression areas. The formation of the Ivanpah features evolution process could have developed with the expansive of evaporite minerals and clays and the soil surface was crack in a sub-circular pattern. Surface water then entered these cracks and dissolution and expansion of the evaporite minerals and clays occurs resulting in collapse

of the upper most surface soils. With the sub linear continuous and discontinuous orientation to these features this suggests there may be a pattern that has yet to be recognized and could eventually emerge as a polygon.

Other explanations for the formations of these features were considered and include affects from basin wide ground-water extraction or a tectonic component associated with the State Line Fault or other unmapped structures in the region, or a natural rise or fall in the ground-water table. Although ground-water withdrawal has the potential to cause subsidence features to develop there are reasons this is not considered a viable option in this case. These factors include the relatively small amount of basin wide change in the water table (less than 5-10 feet) whereas most subsidence caused by ground-water extraction is on the order of a 100 feet of water level change or more; as far as is known these features are isolated to only one area, the northern Ivanpah Dry Lake, and lastly the closest water supply wells are approximately 3-5 miles away and these areas have little documented subsidence movement since pumping began almost ten years ago. Based on this information the connection between ground-water withdrawal and these features appears to be limited.

The potential that tectonic activity has caused or has assisted in the formation of this features in unclear. However, there are no known active faults in the region of these features and no known structural offset in the local region. There is no additional information on the natural rise or fall of the ground-water table other than the effects documented for man-influenced ground-water extraction.

Although this summary has an interpretation as to the potential cause of these features there are a number of items that could be accomplished to further document these features. These items include collecting baseline data and establishing monitoring that would include: 1) map the features, 2) all features could be surveyed and located on a geo referenced base map, 3) a limited number of vertical baseline control staff rods could be located and surveyed in and adjacent to Ivanpah Dry Lake, 4) the Giant Desiccation Polygons could be mapped and surveyed, 5) establish a monitoring plan and resurvey on an annual basis, 6) review existing ground-water elevation maps and compare changes over time, and 7) report findings on an annual basis.

It is important to note that should the consensus be and the data show that the interpretation of these features as naturally occurring features is appropriate, as with suggested interpretation above, then the monitoring of these features would be discontinued.

K. SUMMARY

Actual water-level declines between Fall 1995 and July 2008 appear to be more than the initial predicted water-level declines. Varied transmissivity values and the affects from Whiskey Pete's water supply wells influence water-level changes recorded in the some offsite monitoring wells. Ground-water withdrawal has averaged less than the 1,800 afa

estimated golf course need from the 1998-1999 water year to present, with an average ground-water withdrawal over that period of 1,746 afa. Moreover, ground-water withdrawal has been less than the 1,800 afa estimated golf course need from the 2000-2001 water year to present, with an average ground-water withdrawal over that period of 1,741 afa.

Ground-water withdrawals from water-supply wells PVGC #7, PVGC #8, and PVGC #9 have contributed to changes in EC values in each of these wells since the first field measurements were recorded. EC values in wells PVGC #7 and PVGC #8 increased in EC value when these wells were used as PVGC's main water supply wells. After these wells were designated as backup wells in 2000 their EC values decreased and stabilized. EC values in PVGC #9 have continued to increase after this well was designated as a backup water supply and more recently as a collect point for water quality samples. Colosseum Wells #1 and #2 EC values have remained stable with slight increase in Colosseum Well #1 and show a cyclic nature in field EC values, with values increasing to a maximum in September and decreasing slightly to a seasonal minimum in March. TDS values from water-supply wells PVGC #8, and Colosseum Well #2, and monitoring wells M-8 and M-14 have remained stable or have stabilized over the period of record. TDS values in water-supply wells PVGC #9, WP-5, WP-6, and Colosseum Well #1 have increased, whereas a slight decrease in TDS was observed in water supply well PVGC #7.

Per the revised monitoring plan (BAI, 1999) it appears that the ground-water declines observed in Yates and Stateline monitoring wells are more than the predicted aquifer response determined in the initial hydrologic report (Johnson, 1995) and the follow up hydrologic report Broadbent (1998). Significant land subsidence where the integrity of surface structures has been compromised has not been recorded or observed. Significant migration of high TDS ground-water to a production well such that turf water-quality requirements are not met has not been observed. In fact, TDS concentrations for the Colosseum Wells #1 and #2 have remained relatively stable and are still below the primary drinking water standard.

No recommendations are made at this time to develop additional ground-water production as both the quantity and quality of the water delivered to the golf course has not changed appreciably over the ten years of water production with the exception of water supply well PVGC #9. The water supply will continue to be produced mainly from Colosseum Wells #1 and #2. Water supply wells PVGC # 7 and PVGC #8 shall continue to act in a back up capacity and only be used on a limited basis. PVGC #9 shall only be used to collect water quality samples.

L. GROUNDWATER EXTRACTION SIGNIFICANCE CRITERIA

Initial groundwater extraction significance criteria that were recommended in the PVGC eight-year groundwater monitoring report (Sept, 2006) and later stated in San Bernardino County's Interoffice memorandum dated February 14, 2007 are presented in Tables 4 and 5. Also included in these tables are results for the 2007-2008 PVGC sampling year for

both water level (Table 4) and water quality (Table 5) data. As the results indicate, other than PVGC #9, there are no water levels or water quality results that exceed these established significance criteria. Proposed significance criteria have been included in the tables for those sample points that previously had limited data.

Table 4: Water level significance criteria, PVGC 2007-2008 results, and proposed new significance criteria

Well	Average Elevation (feet AMSL)	Significance Elevations (ft AMSL)	PVGC 2007-2008 result (ft AMSL)
PVGC #7	2515	2495	2512
PVGC #8	2514	2494	2512
PVGC #9	2514	2494	2511
Colosseum Well #1	2507	2487	2503
Colosseum Well #2	2513	2493	2507
Stateline	2521	2501	2518
Yates	2520	2500	2518
M-8	107*	127*	108*
M-13	668*	688*	668*
M-14	233*	253*	234*

* Depth to ground water

M-13 and M-14 are proposed significance criteria established by averaging existing data to obtain the average elevation and using a 20-foot change as the significance criteria elevation.

Table 5: Water quality significance criteria in TDS, PVGC 2007-2008 results, and proposed new significance criteria

Well	Average TDS (mg/L)	Significance TDS (mg/L)	PVGC 2007-2008 TDS result (mg/L)
PVGC #7	1446	1808	1300
PVGC #8	901	1126	940
PVGC #9	484	605	720**
Colosseum Well #1	379	474	450
Colosseum Well #2	343	429	350
Stateline	n/a	n/a	n/a
Yates	n/a	n/a	n/a
M-8	2493	3116	2300
M-13	368	460	340
M-14	340	425	330

** exceeds significance criteria

M-8, M-13, and M-14 are proposed significance criteria established by averaging existing data to obtain the average TDS and adding 25% to establish TDS significance criteria.

M. RECOMMENDATIONS AND MITIGATION

To address the Conditions of Approval, condition 10. (h) set forth by the San Bernardino County, California Planning Department Staff Report, the Revised Ground-Water Monitoring Plan, PRMA Land Development Company, Primm Valley Golf Club, Ivanpah Valley, California, June 1999, and the subsequent June 6, 2001 approval letter the following items require completion and are recommended.

1. Obtain approval for monitoring, well examination, etc. in Yates and Stateline Wells from the BLM and add water quality monitoring to these wells.

2. Continue to limit pumpage from backup water-supply wells PVGC #7 and PVGC #8

3. Use water-supply well PVGC #9 only for water quality sampling purposes..

4. Continue to collect annual TDS and general minerals samples from water-supply wells PVGC #7, PVGC #8, and PVGC #9.

5. Add sounding tubes to Colosseum Wells #1 and #2 when pump equipment is next removed to facilitate water-level measurements.

6. Recalculate predicted water-level decline values based on updated potentiometric change data and use results to determine the need to reestablish or refine significance criteria and whether mitigation is warranted.

7. Based on previously established groundwater extraction significance criteria no mitigation is warranted at this time other than continuing to only use water supply well PVGC #9 for water quality sampling purposes.

8. Evaluate the need to establish baseline data and monitoring associated with the sinkholes on the northern edge of Ivanpah Dry Lake.

Proposed significance criteria for water-level data points M-13 and M-14 (Table 4) have been established by averaging existing data through 2007-2008 to obtain the average elevation and using a 20-foot water level change as the significance criteria elevation. Proposed significance criteria for TDS water-quality data points M-8, M-13, and M-14 (Table 5) have been established by averaging existing data to obtain the average TDS and adding 25% to establish significance criteria.

Significant land subsidence was not recognized. Based upon these results, there appear to be no mitigative measures necessary at this time.

N. CLOSURE

This ground-water monitoring ten-year report was prepared using the expertise and skill ordinarily exercised by an engineering firm practicing under similar conditions in southern California and Nevada at the time this work was performed.

The findings and recommendations presented in this report are based upon the following:

- Observations of field personnel and the points of investigation,
- Results of laboratory tests, data and literature collected,
- Conditions of Approval, set forth by the San Bernardino County, California, Planning Department Staff Report, A)CUP/94-0033/DN1009-729N/09183CF1 IVANPAH/S1, Planning Commission Hearing 3/9/95,
- Revised Ground-Water Monitoring Plan, PRMA Land Development Company, Primm Valley Golf Club, Ivanpah Valley, California, August, 1999,
- San Bernardino County Interoffice memorandum dated February 14, 2007, and
- Our understanding of the California Code of Regulations.

Our services were performed in accordance with generally accepted standards of practice at the time this report was written. No other warranty, expressed or implied was made. This ground-water monitoring ten-year report has been prepared for the exclusive use of the San Bernardino County Planning Department and PRMA.

It is possible that variations in soil or ground-water conditions could exist beyond the points explored in this report. Also, changes in site conditions could occur at some time in the future due to variation in rainfall, temperature, regional water usage, or other factors.

Sincerely,

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Consulting Geologist
Subconsultant to MWH Americas, Inc.

Lonnie C. Roy
Principal

REFERENCES

Glancy, P. A., 1968, Water-resources appraisal of Mesquite-Ivanpah Valley area, Nevada and California: State of Nevada Department of Conservation and Natural Resources, Water Resources - Reconnaissance Series Report, 46, 57p.

Johnson, R.J., 1995, Impacts from Whiskey Pete's Golf Course ground-water withdrawal: submitted to San Bernardino County, California Planning Department Staff, March 9, 1995, 10p.

Johnson, R.J. and Roy, L.C., Ground-Water Monitoring Eight-Year Report, PRMA Land Development Company, Ivanpah Valley, California, September 2006: Broadbent & Associates, Inc., 20p.

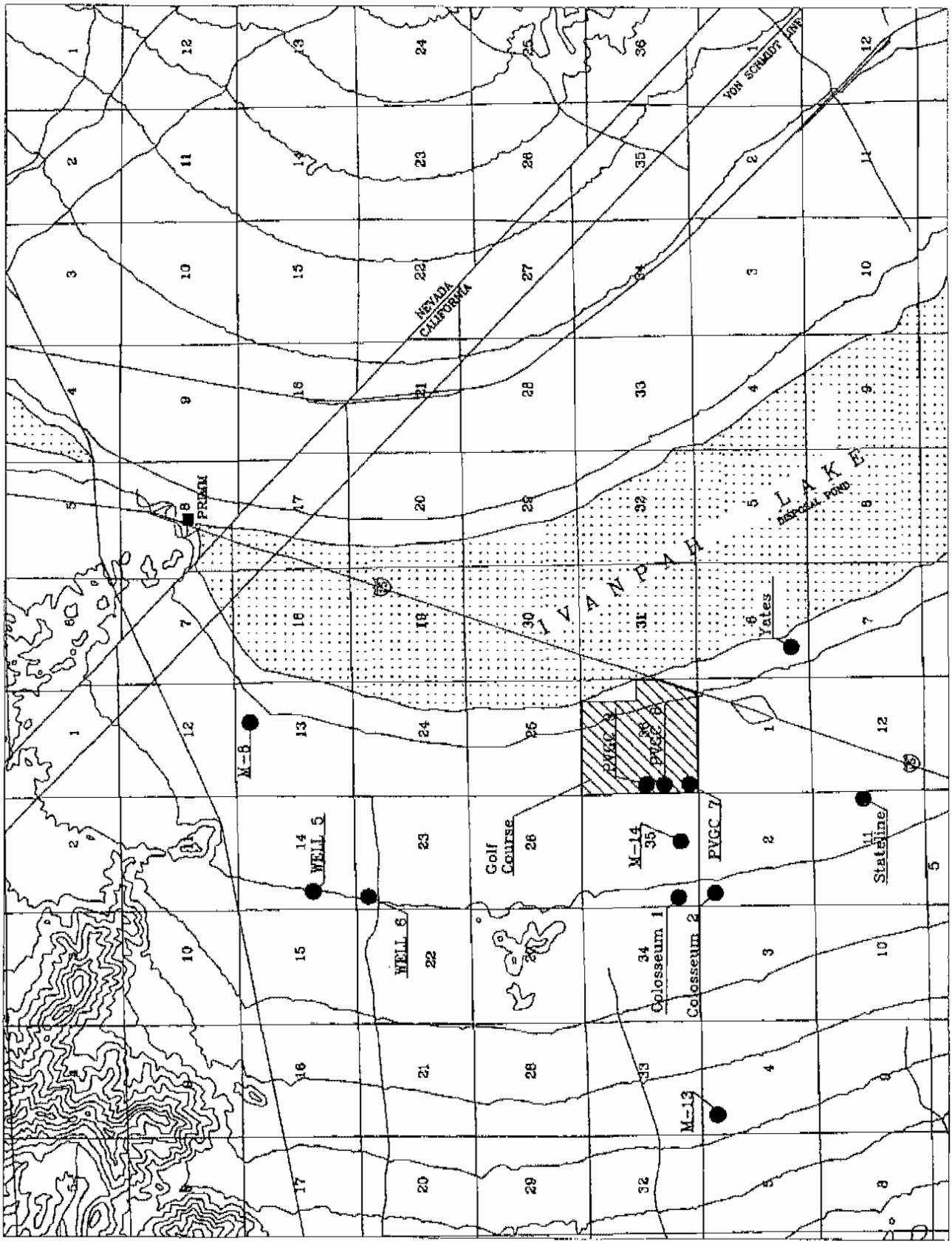
Broadbent, R.C., 1999, Revised Ground-Water Monitoring Plan, PRMA Land Development Company, Primm Valley Golf Club, Ivanpah Valley, California, September, 1999: Broadbent and Associates, Inc., 15p.

Broadbent, R.C., 1998, Report Of Update To Ground-Water Studies For The Primm Valley Golf Course, San Bernardino County, California, February 22, 1998:Broadbent and Associates, Inc., 7p.

MARK Group and J. M. Montgomery Engineers, 1988, Ground-water study of Ivanpah Valley, Nevada and California, in relation to proposed development by Whiskey Pete's/Kactus Kate's, 71p.

Neal, J.T., Langer, A.M., and Kerr, P.F., 1968, Giant Desiccation Polygons of Great Basin Playas: Geological Society of America Bulletin, v. 79, p.69-90.

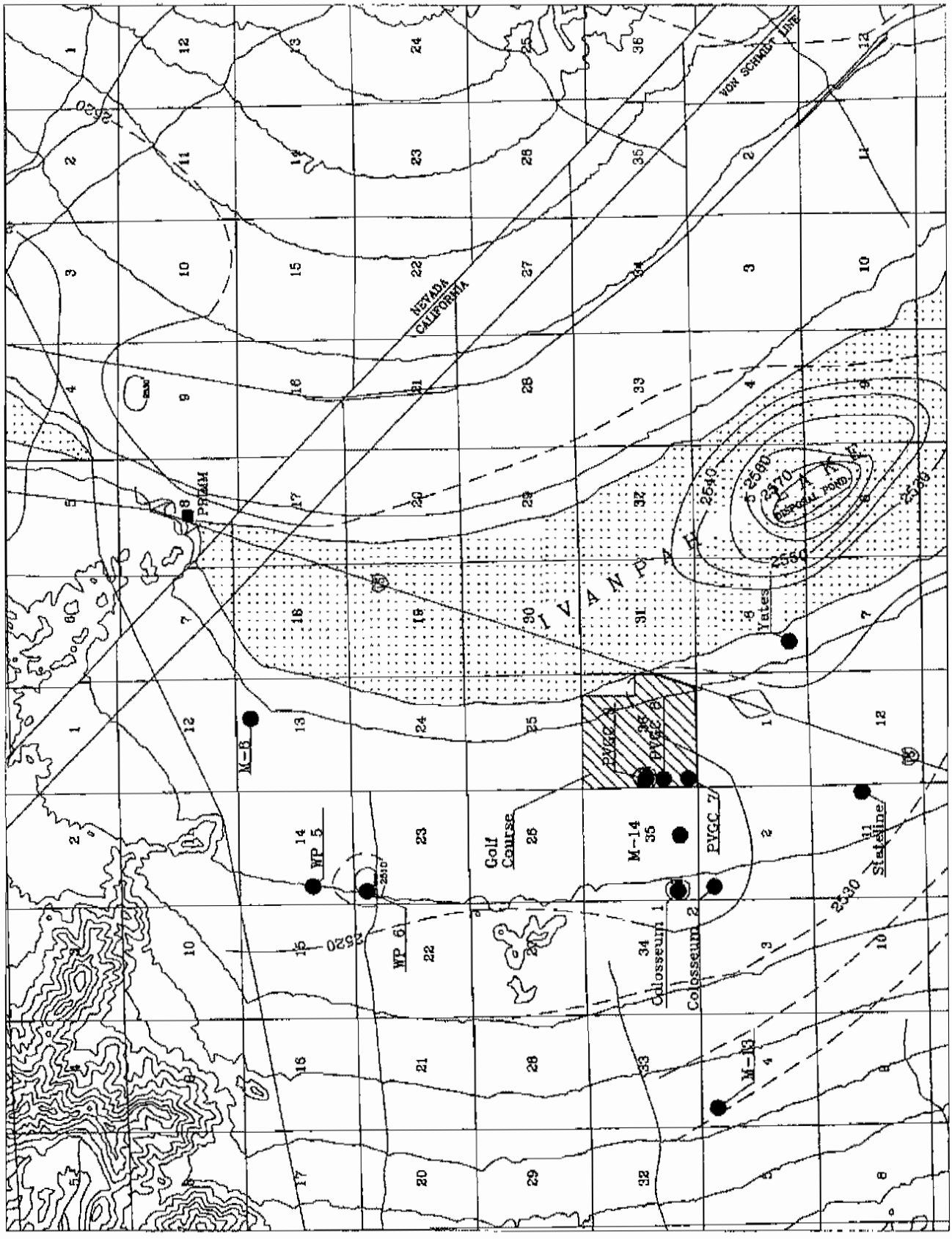
FIGURES



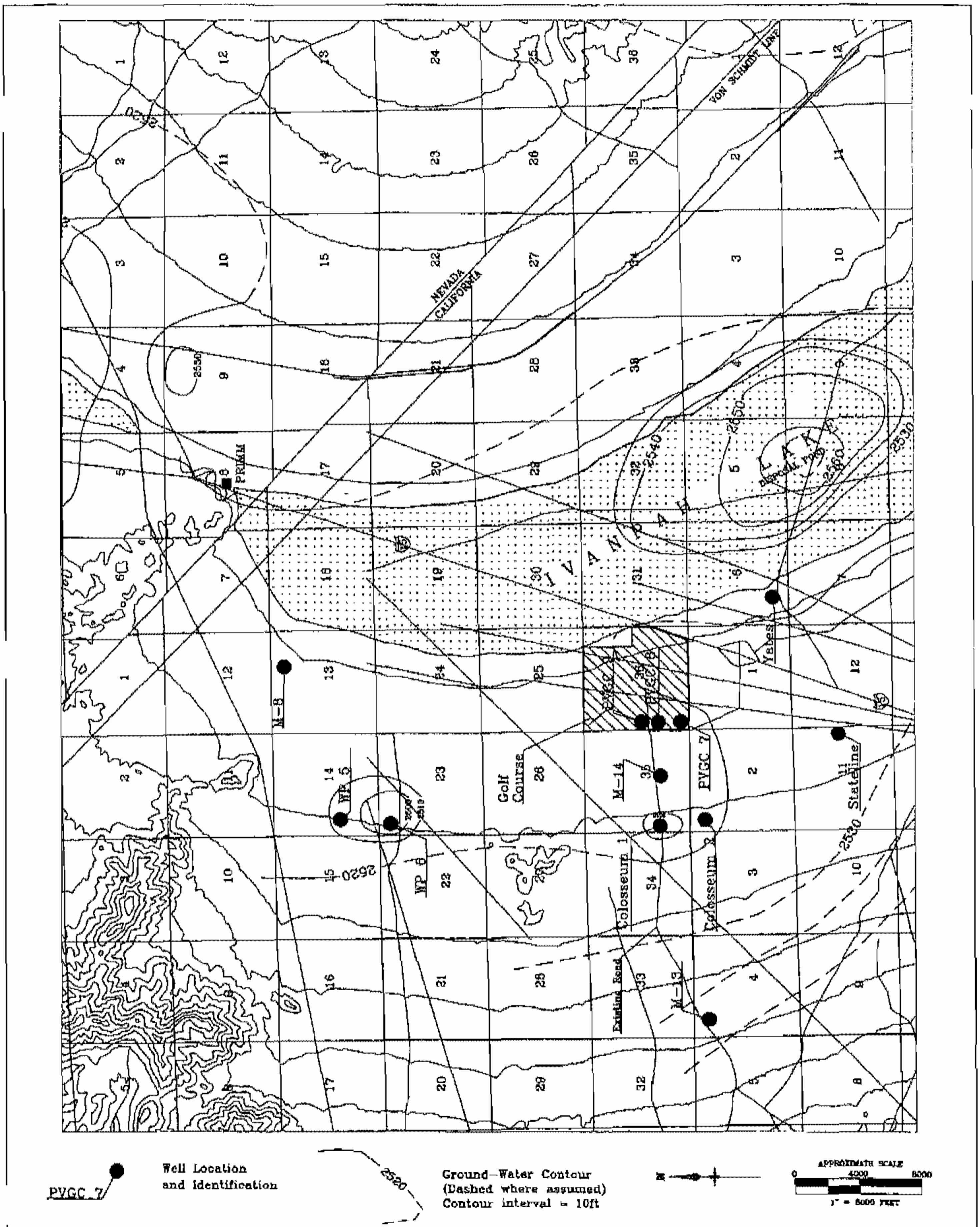
SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
LAS VEGAS • RENO • PHOENIX

Figure 1
Primm Valley Golf Club
Location Map



	SCALE: AS SHOWN	BROADBENT & ASSOCIATES, INC. ENVIRONMENTAL WATER RESOURCES & ENGINEERING CONSULTANTS LAS VEGAS · RENO · PHOENIX		Figure 2a Potentiometric Surface Map for December, 1998



SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
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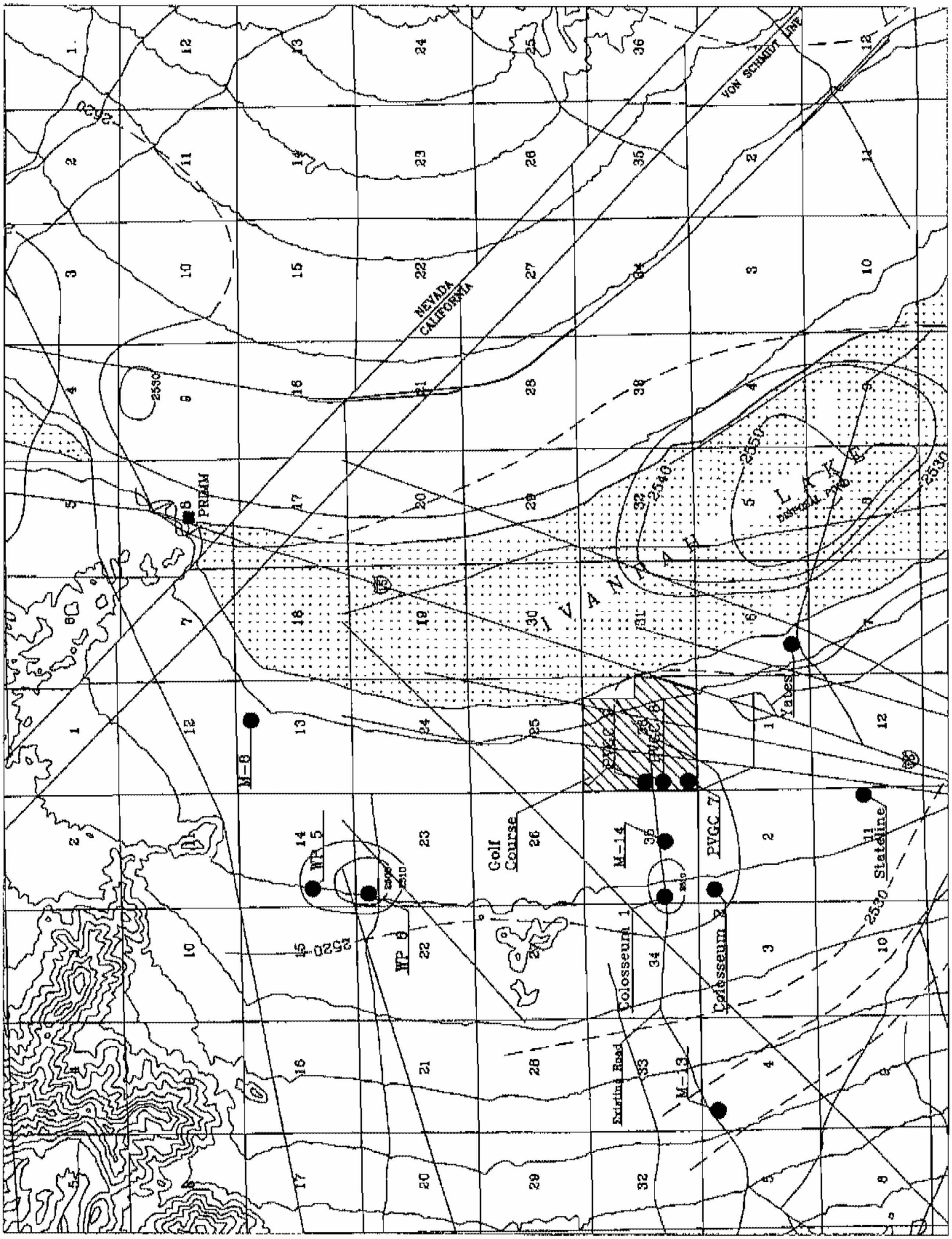
Figure 2b
Potentiometric Surface
Map for December, 1999

2



PVGC 7 — Well Location and Identification

2520 — Ground-Water Contour (Dashed where assumed) Contour interval = 10ft

APPROXIMATE SCALE 0 4000 8000

1" = 8000 FEET

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
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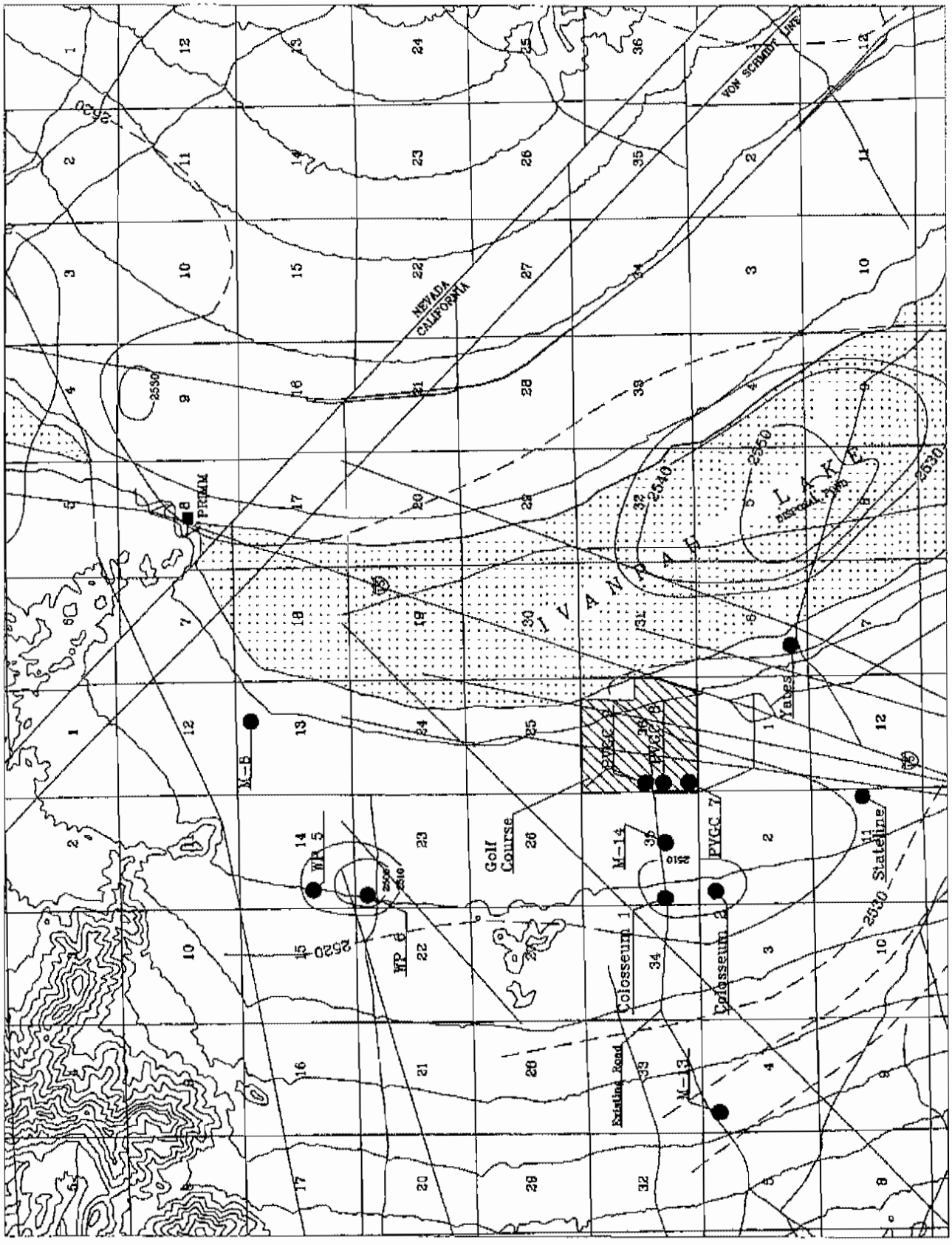
Figure 2c
Potentiometric Surface
Map for December, 2000

3



PVGC 7 — Well Location and Identification

2520 — Ground-Water Contour (Dashed where assumed) Contour interval = 10ft

N

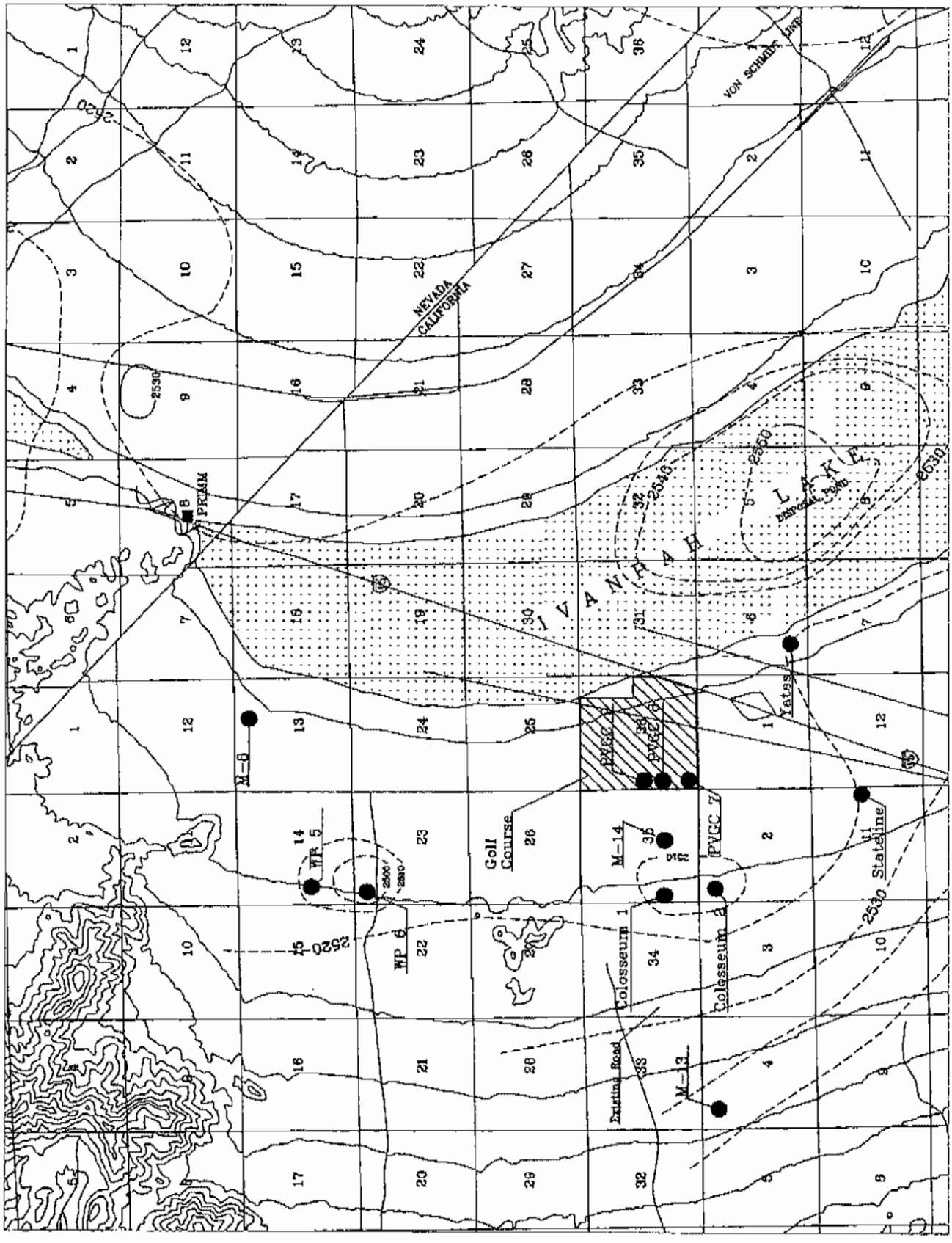
APPROXIMATE SCALE
0 4000 8000
1" = 8000 FEET

