2012 ICR AND TRR WELL FIELD REPORT

Prepared for

ICR WATER USERS ASSOCIATION

By

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2012 ICR AND TRR WELL FIELD REPORT

ICR WATER USERS ASSOCIATION

The ICR Water Users Association (ICRWUA) is a private non-profit water company that provides water to the Inscription Canyon Ranch, Whispering Canyons, Preserve at the Ranch and Talking Rock subdivisions. The company also provides water to the Talking Rock golf course. Water for the first three subdivisions comes from the ICR well field while water for the Talking Rock subdivision and golf course comes from the TRR well field. The combined demand for all uses from both well fields for 2012 was 131,625,000 gallons, table 1. Of this amount some 27,012,000 gallons came from the ICR well field and another 104,613,000 gallons came from the TRR well field. The golf course use was 94,675,000 gallons, or about 91 percent of the total pumpage from the TRR well field. As shown in table 1, pumpage from the well fields for 2012 was lower than that for the previous four years.

Total monthly demand at the two well fields for 2012 ranged from a low of 4,660,000 gallons per month in January to a high of 20,887,000 gallons in July. Average daily demand for both well fields combined was 360,616 gallons or about 250 gallons per minute (gpm).

Table 1.

2008 - 2012 Combined ICR and TRR Well Field Pumpage

Month	2008	2009	2010	2011	2012
Jan	1,919,000	1,973,000	3,941,500	5,500,000	4,660,000
Feb	1,710,000	1,744,800	6,495,000	1,977,980	4,922,000
March	10,751,000	10,438,200	8,630,800	6,149,000	6,786,000
April	16,652,000	11,904,000	15,152,000	12,268,000	11,677,000
May	17,084,400	17,504,500	17,502,000	13,855,000	15,533,000
June	26,130,500	19,327,000	14,457,000	18,999,000	17,806,000
July	14,447,300	16,980,500	17,439,000	16,976,000	20,887,000
August	17,559,700	21,475,200	12,063,000	18,652,000	14,198,000
Sept	15,500,500	15,479,300	16,356,000	15,659,000	10,267,000
Oct	13,185,000	12,150,000	12,594,000	9,500,000	9,481,000
Nov	6,688,900	7,538,500	9,105,000	8,123,000	9,289,000
Dec	1,893,000	1,696,000	6,833,000	4,125,000	6,119,000
Total	143,521,300	138,211,000	140,568,300	131,783,980	131,625,000

THE ICR WELL FIELD

There are two wells in the Inscription Canyon Ranch (ICR) well field about 30 feet apart; ICR 1 and ICR 2. The latter well is often referred to as Whispering Canyon 1 (WC 1). ICR 1 is the original well constructed by the developer of the ICR subdivision to serve the subdivision as initially planned. Whispering Canyons L.L.C constructed ICR 2 and paid all other cost associated with bringing this well on line. The well field provides water to the Inscription Canyon Ranch (ICR), Whispering Canyon (WC), and Preserve at the Ranch sub-divisions.

The wells are located in Section 17, Township 16 North, Range 3 West. They are situated in the Mint Wash floodplain about one-half mile west of Williamson Valley road where the road crosses the wash. Construction of ICR 1 began on June 24, 1994 and was completed on August 5, 1994. Construction of ICR 2 began March 30, 2002 and was completed April 10, 2002.

The wells are owned by the Pierce Properties Ltd. and are on land owned by Pierce Brothers Ltd. ICRWUA has an agreement dated August 1, 1995 that gives the Association the right to operate and use ICR 1 as a water supply for the ICR and Preserve at the Ranch subdivisions for 100 years subject to renewal every 25 years. The purpose of this agreement is to satisfy the Arizona Department of Water Resources 100 year Water Adequacy Requirement. An amendment to the agreement (Amendment 1) dated July 24, 2001 adds Whispering Canyon. It is the responsibility of ICRWUA to operate and maintain the two wells and pay all cost associated with operation and maintenance. Per contract with Pierce Properties, the Association is permitted to withdraw 164,518,498 gallons per year for servicing the ICR, WC, and Preserve at the Ranch subdivisions.

The yield of ICR 1 was initially stated to be in excess of 450 gpm, sufficient to supply the 800 residential lots and a golf course planned for at that time. No estimate of yield was made for ICR 2. The yield of the two wells in 2011 averaged 338 gpm and 372 gpm for wells 1 and 2 respectively.

The aquifer tapped by the well consists of a mixture of unconsolidated sediments ranging in size from clay, silt, sand, and gravel. In places the sediment has been cemented to form a conglomerate. The base of the aquifer is formed by granitic and metamorphic rocks occurring at depth of about 253 ft. at ICR1 and about 220 ft. at well 2.

The altitude of the water table varies naturally in accordance with the seasonal pattern of precipitation. At the time ICR 1 was completed the regional water table was at a depth of about 18 ft. below land surface. At ICR 2, which is slightly higher in elevation than well 1, the initial depth to water was 19 ft.

The well field is managed so that ICR 1 is the main source of water. Well 2 serves as a backup well and is used in a manner to preserve its operational efficiency. Only one well is used on a given day and it is in service, on average for about 3.5 hours or less.

Demand

The demand at the ICR well field in 2012 was 27,012,000 compared to 25,107,980 gallons in 2011. Average 2012 daily demand was 74,005 gallons compared to 68,838 gallons in 2011. For additional comparison, the annual demand in 2009 and 2010 was 29,988,500 and 24,476,500 gallons respectively.