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING WATER RESOURCES & ENVIRONMENTAL
LAS VEGAS RENO PHOENIX

Figure 2d
Potentiometric Surface
Map for December, 2001

4



PVGC 7 — Well Location and Identification

2520 — Ground-Water Contour (Dashed where assumed) Contour interval = 10ft

N

APPROXIMATE SCALE
0 4000 8000
1" = 8000 FEET

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
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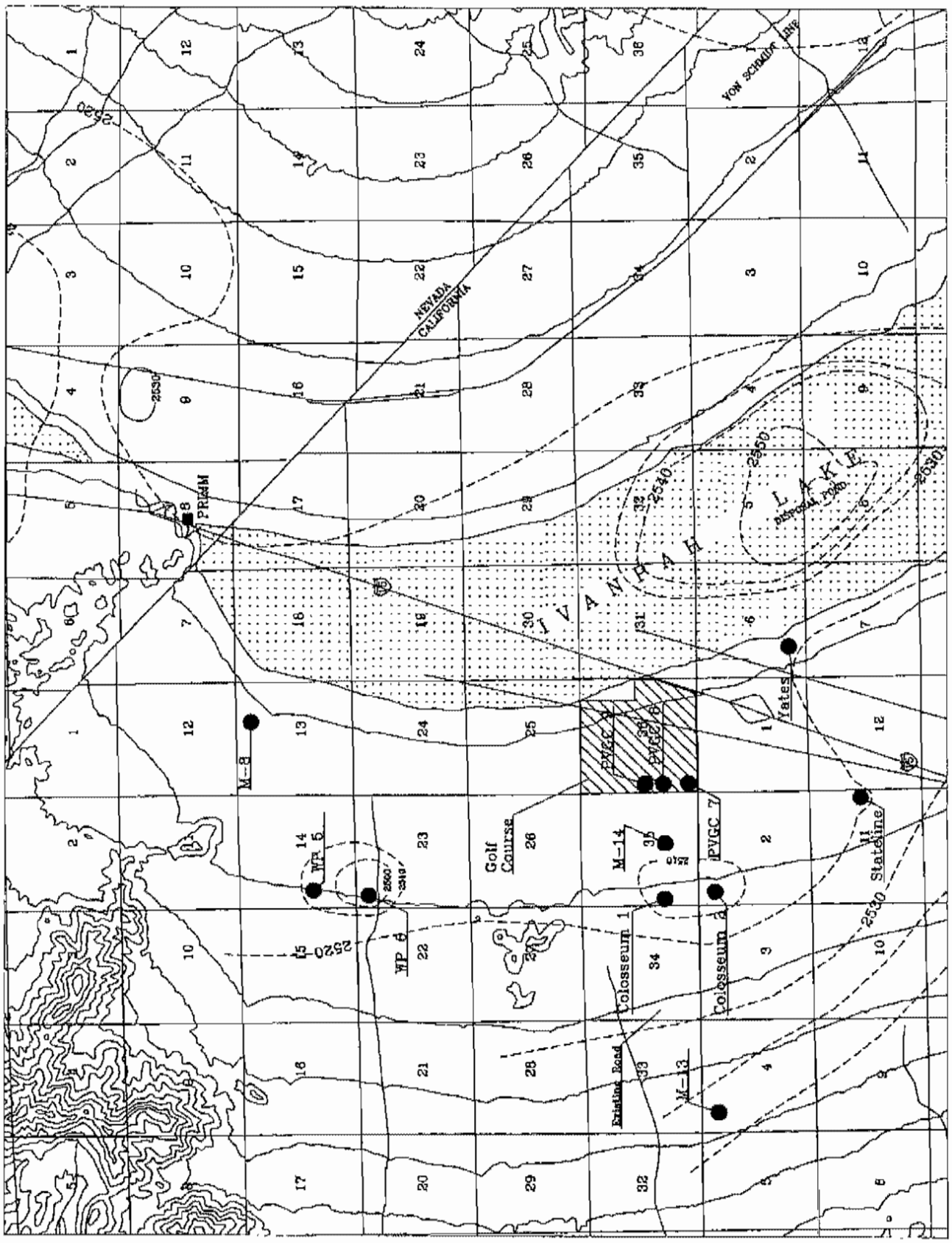
Figure 2e
Potentiometric Surface
Map for December, 2002



SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
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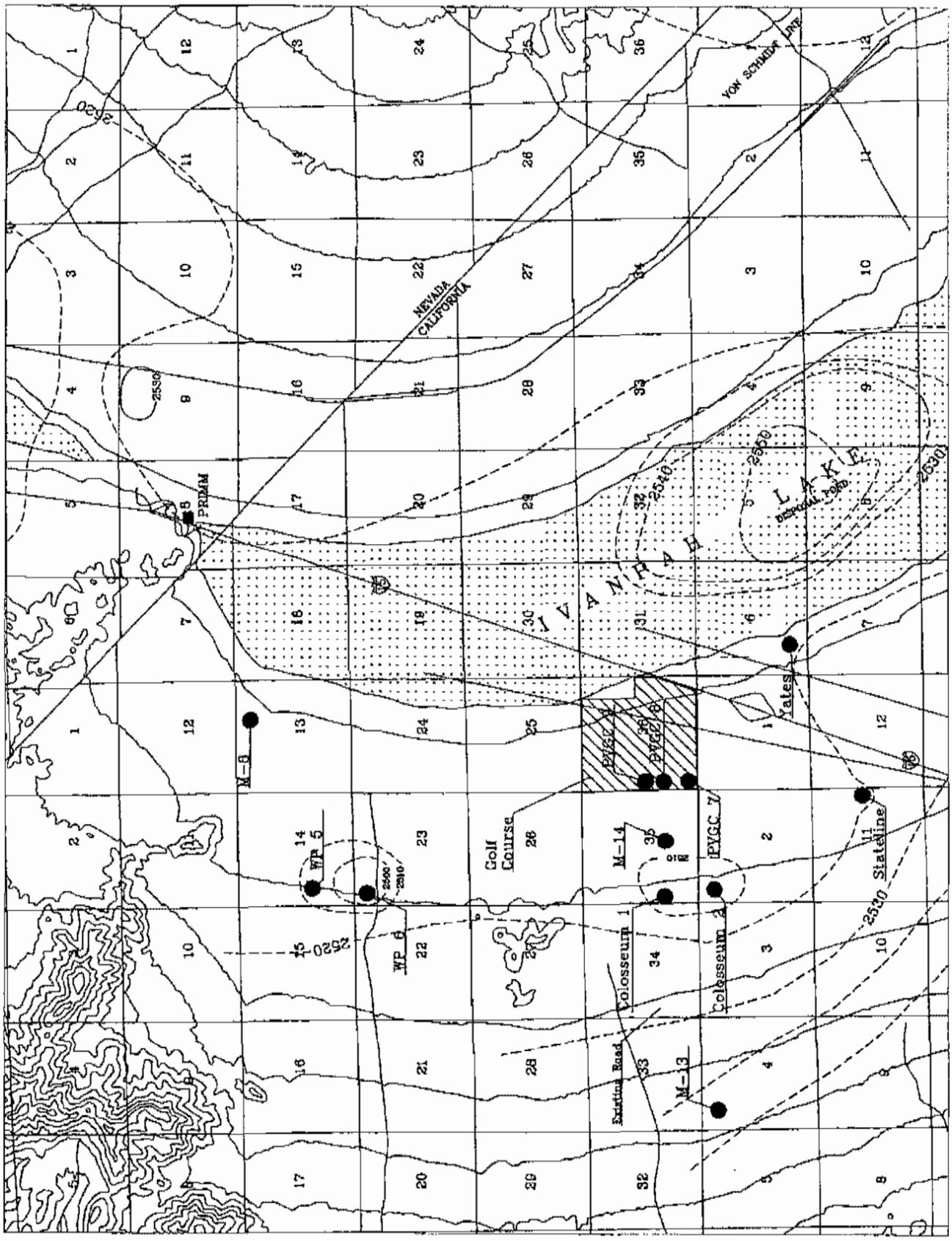
Figure 2f
Potentiometric Surface
Map for December, 2003

6



SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
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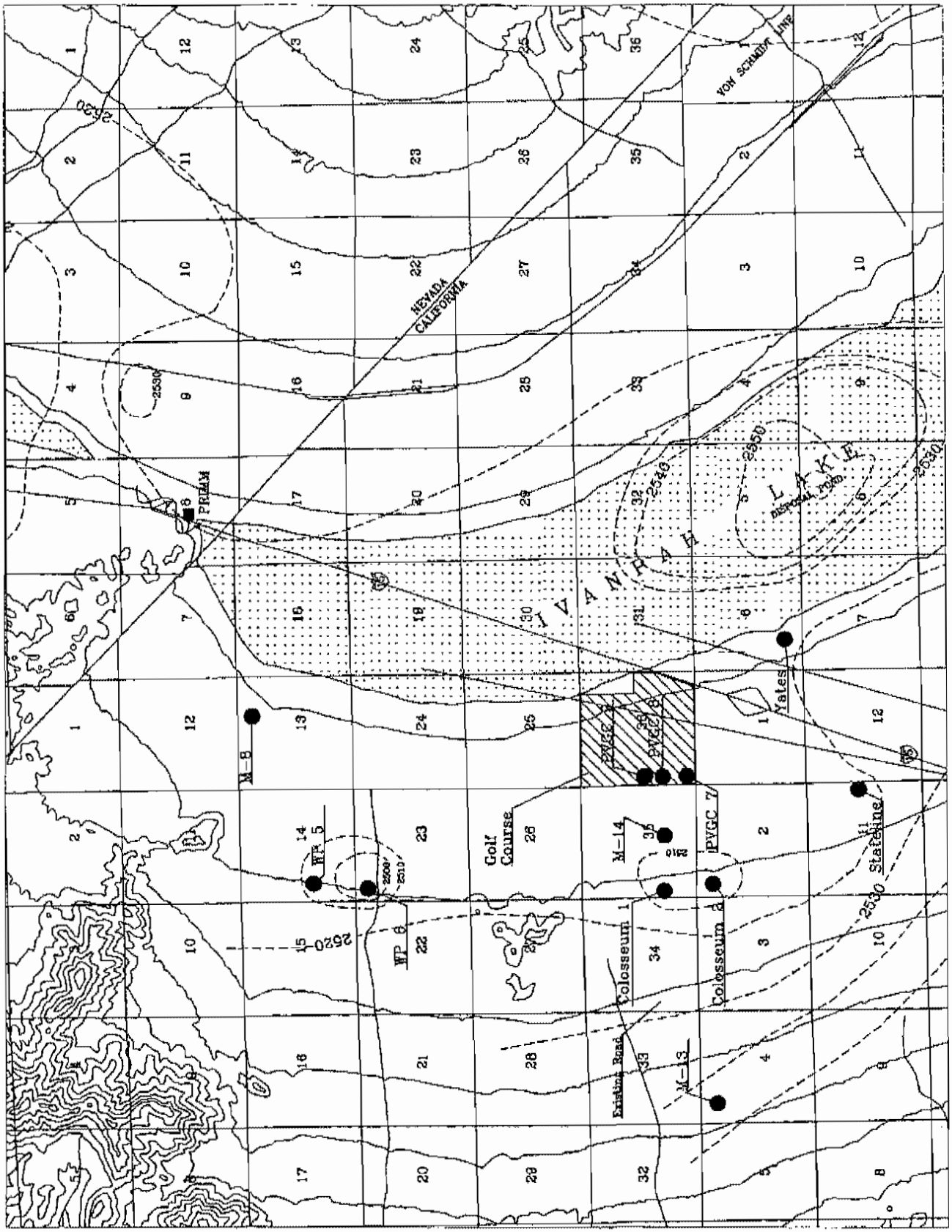
Figure 2g
Potentiometric Surface
Map for December, 2004

7



SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
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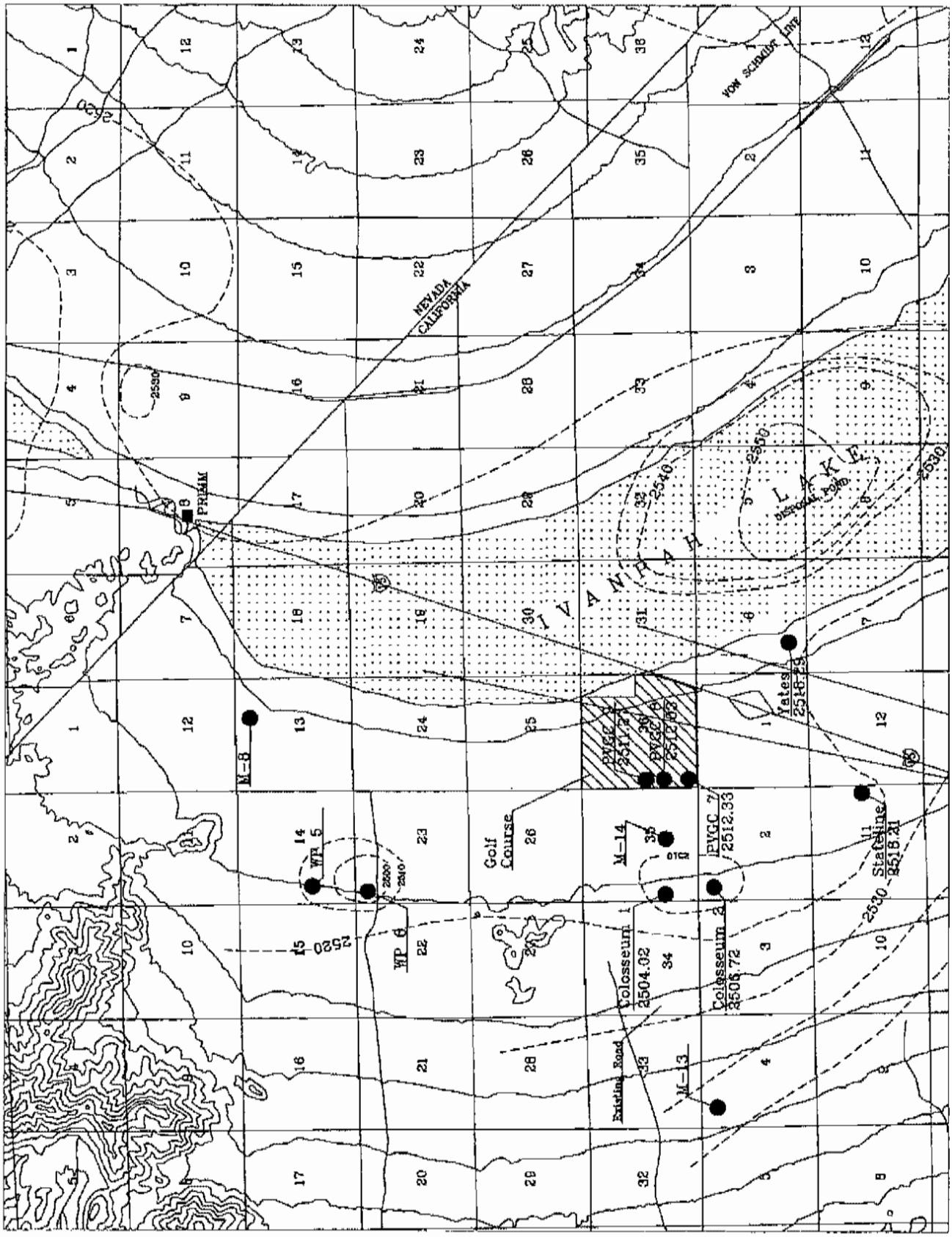
Figure 2h
Potentiometric Surface
Map for December, 2005

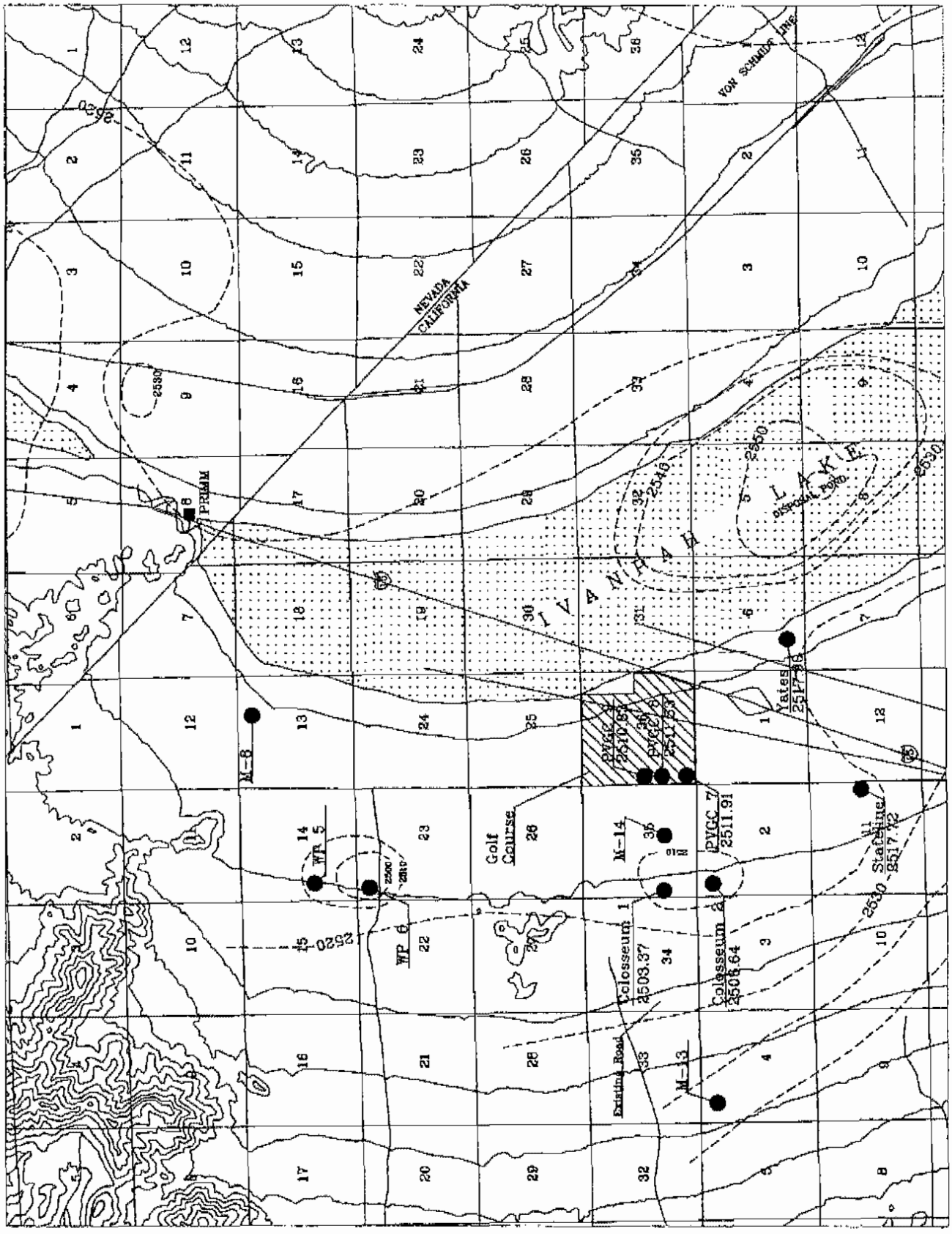


SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
LAS VEGAS RENO PHOENIX

Figure 2i
Potentiometric Surface
Map for December, 2006

9

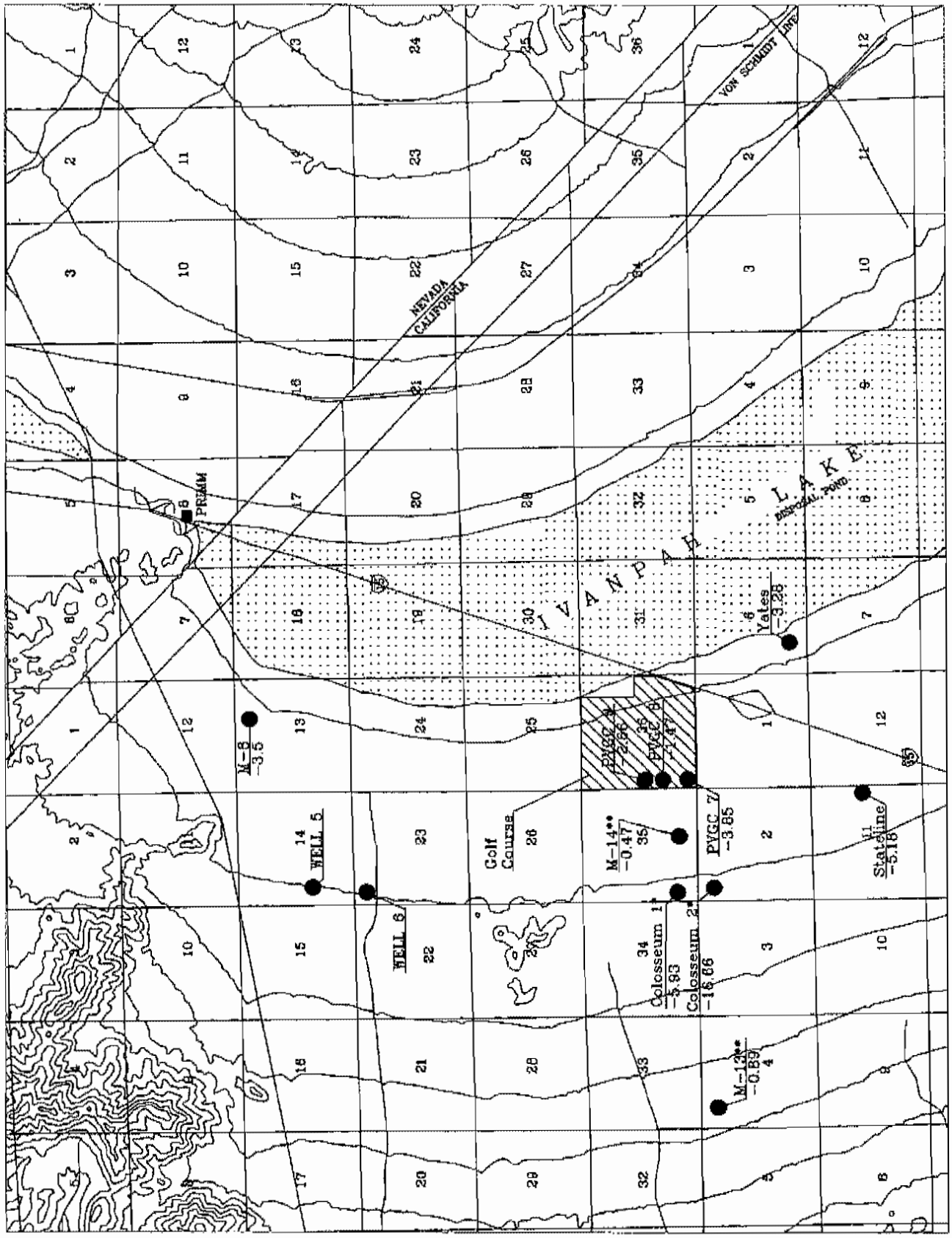


SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
LAS VEGAS · RENO · PHOENIX

Figure 2j
Potentiometric Surface
Map for December, 2007

10



PVGC 7
-3.85

Well Location and Identification

Change in surface water elevation (ft)

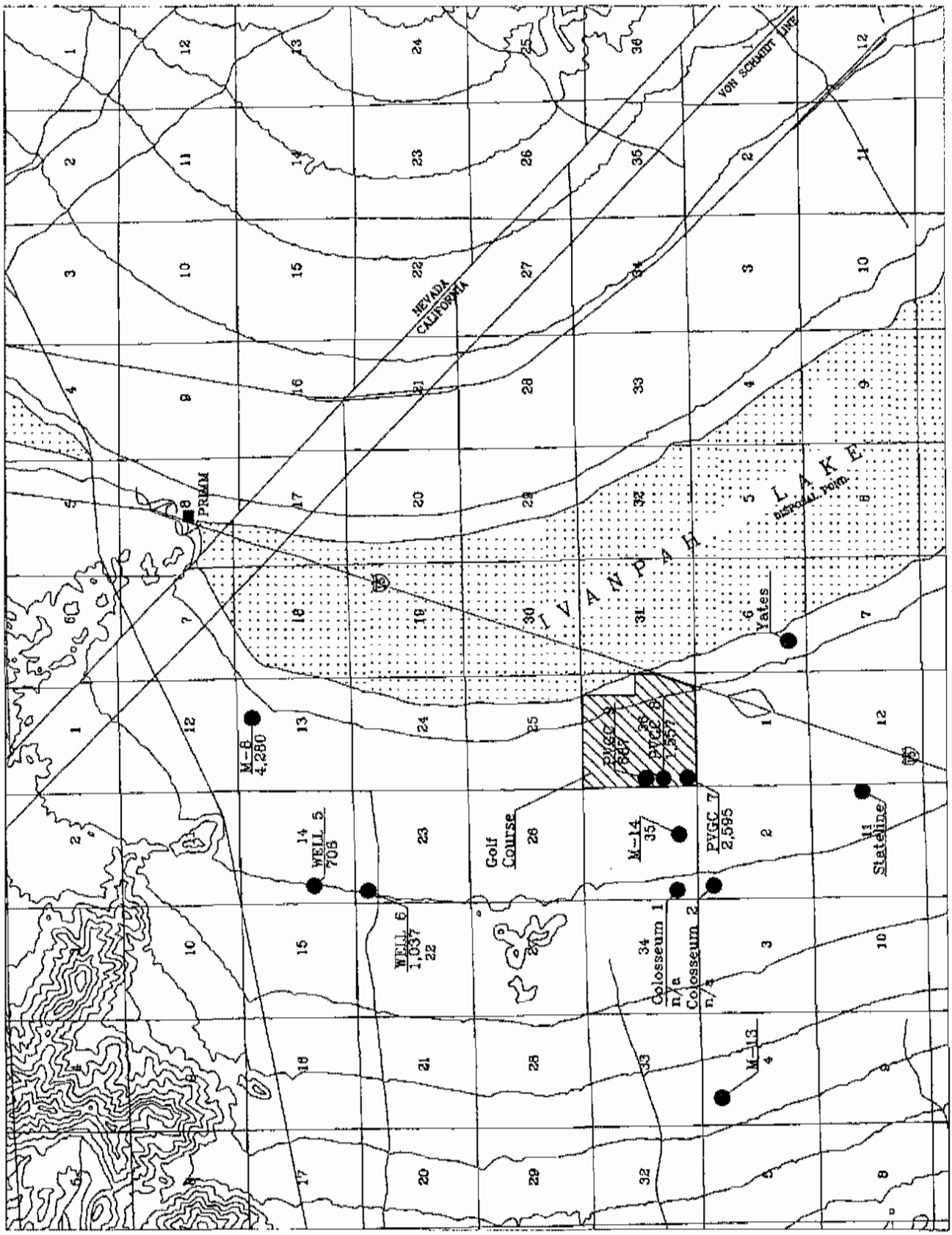
*Data from December 2000 to December 2007

**Data from December 2006 to December 2007

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
LAS VEGAS *RENO *PHOENIX

Figure 3
Change in Potentiometric Surface
Map, December 1998 to December 2007



PVGC 7
2,595

Well Location and Identificetion

Electreal Conductivity in µmhos/cm

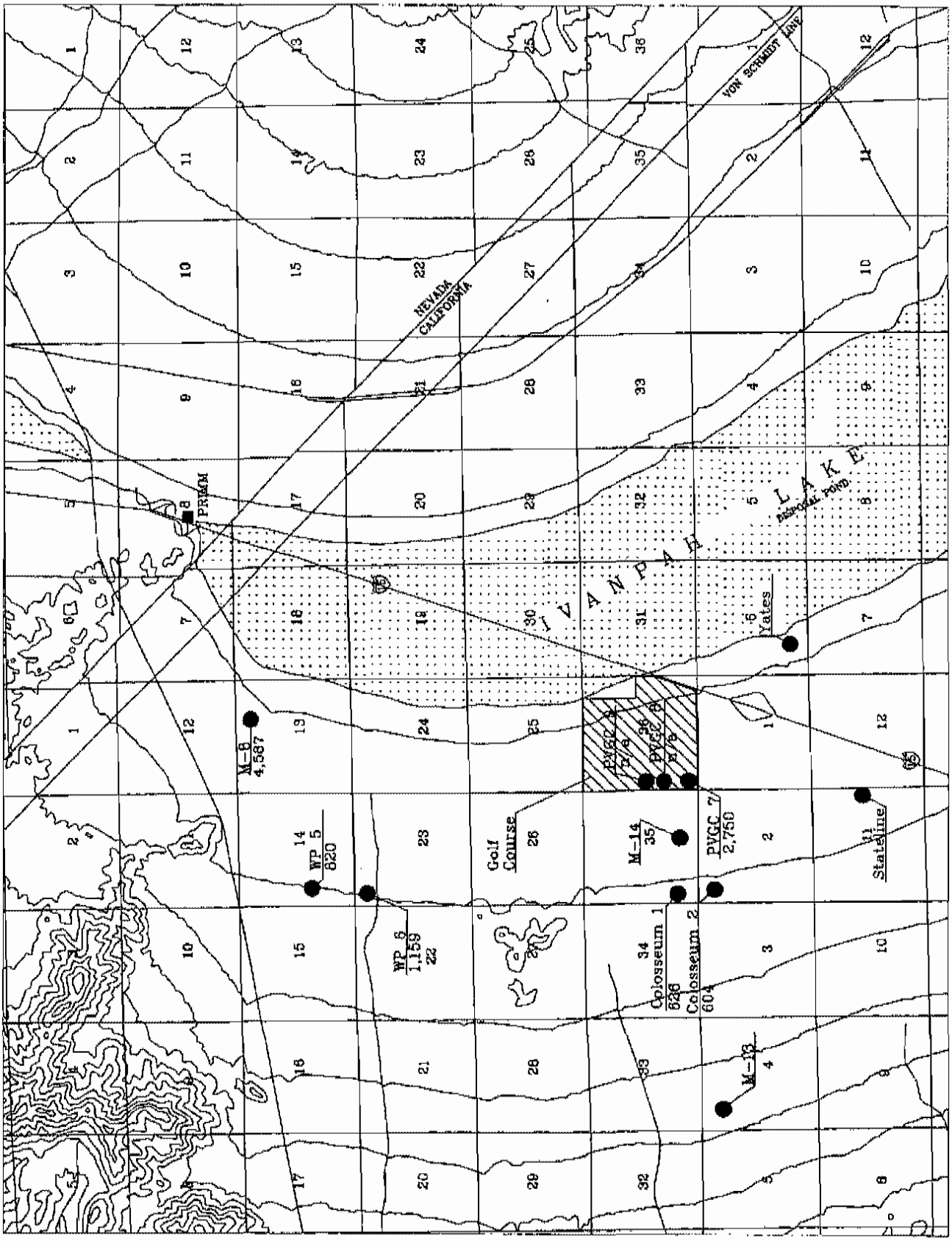
APPROXIMATE SCALE
0 4000 8000
1" = 8000 FEET

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
LAS VEGAS • RENO • PHOENIX

Figure 4a
Field Water Quality Data
Map, June 1998

SHEET 1



SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
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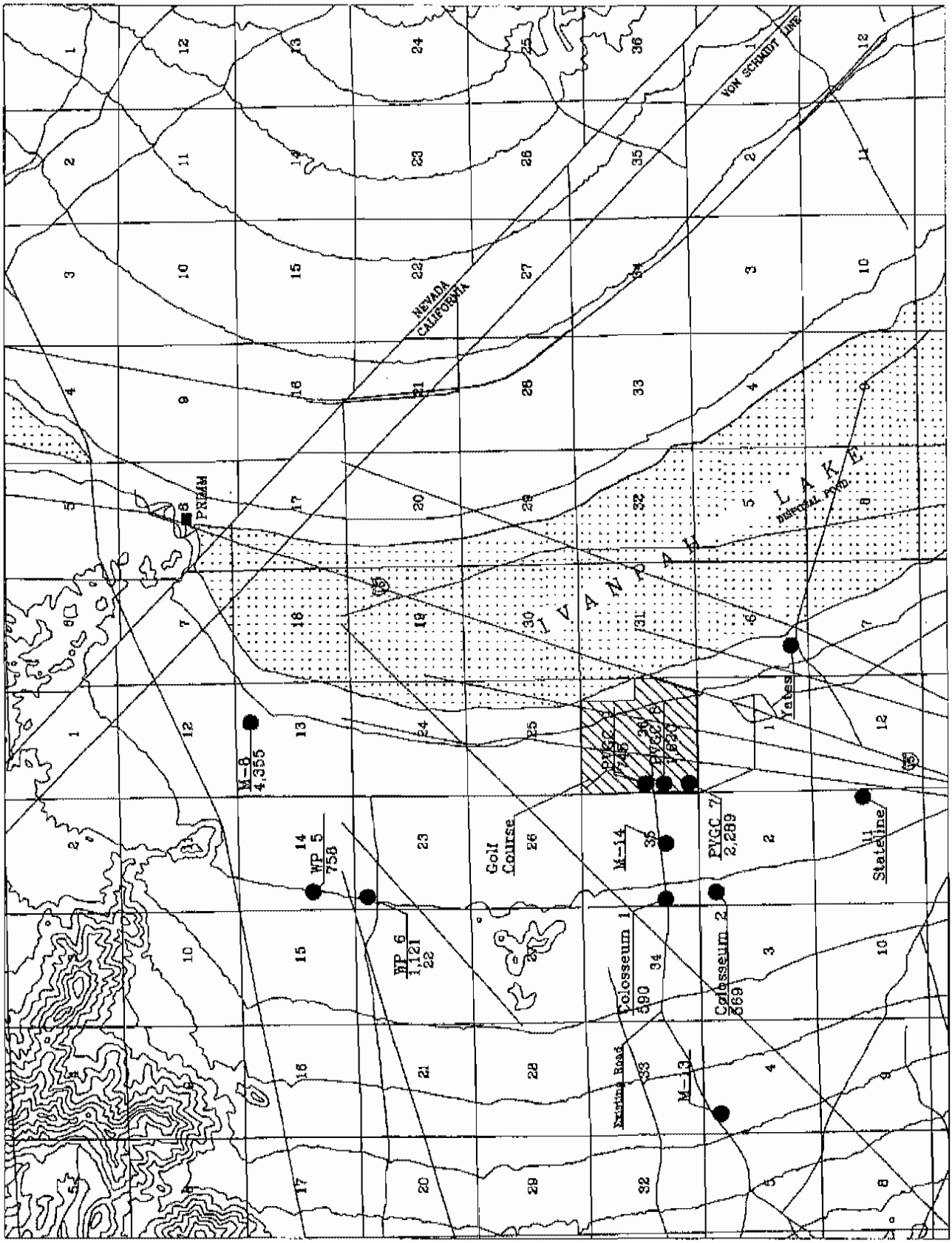
Figure 4b
Field Water Quality Data
Map, June 1999



PVGC 7
2,289

Well Location and Identification

Electrical Conductivity in µmhos/cm

N

APPROXIMATE SCALE
0 4000 8000
1" = 8000 FEET

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
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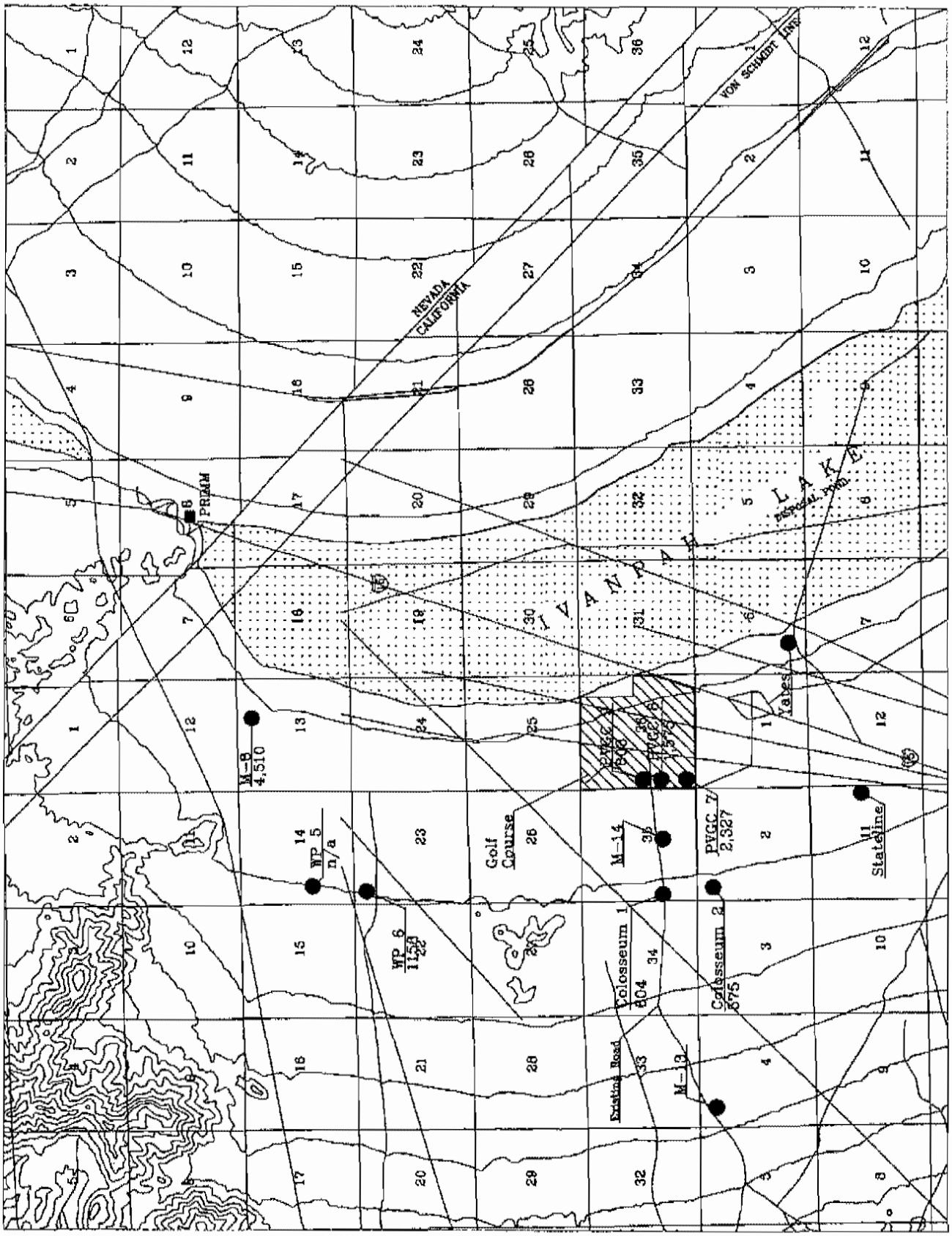
Figure 4c
Field Water Quality Data
Map, June 2000

3



PVGC 7
2,327

Well Location and Identification

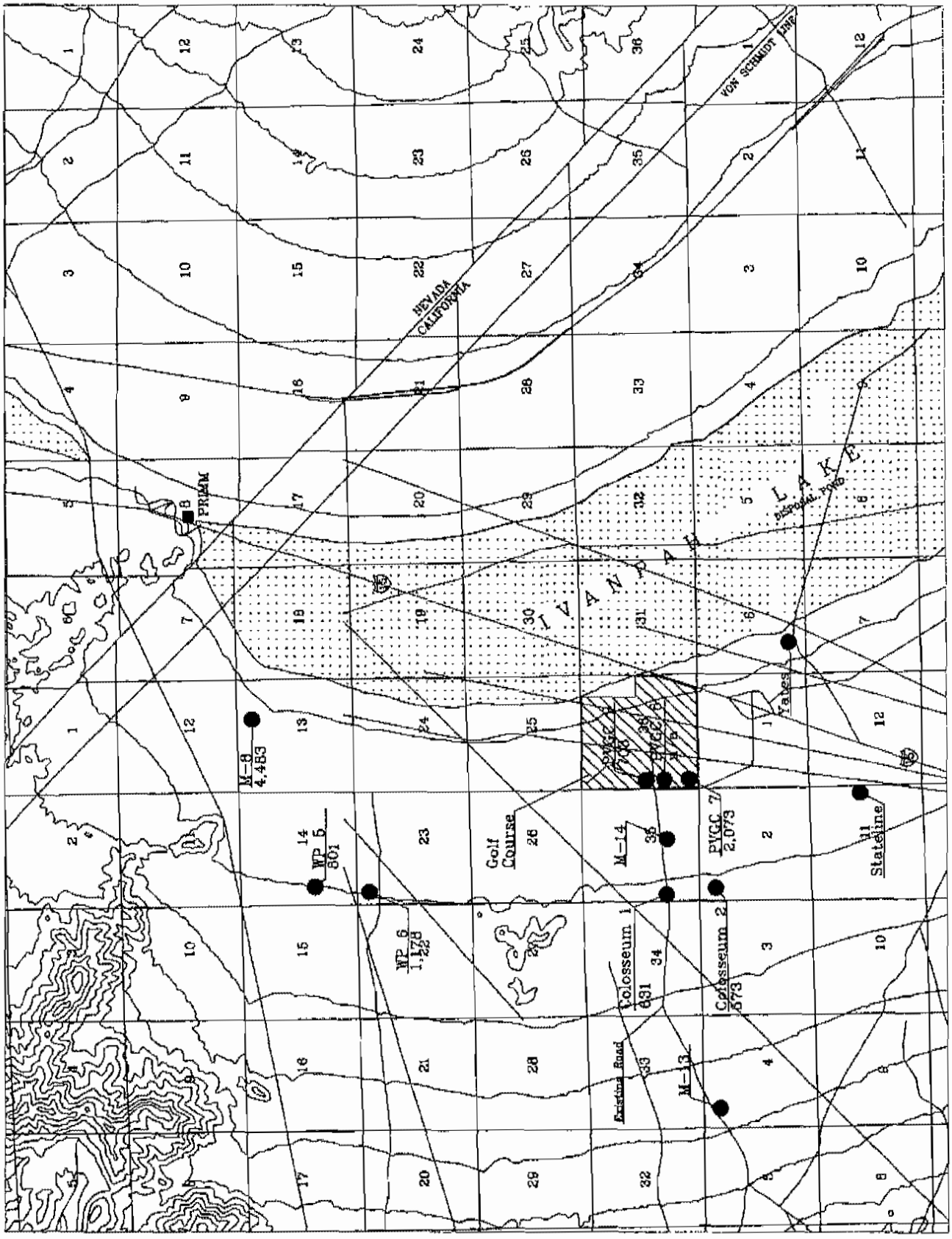
Electrcal Conductivity in µmhos/cm

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
LAS VEGAS • RENO • PHOENIX

Figure 4d
Field Water Quality Data
Map, June 2001

4



PVGC 7
2,073

Well Location and Identification

Electrcal Conductivity in µmhos/cm

N

APPROXIMATE SCALE
0 4000 8000
1" = 8000 FEET

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
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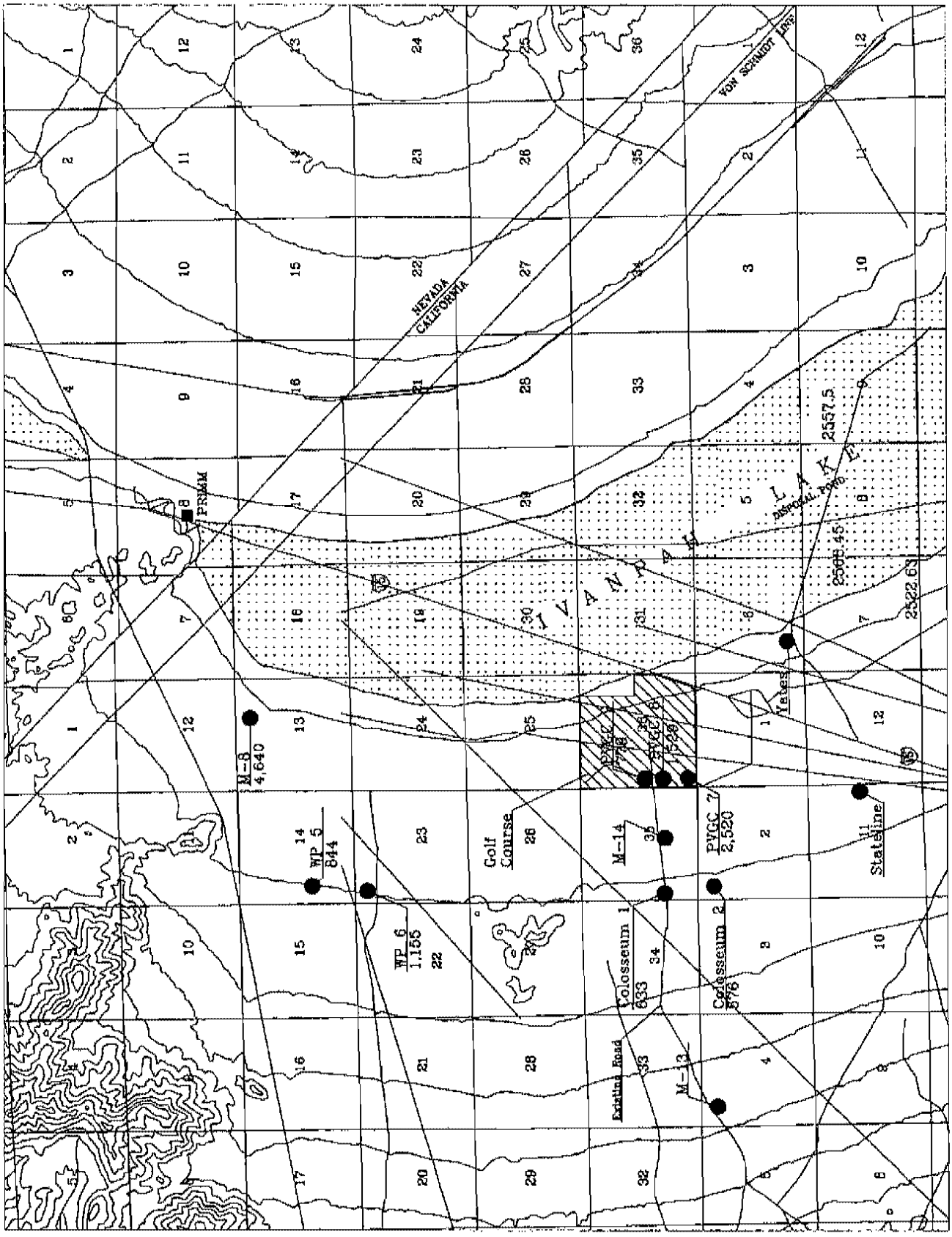
Figure 4c
Field Water Quality Data
Map, June 2002

5



SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
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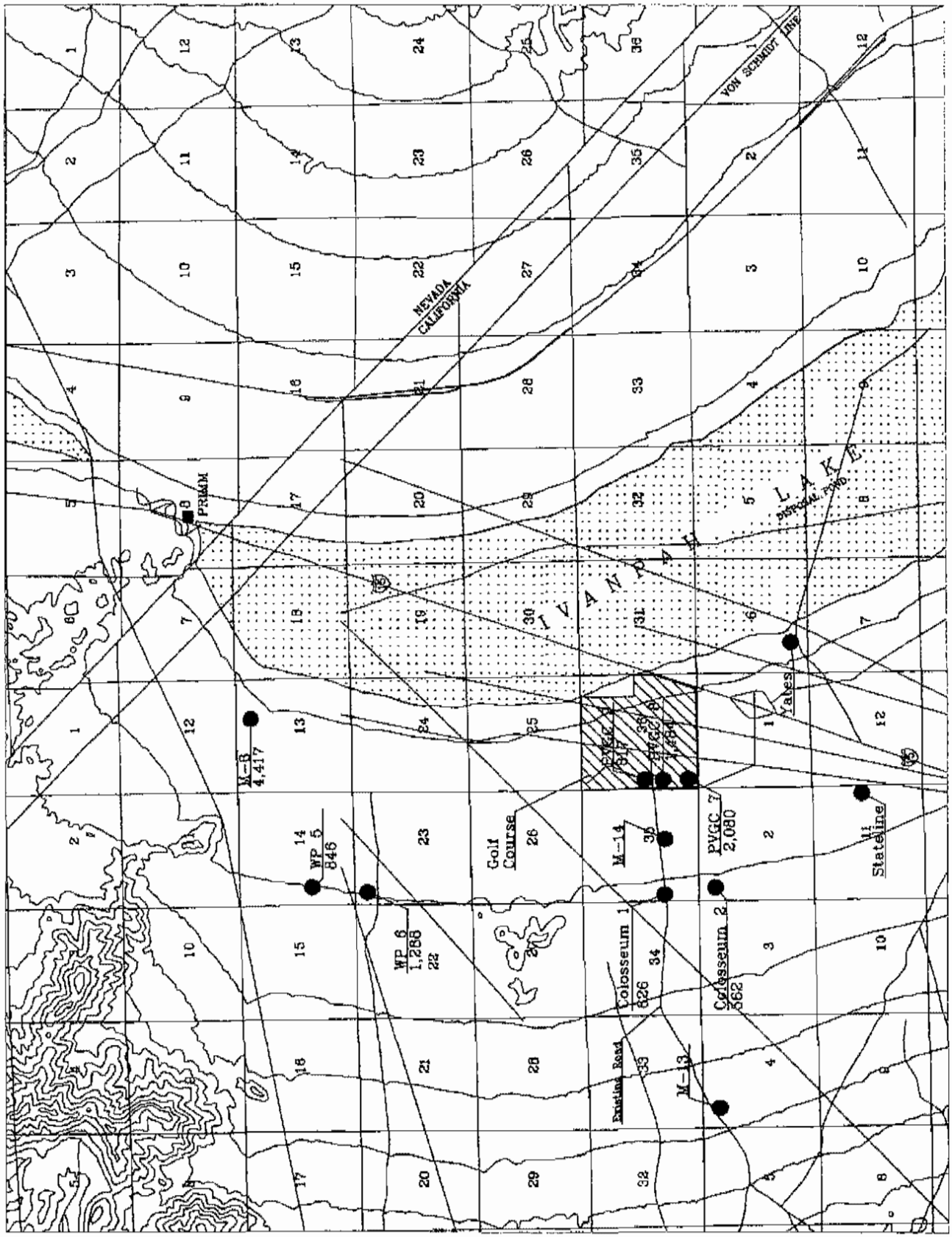
LAS VEGAS · RENO · PHOENIX

Figure 4f
Field Watar Quality Data
Map, June 2003

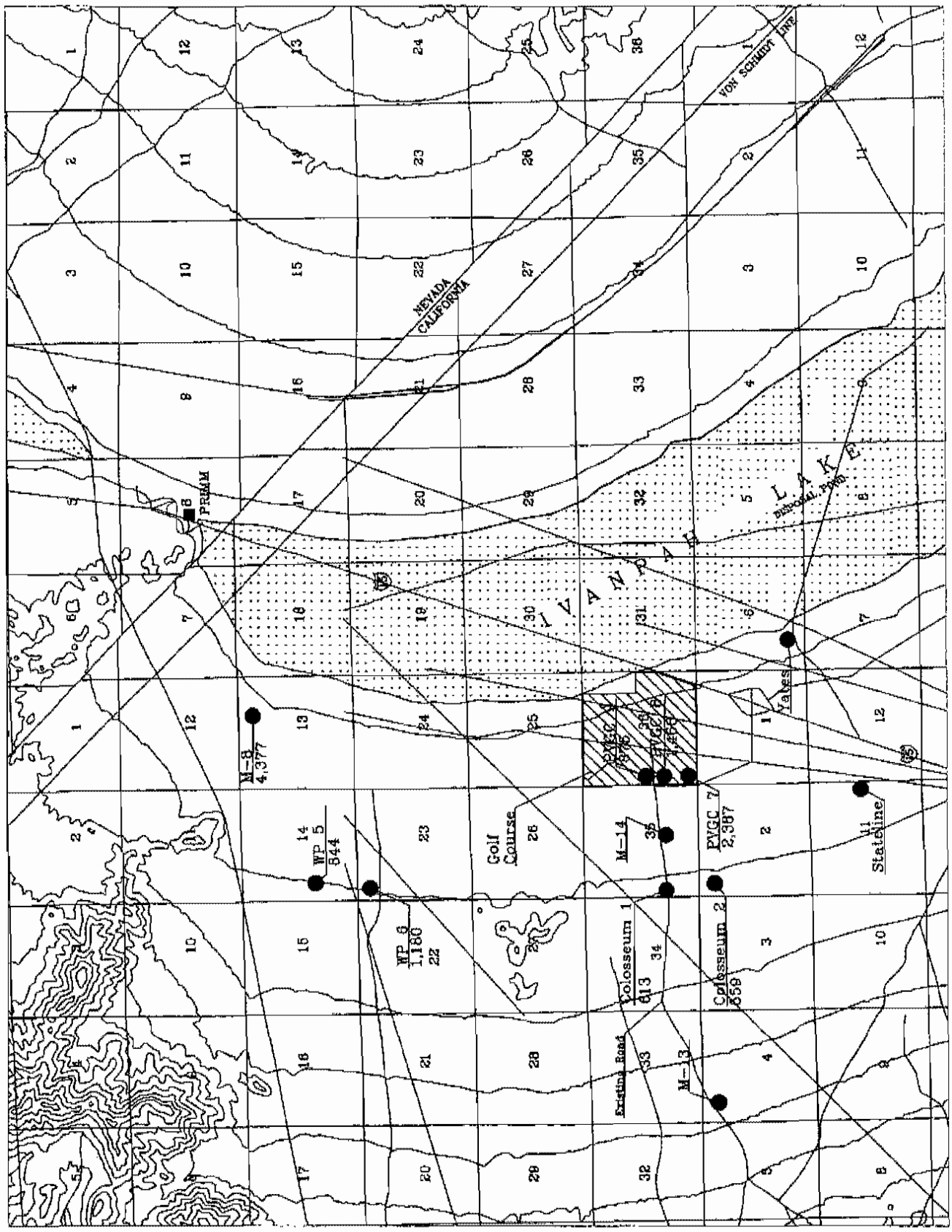
8



SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
LAS VEGAS RENO PHOENIX

Figure 4g
Field Water Quality Data
Map, June 2004



PVGC 7
2,387

Well Location and Identification

Electrical Conductivity in µmhos/cm

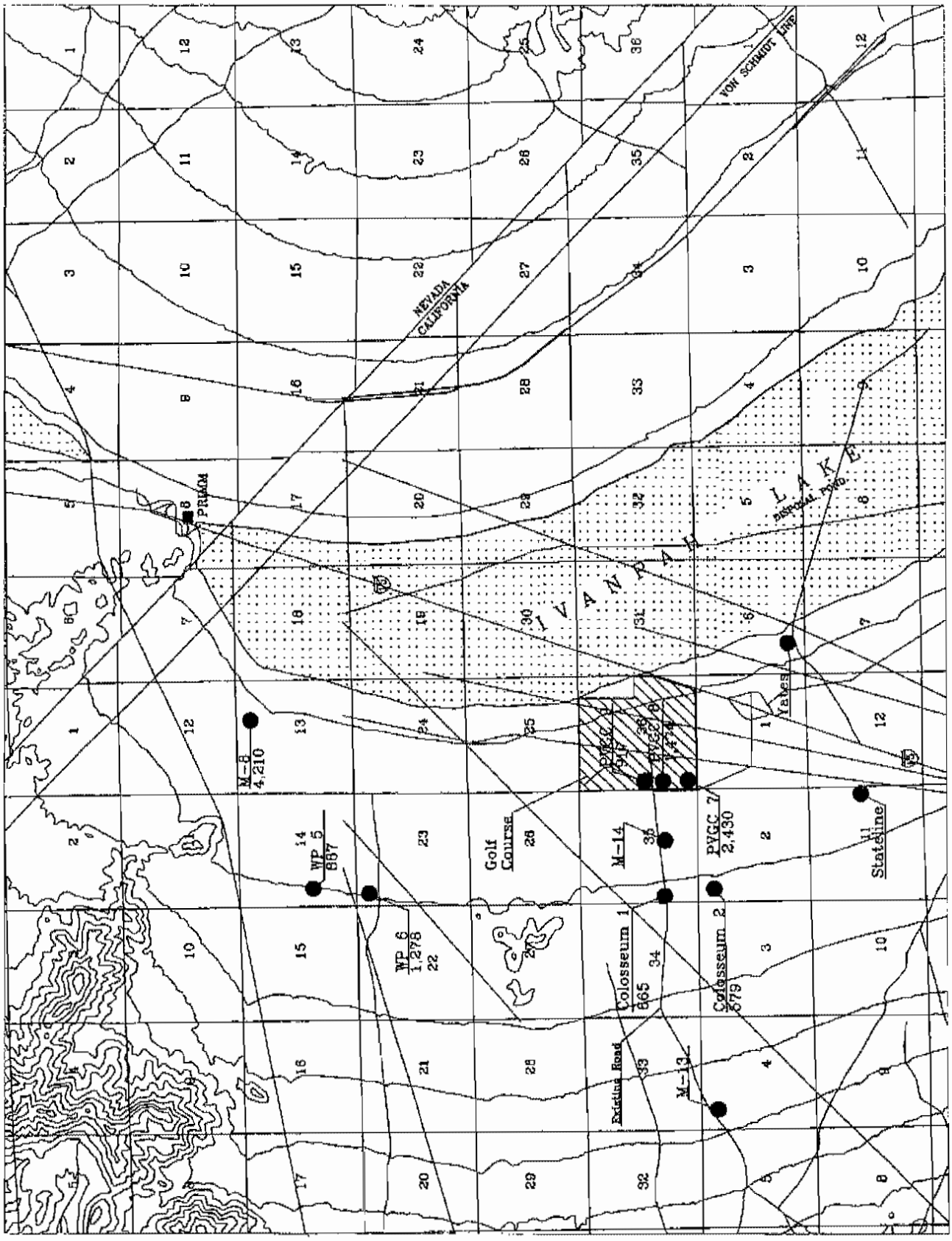
APPROXIMATE SCALE
0 4000 8000
1" = 8000 FEET

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
LAS VEGAS • RENO • PHOENIX

Figure 4h
Field Water Quality Data
Map, June 2005

8



SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING WATER RESOURCES & ENVIRONMENTAL
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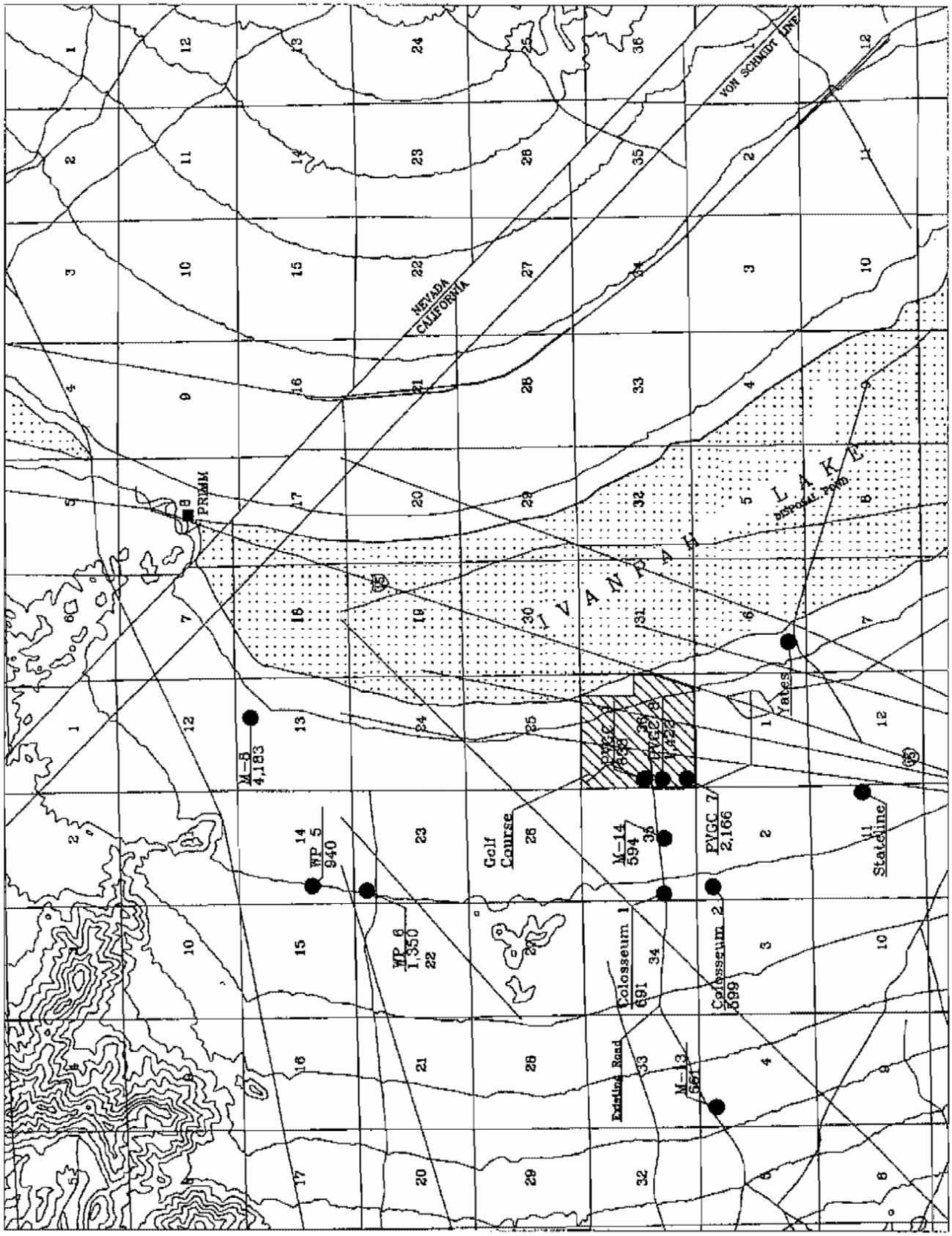
Figure 4i
Field Water Quality Data
Map, June 2006

9



SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING, WATER RESOURCES & ENVIRONMENTAL
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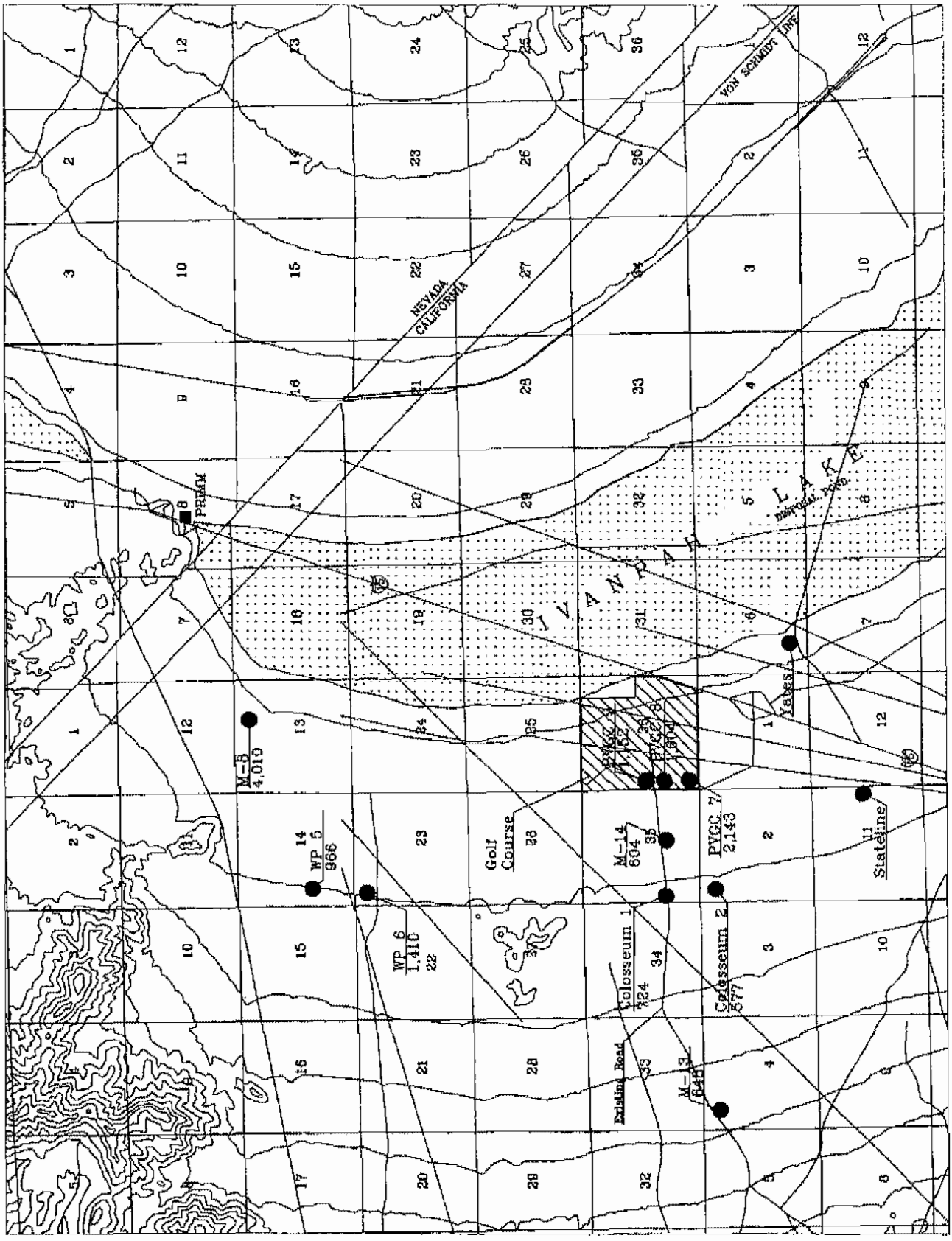
Figure 4j
Field Water Quality Data
Map, June 2007

10



PVGC 7
2,143

Well Location and Identification

Electrical Conductivity in µmhos/cm

APPROXIMATE SCALE
0 4000 8000
1" = 8000 FEET

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
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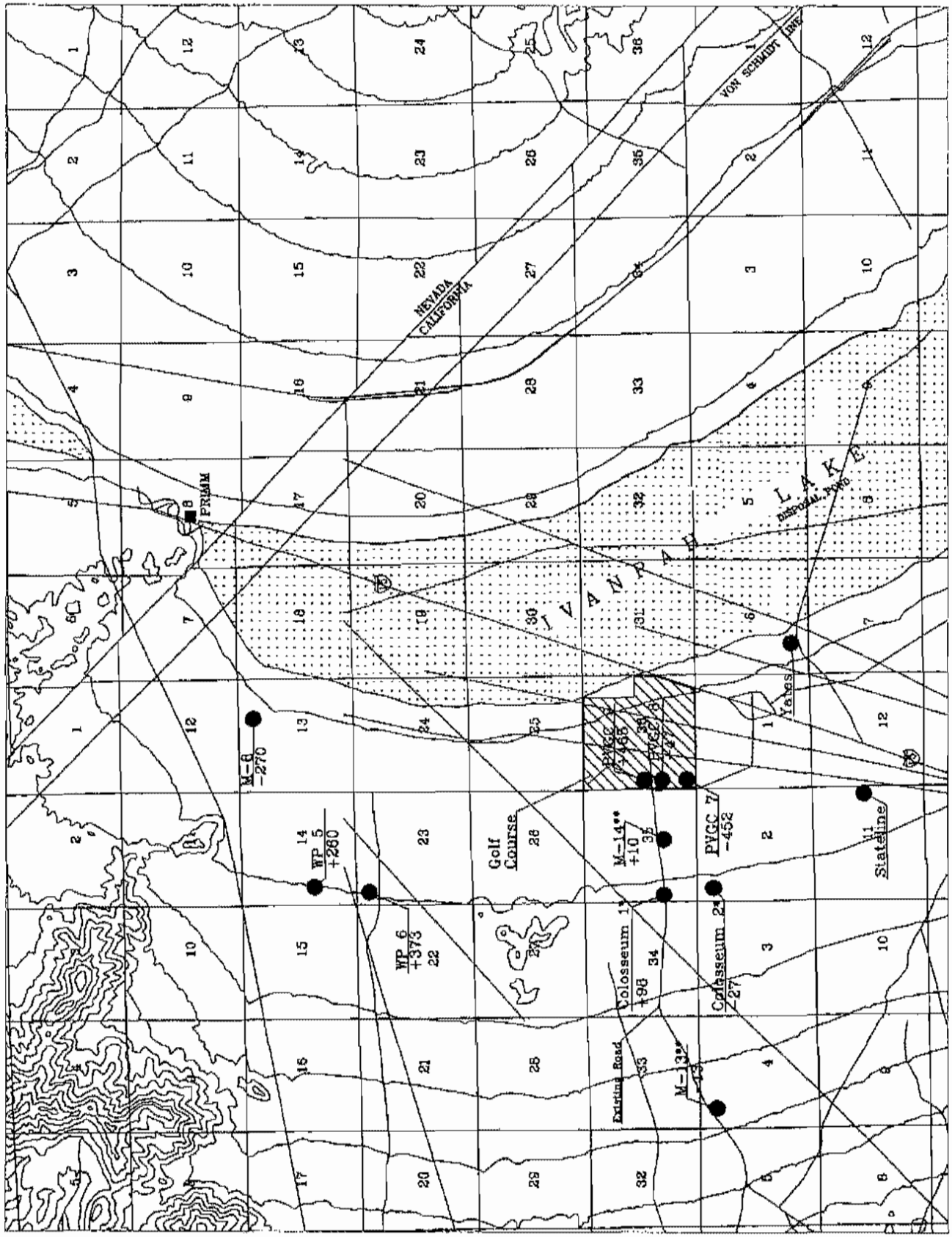
Figure 4k
Field Water Quality Data
Map, June 2008

11



PVGC 7
-452

Well Location and Identification

Change in Electrcal Conductivity in µmhos/cm

*Data from June 1999 to July 2008
**Data from June 2007 to June 2008

APPROXIMATE SCALE
0 4000 8000
1" = 5000 FEET

SCALE: AS SHOWN

BROADBENT & ASSOCIATES, INC.
ENGINEERING WATER RESOURCES & ENVIRONMENTAL
LAS VEGAS • RENO • PHOENIX

Figure 5
Change in Water Quality Data
Map, June 1998 to June 2008

TABLES

Table 1: Primm Valley Golf Club Water-Level and Water-Quality Data

PVGC #7

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	EC umhos/cm	pH	Temp. ° F	Comments
8/22/95	n/a	168.87	2519.57	n/a	n/a	n/a	not pumping
10/17/95	1110	173.52	2514.92	2,023	n/a	79.6	not pumping
9/9/96	1430	262.84	2425.60	2,243	7.8	83.2	well pumping
10/8/96	915	263.39	2425.05	2,343	7.8	81.1	well pumping
11/11/96	1025	171.13	2517.31	2,240	7.8	80.9	not pumping
12/12/96	1100	170.08	2518.36	2,320	7.8	80.4	not pumping
1/10/97	1210	171.60	2516.84	2,180	7.9	81.0	not pumping
2/14/97	1015	261.55	2426.89	2,267	7.7	80.6	well pumping
3/10/97	1030	171.15	2517.29	2,390	7.8	81.2	not pumping
4/7/97	1155	262.25	2426.19	2,555	7.5	81.0	well pumping
5/1/97	900	173.52	2514.92	2,560	7.6	81.3	not pumping
6/5/97	1350	263.50	2424.94	2,670	7.8	80.9	well pumping
7/16/97	1655	254.49	2433.95	2,680	7.8	80.8	well pumping
8/15/97	1250	172.89	2515.55	2,680	7.8	81.1	not pumping
9/10/97	1130	172.31	2516.13	2,645	7.5	82.0	not pumping
10/14/97	950	252.80	2435.64	2,580	7.1	79.3	well pumping
11/12/97	1220	255.48	2432.96	2,565	7.9	79.9	well pumping
12/17/97	1220	172.38	2516.06	2,510	7.9	80.0	not pumping
1/13/98	1335	175.17	2513.27	2,600	7.5	80.7	not pumping
2/16/98	1115	253.60	2434.84	2,520	7.7	80.3	well pumping
3/18/98	1005	257.40	2431.04	2,335	7.9	80.5	well pumping
4/15/98	1000	255.20	2433.24	2,385	7.8	80.4	well pumping
5/18/98	1030	252.56	2435.88	2,570	7.6	81.2	well pumping
6/17/98	1200	256.67	2431.77	2,595	7.9	81.1	well pumping
7/10/98	1245	248.04	2440.40	2,590	7.9	81.5	well pumping
8/18/98	1200	175.57	2512.87	2,595	7.9	81.1	not pumping
9/21/98	1230	173.05	2515.39	2,705	8.0	80.5	not pumping
12/21/98	1215	172.68	2515.76	2,640	7.5	80.5	not pumping
3/24/99	1210	171.66	2516.78	2,810	7.2	80.9	not pumping
6/16/99	930	250.66	2437.78	2,750	7.8	80.4	well pumping
9/16/99	1355	173.34	2515.10	2,940	7.8	81.4	not pumping
12/15/99	1015	173.05	2515.39	n/a	n/a	n/a	pump not operational
3/7/00	1130	171.91	2516.53	n/a	n/a	n/a	pump not operational
6/13/00	1210	173.70	2515.31	2,289	7.5	80.6	not pumping*
9/18/00	1405	174.73	2514.28	2,315	7.8	80.8	not pumping
12/20/00	1047	174.46	2514.55	2,380	7.4	79.6	not pumping
3/21/01	1249	257.80	2431.21	2,420	7.9	80.8	not pumping
6/26/01	1024	180.80	2508.21	2,327	7.6	80.7	well had pumped
9/20/01	1109	275.75	2413.26	2,687	8.0	80.6	well pumping
12/12/01	1130	174.45	2514.56	2,530	7.2	78.3	not pumping
3/26/02	1130	173.76	2515.25	2,417	6.7	80.5	not pumping
6/19/02	1025	174.25	2514.76	2,073	7.7	80.6	not pumping
9/24/02	1355	175.19	2513.82	1,895	7.5	80.1	not pumping
12/24/02	1230	174.95	2514.06	2,083	7.3	79.1	not pumping
3/31/03	1048	174.41	2514.60	2,647	6.6	79.8	not pumping
6/18/03	1203	175.17	2513.84	2,520	6.6	80.4	not pumping
9/24/03	1005	175.76	2513.25	2,493	7.7	80.5	not pumping
12/10/03	1055	175.50	2513.51	2,257	7.6	78.1	not pumping
3/24/04	810	174.98	2514.03	2,220	7.7	79.9	not pumping
6/9/04	115	175.25	2513.76	2,080	7.6	78.5	not pumping
9/24/04	1220	176.20	2512.81	1,848	7.9	79.5	not pumping
12/20/04	1235	175.81	2513.20	1,976	7.0	78.5	not pumping
3/24/05	1050	175.12	2513.89	2,250	7.2	79.3	not pumping
6/29/05	1240	175.34	2513.67	2,387	7.7	79.8	not pumping
9/7/05	700	176.32	2512.69	2,460	7.9	81.4	not pumping
12/4/05	915	176.25	2512.76	2,016	6.9	75.4	not pumping
3/29/06	1030	175.75	2513.26	2,267	7.5	78.1	not pumping
6/20/06	1200	176.50	2512.51	2,430	7.6	81.8	not pumping
9/28/06	1120	176.99	2512.02	2,290	7.3	80.2	not pumping
12/19/06	1310	176.68	2512.33	n/a	n/a	n/a	not pumping
3/20/07	1510	176.14	2512.87	2,360	7.5	79.7	not pumping
6/28/07	800	176.74	2512.27	2,166	7.3	81.2	not pumping
9/28/07	1400	177.41	2511.60	2,063	7.4	79.8	not pumping
12/13/07	1000	177.10	2511.91	2,083	7.0	78.9	not pumping
3/18/08	1300	176.46	2512.55	2,097	7.4	78.3	not pumping
6/26/08	910	177.04	2511.97	2,143	7.4	80.5	not pumping

*New measurement point was established. Monitoring Point Elevation = 2689.08 per survey 9/5/00

Table 1 continued: Primm Valley Golf Club water-level and water-quality data

PVGC #8

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	E C µmhos/cm	pH	Temp. ° F	Comments
9/30/95	n/a	157.20	2520.51	n/a	n/a	n/a	not pumping
10/17/95	830	158.67	2519.04	n/a	n/a	n/a	not pumping
9/9/96	1205	212.90	2464.81	1,498	7.9	82.5	well pumping
10/8/96	1235	161.96	2515.75	1,582	7.7	79.9	not pumping
11/11/96	905	160.80	2516.91	1,457	8.0	79.1	not pumping
12/12/96	930	160.46	2517.25	1,510	7.8	78.6	not pumping
1/10/97	915	160.13	2517.58	n/a	n/a	n/a	pump not operational
2/14/97	830	160.03	2517.68	n/a	n/a	n/a	pump not operational
3/10/97	1315	159.80	2517.91	n/a	n/a	n/a	pump not operational
4/7/97	1050	218.64	2459.07	1,540	7.7	78.7	well pumping
5/1/97	1000	219.65	2458.06	1,551	7.7	78.4	well pumping
6/5/97	1455	212.96	2464.75	1,686	8.0	77.7	well pumping
7/14/97	1600	212.30	2465.41	1,681	7.7	78.7	well pumping
8/15/97	1255	164.89	2512.82	1,661	8.1	80.3	not pumping
9/10/97	1200	211.90	2465.81	1,686	7.7	78.8	well pumping
10/14/97	1045	211.49	2466.22	1,673	7.8	77.8	well pumping
11/12/97	1145	206.80	2470.91	1,668	7.9	78.0	well pumping
12/10/97	1140	164.31	2513.40	1,633	8.0	78.9	not pumping
1/13/98	1325	163.90	2513.81	1,663	7.8	78.8	not pumping
2/16/98	1030	163.34	2514.37	1,554	7.8	78.8	not pumping
3/18/98	1115	203.36	2474.35	1,407	8.1	78.4	well pumping
4/15/98	1225	164.50	2513.21	1,486	8.1	78.8	not pumping
5/18/98	1115	203.97	2473.74	1,566	7.9	79.2	well pumping
6/17/98	1100	207.69	2470.02	1,557	8.1	80.0	well pumping
7/10/98	1345	203.35	2474.36	1,672	8.0	79.8	well pumping
8/18/98	1235	207.97	2469.74	1,634	8.5	78.1	well pumping
9/21/98	1215	165.62	2512.09	1,667	8.1	78.5	not pumping
12/21/98	1200	164.71	2513.00	1,763	7.8	78.1	not pumping
3/24/99	1150	163.14	2514.57	1,673	7.3	69.9	not pumping
6/16/99	1305	163.19	2514.52	n/a	n/a	n/a	pump not operational
9/16/99	1150	163.43	2514.28	n/a	n/a	n/a	pump not operational
12/15/99	1040	163.14	2514.57	n/a	n/a	n/a	pump not operational
3/7/00	1150	162.32	2515.39	n/a	n/a	n/a	pump not operational
6/13/00	1345	214.93	2464.65	1,620	8.0	78.3	well pumping*
9/18/00	1430	168.00	2511.58	1,650	7.8	79.5	not pumping
12/20/00	1019	166.59	2512.99	1,582	7.5	77.5	not pumping
3/21/01	1205	212.68	2466.90	1,521	7.7	78.5	well pumping
6/26/01	1126	212.31	2467.27	1,575	7.8	79.7	well pumping
9/27/01	1031	213.60	2465.98	1,682	8.0	79.0	well pumping
12/12/01	1155	166.05	2513.53	1,634	7.2	76.9	not pumping
3/26/02	1200	165.25	2514.33	1,593	7.4	78.4	not pumping
6/18/02	1039	165.30	2514.28	n/a	n/a	n/a	pump not operational
9/24/02	1040	166.14	2513.44	n/a	n/a	n/a	pump not operational
12/24/02	1205	166.00	2513.58	1,335	7.2	77.2	not pumping
3/31/03	1025	165.35	2514.23	1,666	7.0	77.2	not pumping
6/18/03	1225	165.80	2513.78	1,529	6.9	77.8	not pumping
9/24/03	1140	166.48	2513.10		n/a	n/a	pump not operational
12/10/03	1200	166.37	2513.21	1,523	7.6	77.0	not pumping
3/24/04	830	165.87	2513.71	1,474	7.8	77.9	not pumping
6/9/04	1155	166.02	2513.56	1,484	7.6	77.0	not pumping
9/24/04	1147	166.86	2512.72	1,470	7.7	78.8	not pumping
12/20/04	1215	166.61	2512.97		n/a	n/a	pump not operational
3/24/05	1135	165.98	2513.60	1,415	7.6	77.9	not pumping
6/29/05	1315	166.15	2513.43	1,468	7.9	77.6	not pumping
9/7/05	730	167.02	2512.56	n/a	n/a	n/a	oil problem
12/4/05	1140	167.00	2512.58	n/a	n/a	n/a	oil problem
3/29/06	1125	166.58	2513.00	1,414	7.0	76.0	not pumping
6/20/06	1222	167.23	2512.35	1,474	7.8	78.9	not pumping
9/28/06	1200	167.98	2511.60	1,475	7.0	78.5	not pumping
12/19/06	1330	167.55	2512.03	n/a	n/a	n/a	not pumping
3/20/07	1535	167.02	2512.56	1,338	7.7	78.2	not pumping
6/28/07	855	167.35	2512.23	1,422	7.3	79.2	not pumping
9/28/07	1500	168.18	2511.40	1,411	7.7	78.8	not pumping
12/13/07	1040	168.05	2511.53	n/a	n/a	n/a	not pumping
3/18/08	1400	167.41	2512.17	1,498	7.6	78.7	not pumping
6/26/08	1020	168.31	2511.27	1,604	7.6	79.0	not pumping

*New measurement point was established. Monitoring Point Elevation = 2679.58 per survey 9/5/00

Table 1 continued: Primm Valley Golf Club water-level and water-quality data

PVGC #9

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	E C µmhos/cm	pH	Temp. ° F	Comments
10/16/95	n/a	150.79	2519.84	n/a	n/a	n/a	not pumping
10/17/95	850	150.18	2520.45	n/a	n/a	n/a	not pumping
9/9/96	1505	151.79	2518.84	n/a	n/a	n/a	pump not operational
10/8/96	1000	151.96	2518.67	n/a	n/a	n/a	pump not operational
11/11/96	845	151.84	2518.79	n/a	n/a	n/a	pump not operational
12/12/96	940	151.70	2518.93	n/a	n/a	n/a	pump not operational
1/10/97	1100	267.50	2403.13	545	7.9	76.2	well pumping
2/14/97	900	153.95	2516.68	624	8.2	65.9	intermittent pumping
3/10/97	1400	151.73	2518.90	n/a	n/a	n/a	intermittent pumping
4/7/97	1300	153.69	2516.94	690	8.0	76.2	not pumping
5/1/97	1050	268.50	2402.13	672	8.0	73.4	well pumping
6/5/97	1525	275.35	2395.28	713	8.2	76.3	well pumping
7/14/97	1635	274.25	2396.38	683	7.9	76.6	well pumping
8/15/97	1210	262.90	2407.73	700	8.0	78.2	well pumping
9/10/97	1400	263.82	2406.81	692	7.8	77.6	well pumping
10/14/97	1145	264.27	2406.36	690	7.9	74.7	well pumping
11/12/97	1110	265.76	2404.87	706	7.5	74.8	well pumping
12/10/97	1030	158.25	2512.38	656	8.2	76.4	not pumping
1/13/98	1315	261.80	2408.83	689	7.9	76.1	well pumping
2/16/98	1230	157.06	2513.57	729	8.1	76.7	not pumping
3/18/98	1210	264.15	2406.48	631	8.2	76.2	well pumping
4/15/98	1030	158.91	2511.72	694	8.2	75 8	not pumping
5/18/98	1215	265.72	2404.91	685	8.1	77.0	well pumping
6/17/98	1130	265.25	2405.38	687	8.3	76.7	well pumping
7/10/98	1415	259.60	2411.03	700	8.1	77.3	well pumping
8/18/98	1310	270.82	2399.81	695	8.4	77.2	well pumping
9/21/98	1145	160.70	2509.93	n/a	n/a	n/a	pump not operational
12/21/98	1220	157.14	2513.49	n/a	n/a	n/a	pump not operational
3/24/99	1340	155.47	2515.16	n/a	n/a	n/a	pump not operational
6/16/99	1315	154 97	2515.66	n/a	n/a	n/a	pump not operational
9/16/99	1200	155.11	2515.52	n/a	n/a	n/a	pump not operational
12/15/99	1055	155.05	2515.58	n/a	n/a	n/a	pump not operational
3/7/00	1205	154.58	2516.05	n/a	n/a	n/a	pump not operational
6/13/00	1405	154.99	2515.99	745	7.9	75.6	not pumping*
9/18/00	1446	160.86	2510.12	744	8.0	77 0	not pumping
12/20/00	1037	158.60	2512.38	813	7.9	76.6	not pumping
3/21/01	1230	269.10	2401.88	727	7.8	76 8	well pumping
6/26/01	1206	271.85	2399.13	803	7.9	77.1	well pumping
9/27/01	1044	157.81	2513.17	n/a	n/a	n/a	broken valve
12/12/01	1205	157.64	2513.34	656	7.3	78.3	not pumping
3/26/02	1215	157.11	2513.87	704	7.5	78.9	not pumping
6/19/02	1053	157.06	2513.92	703	7.9	79.2	not pumping
9/24/02	1344	158.31	2512.67	902	7.6	78.3	not pumping
12/24/02	1145	158.09	2512.89	758	7.3	76.0	not pumping
3/31/03	1001	157.60	2513.38	n/a	n/a	n/a	pump not operational
6/18/03	1020	157.45	2513.53	779	7.0	77.0	not pumping
9/24/03	1035	158.25	2512.73	849	7.8	77.3	not pumping
12/10/03	1135	158.35	2512.63	847	8.0	75.2	not pumping
3/24/04	845	158.07	2512.91	782	7.8	76.7	not pumping
6/9/04	1135	158.20	2512.78	817	7.7	74.9	not pumping
9/24/04	1205	158.35	2512.63	731	8.0	78.8	not pumping
12/20/04	1205	157.34	2513.64	793	6 9	73.3	not pumping
3/24/05	1220	158.30	2512.68	825	7.8	75.8	not pumping
6/29/05	1400	158.24	2512.74	875	8.0	76.0	not pumping
9/7/05	700	158.95	2512.03	956	8.1	77.8	not pumping
12/4/05	1020	158.99	2511.99	840	6.7	72.3	not pumping
3/29/06	1105	159.80	2511.18	1,010	7.2	74.7	not pumping
6/20/06	1235	159.33	2511.65	917	7.9	76.1	not pumping
9/28/06	1225	160.18	2510.80	1,099	7.7	77.9	not pumping
12/19/06	1400	159.71	2511.27	n/a	n/a	n/a	not pumping
3/20/07	1525	157.38	2513.60	754	7.8	71.6	not pumping
6/28/07	830	155.18	2515.80	638	7.4	79.1	not pumping
9/28/07	1430	160.52	2510.46	1,045	7.6	76.7	not pumping
12/13/07	1100	160.15	2510.83	n/a	n/a	n/a	not pumping
3/18/08	1330	159.77	2511.21	1,033	7.7	78.0	not pumping
6/26/08	930	160.03	2510.95	1,152	7.6	77.2	not pumping

*New measurement point was established. Monitoring Point Elevation = 2670.98 per survey 9/5/00

Table 1 continued: Primm Valley Golf Club water-level and water-quality data

Colosseum Well #1

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	E C umhos/cm	pH	Temp. ° F	Comments
9/10/97	1000	275.40	2518.20	n/a	n/a	n/a	not pumping
10/14/97	1345	275.19	2518.41	n/a	n/a	n/a	not pumping
11/12/97	1310	275.32	2518.28	n/a	n/a	n/a	not pumping
12/11/97	1220	275.44	2518.16	n/a	n/a	n/a	not pumping
1/13/98	1430	275.40	2518.20	n/a	n/a	n/a	not pumping
9/21/98	1300	346.70	2446.90	590	8.3	80.8	well pumping
12/21/98	1240	n/a	n/a	591	7.7	80.8	not pumping
3/24/99	1225	367.44	2426.16	613	8.3	80.8	not pumping
6/16/99	950	374.37	2419.23	626	7.8	81.0	well pumping
9/16/99	1230	374.37	2419.23	626	7.8	81.0	well pumping
12/15/99	1115	293.52	2500.08	612	8.1	80.5	not pumping
3/7/00	1235	358.20	2435.40	572	8.0	80.5	well pumping
6/13/00	1210	372.10	2421.50	590	8.1	81.2	well pumping*
9/18/00	1312	374.40	2419.20	634	7.8	80.9	well pumping
12/20/00	1139	284.30	2509.30	608	7.5	81.1	not pumping
3/15/01	917	272.70	2520.90	614	7.6	81.0	not pumping
6/26/01	1415	n/a	n/a	604	7.8	80.9	airline broken
9/27/01	1209	n/a	n/a	643	7.8	81.3	airline broken
12/12/01	1242	287.26	2506.34	613	6.9	80.2	not pumping
3/26/02	1015	286.58	2507.02	629	7.5	81.5	not pumping
6/18/02	914	n/a	n/a	631	7.3	81.5	airline broken
9/24/02	1124	n/a	n/a	652	6.6	80.9	airline broken
12/19/02	1330	286.37	2507.23	614	7.3	80.7	not pumping
3/31/03	934	n/a	n/a	657	7.0	81.7	airline broken
6/18/03	1206	n/a	n/a	633	7.5	81.1	airline broken
9/23/03	1021	n/a	n/a	664	7.6	80.5	airline broken
12/10/03	920	288.31	2505.29	627	7.8	80.0	not pumping
3/24/04	710	n/a	n/a	565	7.6	80.3	airline broken
6/8/04	1153	n/a	n/a	626	7.6	81.1	airline broken
9/29/04	1005	n/a	n/a	637	7.6	80.0	airline broken
12/14/04	1320	287.85	2505.75	n/a	n/a	n/a	electricial outage
3/30/05	1405	n/a	n/a	573	7.6	80.1	airline broken
6/29/05	1510	n/a	n/a	613	7.8	80.6	airline broken
9/28/05	1520	n/a	n/a	676	8.0	81.3	airline broken
12/13/05	1135	288.15	2505.45	n/a	n/a	n/a	bearing problems
3/29/06	1135	n/a	n/a	n/a	n/a	n/a	bearing problems
6/25/06	1030	n/a	n/a	665	7.9	81.5	airline broken
9/27/06	1115	n/a	n/a	n/a	n/a	n/a	airline broken
12/13/06	1405	289.58	2504.02	516	7.8	81.0	airline broken
3/20/07	n/a	n/a	n/a	n/a	n/a	n/a	airline broken
6/28/07	955	n/a	n/a	691	7.5	81.8	airline broken
9/24/07	1015	n/a	n/a	627	7.2	80.2	airline broken
12/13/07	830	290.23	2503.37	662	7.0	80.8	not pumping
3/18/08	1220	n/a	n/a	702	7.7	80.2	airline broken
7/9/08	1015	n/a	n/a	724	7.7	81.8	airline broken

*Monitoring Point Elevation = 2793.60 per survey 9/5/00

Table 1 continued: Primm Valley Golf Club water-level and water-quality data

Colosseum Well #2

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	E C umhos/cm	pH	Temp. ° F	Comments
9/10/97	1020	282.03	2519.33	n/a	n/a	n/a	not pumping
10/14/97	1400	282.03	2519.33	n/a	n/a	n/a	not pumping
11/12/97	1330	282.15	2519.21	n/a	n/a	n/a	not pumping
12/11/97	1235	282.28	2519.08	n/a	n/a	n/a	not pumping
1/13/98	1440	282.23	2519.13	n/a	n/a	n/a	not pumping
9/21/98	1330	369.40	2431.96	570	8.1	80.0	well pumping
12/21/98	1300	n/a	n/a	568	7.7	80.4	not pumping
3/24/99	1250	342.82	2458.54	587	8.1	80.0	not pumping
6/16/99	1025	369.39	2431.97	604	7.9	80.0	well pumping
9/16/99	1255	398.26	2403.10	597	7.8	80.3	well pumping
12/15/99	1135	282.76	2518.60	583	8.1	79.9	not pumping
3/7/00	1310	372.80	2428.56	547	8.1	80.0	well pumping
6/13/00	1240	352.10	2449.26	569	8.1	80.4	well pumping*
9/18/00	1350	368.20	2433.16	593	7.8	80.3	well pumping
12/20/00	1126	278.10	2523.26	557	7.6	81.6	not pumping
3/15/01	1012	279.30	2522.06	553	7.5	80.6	not pumping
6/26/01	1012	345.10	2456.26	575	7.6	79.9	well pumping
9/27/01	1136	345.10	2456.26	594	8.0	80.5	well pumping
12/12/01	1301	293.78	2507.58	593	7.4	79.8	not pumping
3/26/02	1025	292.36	2509.00	551	7.6	76.8	not pumping
6/18/02	846	349.80	2451.56	573	7.0	81.3	well pumping
9/24/02	1149	345.10	2456.26	612	7.3	80.2	well pumping
12/19/02	1352	294.60	2506.76	561	7.4	79.3	not pumping
3/31/03	857	340.50	2460.86	606	6.8	79.9	well pumping
6/18/03	1145	349.80	2451.56	576	7.4	80.5	well pumping
9/23/03	1040	347.40	2453.96	604	7.7	79.6	well pumping
12/10/03	945	292.95	2508.41	544	7.6	79.1	not pumping
3/24/04	725	347.40	2453.96	540	7.8	79.5	well pumping
6/8/04	1125	349.80	2451.56	562	7.6	80.3	electiral outage
9/29/04	1030	345.10	2456.26	557	7.7	79.0	well pumping
12/14/04	1345	293.49	2507.87	n/a	n/a	n/a	electiral outage
3/30/05	1320	345.10	2456.26	523	7.8	79.3	well pumping
6/29/05	1440	345.10	2456.26	559	7.9	81.9	well pumping
9/28/05	1545	347.40	2453.96	582	8.0	80.4	well pumping
12/20/05	1045	295.10	2506.26	492	6.6	75.7	well pumping
3/28/06	1200	n/a	n/a	574	7.8	79	meter broke
6/25/06	1055	347.40	2453.96	579	7.9	81.4	well pumping
9/27/06	1135	347.40	2453.96	562	7.6	80.5	well pumping
12/13/06	1315	294.60	2506.72	546	7.8	80.6	well pumping
3/21/07	1135	347.40	2453.96	592	7.7	81.0	well pumping
6/28/07	920	347.40	2453.96	599	7.1	81.0	well pumping
9/24/07	1150	349.70	2451.66	520	7.3	79.7	well pumping
12/13/07	900	294.72	2506.64	547	7.1	81.0	not pumping
3/18/08	1200	347.40	2453.96	544	7.3	80.7	well pumping
7/9/08	1035	347.40	2453.96	577	7.6	81.5	well pumping

*Monitoring Point Elevation = 2801.36 per survey 9/5/00

Table 1 continued: Primm Valley Golf Club water-level and water-quality data

Stateline Well

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	E C µmhos/cm	pH	Temp. ° F	Comments
10/20/95	825	211.25	2524.44	n/a	n/a	n/a	not pumping
9/9/96	1550	211.38	2524.31	n/a	n/a	n/a	not pumping
10/8/96	1110	211.50	2524.19	n/a	n/a	n/a	not pumping
11/11/96	1345	211.52	2524.17	n/a	n/a	n/a	not pumping
12/12/96	1300	211.56	2524.13	n/a	n/a	n/a	not pumping
1/10/97	1315	211.53	2524.16	n/a	n/a	n/a	not pumping
2/14/97	1130	211.65	2524.04	n/a	n/a	n/a	not pumping
3/10/97	1430	211.63	2524.06	n/a	n/a	n/a	not pumping
4/7/97	1430	211.70	2523.99	n/a	n/a	n/a	not pumping
5/1/97	1215	211.77	2523.92	n/a	n/a	n/a	not pumping
6/5/97	1605	211.79	2523.90	n/a	n/a	n/a	not pumping
7/16/97	1700	211.85	2523.84	n/a	n/a	n/a	not pumping
8/15/97	1310	211.90	2523.79	n/a	n/a	n/a	not pumping
9/10/97	1455	211.93	2523.76	n/a	n/a	n/a	not pumping
10/14/97	1415	212.01	2523.68	n/a	n/a	n/a	not pumping
11/12/97	1400	212.09	2523.60	n/a	n/a	n/a	not pumping
12/11/97	1255	212.14	2523.55	n/a	n/a	n/a	not pumping
1/13/98	1400	212.20	2523.49	n/a	n/a	n/a	not pumping
2/16/98	1325	212.25	2523.44	n/a	n/a	n/a	not pumping
3/18/98	1305	212.30	2523.39	n/a	n/a	n/a	not pumping
4/16/98	1505	212.38	2523.31	n/a	n/a	n/a	not pumping
5/18/98	1330	212.44	2523.25	n/a	n/a	n/a	not pumping
6/17/98	1300	212.48	2523.21	n/a	n/a	n/a	not pumping
7/10/98	800	212.56	2523.13	n/a	n/a	n/a	not pumping
8/18/98	1045	212.59	2523.10	n/a	n/a	n/a	not pumping
9/21/98	1410	212.65	2523.04	n/a	n/a	n/a	not pumping
12/21/98	1230	212.79	2522.90	n/a	n/a	n/a	not pumping
3/24/99	1430	212.96	2522.73	n/a	n/a	n/a	not pumping
6/16/99	1350	213.00	2522.69	n/a	n/a	n/a	not pumping
9/16/99	1410	213.19	2522.50	n/a	n/a	n/a	not pumping
12/15/99	1245	213.43	2522.26	n/a	n/a	n/a	not pumping
3/7/00	1445	213.67	2522.02	n/a	n/a	n/a	not pumping
6/13/00	1440	213.81	2521.88	n/a	n/a	n/a	not pumping
9/18/00	1510	214.02	2521.67	n/a	n/a	n/a	not pumping
12/19/00	955	214.29	2521.40	n/a	n/a	n/a	not pumping
3/21/01	1317	214.43	2521.26	n/a	n/a	n/a	not pumping
6/26/01	1241	214.59	2521.10	n/a	n/a	n/a	not pumping
9/27/01	1301	214.67	2521.02	n/a	n/a	n/a	not pumping
12/12/01	1050	214.92	2520.77	n/a	n/a	n/a	not pumping
3/26/02	1255	214.98	2520.71	n/a	n/a	n/a	not pumping
6/18/02	1145	215.10	2520.59	n/a	n/a	n/a	not pumping
9/24/02	1225	215.26	2520.43	n/a	n/a	n/a	not pumping
12/24/02	1205	215.43	2520.26	n/a	n/a	n/a	not pumping
3/31/03	1120	215.58	2520.11	n/a	n/a	n/a	not pumping
6/18/03	1321	215.66	2520.03	n/a	n/a	n/a	not pumping
9/24/03	1055	215.87	2519.82	n/a	n/a	n/a	not pumping
12/10/03	845	216.09	2519.60	n/a	n/a	n/a	not pumping
3/24/04	1220	216.15	2519.54	n/a	n/a	n/a	not pumping
6/9/04	1230	216.30	2519.39	n/a	n/a	n/a	not pumping
9/24/04	1250	216.35	2519.34	n/a	n/a	n/a	not pumping
12/20/04	1405	216.52	2519.17	n/a	n/a	n/a	not pumping
3/24/05	1320	216.72	2518.97	n/a	n/a	n/a	not pumping
6/29/05	950	216.74	2518.95	n/a	n/a	n/a	not pumping
9/7/05	755	216.86	2518.83	n/a	n/a	n/a	not pumping
12/4/05	1055	217.03	2518.66	n/a	n/a	n/a	not pumping
3/29/06	905	217.19	2518.50	n/a	n/a	n/a	not pumping
6/20/06	1130	217.24	2518.45	n/a	n/a	n/a	not pumping
10/5/06	1200	217.39	2518.30	n/a	n/a	n/a	not pumping
12/13/06	1515	217.48	2518.21	n/a	n/a	n/a	not pumping
3/21/07	1600	217.61	2518.08	n/a	n/a	n/a	not pumping
6/28/07	1050	217.70	2517.99	n/a	n/a	n/a	not pumping
9/28/07	1530	217.77	2517.92	n/a	n/a	n/a	not pumping
12/13/07	800	217.97	2517.72	n/a	n/a	n/a	not pumping
3/19/08	1205	218.06	2517.63	n/a	n/a	n/a	not pumping
6/26/08	1205	218.09	2517.60	n/a	n/a	n/a	not pumping

Table 1 continued: Primm Valley Golf Club water-level and water-quality data

Yates Well

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	E C µmhos/cm	pH	Temp. ° F	Comments
10/20/95	1145	91.35	2522.00	n/a	n/a	n/a	not pumping
9/9/96	1620	91.52	2521.83	n/a	n/a	n/a	not pumping
10/8/96	1130	91.58	2521.77	n/a	n/a	n/a	not pumping
11/11/96	1400	91.59	2521.76	n/a	n/a	n/a	not pumping
12/12/96	1320	91.56	2521.79	n/a	n/a	n/a	not pumping
1/10/97	1345	91.49	2521.86	n/a	n/a	n/a	not pumping
2/14/97	1145	91.55	2521.80	n/a	n/a	n/a	not pumping
3/10/97	1520	91.52	2521.83	n/a	n/a	n/a	not pumping
4/7/97	1450	91.58	2521.77	n/a	n/a	n/a	not pumping
5/1/97	1240	91.62	2521.73	n/a	n/a	n/a	not pumping
6/5/97	1620	91.64	2521.71	n/a	n/a	n/a	not pumping
7/16/97	1720	91.72	2521.63	n/a	n/a	n/a	not pumping
8/15/97	1340	91.76	2521.59	n/a	n/a	n/a	not pumping
9/10/97	1515	91.78	2521.57	n/a	n/a	n/a	not pumping
10/14/97	1435	91.81	2521.54	n/a	n/a	n/a	not pumping
11/12/97	n/a	n/a	n/a	n/a	n/a	n/a	n/a
12/11/97	1310	91.84	2521.51	n/a	n/a	n/a	not pumping
1/13/98	1415	91.82	2521.53	n/a	n/a	n/a	not pumping
2/16/98	1340	91.80	2521.55	n/a	n/a	n/a	not pumping
3/18/98	1245	91.91	2521.44	n/a	n/a	n/a	not pumping
4/15/98	1530	91.85	2521.50	n/a	n/a	n/a	not pumping
5/18/98	1350	91.90	2521.45	n/a	n/a	n/a	not pumping
6/17/98	1320	91.97	2521.38	n/a	n/a	n/a	not pumping
7/10/98	730	92.03	2521.32	n/a	n/a	n/a	not pumping
8/18/98	1115	92.02	2521.33	n/a	n/a	n/a	not pumping
9/21/98	1430	92.11	2521.24	n/a	n/a	n/a	not pumping
12/21/98	1245	92.17	2521.18	n/a	n/a	n/a	not pumping
3/24/99	1450	92.17	2521.18	n/a	n/a	n/a	not pumping
6/16/99	1420	107.96	2505.39	n/a	n/a	n/a	well pumping
9/16/99	1420	98.70	2514.65	n/a	n/a	n/a	not pumping
12/15/99	1305	92.51	2520.84	n/a	n/a	n/a	not pumping
3/7/00	1505	108.97	2504.38	n/a	n/a	n/a	well pumping
6/13/00	1505	107.96	2505.39	n/a	n/a	n/a	well pumping
9/18/00	1530	107.96	2505.39	914	8.2	82.9	well pumping
12/19/00	1025	93.24	2520.11	n/a	n/a	n/a	not pumping
3/21/01	1334	92.99	2520.36	n/a	n/a	n/a	not pumping
6/26/01	1314	92.95	2520.40	n/a	n/a	n/a	not pumping
9/27/01	1327	95.05	2518.30	n/a	n/a	n/a	not pumping
12/12/01	1110	93.28	2520.07	n/a	n/a	n/a	not pumping
3/26/02	1320	93.25	2520.10	n/a	n/a	n/a	not pumping
6/18/02	1210	93.37	2519.98	n/a	n/a	n/a	not pumping
9/24/02	1240	93.57	2519.78	n/a	n/a	n/a	not pumping
12/24/02	1145	93.68	2519.67	n/a	n/a	n/a	not pumping
3/31/03	1142	93.67	2519.68	n/a	n/a	n/a	not pumping
6/18/03	1340	93.73	2519.62	n/a	n/a	n/a	not pumping
9/24/03	1222	93.94	2519.41	n/a	n/a	n/a	not pumping
12/10/03	805	94.10	2519.25	n/a	n/a	n/a	not pumping
3/24/04	1205	94.09	2519.26	n/a	n/a	n/a	not pumping
6/9/04	1300	94.21	2519.14	n/a	n/a	n/a	not pumping
9/24/04	1350	94.32	2519.03	n/a	n/a	n/a	not pumping
12/20/04	1425	94.44	2518.91	n/a	n/a	n/a	not pumping
3/24/05	1350	94.40	2518.95	n/a	n/a	n/a	not pumping
6/29/05	1015	94.48	2518.87	n/a	n/a	n/a	not pumping
9/7/05	825	94.62	2518.73	n/a	n/a	n/a	not pumping
12/4/05	1105	94.71	2518.64	n/a	n/a	n/a	not pumping
3/29/06	1210	94.76	2518.59	n/a	n/a	n/a	not pumping
6/20/06	1430	94.83	2518.52	n/a	n/a	n/a	not pumping
10/5/06	1230	95.00	2518.35	n/a	n/a	n/a	not pumping
12/11/06	1305	95.06	2518.29	n/a	n/a	n/a	not pumping
3/21/07	1430	95.11	2518.24	n/a	n/a	n/a	not pumping
6/28/07	1115	95.20	2518.15	n/a	n/a	n/a	not pumping
9/28/07	1600	95.34	2518.01	n/a	n/a	n/a	not pumping
12/15/07	1215	95.45	2517.90	n/a	n/a	n/a	not pumping
3/19/08	1300	95.45	2517.90	n/a	n/a	n/a	not pumping
6/26/08	1240	95.54	2517.81	n/a	n/a	n/a	not pumping

Table 1 continued: Primm Valley Golf Club water-level and water-quality data

WP-5

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	E C µmhos/cm	pH	Temp., °F	Comments
9/24/97	1135	n/a	n/a	738	7.8	77.7	well pumping
12/17/97	910	n/a	n/a	681	8.0	77.1	well pumping
3/18/98	900	n/a	n/a	649	8.0	77.2	well pumping
6/17/98	910	n/a	n/a	706	8.1	77.7	well pumping
9/21/98	930	n/a	n/a	713	7.9	77.8	well pumping
12/21/98	1115	n/a	n/a	719	8.0	77.6	well pumping
3/24/99	1115	n/a	n/a	745	8.1	77.7	well pumping
6/16/99	840	n/a	n/a	820	8.0	77.6	well pumping
9/16/99	1020	n/a	n/a	783	7.9	78.3	well pumping
12/15/99	905	n/a	n/a	792	8.0	77.5	well pumping
3/7/00	1015	n/a	n/a	722	8.1	77.6	well pumping
6/13/00	925	n/a	n/a	758	8.2	78.2	well pumping
9/18/00	933	n/a	n/a	786	7.9	77.7	well pumping
12/20/00	921	n/a	n/a	769	7.5	77.2	well pumping
3/21/01	914	n/a	n/a	775	7.7	77.7	well pumping
6/26/01	n/a	n/a	n/a	n/a	n/a	n/a	pump broken
9/27/01	822	n/a	n/a	845	7.8	77.5	well pumping
12/17/01	1047	n/a	n/a	791	7.2	76.8	well pumping
3/26/02	850	n/a	n/a	815	7.3	77.8	well pumping
6/19/02	936	n/a	n/a	801	7.5	78.4	well pumping
9/24/02	851	n/a	n/a	823	7.4	77.2	well pumping
12/24/02	922	n/a	n/a	800	7.0	77.0	well pumping
3/31/03	935	n/a	n/a	830	6.9	77.1	well pumping
6/18/03	844	n/a	n/a	844	7.0	77.9	well pumping
9/24/03	914	n/a	n/a	861	7.7	77.3	well pumping
12/10/03	1055	n/a	n/a	853	8.0	76.6	well pumping
3/24/04	1045	n/a	n/a	757	7.8	77.3	well pumping
6/9/04	925	n/a	n/a	846	7.2	77.3	well pumping
9/24/04	855	n/a	n/a	857	7.5	76.7	well pumping
12/20/04	910	n/a	n/a	800	7.6	76.1	well pumping
3/24/05	1025	n/a	n/a	804	7.8	76.7	well pumping
6/29/05	940	n/a	n/a	844	7.7	77.2	well pumping
9/7/05	945	n/a	n/a	893	7.9	78.0	well pumping
12/4/05	945	n/a	n/a	885	7.9	77.2	well pumping
3/29/06	935	n/a	n/a	863	7.6	77.1	well pumping
6/25/06	855	n/a	n/a	887	7.8	78.4	well pumping
9/20/06	1100	n/a	n/a	895	7.8	78.7	well pumping
12/14/06	1445	n/a	n/a	840	7.9	77.9	well pumping
3/20/07	1040	n/a	n/a	913	7.7	77.7	well pumping
6/20/07	1140	n/a	n/a	940	7.6	77.9	well pumping
9/28/07	1330	n/a	n/a	891	8.0	77.7	well pumping
12/15/07	900	n/a	n/a	928	7.1	77.1	well pumping
3/31/08	1310	n/a	n/a	777	7.7	77.4	well pumping
6/5/08	1300	n/a	n/a	966	7.9	76.9	well pumping

Table 1 continued: Primm Valley Golf Club water-level and water-quality data

WP-6

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	EC µmhos/cm	pH	Temp. ° F	Comments
9/24/97	1110	n/a	n/a	1,099	8.0	79.4	well pumping
12/17/97	840	n/a	n/a	1,013	8.3	78.1	well pumping
3/18/98	915	n/a	n/a	950	8.2	79.5	well pumping
6/17/98	845	n/a	n/a	1,037	8.2	79.5	well pumping
9/21/98	1005	n/a	n/a	1,059	8.2	79.4	well pumping
12/21/98	1100	n/a	n/a	1,068	7.9	79.1	well pumping
3/24/99	1025	n/a	n/a	1,098	7.8	79.8	well pumping
6/16/99	750	n/a	n/a	1,159	8.1	79.4	well pumping
9/16/99	930	n/a	n/a	1,148	8.1	79.7	well pumping
12/15/99	830	n/a	n/a	1,161	8.2	79.3	well pumping
3/7/00	945	n/a	n/a	1,065	8.3	79.7	well pumping
6/13/00	945	n/a	n/a	1,121	8.4	79.5	well pumping
9/18/00	908	n/a	n/a	1,165	8.1	79.4	well pumping
12/20/00	904	n/a	n/a	1,123	7.8	79.4	well pumping
3/21/01	854	n/a	n/a	1,084	7.9	79.7	well pumping
6/26/01	819	n/a	n/a	1,158	7.6	79.9	well pumping
9/27/01	828	n/a	n/a	1,197	8.0	79.3	well pumping
12/17/01	927	n/a	n/a	1,167	7.4	78.4	well pumping
3/26/02	n/a	n/a	n/a	n/a	n/a	n/a	pump not operational
6/19/02	911	n/a	n/a	1,178	7.6	79.3	well pumping
9/24/02	834	n/a	n/a	1,213	7.4	78.8	well pumping
12/24/02	948	n/a	n/a	1,136	7.4	78.6	well pumping
3/31/03	1003	n/a	n/a	1,188	7.3	78.8	well pumping
6/18/03	911	n/a	n/a	1,155	7.3	79.3	well pumping
9/24/03	850	n/a	n/a	1,265	7.9	78.6	well pumping
12/10/03	1020	n/a	n/a	1,200	8.1	78.7	well pumping
3/24/04	1025	n/a	n/a	1,073	8.2	79.2	well pumping
6/9/04	850	n/a	n/a	1,288	7.5	78.8	well pumping
9/24/04	n/a	n/a	n/a	n/a	n/a	n/a	pump not operational
12/20/04	1000	n/a	n/a	1,102	7.6	78.1	well pumping
3/24/05	905	n/a	n/a	1,218	7.7	78.8	well pumping
6/29/05	855	n/a	n/a	1,180	7.9	78.8	well pumping
9/7/05	835	n/a	n/a	1,262	8.0	79.3	well pumping
12/4/05	915	n/a	n/a	1,285	8.1	78.7	well pumping
3/29/06	900	n/a	n/a	1,237	7.6	78.9	well pumping
6/25/06	830	n/a	n/a	1,278	7.9	79.7	well pumping
9/20/06	930	n/a	n/a	1,305	7.9	79.7	well pumping
12/14/06	1400	n/a	n/a	1,259	7.5	79.0	well pumping
3/20/07	1010	n/a	n/a	1,307	7.8	79.4	well pumping
6/20/07	1050	n/a	n/a	1,350	7.8	79.5	well pumping
9/28/07	1300	n/a	n/a	1,297	8.2	80.2	well pumping
12/15/07	935	n/a	n/a	1,283	7.5	79.0	well pumping
3/31/08	1245	n/a	n/a	1,144	7.8	79.2	well pumping
6/5/08	1220	n/a	n/a	1,410	7.9	79.3	well pumping

Table 1 continued: Primm Valley Golf Club water-level and water-quality data

M-8

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	E C µmhos/cm	pH	Temp., °F	Comments
9/1/95	n/a	103.3	n/a	n/a	n/a	n/a	not pumping
9/6/97	n/a	104.4	n/a	4,270	8.2	72.7	not pumping
12/17/97	n/a	104.4	n/a	4,215	8.4	72.4	not pumping
3/2/98	n/a	104.4	n/a	3,600	8.4	72.4	not pumping
6/4/98	n/a	104.7	n/a	4,280	8.2	72.9	not pumping
9/21/98	n/a	104.9	n/a	4,495	7.9	73.5	not pumping
12/21/98	n/a	104.9	n/a	4,420	7.5	72.9	not pumping
3/24/99	n/a	106.2	n/a	4,485	7.7	73.3	not pumping
6/16/99	n/a	106.1	n/a	4,587	8.1	73.4	not pumping
9/16/99	n/a	106.3	n/a	4,640	8.3	73.8	not pumping
12/15/99	810	106.4	n/a	n/a	n/a	n/a	pump not operational
3/7/00	925	106.0	n/a	4,277	8.3	72.8	not pumping
6/13/00	1009	117.0	n/a	4,355	8.4	73.4	not pumping
9/18/00	953	107.0	n/a	4,455	8.2	73.3	not pumping
12/20/00	838	107.0	n/a	4,580	7.9	73.1	not pumping
3/21/01	940	107.0	n/a	4,470	8.0	73.3	not pumping
7/10/01	1137	106.2	n/a	4,510	8.1	73.5	not pumping
9/29/01	849	108.8	n/a	4,700	8.3	73.1	not pumping
12/12/01	935	106.8	n/a	4,497	6.6	72.4	not pumping
3/26/02	820	106.8	n/a	4,488	8.0	72.7	not pumping
6/19/02	1129	107.0	n/a	4,483	8.0	73.9	not pumping
9/24/02	910	107.0	n/a	4,687	8.0	73.0	not pumping
12/24/02	1125	107.0	n/a	4,450	7.7	72.3	not pumping
3/31/03	1023	107.0	n/a	4,400	7.8	72.3	not pumping
6/18/03	1108	107.0	n/a	4,640	7.6	73.7	not pumping
9/24/03	835	108.5	n/a	4,590	8.4	72.9	not pumping
12/10/03	920	108.5	n/a	4,513	8.3	72.9	not pumping
3/24/04	1120	108.5	n/a	4,073	8.6	73.2	not pumping
6/9/04	1120	108.8	n/a	4,417	7.8	73.0	not pumping
9/24/04	1125	108.9	n/a	4,453	8.1	72.9	not pumping
12/20/04	1130	109.2	n/a	4,217	7.5	72.4	not pumping
3/24/05	1140	109.2	n/a	4,250	8.0	72.1	not pumping
6/29/05	1020	109.2	n/a	4,377	8.2	72.7	not pumping
9/7/05	1115	108.3	n/a	4,126	8.3	73.0	not pumping
12/4/05	1025	109.2	n/a	4,247	8.3	72.4	not pumping
3/29/06	1010	108.3	n/a	4,240	8.1	72.0	not pumping
6/25/06	800	108.6	n/a	4,210	8.5	74.0	not pumping
9/20/06	800	108.9	n/a	n/a	n/a	n/a	pump broke
12/22/06	900	108.8	n/a	4,166	8.3	72.9	not pumping
3/20/07	930	108.9	n/a	4,365	8.2	73.3	not pumping
6/20/07	1015	108.8	n/a	4,183	8.2	73.9	not pumping
9/24/07	930	108.3	n/a	4,100	8.0	73.1	purged sample
12/15/07	1230	108.3	n/a	n/a	n/a	n/a	electricial problem
3/31/08	1100	108.5	n/a	n/a	n/a	n/a	electricial problem
6/5/08	1410	108.5	n/a	4,010	8.8	74.9	purged sample

Table 1 continued: Primm Valley Golf Club water-level and water-quality data

MW-13

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	E C µmhos/cm	pH	Temp. ° F	Comments
9/--/06	n/a	n/a	n/a				purge sample
12/13/06	1005	667.21	n/a	626	7.8	86.7	purge sample
3/20/07	1220	667.33	n/a	658	7.6	87.3	purge sample
6/27/07	1405	667.72	n/a	661	7.6	87.6	purge sample
9/24/07	900	667.94	n/a	n/a	n/a	n/a	electricial problem
12/15/07	1050	668.10	n/a	n/a	n/a	n/a	electricial problem
3/31/08	1420	668.29	n/a	637	7.1	87.8	purge sample
6/5/08	950	668.31	n/a	648	7.1	86.7	purge sample

MW-14

Date	Time	Ground Water Depth (feet)	Ground Water Elevation (feet)	E C µmhos/cm	pH	Temp. ° F	Comments
9/--/06	n/a	n/a	n/a				purge sample
12/13/06	1230	233.18	n/a	594	7.8	77.6	purge sample
3/20/07	1405	232.04	n/a	612	7.6	77.8	purge sample
6/27/07	1520	233.79	n/a	594	7.5	77.9	purge sample
9/24/07	1215	234.50	n/a	586	7.3	77.6	purge sample
12/15/07	1125	233.65	n/a	n/a	n/a	n/a	electricial problem
3/31/08	1550	232.91	n/a	599	7.4	78.2	purge sample
6/5/08	1110	233.64	n/a	604	7.7	77.3	purge sample

Table 2: Primm Valley Golf Club water quality laboratory analysis

PVGC #7

Date	EC µmhos/cm	TDS mg/l	pH units	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Bicarb mg/l	SO4 mg/l	Cl mg/l
7/31/1997	2,720	1,520	7.7	77	15	430	7.0	150	39	750
7/15/98*	n/a	1,480	7.8	86	18	470	7.0	130	21	770
7/15/1998	2,720	1,530	7.7	85	17	450	7.0	170	46	680
7/7/1999	2,750	1,610	7.8	75	17	440	7.0	160	52	750
7/11/2000	2,360	1,580	7.8	78	17	440	7.0	160	48	760
7/10/2001	2,530	1,460	7.6	71	17	400	6.0	160	42	640
7/11/2002	2,400	1,300	7.7	68	17	380	6.0	160	37	650
7/23/2003	2,600	1,500	7.4	71	17	430	6.5	150	38	740
7/20/2004	2,300	1,300	7.9	65	19	330	5.4	160	38	550
7/20/04*	2,270	1,160	7.8	71	22	360	3.4	130	42	640
7/26/2005	2,500	1,400	7.8	77	17	400	6.0	160	38	740
8/29/2006	2,600	1,500	7.8	78	19	380	6.7	150	39	700
7/24/2007	2,500	1,400	7.9	77	19	390	6.1	150	40	690
7/9/2008	2,300	1,300	7.8	76	24	360	5.8	160	40	640

*Duplicate QA sample analysis

PVGC #8

Date	EC µmhos/cm	TDS mg/l	pH units	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Bicarb mg/l	SO4 mg/l	Cl mg/l
7/31/1997	1,760	940	8.0	31	11	300	5.0	190	46	400
7/15/1998	1,740	940	8.0	33	14	300	5.0	200	50	350
7/11/2000	1,390	870	7.9	34	14	270	5.0	190	48	380
7/10/2001	1,760	940	7.7	31	13	260	5.0	180	46	350
7/10/01*	n/a	868	7.8	31	14	270	5.7	150	45	430
7/11/2002	not sampled/pump broken									
7/23/2003	not sampled/pump broken									
7/20/2004	1,600	930	7.9	57	30	190	4.4	180	38	340
7/26/2005	1,600	870	7.9	50	23	230	4.7	180	47	420
8/29/2006	1,600	860	7.9	40	19	240	4.8	180	48	370
8/29/06*	1,670	810	7.6	32	18	130	5.1	130	52	360
7/24/2007	1,600	900	8.0	46	21	240	4.6	180	44	370
7/9/2008	1,700	940	7.9	47	22	280	5.2	180	44	420

*Duplicate QA sample analysis

Table 2 continued: Primm Valley Golf Club water quality laboratory analysis

PVGC #9

Date	EC µmhos/cm	TDS mg/l	pH units	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Bicarb mg/l	SO4 mg/l	Cl⁻ mg/l
7/31/1997	730	420	8.2	25	10	110	3.0	230	47	66
7/15/1998	740	450	8.2	26	11	120	4.0	230	53	78
7/11/2000	690	410	8.1	23	11	120	3.0	230	53	90
7/10/2001	890	500	7.9	20	9	140	4.0	230	54	110
7/11/2002	730	400	7.9	25	16	97	2.7	210	42	88
7/23/2003	850	470	7.8	27	13	120	3.6	220	45	110
7/20/2004	910	510	8.2	30	15	120	3.6	220	47	120
7/20/2005	950	540	8.0	43	21	130	3.9	220	48	170
8/29/2006	1,100	590	8.0	44	23	130	3.9	210	55	180
7/24/2007	700	390	8.0	33	20	78	2.2	200	38	86
7/9/2008	1,200	720	8.0	61	32	140	4.2	210	65	220

WP-5

Date	EC µmhos/cm	TDS mg/l	pH units	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Bicarb mg/l	SO4 mg/l	Cl⁻ mg/l
9/24/1997	730	490	8.0	28	27	78	4.0	210	78	64
9/24/97*	720	530	6.9	27	29	86	5.0	180	79	57
7/15/1998	740	470	8.1	29	28	84	5.0	210	73	65
7/7/1999	780	460	7.8	27	28	85	4.0	210	81	69
7/11/2000	700	480	8.0	28	28	89	4.0	210	89	80
7/10/2001	not sampled/pump broken									
7/11/2002	840	470	7.8	28	28	92	4.4	200	27	22
7/23/2003	860	510	7.8	26	29	100	4.6	200	93	100
7/20/2004	910	540	7.9	30	30	100	4.5	210	95	97
7/20/2005	930	520	8.0	36	35	120	5.2	210	100	110
7/25/2006	950	540	8.0	32	32	110	4.9	210	100	120
7/24/2007	980	480	8.1	32	31	110	4.6	210	110	120
7/10/2008	1,000	560	7.9	31	31	120	4.9	220	110	130

*Duplicate QA sample analysis

Table 2 continued: Primm Valley Golf Club water quality laboratory analysis

WP-6

Date	EC µmhos/cm	TDS mg/l	pH units	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Bicarb mg/l	SO4 mg/l	Cl⁻ mg/l
9/24/1997	1,070	640	8.2	15	15	180	7.0	230	80	160
7/15/1998	1,010	640	8.3	15	15	190	7.0	240	74	160
7/7/1999	1,120	650	8.1	14	15	190	7.0	240	81	170
7/7/99*	n/a	635	7.9	17	17	220	8.3	190	88	180
7/11/2000	1,010	680	8.1	14	15	200	7.0	240	87	180
7/10/2001	1,190	670	8.0	15	16	200	8.0	230	79	180
7/11/2002	1,200	650	8.0	14	15	200	7.1	230	85	190
7/23/2003	1,200	680	8.0	14	16	220	7.2	230	86	210
7/20/2004	1,300	720	8.0	15	16	220	7.2	230	88	200
7/20/2005	1,200	730	8.0	18	18	240	8.0	240	92	230
7/20/2006	1,400	730	8.1	16	17	250	8.0	230	91	230
7/24/2007	1,400	720	8.2	16	16	230	7.1	230	95	230
7/10/2008	1,400	760	8.1	15	17	240	7.5	240	98	240

*Duplicate QA sample analysis

M-8

Date	EC µmhos/cm	TDS mg/l	pH units	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Bicarb mg/l	SO4 mg/l	Cl⁻ mg/l
9/24/1997	3,990	2,260	8.3	17	19	810	6	280	230	980
7/15/1998	4,420	2,520	8.2	21	19	920	12	310	250	1,100
7/7/1999	4,770	2,700	8.2	18	17	960	13	300	250	1,200
7/11/2000	3,980	2,640	8.2	17	15	1,000	12	300	260	1,200
7/10/2001	4,640	2,630	8.0	16	15	940	12	290	240	1,200
7/11/2002	4,500	2,700	8.2	15	15	970	13	300	260	1,300
7/23/2003	4,500	2,500	8.2	14	14	920	13	290	250	1,300
7/23/03*	4,490	2,470	8.4	15	15	760	13	250	250	1,200
7/20/2004	4,500	2,500	8.2	14	14	860	12	300	230	930
7/20/2005	not sampled/pump broken									
8/29/2006	4,400	2,400	8.5	14	14	810	12	290	240	1,100
8/2/2007	4,100	2,300	8.6	11	12	810	11	240	230	1,000
7/10/2008	4,200	2,300	8.5	13	14	830	12	280	220	1,100

*Duplicate QA sample analysis

Table 2 continued: Primm Valley Golf Club water quality laboratory analysis

Colosseum #1

Date	EC µmhos/cm	TDS mg/l	pH units	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Bicarb mg/l	SO4 mg/l	Cl mg/l
7/7/1999	620	350	7.9	33	21	58	2.0	200	44	59
7/11/2000	550	380	7.9	33	20	58	2.0	200	36	63
7/11/00*	n/a	334	7.79	40	25	67	3.0	160	36	65
7/10/2001	660	380	7.6	36	22	59	3.0	200	36	69
7/11/2002	660	360	7.8	34	20	59	2.6	200	35	78
7/23/2003	670	380	7.7	34	21	62	2.4	200	34	76
7/20/2004	680	380	7.8	35	21	60	2.4	200	42	97
7/20/2005	740	500	8	46	26	77	3.0	200	32	110
8/22/05**	680	420	8.0	40	24	69	2.7	200	37	88
8/22/05*	n/a	394	n/a	36	24	27	3.0	160	39	80
7/25/2006	700	380	8.0	37	23	67	2.6	200	35	88
7/24/2007	750	450	8.0	40	23	68	2.3	200	33	110
*8/14/2007	720	403	7.7	41	25	59	3.0	160	37	91
7/10/2008	760	450	7.9	44	25	74	2.8	200	35	110

*Duplicate QA sample analysis.

**Additional sample collected in 2005 due to anomolous July 2005 result.

Colosseum #2

Date	EC µmhos/cm	TDS mg/l	pH units	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Bicarb mg/l	SO4 mg/l	Cl mg/l
7/7/1999	600	340	7.9	29	21	57	2.0	200	46	51
7/11/2000	510	350	7.9	29	20	57	2.0	200	46	53
7/10/2001	580	320	7.6	30	20	57	3.0	210	32	41
7/11/2002	590	330	7.9	29	20	57	2.3	200	37	54
7/11/2002*	596	483	7.9	31	21	57	2.9	160	32	59
7/23/2003	600	330	7.7	28	20	57	2.2	200	37	54
7/20/2004	600	330	8.0	29	20	56	2.2	200	39	55
7/20/2005	600	380	8	34	23	63	2.5	200	39	59
7/25/2006	600	360	7.9	29	21	57	2.2	200	37	58
7/24/2007	600	330	8	31	20	60	2.0	200	31	56
7/9/2008	610	350	7.8	33	22	62	2.5	200	37	58
7/9/2008*	619	301	7.8	29	21	62	2.6	180	47	57

*Duplicate QA sample analysis

Table 2 continued: Primm Valley Golf Club water quality laboratory analysis

M-13

Date	EC µmhos/cm	TDS mg/l	pH units	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Bicarb mg/l	SO4 mg/l	Cl mg/l
4/8/2004		404	7.8	66	24	89	4.1	160	37	80
8/30/2004		344	7.8	30	14	90	5	170	110	200
9/27/2006	670	370	7.9					170	50	74
8/2/2007		380	7.8	27	13	80	3.3	200	44	73
7/10/2008	670	340	7.7	31	13	82	3.1	200	44	74

*Duplicate QA sample analysis

M-14

Date	EC µmhos/cm	TDS mg/l	pH units	Ca mg/l	Mg mg/l	Na mg/l	K mg/l	Bicarb mg/l	SO4 mg/l	Cl mg/l
6/27/2003		323	7.9	44	30	83	4.3	170	57	84
4/8/2004		341	7.8	32	22		nd	160	92	71
8/30/2004		326	7.8	35	26	67	3.2	160	22	100
9/27/2006	650	360	8					170	47	78
8/16/2007		360	7.8	31	22	61	2.6	210	42	70
7/10/2008	640	330	7.8	31	21	58	2.3	200	40	65

*Duplicate QA sample analysis

Table 3: Primm Valley Golf Course ground-water usage in acre feet

Ground-water Withdrawl from July 10, 1998 through July 10, 1999

Month	Well 1	Well 2	Well 7	Well 8	Well 9	Total 1-9
Jul-98	29.90	18.40	28.00	48.80	47.00	172.10
Aug-98	93.10	46.30	22.50	38.90	36.30	237.10
Sep-98	85.90	31.00	5.10	19.90	16.40	158.30
Oct-98	104.90	57.70	42.50	35.70	0.00	240.80
Nov-98	59.40	32.70	7.20	31.50	0.00	130.80
Dec-98	27.80	15.30	6.40	8.40	0.00	57.90
Jan-99	32.30	17.80	9.20	0.00	0.00	59.30
Feb-99	41.90	23.00	2.70	0.00	0.00	67.60
Mar-99	49.30	38.60	6.70	8.40	0.00	103.00
Apr-99	86.80	53.90	3.00	13.80	0.00	157.50
May-99	107.50	57.50	53.10	0.00	0.00	218.10
Jun-99	121.30	68.10	66.30	0.00	0.00	255.70
Jul-99	28.50	19.30	22.10	0.00	0.00	69.90
Total	868.60	479.60	274.80	205.40	99.70	1928.10

Ground-water Withdrawl from July 10, 1999 through July 10, 2000

Month	Well 1	Well 2	Well 7	Well 8	Well 9	Total 1-9
Jul-99	63.04	41.63	27.51	0.01	0.01	132.20
Aug-99	113.00	75.80	36.50	0.00	0.00	225.30
Sep-99	103.10	72.00	0.30	0.00	0.00	175.40
Oct-99	102.70	88.30	55.60	0.00	0.00	246.60
Nov-99	76.30	51.60	0.00	0.00	0.00	127.90
Dec-99	37.10	24.90	0.00	0.00	0.00	62.00
Jan-00	39.90	26.10	0.00	0.00	0.00	66.00
Feb-00	31.50	18.10	0.00	0.00	0.00	49.60
Mar-00	75.80	50.70	0.00	0.00	0.00	126.50
Apr-00	96.90	62.10	0.00	0.00	0.00	159.00
May-00	126.90	82.10	0.00	0.00	0.00	209.00
Jun-00	122.40	78.80	0.00	74.50	0.30	276.00
Jul-00	27.30	14.90	0.00	23.40	22.00	87.60
Total	1015.94	687.03	119.91	97.91	22.31	1943.10

Ground-water Withdrawl from July 10, 2000 through July 10, 2001

Month	Well 1	Well 2	Well 7	Well 8	Well 9	Total 1-9
Jul-00	75.91	24.83	0.00	75.91	49.84	226.49
Aug-00	75.00	44.10	0.00	31.70	28.40	179.20
Sep-00	96.00	56.70	0.00	47.00	38.60	238.30
Oct-00	43.40	25.40	0.00	20.80	14.90	104.50
Nov-00	40.50	15.40	0.00	3.90	2.80	62.60
Dec-00	27.60	13.00	0.00	0.40	0.30	41.30
Jan-01	12.15	6.71	0.00	0.17	0.15	19.18
Feb-01	14.44	0.00	0.00	8.22	3.59	26.25
Mar-01	10.95	23.34	0.00	27.26	17.98	79.53
Apr-01	34.40	91.90	0.00	24.20	19.50	170.00
May-01	74.30	86.80	0.00	31.00	19.60	211.70
Jun-01	100.48	111.86	0.00	1.66	0.61	214.61
Jul-01	25.32	28.68	0.00	0.00	0.00	54.00
Total	630.45	528.72	0.00	272.22	196.27	1627.66

Table 3: Primm Valley Golf Course ground-water usage in acre feet

Ground-water Withdrawl from July 10, 2001 through July 10, 2002

Month	Well 1	Well 2	Well 7	Well 8	Well 9	Total 1-9
Jul-01	64.74	70.64	7.68	25.06	11.72	179.84
Aug-01	98.74	107.22	0.00	0.00	-6.72	199.24
Sep-01	96.94	105.22	0.00	8.37	0.00	210.53
Oct-01	69.71	70.02	0.00	7.12	0.00	146.85
Nov-01	28.98	31.13	0.00	0.00	0.00	60.11
Dec-01	31.41	33.38	0.00	1.71	1.33	67.83
Jan-02	10.86	27.88	0.00	0.00	0.00	38.74
Feb-02	39.13	41.31	0.00	0.00	0.00	80.44
Mar-02	66.63	60.28	1.35	0.80	0.86	129.92
Apr-02	79.34	85.74	0.00	0.00	0.00	165.08
May-02	96.65	104.82	0.03	0.00	0.59	202.09
Jun-02	104.26	113.45	0.85	0.00	0.46	219.02
Jul-02	40.66	43.87	0.00	0.00	0.00	84.53
Total	828.05	894.96	9.91	43.06	8.24	1784.22

Ground-water Withdrawl from July 10, 2002 through July 10, 2003

Month	Well 1	Well 2	Well 7	Well 8	Well 9	Total 1-9
Jul-02	66.16	71.69	0.85	0.00	0.00	138.70
Aug-02	107.78	99.36	0.10	0.00	22.46	229.70
Sep-02	120.69	131.52	0.00	0.00	10.86	263.07
Oct-02	88.70	36.17	0.63	0.11	2.57	128.18
Nov-02	21.78	29.50	0.00	-0.09	0.30	51.49
Dec-02	5.30	32.50	10.04	0.54	5.37	53.75
Jan-03	31.70	16.50	0.39	0.00	0.00	48.59
Feb-03	34.50	15.00	0.00	0.00	0.00	49.50
Mar-03	20.76	62.26	0.14	0.00	0.00	83.16
Apr-03	79.37	56.16	0.00	0.00	0.00	135.53
May-03	102.79	102.74	1.20	0.00	0.00	206.73
Jun-03	112.54	114.47	20.27	0.00	0.09	247.37
Jul-03	37.45	40.42	0.00	8.65	5.66	92.18
Total	829.52	808.29	33.62	9.21	47.31	1727.95

Ground-water Withdrawl from July 10, 2003 through July 10, 2004

Month	Well 1	Well 2	Well 7	Well 8	Well 9	Total 1-9
Jul-03	67.89	72.17	8.99	0.30	12.05	161.40
Aug-03	79.37	84.50	0.00	0.00	0.00	163.87
Sep-03	111.93	122.25	1.71	0.30	0.00	236.19
Oct-03	80.91	71.27	0.00	0.05	0.00	152.23
Nov-03	22.88	19.37	1.23	0.00	0.00	43.48
Dec-03	38.81	2.53	0.19	1.03	0.71	43.27
Jan-04	23.40	0.00	0.00	0.00	0.00	23.40
Feb-04	41.68	8.60	0.00	0.00	0.00	50.28
Mar-04	65.96	56.94	0.57	0.43	0.00	123.90
Apr-04	68.64	73.15	0.00	0.00	0.00	141.79
May-04	107.40	103.75	0.00	0.00	0.00	211.15
Jun-04	117.81	126.51	0.79	0.67	0.00	245.78
Jul-04	40.21	43.44	0.00	0.00	0.00	83.65
Total	866.89	784.48	13.48	2.78	12.76	1680.39

Table 3: Primm Valley Golf Course ground-water usage in acre feet

Ground-water Withdrawl from July 10, 2004 through July 10, 2005

Month	Well 1	Well 2	Well 7	Well 8	Well 9	Total 1-9
Jul-04	75.08	80.67	0.79	0.59	0.38	157.51
Aug-04	107.26	105.53	0.00	0.00	0.00	212.79
Sep-04	102.42	92.45	0.80	0.58	0.36	196.61
Oct-04	39.69	45.04	0.02	0.00	0.00	84.75
Nov-04	27.99	17.27	0.00	0.27	0.00	45.53
Dec-04	18.81	10.17	1.24	0.00	7.69	37.91
Jan-05	4.55	0.40	0.00	0.00	0.00	4.95
Feb-05	17.92	10.54	0.00	0.00	0.00	28.46
Mar-05	47.30	9.92	3.04	2.22	1.48	63.96
Apr-05	67.89	71.01	0.00	0.00	0.00	138.90
May-05	121.55	89.13	0.00	0.00	0.00	210.68
Jun-05	119.14	115.04	5.35	4.16	6.87	250.56
Jul-05	44.51	47.83	0.00	0.00	9.25	101.59
Total	794.11	695.00	11.24	7.82	26.03	1534.20

Ground-water Withdrawl from July 10, 2005 through July 10, 2006

Month	Well 1	Well 2	Well 7	Well 8	Well 9	Total 1-9
Jul-05	55.74	63.73	3.31	2.54	4.72	130.04
Aug-05	77.73	99.13	0.00	0.00	0.00	176.86
Sep-05	113.75	122.23	2.96	0.67	1.49	241.10
Oct-05	40.75	52.30	0.00	0.00	0.00	93.05
Nov-05	53.93	19.11	0.00	0.00	0.00	73.04
Dec-05	0.89	31.07	9.87	0.00	5.08	46.91
Jan-06	0.44	41.32	3.31	0.00	0.00	45.07
Feb-06	5.07	16.55	0.00	0.01	0.00	21.63
Mar-06	12.37	83.47	4.54	3.19	8.28	111.85
Apr-06	43.70	80.85	0.00	0.00	0.04	124.59
May-06	78.75	113.06	22.06	0.00	13.67	227.54
Jun-06	110.79	120.54	3.87	0.00	24.27	259.47
Jul-06	6.88	21.05	0.00	4.56	5.33	37.82
Total	600.79	864.41	49.92	10.97	62.88	1588.97

Ground-water Withdrawl from July 10, 2006 through July 10, 2007

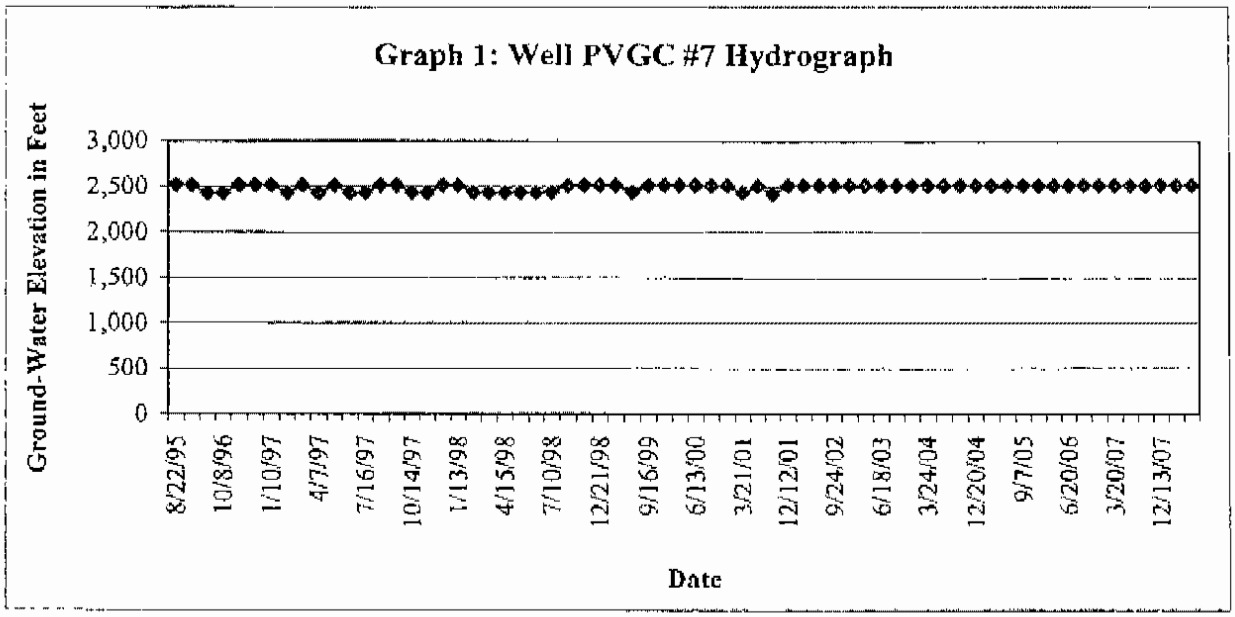
Month	Well 1	Well 2	Well 7	Well 8	Well 9	Total 1-9
Jul-06	73.09	74.15	0.00	0.64	4.31	152.19
Aug-06	120.02	117.54	3.69	0.09	5.29	246.63
Sep-06	107.53	102.07	0.98	3.53	13.95	228.06
Oct-06	72.90	16.58	0.00	0.00	0.00	89.48
Nov-06	68.37	43.96	0.00	0.00	0.00	112.33
Dec-06	14.76	0.49	2.78	0.01	1.40	19.44
Jan-07	44.06	18.29	0.00	0.00	0.00	62.35
Feb-07	64.96	3.96	0.00	0.00	0.00	68.92
Mar-07	76.31	33.33	1.28	0.84	0.57	112.33
Apr-07	112.16	59.42	0.00	0.00	0.00	171.58
May-07	103.99	109.17	0.19	0.18	0.00	213.53
Jun-07	118.29	110.23	0.21	0.00	0.00	228.73
Jul-07	38.83	38.73	3.70	3.42	0.00	84.68
Total	1015.27	727.92	12.83	8.71	25.52	1790.25

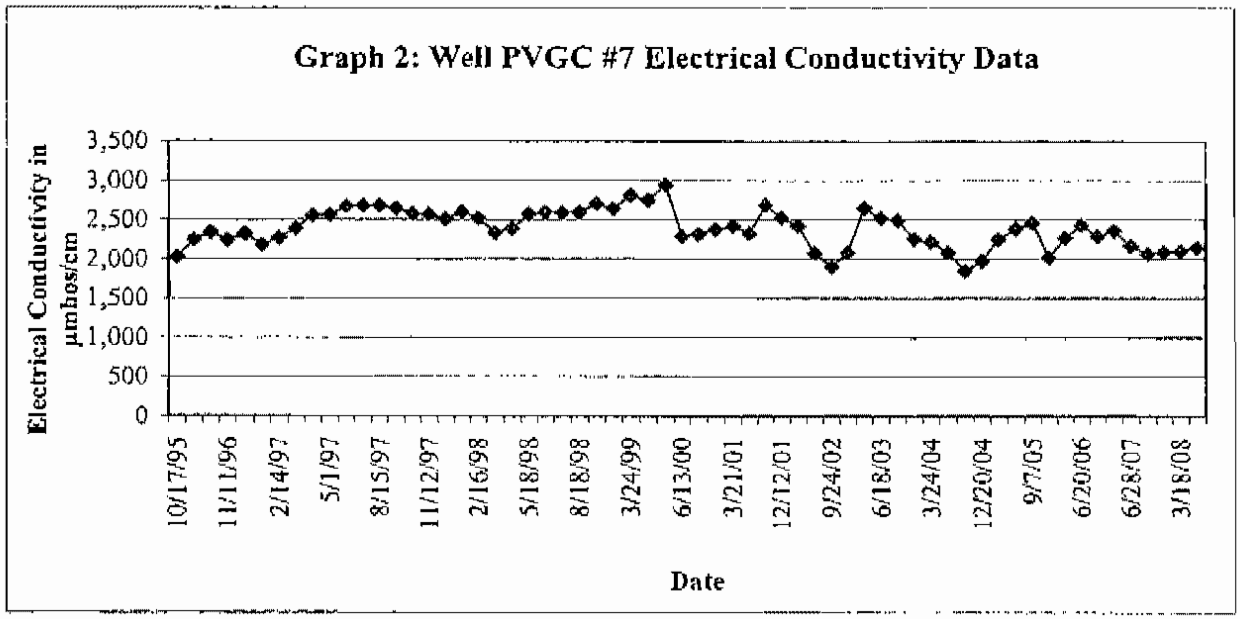
Table 3: Primm Valley Golf Course ground-water usage in acre feet

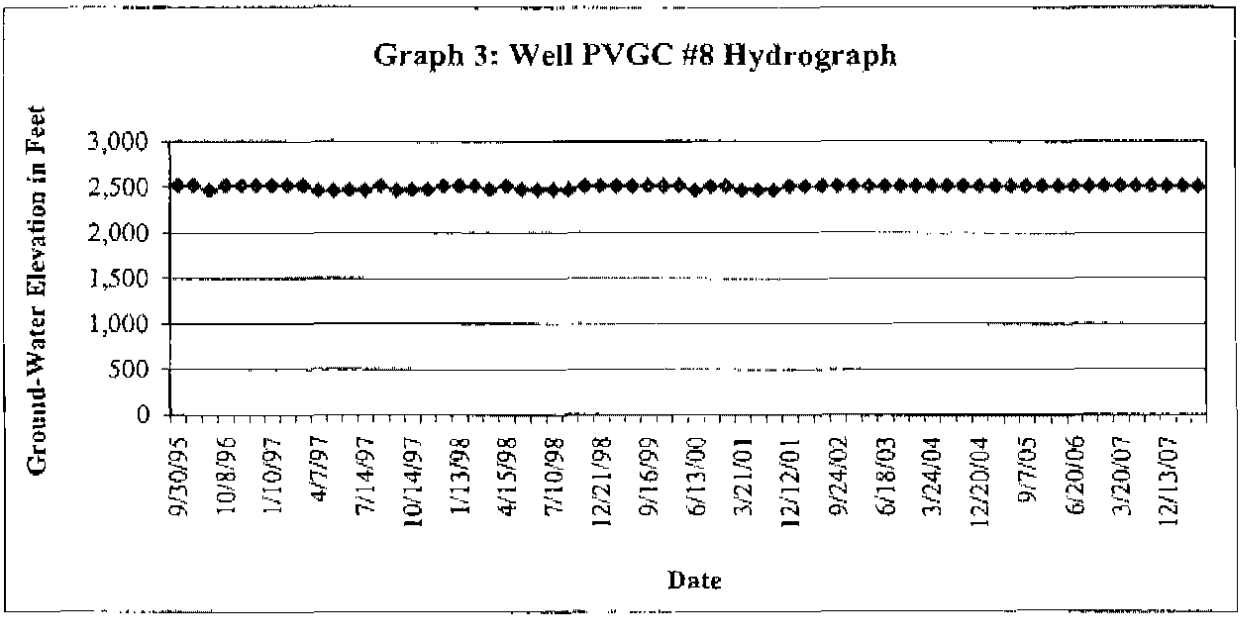
Ground-water Withdrawl from July 10, 2007 through July 10, 2008

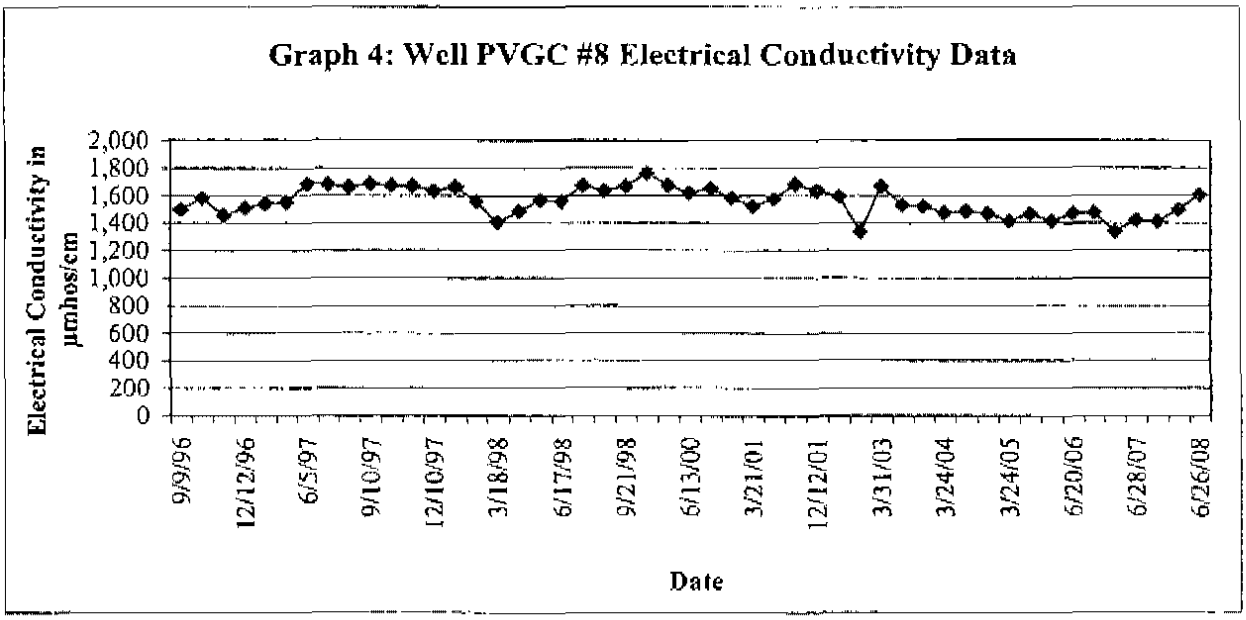
Month	Well 1	Well 2	Well 7	Well 8	Well 9	Total 1-9
Jul-07	65.97	66.49	23.54	17.43	0.00	173.43
Aug-07	106.45	95.21	0.00	0.00	0.00	201.66
Sep-07	79.22	72.77	0.00	0.00	0.00	151.99
Oct-07	118.10	22.70	0.00	0.00	0.00	140.80
Nov-07	66.89	0.03	0.78	0.61	0.38	68.69
Dec-07	24.99	0.69	0.60	0.00	0.00	26.29
Jan-08	20.14	4.02	0.00	0.00	0.00	24.16
Feb-08	48.09	0.00	0.07	0.00	0.00	48.16
Mar-08	127.42	0.00	0.06	0.04	0.02	127.54
Apr-08	124.26	39.51	0.00	15.45	0.00	179.22
May-08	68.41	109.70	0.00	0.00	0.00	178.11
Jun-08	123.83	108.96	0.00	6.99	0.00	239.78
Jul-08	38.73	40.11	3.86	3.09	2.03	87.82
Total	1012.50	560.19	28.92	43.61	2.43	1647.64

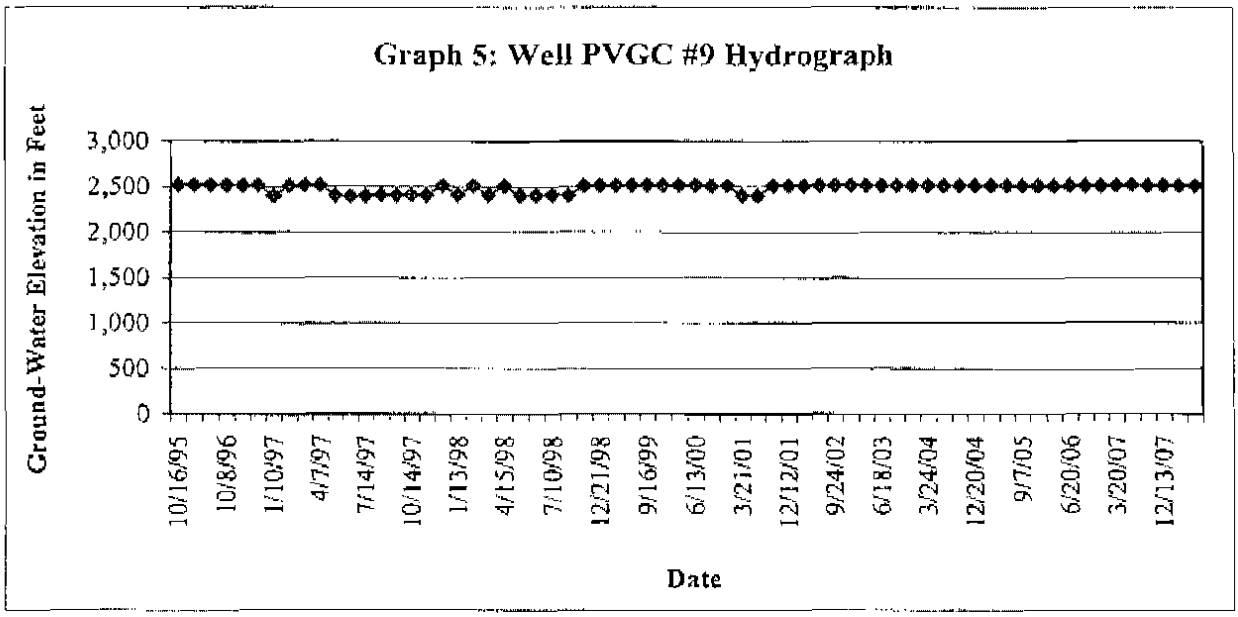
GRAPHS

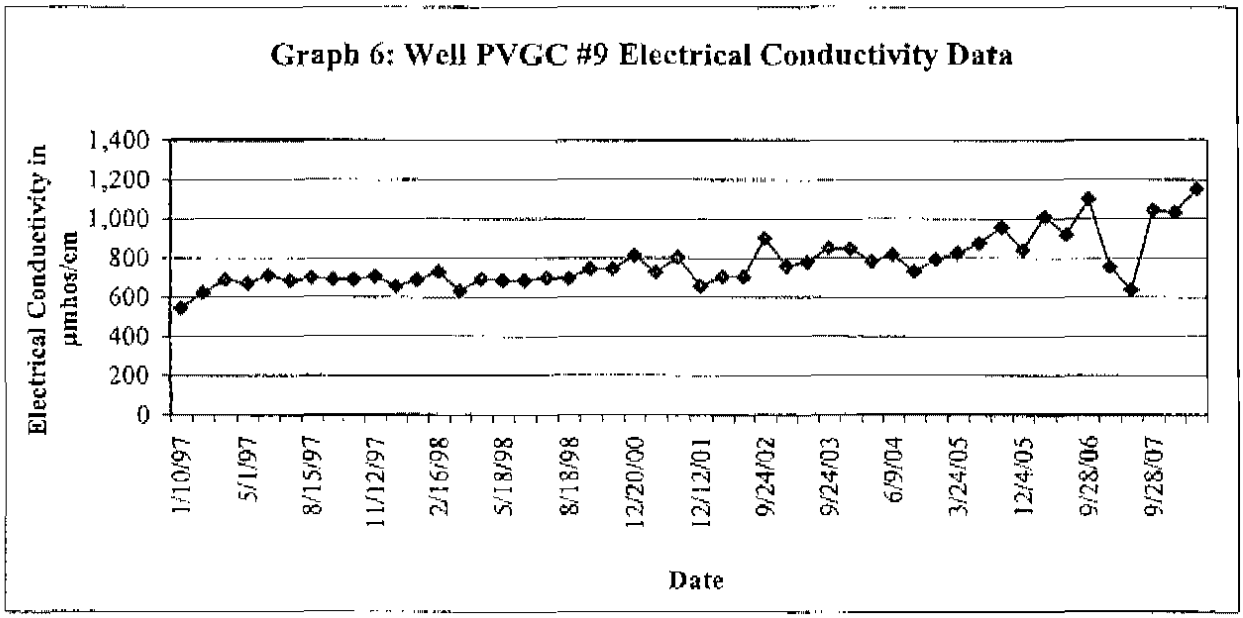

Graph 1: Well PVGC #7 Hydrograph
Ground-Water Elevation in Feet
3,000
2,500
2,000
1,500
1,000
500
0
8/22/95
10/8/96
1/10/97
4/7/97
7/16/97
10/14/97
1/13/98
4/15/98
7/10/98
12/21/98
9/16/99
6/13/00
3/21/01
12/12/01
9/24/02
6/18/03
3/24/04
12/20/04
9/7/05
6/20/06
3/20/07
12/13/07
Date

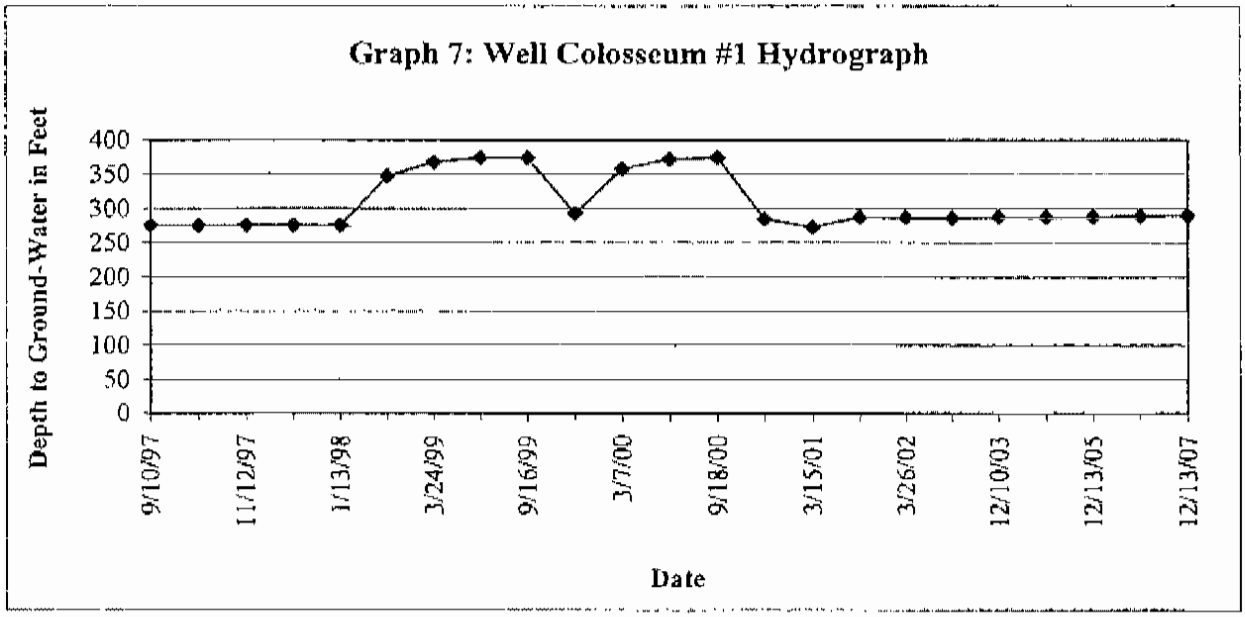

Graph 2: Well PVGC #7 Electrical Conductivity Data
Electrical Conductivity in µmhos/cm
3,500
3,000
2,500
2,000
1,500
1,000
500
0
10/17/95
11/11/96
2/14/97
5/1/97
8/15/97
11/12/97
2/16/98
5/18/98
8/18/98
3/24/99
6/13/00
3/21/01
12/12/01
9/24/02
6/18/03
3/24/04
12/20/04
9/7/05
6/20/06
6/28/07
3/18/08
Date

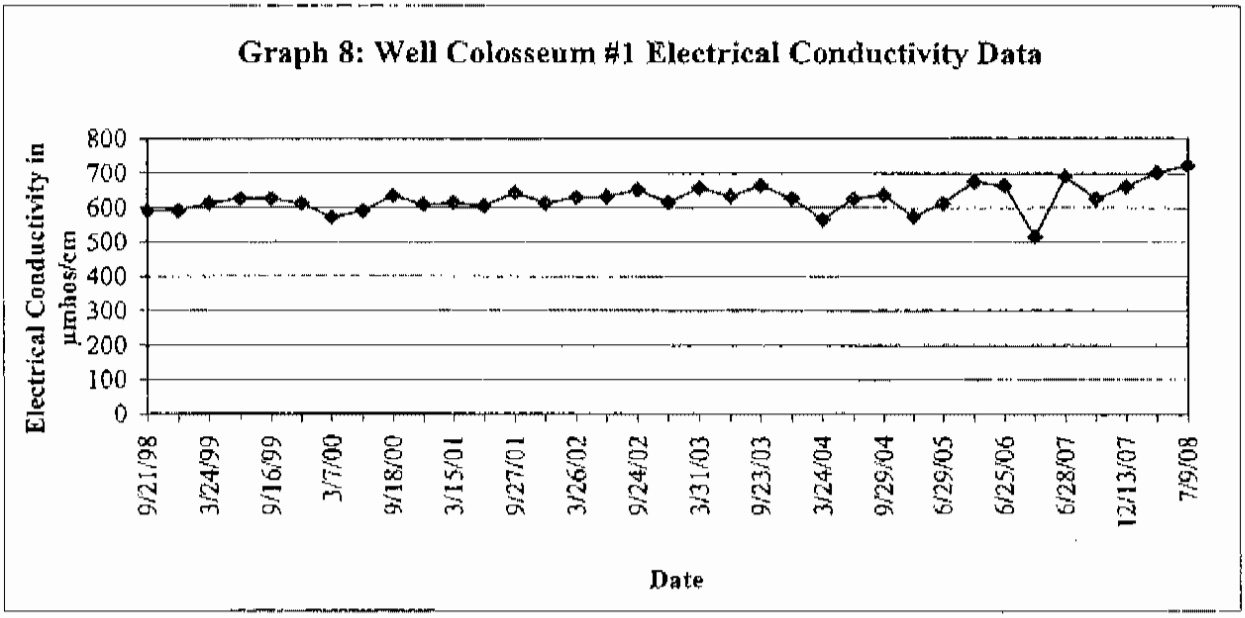

Graph 3: Well PVGC #8 Hydrograph
Ground-Water Elevation in Feet
3,000
2,500
2,000
1,500
1,000
500
0
9/30/95
10/8/96
1/10/97
4/7/97
7/14/97
10/14/97
1/13/98
4/15/98
7/10/98
12/21/98
9/16/99
6/13/00
3/21/01
12/12/01
9/24/02
6/18/03
3/24/04
12/20/04
9/7/05
6/20/06
3/20/07
12/13/07
Date

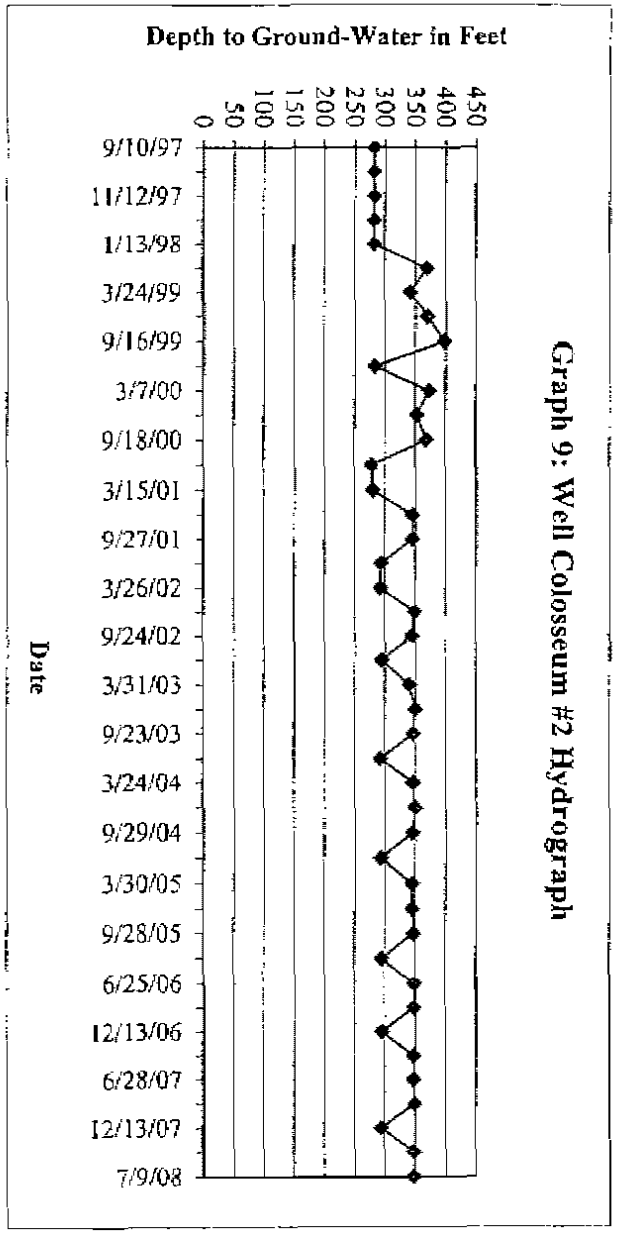

Graph 4: Well PVGC #8 Electrical Conductivity Data
Electrical Conductivity in µmhos/cm
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0
9/9/96
12/12/96
6/5/97
9/10/97
12/10/97
3/18/98
6/17/98
9/21/98
6/13/00
3/21/01
12/12/01
3/31/03
3/24/04
3/24/05
6/20/06
6/28/07
6/26/08
Date


Graph 5: Well PVGC #9 Hydrograph
Ground-Water Elevation in Feet
3,000
2,500
2,000
1,500
1,000
500
0
10/16/95
10/8/96
1/10/97
4/7/97
7/14/97
10/14/97
1/13/98
4/15/98
7/10/98
12/21/98
9/16/99
6/13/00
3/21/01
12/12/01
9/24/02
6/18/03
3/24/04
12/20/04
9/7/05
6/20/06
3/20/07
12/13/07
Date

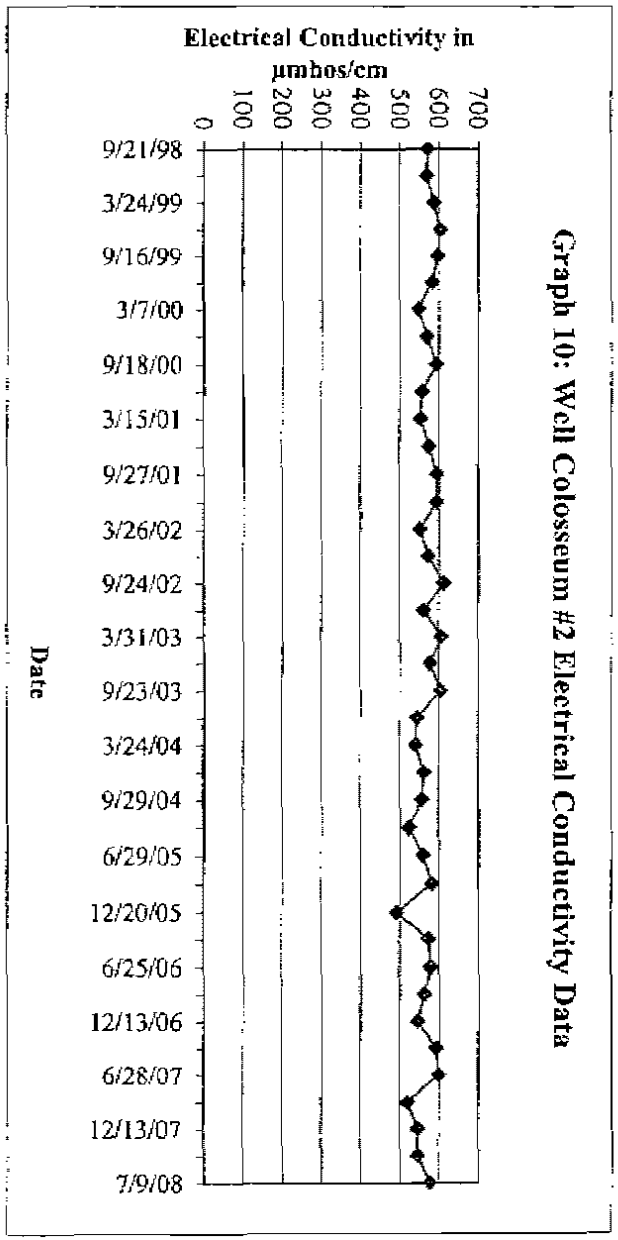

Graph 6: Well PVGC #9 Electrical Conductivity Data
Electrical Conductivity in µmhos/cm
1,400
1,200
1,000
800
600
400
200
0
1/10/97
5/1/97
8/15/97
11/12/97
2/16/98
5/18/98
8/18/98
12/20/00
12/12/01
9/24/02
9/24/03
6/9/04
3/24/05
12/4/05
9/28/06
9/28/07
Date


Graph 7: Well Colosseum #1 Hydrograph
Depth to Ground-Water in Feet
400
350
300
250
200
150
100
50
0
9/10/97
11/12/97
1/13/98
3/24/99
9/16/99
3/7/00
9/18/00
3/15/01
3/26/02
12/10/03
12/13/05
12/13/07
Date

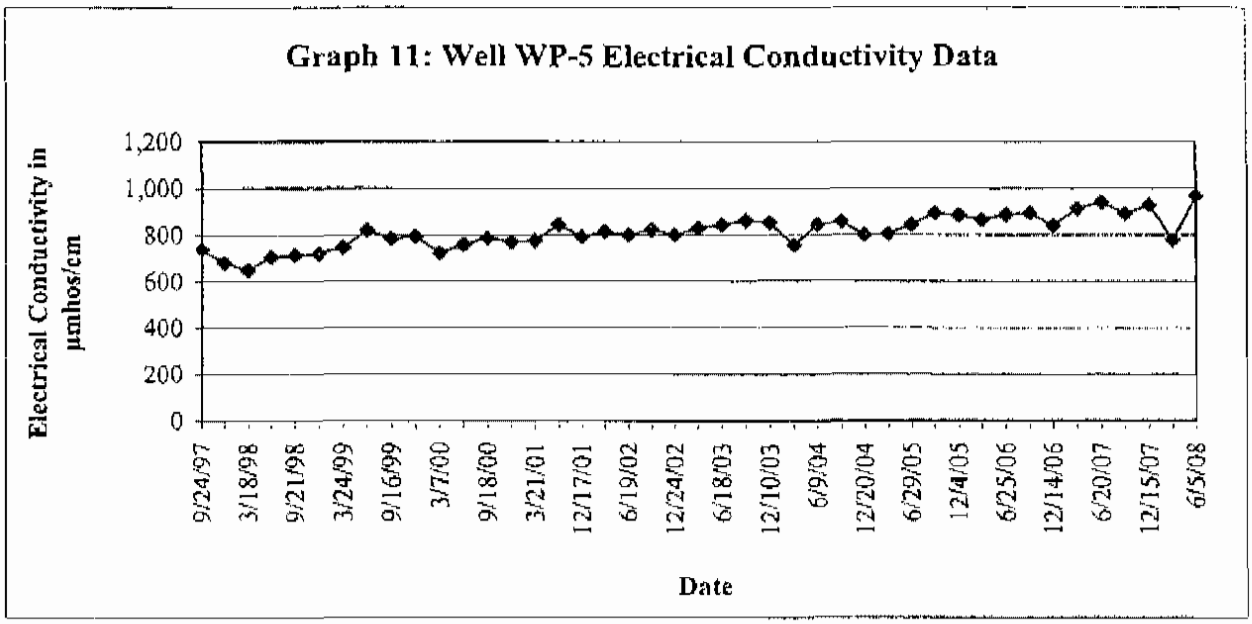

Graph 8: Well Colosseum #1 Electrical Conductivity Data
Electrical Conductivity in µmhos/cm
800
700
600
500
400
300
200
100
0
9/21/98
3/24/99
9/16/99
3/7/00
9/18/00
3/15/01
9/27/01
3/26/02
9/24/02
3/31/03
9/23/03
3/24/04
9/29/04
6/29/05
6/25/06
6/28/07
12/13/07
7/9/08
Date

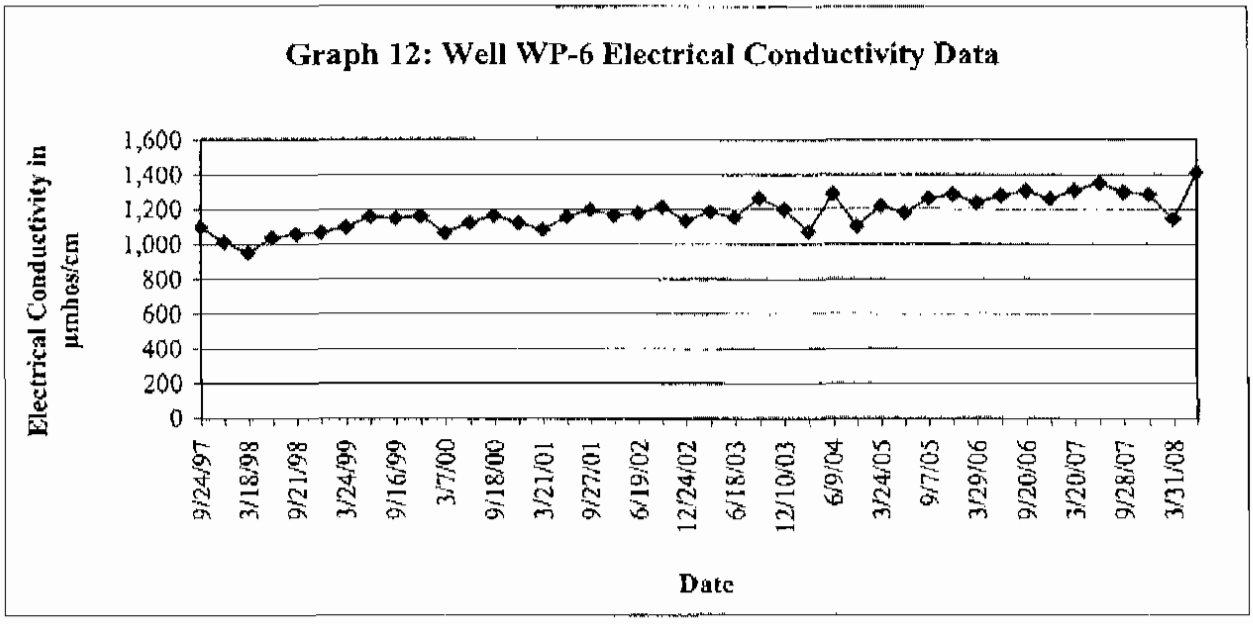


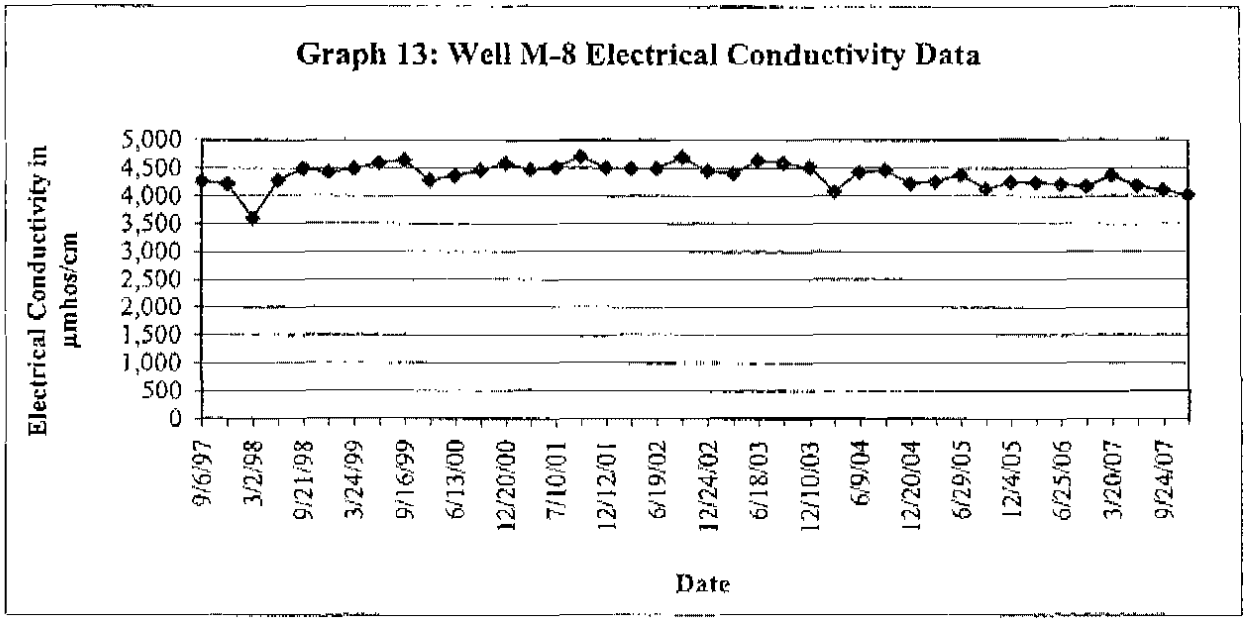
Graph 9: Well Colosseum #2 Hydrograph



Graph 10: Well Colosseum #2 Electrical Conductivity Data


Graph 11: Well WP-5 Electrical Conductivity Data
Electrical Conductivity in µmhos/cm
1,200
1,000
800
600
400
200
0
9/24/97
3/18/98
9/21/98
3/24/99
9/16/99
3/7/00
9/18/00
3/21/01
12/17/01
6/19/02
12/24/02
6/18/03
12/10/03
6/9/04
12/20/04
6/29/05
12/4/05
6/25/06
12/14/06
6/20/07
12/15/07
6/5/08
Date


Graph 12: Well WP-6 Electrical Conductivity Data
Electrical Conductivity in µmhos/cm
1,600
1,400
1,200
1,000
800
600
400
200
0
9/24/97
3/18/98
9/21/98
3/24/99
9/16/99
3/7/00
9/18/00
3/21/01
9/27/01
6/19/02
12/24/02
6/18/03
12/10/03
6/9/04
3/24/05
9/7/05
3/29/06
9/20/06
3/20/07
9/28/07
3/31/08
Date


Graph 13: Well M-8 Electrical Conductivity Data
Electrical Conductivity in µmhos/cm
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
9/6/97
3/2/98
9/21/98
3/24/99
9/16/99
6/13/00
12/20/00
7/10/01
12/12/01
6/19/02
12/24/02
6/18/03
12/10/03
6/9/04
12/20/04
6/29/05
12/4/05
6/25/06
3/20/07
9/24/07
Date

APPENDIX A

Revised Monitoring Plan (1999) Approval Letter Dated June 6, 2001

cc: [illegible]

COUNTY OF SAN BERNARDINO
ECONOMIC DEVELOPMENT
AND PUBLIC SERVICES GROUP

LAND USE SERVICES DEPARTMENT

PLANNING DIVISION
385 North Arrowhead Avenue • San Bernardino, CA 92415-0182 • (909) 387-4131
First Floor Fax (909) 387-3249 • Third Floor Fax (909) 387-3223
15505 Civic Drive • Victorville, CA 92392 • (760) 243-8245 • Fax (760) 243-8212
http://www.co.san-bernardino.ca.us/landuseservices

MICHAEL E. HAYS
Director of Land Use Services

San Bernardino Co. CUP
file

June 6, 2001

Mr. Lonnie Roy, Principal
Broadbent & Associates, Inc.
8 West Pacific Avenue
Henderson, NV 89015

RE: 1998-2000 GROUNDWATER MONITORING REPORT, PRIMM VALLEY GOLF CLUB (PVGC)

Dear Mr. Roy:

Thank you for complying with our December 15, 2000 request to submit the 1998-2000 Groundwater Monitoring Report for the Primm Valley Golf Club (PVGC). As indicated in your cover sheet, this single report, entitled *Groundwater Monitoring Annual Report, July 10, 1998 to July 10, 2000, Primm Valley Golf Club, PRMA Land Development Company, Ivanpah Valley, California,* presents monitoring results for both the second and third monitoring years (1998-1999 and 1999-2000). Robert C. Broadbent, Registered Geologist and Certified Hydrogeologist signed the report, which was prepared by Broadbent & Associates, Inc.

Upon receipt, County Land Use Services Department Staff and the County Geologist reviewed the *Groundwater Monitoring Annual Report* for the PVGC. Our evaluation of the report is as follows:

1. As one of the conditions of approval for the Primm Valley Golf Club, PRMA Land Development Company was required to submit a detailed plan for groundwater monitoring within six months of final project approval. The original Monitoring Plan that was prepared by Montgomery Watson and dated March 1997, established an annual groundwater extraction limit of 1,500 acre-feet and was determined to meet minimum requirements. The County approved this plan in July 1997. The first *Groundwater Monitoring Annual Report* indicated a withdrawal of 1,885 acre-feet – an amount that exceeded the maximum extraction of 1,500 acre-feet annually by 26%. In response to this, the County required a revised Groundwater Monitoring Plan. In September 1999, Broadbent & Associates, Inc. prepared and submitted a Revised Groundwater Monitoring Plan. The revised Groundwater Monitoring Plan, approved by the County, established an annual extraction limit of 1,800 acre-feet. Monitoring and reporting criteria used in the current report are based upon the 1999 revised plan.

2. The *Groundwater Monitoring Annual Report* currently being evaluated indicates that groundwater extraction for the past two years has increased again. Total volumes reported for 1998-1999 and 1999-2000 were 1,928 acre-feet and 1,954 acre-feet, respectively. In addition, the report indicated that a problem has been identified with the meters on both Colosseum Wells. In certain situations, the well meter for Colosseum Well 2 ran backwards. Therefore, the volume reported for 1999-2000 is an estimate only. The County is concerned that the actual volume extracted may be greater than reported.

3. Previous reviews of the original 1997 Monitoring Plan, the 1998 Annual Monitoring Report, and the 1999 Revised Monitoring Plan highlighted the importance of prompt construction of the required monitoring wells M-13 and M-14. The current report indicates that after nearly three years these wells have still not been constructed.

4. With the addition of the Colosseum Wells, the Revised Monitoring Plan indicated the PVGC Wells 7-9 would be *"used in the event of an emergency only"*. However, the 1998-2000 report indicates that over 800 acre-feet of groundwater has been withdrawn from these wells. This appears to be more than emergency consumption.

5. The Revised Monitoring Plan indicated that land survey monuments were to be established at Colosseum Wells 1 and 2 and surveyed on an annual basis. The report does not discuss monuments or surveying at these two locations. Additionally, the full survey data from a Licensed Land Surveyor is not included in the report.

Based on data included in the 1998-2000 report, the decline in static groundwater levels appears to be continuing. For the two year reporting period from July 1998 to July 2000, the report indicates a decline of over 18 feet at Colosseum Well 1 (the principal production well). While significance criteria are to be established as part of the required 5-year report, due in July 2002, it appears that the 18 foot decline is significant and should be reduced or otherwise mitigated.

Until final significance criteria are defined and approved in the 5-year report, the County retains the right to decide what constitutes a significant decline in groundwater levels. Based on the facts presented above, it appears that Primm Valley Golf Club is not in compliance with the Conditions of Approval. Failure to comply with the conditions required as part of the approval process may result in an enforcement action being taken by the County. If groundwater levels continue to decline the project proponent will be required to mitigate the impact.

It is essential for PRMA Land Development Company to immediately implement the following for the Primm Valley Golf Club:

1. Submit future Groundwater Monitoring Reports on an annual basis as stipulated in the Conditions of Approval.

2. As listed in the RECOMMENDATIONS and MITIGATION section of the 1998-2000 report, drill and complete M-13 & M-14 as offsite monitoring wells.

3. As listed in the RECOMMENDATIONS and MITIGATION section of the 1998-2000 report, obtain BLM approval to monitor and examine the Yates well and the Stateline well.

4. As listed in the RECOMMENDATIONS and MITIGATION section of the 1998-2000 report, remedy the problem identified with the well meters on Colosseum Wells 1 and 2, by calibrating and/or replacing the meters and checking the valves.

5. Establish land survey monuments at Colosseum Wells 1 and 2. Annually survey these two locations and include the full survey data from a Licensed Land Surveyor in future Groundwater Monitoring Annual Reports.

6. Develop and submit for County approval appropriate mitigation measures that will immediately eliminate or reduce to a less than significant level any further impacts by the Primm Valley Golf Club to static groundwater levels.

If you have any questions regarding this letter, please call me at (909) 387-4147.

Sincerely,

TRACY CREASON, Senior Associate Planner
Advance Planning

cc: PRMA Land Development Company
Randy Scott, AICP, Division Chief, Advance Planning
Wes Reeder, County Geologist
Mike Williams, Senior Associate Planner
MMRP File

CERTIFIED MAIL

County of San Bernardino
ED/PUBLIC SERVICES GROUP
Land Use Services Dept./ADV PLG
385 North Arrowhead Avenue, 3rd Floor
San Bernardino, CA 92415-0182

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RETURN RECEIPT REQUESTED

PRMA Land Development Company
P.O. Box 19129
Jean, NV 89109

89019-9129

APPENDIX B

Laboratory Data and Chain of Custody Records

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories sit 1906

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
A8G1026-01	PVGC M-13	Water	07/10/08 09:50	R. J. Johnson	07/11/08 09:00	FedEx
A8G1026-02	PVGC M-14	Water	07/10/08 10:50	R. J. Johnson	07/11/08 09:00	FedEx
A8G1026-03	PVGC WP-6	Water	07/10/08 11:50	R. J. Johnson	07/11/08 09:00	FedEx
A8G1026-04	PVGC WP-5	Water	07/10/08 12:20	R. J. Johnson	07/11/08 09:00	FedEx
A8G1026-05	PVGC M-8	Water	07/10/08 13:00	R. J. Johnson	07/11/08 09:00	FedEx

Included in this Data Package please find an amended report for the laboratory number referenced below.

Laboratory Number: A8G1026-01
Analysis: SM 2320B (Total Alkalinity/Bicarbonate)
Reason for Amendment:
As per client request, the analysis for SM 2320B (Total Alkalinity/Bicarbonate) was redone. Although all batches met the quality control acceptance criteria of the laboratory, the original results could not be duplicated. The retest results were confirmed by Cation-Anion expected ratios and the results of the retest appears on this report.

This report supersedes the report issued on 28-Jul-2008.

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Laboratory Reference Number
A8G1026-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC M-13	Water	07/10/08 09:50	07/11/08 9:00

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	130	3.0	mg/L	SM 3120B	07/21/08 19:08	lmt	
Calcium	31	1.0	mg/L	EPA 200.7	07/21/08 19:08	lmt	
Magnesium	13	1.0	mg/L	EPA 200.7	07/21/08 19:08	lmt	
dium	82	1.0	mg/L	EPA 200.7	07/21/08 19:08	lmt	
Potassium	3.1	1.0	mg/L	EPA 200.7	07/21/08 19:08	lmt	
Anions							
Total Alkalinity	160	3.0	mg/L	SM 2320B	08/12/08 13:57	je	N_HTa
Hydroxide	ND	3.0	mg/L	SM 2320B	08/12/08 13:57	je	N_HTa
Carbonate	ND	3.0	mg/L	SM 2320B	08/12/08 13:57	je	N_HTa
Bicarbonate	200	3.0	mg/L	SM 2320B	08/12/08 13:57	je	N_HTa
Chloride	74	1.0	mg/L	EPA 300.0	07/11/08 23:07	SBD	
Sulfate	44	0.50	mg/L	EPA 300.0	07/11/08 23:07	SBD	
Nitrate	4.4	1.0	mg/L	EPA 300.0	07/11/08 23:07	SBD	
Aggregate Properties							
pH	7.7	1.0	pH Units	SM 4500H+ B	07/11/08 19:02	rmc	
Specific Conductance	670	1.0	umhos/cm	SM 2510 B	07/11/08 19:02	rmc	
Solids							
Total Dissolved Solids	340	20	mg/L	SM 2540C	07/16/08 18:05	jma	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/11/08 16:00	ctl	

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Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Laboratory Reference Number
A8G1026-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC M-13	Water	07/10/08 09:50	07/11/08 9:00

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Copper	ND	50	ug/L	EPA 200.7	07/21/08 19:08	lmt	
Iron	140	100	ug/L	EPA 200.7	07/21/08 19:08	lmt	
Manganese	37	20	ug/L	EPA 200.7	07/21/08 19:08	lmt	
Zinc	660	50	ug/L	EPA 200.7	07/21/08 19:08	lmt	

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Client Name: Geosciences Consulting
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Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Laboratory Reference Number
A8G1026-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC M-14	Water	07/10/08 10:50	07/11/08 9:00

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	170	3.0	mg/L	SM 3120B	07/21/08 19:10	lmt	
Calcium	31	1.0	mg/L	EPA 200.7	07/21/08 19:10	lmt	
Magnesium	21	1.0	mg/L	EPA 200.7	07/21/08 19:10	lmt	
Sodium	58	1.0	mg/L	EPA 200.7	07/21/08 19:10	lmt	
Potassium	2.3	1.0	mg/L	EPA 200.7	07/21/08 19:10	lmt	
Anions							
Total Alkalinity	170	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Hydroxide	ND	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Carbonate	ND	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Bicarbonate	200	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Chloride	65	1.0	mg/L	EPA 300.0	07/11/08 23:17	SBD	
Sulfate	40	0.50	mg/L	EPA 300.0	07/11/08 23:17	SBD	
Nitrate	6.2	1.0	mg/L	EPA 300.0	07/11/08 23:17	SBD	
Aggregate Properties							
pH	7.8	1.0	pH Units	SM 4500H+ B	07/11/08 19:02	rmc	
Specific Conductance	640	1.0	umhos/cm	SM 2510 B	07/11/08 19:02	rmc	
Solids							
Total Dissolved Solids	330	20	mg/L	SM 2540C	07/16/08 18:05	jma	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/11/08 16:00	ctl	

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Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Laboratory Reference Number
A8G1026-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC M-14	Water	07/10/08 10:50	07/11/08 9:00

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Copper	ND	50	ug/L	EPA 200.7	07/21/08 19:10	lmt	
Iron	150	100	ug/L	EPA 200.7	07/21/08 19:10	lmt	
Manganese	ND	20	ug/L	EPA 200.7	07/21/08 19:10	lmt	
Zinc	720	50	ug/L	EPA 200.7	07/21/08 19:10	lmt	

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Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Laboratory Reference Number
A8G1026-03

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC WP-6	Water	07/10/08 11:50	07/11/08 9:00

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	110	3.0	mg/L	SM 3120B	07/21/08 19:12	lmt	
Calcium	15	1.0	mg/L	EPA 200.7	07/21/08 19:12	lmt	
Magnesium	17	1.0	mg/L	EPA 200.7	07/21/08 19:12	lmt	
Sodium	240	1.0	mg/L	EPA 200.7	07/21/08 19:12	lmt	
Potassium	7.5	1.0	mg/L	EPA 200.7	07/21/08 19:12	lmt	
Anions							
Total Alkalinity	200	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Hydroxide	ND	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Carbonate	ND	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Bicarbonate	240	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Chloride	240	1.0	mg/L	EPA 300.0	07/12/08 00:07	SBD	
Sulfate	98	0.50	mg/L	EPA 300.0	07/12/08 00:07	SBD	
Nitrate	20	1.0	mg/L	EPA 300.0	07/12/08 00:07	SBD	
Aggregate Properties							
pH	8.1	1.0	pH Units	SM 4500H+ B	07/11/08 19:02	rmc	
Specific Conductance	1400	1.0	umhos/cm	SM 2510 B	07/11/08 19:02	rmc	
Solids							
Total Dissolved Solids	760	20	mg/L	SM 2540C	07/16/08 18:05	jma	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/11/08 16:00	ctl	

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Client Name: Geosciences Consulting
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Address: 948 Keys Drive
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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Laboratory Reference Number
A8G1026-03

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC WP-6	Water	07/10/08 11:50	07/11/08 9:00

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Copper	ND	50	ug/L	EPA 200.7	07/21/08 19:13	lmt	
Iron	ND	100	ug/L	EPA 200.7	07/21/08 19:13	lmt	
Manganese	ND	20	ug/L	EPA 200.7	07/21/08 19:13	lmt	
Zinc	ND	50	ug/L	EPA 200.7	07/21/08 19:13	lmt	

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Client Name: Geosciences Consulting
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Address: 948 Keys Drive
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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Laboratory Reference Number
A8G1026-04

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC WP-5	Water	07/10/08 12:20	07/11/08 9:00

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	210	3.0	mg/L	SM 3120B	07/21/08 19:14	lmt	
Calcium	31	1.0	mg/L	EPA 200.7	07/21/08 19:14	lmt	
Magnesium	31	1.0	mg/L	EPA 200.7	07/21/08 19:14	lmt	
Sodium	120	1.0	mg/L	EPA 200.7	07/21/08 19:14	lmt	
Potassium	4.9	1.0	mg/L	EPA 200.7	07/21/08 19:14	lmt	
Anions							
Total Alkalinity	180	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Hydroxide	ND	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Carbonate	ND	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Bicarbonate	220	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Chloride	130	1.0	mg/L	EPA 300.0	07/12/08 00:17	SBD	
Sulfate	110	0.50	mg/L	EPA 300.0	07/12/08 00:17	SBD	
Nitrate	21	1.0	mg/L	EPA 300.0	07/12/08 00:17	SBD	
Aggregate Properties							
pH	7.9	1.0	pH Units	SM 4500H+ B	07/11/08 19:02	rmc	
Specific Conductance	1000	1.0	umhos/cm	SM 2510 B	07/11/08 19:02	rmc	
Solids							
Total Dissolved Solids	560	20	mg/L	SM 2540C	07/17/08 13:00	jma	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/11/08 16:00	ctl	

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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Laboratory Reference Number
A8G1026-04

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC WP-5	Water	07/10/08 12:20	07/11/08 9:00

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Copper	ND	50	ug/L	EPA 200.7	07/21/08 19:15	lmt	
Iron	ND	100	ug/L	EPA 200.7	07/21/08 19:15	lmt	
Manganese	ND	20	ug/L	EPA 200.7	07/21/08 19:15	lmt	
Zinc	ND	50	ug/L	EPA 200.7	07/21/08 19:15	lmt	

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Client Name: Geosciences Consulting
Contact: R. J. Johnson
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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Laboratory Reference Number
A8G1026-05

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC M-8	Water	07/10/08 13:00	07/11/08 9:00

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	91	3.0	mg/L	SM 3120B	07/21/08 19:16	lmt	
Calcium	13	1.0	mg/L	EPA 200.7	07/21/08 19:16	lmt	
Magnesium	14	1.0	mg/L	EPA 200.7	07/21/08 19:16	lmt	
Sodium	830	5.0	mg/L	EPA 200.7	07/24/08 17:47	lmt	
Potassium	12	1.0	mg/L	EPA 200.7	07/21/08 19:16	lmt	
Anions							
Total Alkalinity	240	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Hydroxide	ND	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Carbonate	4.8	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Bicarbonate	280	3.0	mg/L	SM 2320B	07/21/08 16:40	ctl	
Chloride	1100	5.0	mg/L	EPA 300.0	07/14/08 21:08	cth	
Sulfate	220	0.50	mg/L	EPA 300.0	07/12/08 00:28	SBD	
Nitrate	9.9	1.0	mg/L	EPA 300.0	07/12/08 00:28	SBD	
Aggregate Properties							
pH	8.5	1.0	pH Units	SM 4500H+ B	07/11/08 19:02	rmc	
Specific Conductance	4200	1.0	umhos/cm	SM 2510 B	07/11/08 19:02	rmc	
Solids							
Total Dissolved Solids	2300	80	mg/L	SM 2540C	07/17/08 13:00	jma	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/11/08 16:00	ctl	

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Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Laboratory Reference Number
A8G1026-05

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC M-8	Water	07/10/08 13:00	07/11/08 9:00

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Copper	ND	50	ug/L	EPA 200.7	07/21/08 19:17	lmt	
Iron	600	100	ug/L	EPA 200.7	07/21/08 19:17	lmt	
Manganese	29	20	ug/L	EPA 200.7	07/21/08 19:17	lmt	
Zinc	250	50	ug/L	EPA 200.7	07/21/08 19:17	lmt	

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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Cations - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G21051 - 200.7/ No Digest M07										
Blank (8G21051-BLK1)				Prepared & Analyzed: 07/21/08						
Calcium	ND	1.0	mg/L							
Magnesium	ND	1.0	mg/L							
Sodium	ND	1.0	mg/L							
Potassium	ND	1.0	mg/L							
LCS (8G21051-BS1)				Prepared & Analyzed: 07/21/08						
Calcium	19.4	1.0	mg/L	20.0		97.3	85-115			
Magnesium	20.3	1.0	mg/L	20.0		102	85-115			
Sodium	40.2	1.0	mg/L	40.1		100	85-115			
Potassium	19.6	1.0	mg/L	20.0		98.1	85-115			
LCS Dup (8G21051-BSD1)				Prepared & Analyzed: 07/21/08						
Calcium	19.3	1.0	mg/L	20.0		96.5	85-115	0.843	20	
Magnesium	20.0	1.0	mg/L	20.0		100	85-115	1.31	20	
Sodium	40.0	1.0	mg/L	40.1		99.9	85-115	0.508	20	
Potassium	19.6	1.0	mg/L	20.0		98.1	85-115	0.0611	20	
Matrix Spike (8G21051-MS1)	Source: A8G1026-01			Prepared & Analyzed: 07/21/08						
Calcium	49.4	1.0	mg/L	20.0	30.6	94.1	70-130			
Magnesium	32.9	1.0	mg/L	20.0	13.4	97.8	70-130			
Sodium	121	1.0	mg/L	40.1	81.8	97.3	70-130			
Potassium	22.6	1.0	mg/L	20.0	3.10	97.4	70-130			
Matrix Spike (8G21051-MS2)	Source: A8G1197-01			Prepared & Analyzed: 07/21/08						
Calcium	24.5	1.0	mg/L	20.0	4.22	102	70-130			
Magnesium	20.3	1.0	mg/L	20.0	ND	102	70-130			
Sodium	136	1.0	mg/L	40.1	96.9	97.9	70-130			
Potassium	20.6	1.0	mg/L	20.0	0.695	99.5	70-130			

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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Cations - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G23016 - 200.7/ No Digest M07										
Blank (8G23016-BLK1)				Prepared & Analyzed: 07/24/08						
Sodium	ND	1.0	mg/L							
LCS (8G23016-BS1)				Prepared & Analyzed: 07/24/08						
Sodium	36.3	1.0	mg/L	40.1		90.5	85-115			
LCS Dup (8G23016-BSD1)				Prepared & Analyzed: 07/24/08						
Sodium	36.9	1.0	mg/L	40.1		92.1	85-115	1.71	20	
Matrix Spike (8G23016-MS1)	Source: A8G1222-01			Prepared & Analyzed: 07/24/08						
Sodium	142	1.0	mg/L	40.1	104	96.7	70-130			
Matrix Spike (8G23016-MS2)	Source: A8G1397-01			Prepared & Analyzed: 07/24/08						
Sodium	68.2	1.0	mg/L	40.1	28.9	98.0	70-130			

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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Anions - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G11069 - Analyzed as received										
Blank (8G11069-BLK1)				Prepared & Analyzed: 07/11/08						
Sulfate	ND	0.50	mg/L							
Chloride	ND	1.0	mg/L							
Nitrate	ND	1.0	mg/L							
LCS (8G11069-BS1)				Prepared & Analyzed: 07/11/08						
Sulfate	49.7	0.50	mg/L	50.0		99.4	90-110			
Chloride	47.9	1.0	mg/L	50.0		95.8	90-110			
Nitrate	50.7	1.0	mg/L	50.0		101	90-110			
atrix Spike (8G11069-MS1)		Source: A8G1026-01		Prepared & Analyzed: 07/11/08						
Sulfate	150	0.50	mg/L	100	43.6	107	89-120			
Chloride	122	1.0	mg/L	50.0	73.6	97.2	89-115			
Nitrate	23.9	1.0	mg/L	20.0	4.40	97.6	85-116			
Matrix Spike (8G11069-MS2)		Source: A8G1039-01		Prepared & Analyzed: 07/11/08						
Sulfate	145	0.50	mg/L	100	36.2	109	89-120			
Chloride	64.3	1.0	mg/L	50.0	19.8	88.9	89-115			QFnt, QMout
Nitrate	24.8	1.0	mg/L	20.0	4.60	101	85-116			
Matrix Spike Dup (8G11069-MSD1)		Source: A8G1026-01		Prepared & Analyzed: 07/11/08						
Sulfate	153	0.50	mg/L	100	43.6	109	89-120	1.43	20	
Chloride	125	1.0	mg/L	50.0	73.6	102	89-115	2.01	20	
Nitrate	24.1	1.0	mg/L	20.0	4.40	98.7	85-116	0.862	20	
Batch 8G14053 - Analyzed as received										
Blank (8G14053-BLK1)				Prepared & Analyzed: 07/14/08						
Chloride	ND	1.0	mg/L							

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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Anions - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G14053 - Analyzed as received										
LCS (8G14053-BS1)				Prepared & Analyzed: 07/14/08						
Chloride	48.2	1.0	mg/L	50.0		98.4	90-110			
Matrix Spike (8G14053-MS1)		Source: A8G1125-01		Prepared & Analyzed: 07/14/08						
Chloride	121	1.0	mg/L	50.0	69.2	124	89-115			QFnt, QMout
Matrix Spike (8G14053-MS2)		Source: A8G1134-03		Prepared & Analyzed: 07/14/08						
Chloride	146	1.0	mg/L	50.0	91.7	108	89-115			
Matrix Spike Dup (8G14053-MSD1)		Source: A8G1125-01		Prepared & Analyzed: 07/14/08						
Chloride	120	1.0	mg/L	50.0	69.2	121	89-115	1.03	20	QFnt, QMo
atch 8G21033 - Analyzed as received										
Blank (8G21033-BLK1)				Prepared & Analyzed: 07/21/08						
Total Alkalinity	ND	3.0	mg/L							
Hydroxide	ND	3.0	mg/L							
Carbonate	ND	3.0	mg/L							
Bicarbonate	ND	3.0	mg/L							
LCS (8G21033-BS1)				Prepared & Analyzed: 07/21/08						
Total Alkalinity	480	3.0	mg/L	472		102	95-105			
Carbonate	277	3.0	mg/L	272		102	95-105			
Duplicate (8G21033-DUP1)		Source: A8G1026-05		Prepared: 07/11/08 Analyzed: 07/21/08						
Total Alkalinity	240	3.0	mg/L		239			0.418	20	
Hydroxide	ND	3.0	mg/L		ND				20	
Carbonate	3.60	3.0	mg/L		4.80			28.6	20	QRPDI
Bicarbonate	285	3.0	mg/L		282			1.06	20	

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Aggregate Properties - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G11065 - Analyzed as received										
LCS (8G11065-BS1)				Prepared & Analyzed: 07/11/08						
pH	4.0	1.0	pH Units	4.00		100	97.5-102.5			
Specific Conductance	1430	1.0	umhos/cm	1410		101	90-110			
Duplicate (8G11065-DUP1)	Source: A8G1026-01			Prepared & Analyzed: 07/11/08						
pH	7.7	1.0	pH Units		7.7			0.00	5	
Specific Conductance	666	1.0	umhos/cm		671			0.748	20	

Client Name: Geosciences Consulting
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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Solids - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G16012 - Analyzed as received										
Blank (8G16012-BLK1)				Prepared & Analyzed: 07/16/08						
Total Dissolved Solids	ND	10	mg/L							
LCS (8G16012-BS1)				Prepared & Analyzed: 07/16/08						
Total Dissolved Solids	730	20	mg/L	746		97.9	90-110			
Duplicate (8G16012-DUP1)				Source: A8G0729-52RE	Prepared & Analyzed: 07/16/08					
Total Dissolved Solids	423	20	mg/L		413			2.39	20	
Batch 8G17029 - Analyzed as received										
Blank (8G17029-BLK1)				Prepared & Analyzed: 07/17/08						
otal Dissolved Solids	ND	10	mg/L							
LCS (8G17029-BS1)				Prepared & Analyzed: 07/17/08						
Total Dissolved Solids	716	20	mg/L	746		96.0	90-110			
Duplicate (8G17029-DUP1)				Source: A8G0729-08	Prepared: 07/08/08 Analyzed: 07/17/08					
Total Dissolved Solids	284	20	mg/L		309			8.43	20	

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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Surfactants - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G11028 - Analyzed as received										
Blank (8G11028-BLK1)				Prepared & Analyzed: 07/11/08						
MBAS	ND	0.05	mg/L							
LCS (8G11028-BS1)				Prepared & Analyzed: 07/11/08						
MBAS	0.441	0.05	mg/L	0.400		110	82-132			
Matrix Spike (8G11028-MS1)		Source: A8G1039-02		Prepared & Analyzed: 07/11/08						
MBAS	0.218	0.05	mg/L	0.200	ND	109	41-153			
Matrix Spike Dup (8G11028-MSD1)		Source: A8G1039-02		Prepared & Analyzed: 07/11/08						
MBAS	0.203	0.05	mg/L	0.200	ND	102	41-153	7.13	20	

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Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Metals and Metalloids - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G21051 - 200.7/ No Digest M07										
Blank (8G21051-BLK1)				Prepared & Analyzed: 07/21/08						
Copper	ND	50	ug/L							
Iron	ND	100	ug/L							
Manganese	ND	20	ug/L							
Zinc	ND	50	ug/L							
LCS (8G21051-BS1)				Prepared & Analyzed: 07/21/08						
Copper	414	50	ug/L	401		103	85-115			
Iron	371	100	ug/L	401		92.6	85-115			
Manganese	386	20	ug/L	401		96.1	85-115			
Zinc	364	50	ug/L	401		90.8	85-115			
LCS Dup (8G21051-BSD1)				Prepared & Analyzed: 07/21/08						
Copper	410	50	ug/L	401		102	85-115	0.931	20	
Iron	367	100	ug/L	401		91.6	85-115	1.10	20	
Manganese	382	20	ug/L	401		95.3	85-115	0.890	20	
Zinc	360	50	ug/L	401		89.7	85-115	1.17	20	
Matrix Spike (8G21051-MS1)		Source: A8G1026-01		Prepared & Analyzed: 07/21/08						
Copper	421	50	ug/L	401	ND	105	70-130			
Iron	523	100	ug/L	401	142	95.0	70-130			
Manganese	424	20	ug/L	401	37.2	96.5	70-130			
Zinc	1040	50	ug/L	401	663	93.7	70-130			
Matrix Spike (8G21051-MS2)		Source: A8G1197-01		Prepared & Analyzed: 07/21/08						
Copper	432	50	ug/L	401	ND	108	70-130			
Iron	436	100	ug/L	401	60.3	93.7	70-130			
Manganese	391	20	ug/L	401	1.70	97.1	70-130			
Zinc	389	50	ug/L	401	ND	97.1	70-130			

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Analytical Report: Page 20 of 21
Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Notes and Definitions

pH:	Regulatory 15 minute holding time exceeded	(A8G1026-01)
pH:	Regulatory 15 minute holding time exceeded	(A8G1026-02)
pH:	Regulatory 15 minute holding time exceeded	(A8G1026-03)
pH:	Regulatory 15 minute holding time exceeded	(A8G1026-04)
pH:	Regulatory 15 minute holding time exceeded	(A8G1026-05)

N_HTa Sample analyzed outside of the EPA recommended holding time.

QFnt The referenced sample did not require this QC analyte, so a follow-up is not needed.

QMout MS and/or MSD recovery did not meet laboratory acceptance criteria.

QRPDl Analyte concentration was below range for valid RPD determination.

ND: Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)

NR: Not Reported

RDL: Reportable Detection Limit

MDL: Method Detection Limit

* / (Non-NELAP): NELAP does not offer accreditation for this analyte/method/matrix combination

E.S.BABCOCK&Sons,Inc.
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Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G1026

Received on Ice (Y/N): Yes Temp: 16 °C

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted. Babcock Laboratories and its officers and employees assume no responsibility and make no warranty, express or implied, for uses or interpretations made by any recipients, intended or unintended, of this report.

Lorenzo Rodriguez

☒ Lorenzo Rodriguez
Project Manager

☐ Allison Mackenzie
General Manager

☐ Lawrence J. Chrystal
Laboratory Director

cc:

ESB_Standard. Report

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1905

6100 Quail Valley Court Riverside, CA 92507
(951) 653-3351 • FAX (951) 653-1662
www.babcocklabs.com

Chain of Custody & Sample Information Record

Client: Geosciences Consulting | Contact: R. J. Johnson | Fax No. 702-293-1241

Phone No. 702-293-5278 | email: rjjonson@aol.com

Project Name: Primm Valley Golf Club

Project Location: Primm area California

Turn Around Time: (Routine) *72 Hour Rush *48 Hour Rush *24 Hour Rush

*Lab TAT Approval By: *Additional Charges Apply

Additional Reporting Requests
Include QC Data Package: ☒ Yes ☐ No
FAX Results: ☐ Yes ☐ No
Email Results: ☒ Yes ☐ No
State EDT: ☐ Yes ☐ No
(include Source Number in Notes)

Sampler Information
Name: R. J. Johnson
Employer: Geosciences Consulting
Signature: R. J. Johnson

Sample ID	Date	Time	# of Containers & Preservatives: Unpreserved	H_2SO_4	HCl	HNO_3	$Na_2S_2O_3$	NaOH	NaOH/Zn Acetate	NH_4Cl	MCAA	Total # of Containers	Sample Type: (Routine) Resample Special	Analysis Requested: Gen. Minerals	TDS	TH	EC	Matrix
M-13	07/10/08	0935	1			1						2						GW
M-14	07/10/08	1050	1			1						2						GW
WP-6	07/10/08	1150	1			1						2						DW+GW
WP-5	07/10/08	1220	1			1						2						DW+GW
M-8	07/10/08	1300	1			1						2						GW

DW = Drinking Water
WW = Waste Water
GW = Ground Water
S = Soil
SG = Sludge
L = Liquid
M = Miscellaneous

Notes
Shipping
Please return receipt to:
948 Keys Dr.
Boulder City, NV
89005

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (sign)	Print Name / Company
R. J. Johnson	R. J. Johnson FedEx	7/11/08 9:00	Elizabeth Machado	Elizabeth Machados

(For Lab Use Only) Sample Integrity Upon Receipt | Lab Notes

Sample(s) Submitted on Ice? (Yes) No Temperature 6 °C
Custody Seal(s) Intact? Yes No (NA)
Sampler(s) Intact? (Yes) No ☐ Cooler ☐ Ice

Lab No. ABG10260

Page 1 of 1

Rev. 6/07

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories since 1906

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Attached is the analytical report for the sample(s) received for your project. Below is a list of the individual sample descriptions with the corresponding laboratory number(s). Also, enclosed is a copy of the Chain of Custody document (if received with your sample(s)). Please note any unused portion of the sample(s) may be responsibly discarded after 30 days from the above report date, unless you have requested otherwise.

Thank you for the opportunity to serve your analytical needs. If you have any questions or concerns regarding this report please contact our client service department.

Sample Identification

Lab Sample #	Client Sample ID	Matrix	Date Sampled	By	Date Submitted	By
A8G0914-01	PVGC-7	Water	07/09/08 08:50	R.J. Johnson	07/10/08 09:15	FedEx
A8G0914-02	PVGC-8	Water	07/09/08 09:25	R.J. Johnson	07/10/08 09:15	FedEx
A8G0914-03	PVGC-9	Water	07/09/08 09:50	R.J. Johnson	07/10/08 09:15	FedEx
A8G0914-04	CW-1	Water	07/09/08 10:30	R.J. Johnson	07/10/08 09:15	FedEx
A8G0914-05	CW-2	Water	07/09/08 10:55	R.J. Johnson	07/10/08 09:15	FedEx

Included in this Data Package please find an amended report for the laboratory number referenced below.

Laboratory Number: A8G0914-02
Analysis: SM 2320B (Total Alkalinity/Bicarbonate)
Reason for Amendment:
As per client request, the analysis for SM 2320B (Total Alkalinity/Bicarbonate) was redone. Although all batches met the quality control acceptance criteria of the laboratory, the original results could not be duplicated. The retest results were supported by historical data and the results of the retest appears on this report.

Laboratory Number: A8G0914-02
Analysis: EPA 300.0 (Chloride)
Reason for Amendment:
As per client request, the analysis for EPA 300.0 (Chloride) was redone. Although all batches met the quality control acceptance criteria of the laboratory, the original result could not be duplicated. The retest result was confirmed by a duplicate and the result of the retest appears on this report.
This report supersedes the report issued on 21-Jul-2008.

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
A8G0914-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC-7	Water	07/09/08 08:50	07/10/08 9:15

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	290	3.0	mg/L	SM 3120B	07/17/08 12:45	lmt	
Calcium	76	1.0	mg/L	EPA 200.7	07/17/08 12:45	lmt	
Magnesium	24	1.0	mg/L	EPA 200.7	07/17/08 12:45	lmt	
dium	360	1.0	mg/L	EPA 200.7	07/17/08 12:45	lmt	
otassium	5.8	1.0	mg/L	EPA 200.7	07/17/08 12:45	lmt	
Anions							
Total Alkalinity	130	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Hydroxide	ND	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Carbonate	ND	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Bicarbonate	160	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Chloride	640	5.0	mg/L	EPA 300.0	07/11/08 22:47	SBD	
Sulfate	40	0.50	mg/L	EPA 300.0	07/10/08 21:29	CTH	
Nitrate	12	1.0	mg/L	EPA 300.0	07/10/08 21:29	CTH	
Aggregate Properties							
pH	7.8	1.0	pH Units	SM 4500H+ B	07/10/08 19:45	adb	
Specific Conductance	2300	1.0	umhos/cm	SM 2510 B	07/10/08 19:45	adb	
Solids							
Total Dissolved Solids	1300	20	mg/L	SM 2540C	07/15/08 10:30	hga	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/10/08 13:20	ctl	

E.S.BABCOCK&Sons, Inc.
Environmental Laboratories est 1906

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
A8G0914-01

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC-7	Water	07/09/08 08:50	07/10/08 9:15

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Copper	ND	50	ug/L	EPA 200.7	07/17/08 12:46	lmt	
Iron	ND	100	ug/L	EPA 200.7	07/17/08 12:46	lmt	
Manganese	ND	20	ug/L	EPA 200.7	07/17/08 12:46	lmt	
Zinc	ND	50	ug/L	EPA 200.7	07/17/08 12:46	lmt	

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
A8G0914-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC-8	Water	07/09/08 09:25	07/10/08 9:15

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	210	3.0	mg/L	SM 3120B	07/17/08 12:49	lmt	
Calcium	47	1.0	mg/L	EPA 200.7	07/17/08 12:49	lmt	
Magnesium	22	1.0	mg/L	EPA 200.7	07/17/08 12:49	lmt	
dium	280	1.0	mg/L	EPA 200.7	07/17/08 12:49	lmt	
otassium	5.2	1.0	mg/L	EPA 200.7	07/17/08 12:49	lmt	
Anions							
Total Alkalinity	150	3.0	mg/L	SM 2320B	08/12/08 13:57	je	N_HTa
Hydroxide	ND	3.0	mg/L	SM 2320B	08/12/08 13:57	je	N_HTa
Carbonate	ND	3.0	mg/L	SM 2320B	08/12/08 13:57	je	N_HTa
Bicarbonate	180	3.0	mg/L	SM 2320B	08/12/08 13:57	je	N_HTa
Chloride	420	5.0	mg/L	EPA 300.0	08/11/08 22:02	SBD	N_HTh
Sulfate	44	0.50	mg/L	EPA 300.0	07/10/08 21:38	CTH	
Nitrate	12	1.0	mg/L	EPA 300.0	07/10/08 21:38	CTH	
Aggregate Properties							
pH	7.9	1.0	pH Units	SM 4500H+ B	07/10/08 19:45	adb	
Specific Conductance	1700	1.0	umhos/cm	SM 2510 B	07/10/08 19:45	adb	
Solids							
Total Dissolved Solids	940	20	mg/L	SM 2540C	07/16/08 10:40	hga	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/10/08 17:00	ctl	

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Environmental Laboratories est 1906

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
A8G0914-02

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC-8	Water	07/09/08 09:25	07/10/08 9:15

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Copper	ND	50	ug/L	EPA 200.7	07/17/08 12:50	lmt	
Iron	ND	100	ug/L	EPA 200.7	07/17/08 12:50	lmt	
Manganese	ND	20	ug/L	EPA 200.7	07/17/08 12:50	lmt	
nc	ND	50	ug/L	EPA 200.7	07/17/08 12:50	lmt	

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Environmental Laboratories since 1909

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
A8G0914-03

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC-9	Water	07/09/08 09:50	07/10/08 9:15

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	290	3.0	mg/L	SM 3120B	07/17/08 12:53	lmt	
Calcium	61	1.0	mg/L	EPA 200.7	07/17/08 12:53	lmt	
Magnesium	32	1.0	mg/L	EPA 200.7	07/17/08 12:53	lmt	
Sodium	140	1.0	mg/L	EPA 200.7	07/17/08 12:53	lmt	
Potassium	4.2	1.0	mg/L	EPA 200.7	07/17/08 12:53	lmt	
Anions							
Total Alkalinity	180	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Hydroxide	ND	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Carbonate	ND	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Bicarbonate	210	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Chloride	220	1.0	mg/L	EPA 300.0	07/10/08 21:48	CTH	
Sulfate	65	0.50	mg/L	EPA 300.0	07/10/08 21:48	CTH	
Nitrate	22	1.0	mg/L	EPA 300.0	07/10/08 21:48	CTH	
Aggregate Properties							
pH	8.0	1.0	pH Units	SM 4500H+ B	07/10/08 19:45	adb	
Specific Conductance	1200	1.0	umhos/cm	SM 2510 B	07/10/08 19:45	adb	
Solids							
Total Dissolved Solids	720	20	mg/L	SM 2540C	07/16/08 10:40	hga	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/10/08 17:00	ctl	

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories est 1906

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
A8G0914-03

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
PVGC-9	Water	07/09/08 09:50	07/10/08 9:15

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Copper	ND	50	ug/L	EPA 200.7	07/17/08 12:53	lmt	
Iron	ND	100	ug/L	EPA 200.7	07/17/08 12:53	lmt	
Manganese	ND	20	ug/L	EPA 200.7	07/17/08 12:53	lmt	
nc	ND	50	ug/L	EPA 200.7	07/17/08 12:53	lmt	

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Environmental Laboratories est 1905

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
A8G0914-04

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
CW-1	Water	07/09/08 10:30	07/10/08 9:15

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	210	3.0	mg/L	SM 3120B	07/17/08 12:55	lmt	N_pAdl
Calcium	44	1.0	mg/L	EPA 200.7	07/17/08 12:55	lmt	N_pAdl
Magnesium	25	1.0	mg/L	EPA 200.7	07/17/08 12:55	lmt	N_pAdl
dium	74	1.0	mg/L	EPA 200.7	07/17/08 12:55	lmt	N_pA
Potassium	2.8	1.0	mg/L	EPA 200.7	07/17/08 12:55	lmt	N_pA
Anions							
Total Alkalinity	170	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Hydroxide	ND	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Carbonate	ND	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Bicarbonate	200	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Chloride	110	1.0	mg/L	EPA 300.0	07/10/08 21:58	CTH	
Sulfate	35	0.50	mg/L	EPA 300.0	07/10/08 21:58	CTH	
Nitrate	9.3	1.0	mg/L	EPA 300.0	07/10/08 21:58	CTH	
Aggregate Properties							
pH	7.9	1.0	pH Units	SM 4500H+ B	07/10/08 19:45	adb	
Specific Conductance	760	1.0	umhos/cm	SM 2510 B	07/10/08 19:45	adb	
Solids							
Total Dissolved Solids	450	20	mg/L	SM 2540C	07/16/08 10:40	hga	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/11/08 10:10	ctl	

E.S.BABCOCK&Sons,Inc.
Environmental Laboratories since 1906

Client Name: Geosciences Consulting
Contact: R. J. Johnson
Address: 948 Keys Drive
Boulder City, NV 89005

Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
A8G0914-04

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
CW-1	Water	07/09/08 10:30	07/10/08 9:15

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Copper	ND	50	ug/L	EPA 200.7	07/17/08 12:55	lmt	N_pAdl
Iron	ND	100	ug/L	EPA 200.7	07/17/08 12:55	lmt	N_pAdl
Manganese	ND	20	ug/L	EPA 200.7	07/17/08 12:55	lmt	N_pAdl
Zinc	ND	50	ug/L	EPA 200.7	07/17/08 12:55	lmt	N_pA

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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
A8G0914-05

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
CW-2	Water	07/09/08 10:55	07/10/08 9:15

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Cations							
Total Hardness	170	3.0	mg/L	SM 3120B	07/17/08 12:57	lmt	N_pAdl
Calcium	33	1.0	mg/L	EPA 200.7	07/17/08 12:57	lmt	N_pAdl
Magnesium	22	1.0	mg/L	EPA 200.7	07/17/08 12:57	lmt	N_pAdl
dium	62	1.0	mg/L	EPA 200.7	07/17/08 12:57	lmt	N_p/
Potassium	2.5	1.0	mg/L	EPA 200.7	07/17/08 12:57	lmt	N_p.
Anions							
Total Alkalinity	170	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Hydroxide	ND	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Carbonate	ND	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Bicarbonate	200	3.0	mg/L	SM 2320B	07/18/08 15:58	ctl	
Chloride	58	1.0	mg/L	EPA 300.0	07/10/08 22:46	CTH	
Sulfate	37	0.50	mg/L	EPA 300.0	07/10/08 22:46	CTH	
Nitrate	7.8	1.0	mg/L	EPA 300.0	07/10/08 22:46	CTH	
Aggregate Properties							
pH	7.8	1.0	pH Units	SM 4500H+ B	07/10/08 19:45	adb	
Specific Conductance	610	1.0	umhos/cm	SM 2510 B	07/10/08 19:45	adb	
Solids							
Total Dissolved Solids	350	20	mg/L	SM 2540C	07/16/08 10:40	hga	
Surfactants							
MBAS	ND	0.05	mg/L	SM 5540C	07/11/08 10:10	ctl	

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Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Laboratory Reference Number
A8G0914-05

Sample Description	Matrix	Sampled Date/Time	Received Date/Time
CW-2	Water	07/09/08 10:55	07/10/08 9:15

Analyte(s)	Result	RDL	Units	Method	Analysis Date	Analyst	Flag
Metals and Metalloids							
Copper	ND	50	ug/L	EPA 200.7	07/17/08 12:57	lmt	N_pAdl
Iron	ND	100	ug/L	EPA 200.7	07/17/08 12:58	lmt	N_pAdl
Manganese	ND	20	ug/L	EPA 200.7	07/17/08 12:58	lmt	N_pAdl
Zinc	ND	50	ug/L	EPA 200.7	07/17/08 12:58	lmt	N_pA

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Report Date: 12-Aug-2008

Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Cations - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G17012 - 200.7/ No Digest M07										
Blank (8G17012-BLK1)				Prepared & Analyzed: 07/17/08						
Calcium	ND	1.0	mg/L							
Magnesium	ND	1.0	mg/L							
Sodium	ND	1.0	mg/L							
Potassium	ND	1.0	mg/L							
LCS (8G17012-BS1)				Prepared & Analyzed: 07/17/08						
Calcium	20.1	1.0	mg/L	20.0		100	85-115			
Magnesium	20.4	1.0	mg/L	20.0		102	85-115			
Sodium	40.3	1.0	mg/L	40.1		100	85-115			
Potassium	19.9	1.0	mg/L	20.0		99.5	85-115			
LCS Dup (8G17012-BSD1)				Prepared & Analyzed: 07/17/08						
Calcium	20.1	1.0	mg/L	20.0		101	85-115	0.107	20	
Magnesium	20.7	1.0	mg/L	20.0		104	85-115	1.54	20	
Sodium	40.9	1.0	mg/L	40.1		102	85-115	1.60	20	
Potassium	20.0	1.0	mg/L	20.0		100	85-115	0.580	20	
Matrix Spike (8G17012-MS1)	Source: A8G0837-01			Prepared & Analyzed: 07/17/08						
Calcium	246	1.0	mg/L	20.0	230	76.1	70-130			
Magnesium	70.2	1.0	mg/L	20.0	51.0	95.8	70-130			
Sodium	108	1.0	mg/L	40.1	69.3	96.5	70-130			
Potassium	23.4	1.0	mg/L	20.0	3.94	97.4	70-130			
Matrix Spike (8G17012-MS2)	Source: A8G0879-01			Prepared & Analyzed: 07/17/08						
Calcium	65.0	1.0	mg/L	20.0	44.8	101	70-130			
Magnesium	28.3	1.0	mg/L	20.0	8.60	98.6	70-130			
Sodium	80.5	1.0	mg/L	40.1	41.7	95.8	70-130			
Potassium	24.5	1.0	mg/L	20.0	5.19	96.8	70-130			

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Project Name: No Project
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Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Anions - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G10047 - Analyzed as received										
Blank (8G10047-BLK1)				Prepared & Analyzed: 07/10/08						
Sulfate	ND	0.50	mg/L							
Chloride	ND	1.0	mg/L							
Nitrate	ND	1.0	mg/L							
LCS (8G10047-BS1)				Prepared & Analyzed: 07/10/08						
Sulfate	48.2	0.50	mg/L	50.0		96.4	90-110			
Chloride	48.2	1.0	mg/L	50.0		96.4	90-110			
Nitrate	49.9	1.0	mg/L	50.0		99.8	90-110			
Matrix Spike (8G10047-MS1)		Source: A8G0914-01		Prepared & Analyzed: 07/10/08						
Sulfate	141	0.50	mg/L	100	39.6	102	89-120			
Chloride	574	1.0	mg/L	50.0	527	94.5	89-115			QOcal
Nitrate	33.8	1.0	mg/L	20.0	11.7	111	85-116			
Matrix Spike (8G10047-MS2)		Source: A8G0975-01		Prepared & Analyzed: 07/10/08						
Sulfate	138	0.50	mg/L	100	29.8	108	89-120			
Chloride	109	1.0	mg/L	50.0	51.9	113	89-115			
Nitrate	28.7	1.0	mg/L	20.0	8.40	101	85-116			
Matrix Spike Dup (8G10047-MSD1)		Source: A8G0914-01		Prepared & Analyzed: 07/10/08						
Sulfate	151	0.50	mg/L	100	39.6	111	89-120	6.45	20	
Chloride	534	1.0	mg/L	50.0	527	14.5	89-115	7.23	20	QMSD, QOcal
Nitrate	32.3	1.0	mg/L	20.0	11.7	103	85-116	4.69	20	
Batch 8G11069 - Analyzed as received										
Blank (8G11069-BLK1)				Prepared & Analyzed: 07/11/08						
Chloride	ND	1.0	mg/L							

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Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Anions - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G11069 - Analyzed as received										
LCS (8G11069-BS1)				Prepared & Analyzed: 07/11/08						
Chloride	47.9	1.0	mg/L	50.0		95.8	90-110			
Matrix Spike (8G11069-MS1)		Source: A8G1026-01		Prepared & Analyzed: 07/11/08						
Chloride	122	1.0	mg/L	50.0	73.6	97.2	89-115			
Matrix Spike (8G11069-MS2)		Source: A8G1039-01		Prepared & Analyzed: 07/11/08						
Chloride	64.3	1.0	mg/L	50.0	19.8	88.9	89-115			QFnt, QMout
Matrix Spike Dup (8G11069-MSD1)		Source: A8G1026-01		Prepared & Analyzed: 07/11/08						
Chloride	125	1.0	mg/L	50.0	73.6	102	89-115	2.01	20	
Batch 8G18045 - Analyzed as received										
Blank (8G18045-BLK1)				Prepared & Analyzed: 07/18/08						
Total Alkalinity	ND	3.0	mg/L							
Hydroxide	ND	3.0	mg/L							
Carbonate	ND	3.0	mg/L							
Bicarbonate	ND	3.0	mg/L							
LCS (8G18045-BS1)				Prepared & Analyzed: 07/18/08						
Total Alkalinity	477	3.0	mg/L	472		101	95-105			
Carbonate	277	3.0	mg/L	272		102	95-105			
Duplicate (8G18045-DUP1)		Source: A8G0859-02		Prepared: 07/09/08 Analyzed: 07/18/08						
Total Alkalinity	157	3.0	mg/L		155			1.28	20	
Hydroxide	ND	3.0	mg/L		ND				20	
Carbonate	16.0	3.0	mg/L		14.0			13.3	20	
Bicarbonate	160	3.0	mg/L		160			0.00	20	

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Received on Ice (Y/N): Yes Temp: 14 °C

Anions - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8H11064 - Analyzed as received										
Blank (8H11064-BLK1)				Prepared & Analyzed: 08/11/08						
Chloride	ND	1.0	mg/L							
LCS (8H11064-BS1)				Prepared & Analyzed: 08/11/08						
Chloride	47.4	1.0	mg/L	50.0		94.8	90-110			
Matrix Spike (8H11064-MS1)		Source: A8H0810-02		Prepared & Analyzed: 08/11/08						
Chloride	132	1.0	mg/L	50.0	75.5	112	89-115			
Matrix Spike (8H11064-MS2)		Source: A8H0904-01		Prepared & Analyzed: 08/11/08						
Chloride	179	1.0	mg/L	50.0	134	90.0	89-115			
Matrix Spike Dup (8H11064-MSD1)		Source: A8H0810-02		Prepared & Analyzed: 08/11/08						
Chloride	132	1.0	mg/L	50.0	75.5	112	89-115	0.0786	20	

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Received on Ice (Y/N): Yes Temp: 14 °C

Aggregate Properties - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G10043 - Analyzed as received										
LCS (8G10043-BS1)				Prepared & Analyzed: 07/10/08						
pH	4.0	1.0	pH Units	4.00		101	97.5-102.5			
Specific Conductance	1410	1.0	umhos/cm	1410		100	90-110			
Duplicate (8G10043-DUP1)		Source: A8G0914-01		Prepared & Analyzed: 07/10/08						
pH	7.8	1.0	pH Units		7.8			0.129	5	
Specific Conductance	2280	1.0	umhos/cm		2280			0.0438	20	

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Received on Ice (Y/N): Yes Temp: 14 °C

Solids - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G15011 - Analyzed as received										
Blank (8G15011-BLK1)				Prepared & Analyzed: 07/15/08						
Total Dissolved Solids	ND	10	mg/L							
LCS (8G15011-BS1)				Prepared & Analyzed: 07/15/08						
Total Dissolved Solids	725	20	mg/L	746		97.2	90-110			
Duplicate (8G15011-DUP1)		Source: A8G0951-01		Prepared & Analyzed: 07/15/08						
Total Dissolved Solids	15.5	10	mg/L		14.5			6.67	20	
Batch 8G16003 - Analyzed as received										
Blank (8G16003-BLK1)				Prepared & Analyzed: 07/16/08						
Total Dissolved Solids	ND	10	mg/L							
LCS (8G16003-BS1)				Prepared & Analyzed: 07/16/08						
Total Dissolved Solids	720	20	mg/L	746		96.5	90-110			
Duplicate (8G16003-DUP1)		Source: A8G0844-03		Prepared & Analyzed: 07/16/08						
Total Dissolved Solids	372	20	mg/L		352			5.52	20	
Duplicate (8G16003-DUP2)		Source: A8G0914-05		Prepared & Analyzed: 07/16/08						
Total Dissolved Solids	358	20	mg/L		353			1.41	20	

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Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Surfactants - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G09027 - Analyzed as received										
Blank (8G09027-BLK1)				Prepared & Analyzed: 07/09/08						
MBAS	ND	0.05	mg/L							
Blank (8G09027-BLK2)				Prepared & Analyzed: 07/10/08						
MBAS	ND	0.05	mg/L							
LCS (8G09027-BS1)				Prepared & Analyzed: 07/09/08						
MBAS	0.458	0.05	mg/L	0.400		114	62-132			
LCS (8G09027-BS2)				Prepared & Analyzed: 07/10/08						
MBAS	0.452	0.05	mg/L	0.400		113	62-132			
Matrix Spike (8G09027-MS1)		Source: A8G0646-01		Prepared: 07/08/08			Analyzed: 07/09/08			
MBAS	0.248	0.05	mg/L	0.200	0.0350	106	41-153			
Matrix Spike Dup (8G09027-MSD1)		Source: A8G0646-01		Prepared: 07/08/08			Analyzed: 07/09/08			
MBAS	0.240	0.05	mg/L	0.200	0.0350	102	41-153	3.28	20	
Batch 8G11028 - Analyzed as received										
Blank (8G11028-BLK1)				Prepared & Analyzed: 07/11/08						
MBAS	ND	0.05	mg/L							
LCS (8G11028-BS1)				Prepared & Analyzed: 07/11/08						
MBAS	0.441	0.05	mg/L	0.400		110	62-132			
Matrix Spike (8G11028-MS1)		Source: A8G1039-02		Prepared & Analyzed: 07/11/08						
MBAS	0.218	0.05	mg/L	0.200	ND	109	41-153			

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Received on Ice (Y/N): Yes Temp: 14 °C

Surfactants - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G11028 - Analyzed as received										
Matrix Spike Dup (8G11028-MSD1)	Source: A8G1039-02			Prepared & Analyzed: 07/11/08						
MBAS	0.203	0.05	mg/L	0.200	ND	102	41-153	7.13	20	

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Received on Ice (Y/N): Yes Temp: 14 °C

Metals and Metalloids - Batch Quality Control

Analyte(s)	Result	RDL	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Flag
Batch 8G17012 - 200.7/ No Digest M07										
Blank (8G17012-BLK1)				Prepared & Analyzed: 07/17/08						
Copper	ND	50	ug/L							
Iron	ND	100	ug/L							
Manganese	ND	20	ug/L							
Zinc	ND	50	ug/L							
LCS (8G17012-BS1)				Prepared & Analyzed: 07/17/08						
Copper	408	50	ug/L	401		102	85-115			
Iron	373	100	ug/L	401		93.1	85-115			
Manganese	377	20	ug/L	401		94.0	85-115			
Zinc	375	50	ug/L	401		93.4	85-115			
LCS Dup (8G17012-BSD1)				Prepared & Analyzed: 07/17/08						
Copper	417	50	ug/L	401		104	85-115	2.18	20	
Iron	377	100	ug/L	401		94.1	85-115	1.07	20	
Manganese	383	20	ug/L	401		95.4	85-115	1.49	20	
Zinc	378	50	ug/L	401		94.1	85-115	0.773	20	
Matrix Spike (8G17012-MS1)	Source: A8G0837-01			Prepared & Analyzed: 07/17/08						
Copper	401	50	ug/L	401	ND	100	70-130			
Iron	360	100	ug/L	401	ND	89.8	70-130			
Manganese	372	20	ug/L	401	ND	92.8	70-130			
Zinc	369	50	ug/L	401	7.29	90.2	70-130			
Matrix Spike (8G17012-MS2)	Source: A8G0879-01			Prepared & Analyzed: 07/17/08						
Copper	424	50	ug/L	401	ND	106	70-130			
Iron	385	100	ug/L	401	ND	96.1	70-130			
Manganese	416	20	ug/L	401	29.0	96.6	70-130			
Zinc	378	50	ug/L	401	ND	94.4	70-130			

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Work Order Number: A8G0914
Received on Ice (Y/N): Yes Temp: 14 °C

Notes and Definitions

pH:	Regulatory 15 minute holding time exceeded	(A8G0914-01)
pH:	Regulatory 15 minute holding time exceeded	(A8G0914-02)
pH:	Regulatory 15 minute holding time exceeded	(A8G0914-03)
pH:	Regulatory 15 minute holding time exceeded	(A8G0914-04)
pH:	Regulatory 15 minute holding time exceeded	(A8G0914-05)

N_HTa Sample analyzed outside of the EPA recommended holding time.

N_HTh Original sample was run within holding time. Due to a high original result, the sample was diluted and reanalyzed outside of EPA recommended holding time .

N_pAdl Sample was submitted with proper preservation however additional preservation was needed to obtain required conditions.

QFnt The referenced sample did not require this QC analyte, so a follow-up is not needed.

QMout MS and/or MSD recovery did not meet laboratory acceptance criteria.

QMSD The MS recovery and MS/MSD RPD met laboratory acceptance criteria. MSD recovery was not within range. MSD performed to assess precision data only.

QOcal The concentration indicated for this analyte is an estimated value above the calibration range of the instrument.

ND: Analyte NOT DETECTED at or above the Method Detection Limit **(if MDL is reported)**, otherwise at or above the Reportable Detection Limit (RDL)

NR: Not Reported

RDL: Reportable Detection Limit

MDL: Method Detection Limit

* / (Non-NELAP): NELAP does not offer accreditation for this analyte/method/matrix combination

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Project Name: No Project
Project Number: No Project

Work Order Number: A8G0914

Received on Ice (Y/N): Yes Temp: 14 °C

Approval

Enclosed are the analytical results for the submitted sample(s). Babcock Laboratories certify the data presented as part of this report meet the minimum quality standards in the referenced analytical methods. Any exceptions have been noted. Babcock Laboratories and its officers and employees assume no responsibility and make no warranty, express or implied, for uses or interpretations made by any recipients, intended or unintended, of this report.

Lorenzo Rodriguez

☒ Lorenzo Rodriguez
Project Manager

☐ Allison Mackenzie
General Manager

☐ Lawrence J. Chrystal
Laboratory Director

cc:

ESB_Standard. Report

E.S. BABCOCK & Sons, Inc.
Environmental Laboratories est 1936

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Chain of Custody & Sample Information Record

Client: Geosciences Consulting | Contact: R. J. Johnson | Fax No. 702-293-1241

Phone No. 702-293-5273 | email: rjjohnson@aol.com

Project Name: Primm Valley Golf Club | Turn Around Time: (Routine) *72 Hour Rush *48 Hour Rush *24 Hour Rush

Project Location: Primm California area | *Lab TAT Approval: By: *Additional Charges Apply

Additional Reporting Requests
Include QC Data Package: ☒ Yes ☐ No
FAX Results: ☐ Yes ☐ No
Email Results: ☒ Yes ☐ No
State EDT: ☐ Yes ☐ No
(Include Source Number in Notes)

Sampler Information
Name: R. J. Johnson
Employer: Geosciences Consulting
Signature:

Sample ID	Date	Time	# of Containers & Preservatives: Unpreserved	H_2SO_4	HCl	HNO_3	$Na_2S_2O_3$	NaOH	NaOH/Zn Acetate	NH_4Cl	MCAA	Total # of Containers	Sample Type: Routine	Resample	Special	Analysis Requested: Gen. Minerals	TDS	pH	EC	Matrix	Notes
PVGC-7	070908	0850	1			1						2				✓	✓	✓	✓	DW/GW	
PVGC-8	070908	0925	1			1						2									
PVGC-9	070908	0950	1			1						2									
CW-1	070908	1030	1			1						2									
CW-2	070908	1055	1			1						2									

Please return ice chest to
Thanks
948 Keys Dr. Boulder City NV 89005

Relinquished By (sign)	Print Name / Company	Date / Time	Received By (sign)	Print Name / Company
	R. J. Johnson	070908/1400		
	FedEx 7/10/08 9:15			

(For Lab Use Only) Sample Integrity Upon Receipt | Lab Notes

Sample(s) Submitted on Ice? (Yes) No | Temperature 4 °C
Custody Seal(s) Intact? Yes No (NA)
Sample(s) Intact? (Yes) No ☐ Cooler Blank

Lab No. A8G0914

Page 1 of 1

Rev. 6/07

REVISED

Southwest Analytical, Inc.

Earth ◣ Water ◣ Air

4208 Arcata Way, N. Las Vegas, NV 89030 Phone: 702.657.1010 Fax: 702.657.1577

Friday, August 15, 2008

R.J. Johnson
Geosciences Consulting
948 Keys Dr.
Boulder City, NV 89005
TEL: (702) 293-5273
FAX: (702) 293-1241

RE Project: **Primm Valley Golf Club** Order No.: **L0807105**

Dear R.J. Johnson:

Southwest Analytical, Inc. received 1 sample on 7/9/08 1:29:00 PM for the analyses presented in the following report.

The case narrative for the project listed above specifies all quality assurance deficiencies associated with the data. Data that is not qualified in the case narrative has met or exceeded the US-EPA or laboratory specifications for the analytical method.

If you have any questions regarding these tests results, please feel free to call.

Caroline Sangari
Project Manager

8-15-08
Date

Certifications:

Nevada NV052

REVISED

Southwest Analytical, Inc.

Earth ◣ Water ◣ Air

4208 Arcata Way, N. Las Vegas, NV 89030 Phone: 702.657.1010 Fax: 702.657.1577

CLIENT: Geosciences Consulting
Project: Primm Valley Golf Club
Lab Order: L0807105

CASE NARRATIVE

Date: *15-Aug-08*

Attached are the analytical results for samples in support of the above referenced project. Should you have any questions or comments, please feel free to contact our Client Services Department.

Analytical Comments:

Revised after re-run of analysis was done to balance the cation-anions.

REVISED

Southwest Analytical, Inc.

Date: *15-Aug-08*

CLIENT:	Geosciences Consulting	**Client Sample ID:**	CW-2
Lab Order:	L0807105	**Collection Date:**	7/9/08 10:55:00 AM
Project:	Primm Valley Golf Club		
Lab ID:	L0807105-001	**Matrix:**	DRINKING WATER

Analyses	Result	Limit	Qual	Units	DF	Date Analyzed
TOTAL METALS BY EPA 200.7 (ICP/OES)		**E200.7**				Analyst: VVG-L
Calcium	29	0.75		mg/L	10	7/24/08 10:28:02 AM
Magnesium	21	0.50		mg/L	10	7/24/08 10:28:02 AM
Potassium	2.6	0.12		mg/L	1	7/24/08 10:28:02 AM
Sodium	62	7.5		mg/L	50	8/14/08
ANIONS BY ION CHROMATOGRAPHY		**E300.0**				Analyst: EVK-L
Chloride	56.9	1.00		mg/L	1	7/9/08 2:51:27 PM
Sulfate	47.3	1.00		mg/L	1	7/9/08 2:51:27 PM
ALKALINITY		**SM2320 B**				Analyst: EVK-L
Alkalinity, Bicarbonate (As CaCO3)	180	25		mg/L	1	7/16/08 1:30:00 PM
Alkalinity, Carbonate (As CaCO3)	ND	25		mg/L	1	7/16/08 1:30:00 PM
Hydroxide (As CaCO3)	ND	25		mg/L	1	7/16/08 1:30:00 PM
Alkalinity, Total (As CaCO3)	180	25		mg/L	1	7/16/08 1:30:00 PM
CONDUCTANCE		**SM2510 B**				Analyst: EVK-L
Specific Conductivity	619	1.00		µS/cm	1	7/9/08 4:00:00 PM
PH		**E150.1**				Analyst: EVK-L
pH	7.81	1.000		pH units	1	7/9/08 4:00:00 PM
TOTAL DISSOLVED SOLIDS		**SM2540 C**				Analyst: EVK-L
Total Dissolved Solids	301	10.0		mg/L	1	7/15/08 11:00:00 AM

APPENDIX C

Ground-Water Flow Velocity Estimate

Transmissivity	77562	gpd/ft (test data)
Thickness (b)	800	ft (assumed)
Effective Porosity	0.00055	(assumed)

Distance	120000	ft (measured)

Date	JRS Well elevation	Nipton Well elevation	Gradient	Calculated Velocity ft/yr
Dec-03	359.76	371.16	0.00009500000	16.75
Dec-04	359.57	370.81	0.00009366667	16.51
Dec-05	359.63	371.02	0.00009491667	16.73
Jan-07	359.12	370.93	0.00009841667	17.35
Jun-08	358.91	371.21	0.00010250000	18.07