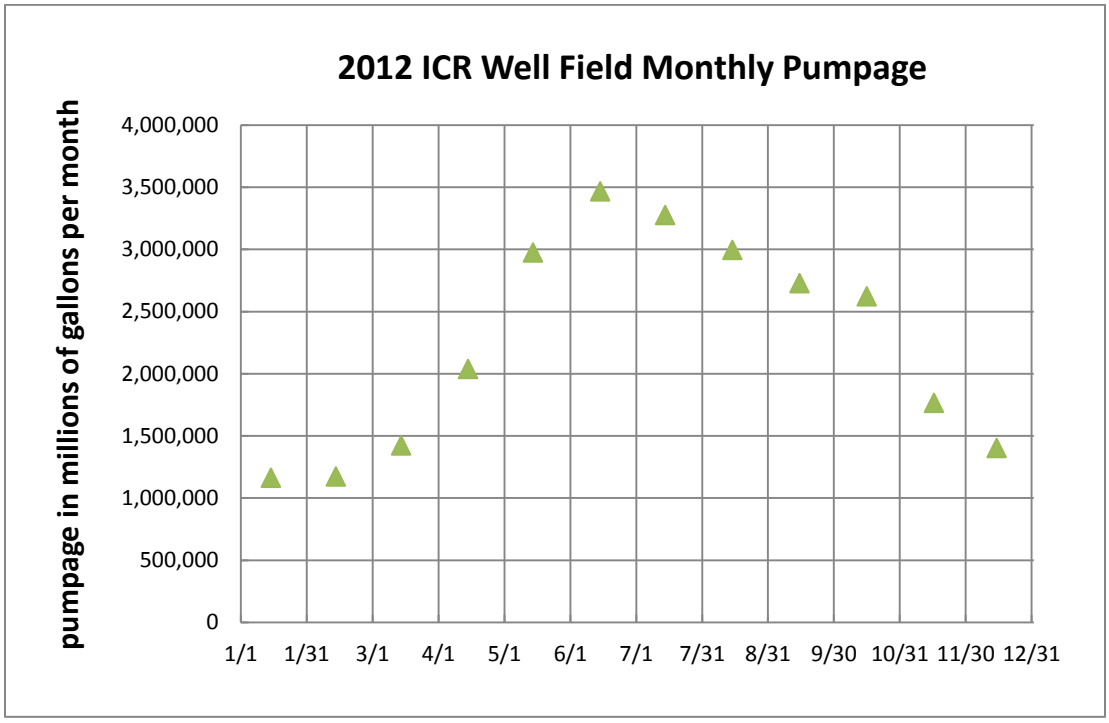
Pumpage was distributed between both wells during the year although well 2 pumped the larger amount, 17,883,000 gallons compared to 9,129,000s gallon at well 1, table 2. Demand varied significantly during the year, increasing from March through June when the greatest demand (3,464,000 gallons) occurred, figure 1. Monthly demand increased from about 1,161,000 gallons in January to about 1,423,000 gallons in March, 2,036,000 gallons in April, and 3,464,000 gallons in June. Pumpage remained high from May through October. Demand slowly decreased after October, falling to about 1,402,000 gallons in December. The increased demand during the warmer, drier part of the year is mainly associated with landscape irrigation.

Columns 2 and 3, table 2, show monthly pumpage from wells 1 and 2. Column 4 shows total monthly pumpage from both wells in gallons. Column 5 shows average daily pumpage in gallons per day, and column 6 shows average demand at the well field during the month in gallons per minute.

Table 2. Average 2012 Daily, Monthly and Annual ICR Well Field Pumpage, in Gallons

1	2	3	4	5	6
Month	**ICR #1**	**ICR #2**	**Total**	**Daily**	**GPM**
Jan	699,000	462,000	1,161,000	37,452	26
Feb	1,172,000	0	1,172,000	41,857	29
March	87,000	1,336,000	1,423,000	45,903	32
April	0	2,036,000	2,036,000	67,867	47
May	69,000	2,904,000	2,973,000	95,903	67
June	3,412,000	52,000	3,464,000	115,467	80
July	2,334,000	940,000	3,274,000	105,613	73
August	0	2,995,000	2,995,000	96,613	67
Sept	0	2,727,000	2,727,000	90,900	63
Oct	546,000	2,075,000	2,621,000	84,548	59
Nov	523,000	1,241,000	1,764,000	58,800	41
Dec	287,000	1,115,000	1,402,000	45,226	31
Total	9,129,000	17,883,000	27,012,000		

Figure 1



Yield

In general the ICR well field is operated with only one well pumping during a given day. ICR 1 was used for 450 hours during the year for an average daily use of about 1.2 hours. ICR 2 was used for 800 hours for an average daily use of 2.2 hours. Yield from ICR 1 averaged 338 gpm while that from ICR 2 averaged 372 gpm.

Water Levels

There is a long-term decline in the water level of a pumped well until water in an amount equal to the rate the well is being pumped is diverted to the well from the aquifer's discharge area. Once this occurs, the long-term decline ceases. For the two ICR wells, this diversion would be expected to take decades if not longer to occur. If water levels fall too far before stabilizing, the wells will cease to be viable. It is important therefore to measure water levels through time in order to monitor the well field's status. There is also a short term, but significant, decline in the water level at a well that is being pumped intermittently, such as those at the ICR well field.

Water levels fall while the well is being pumped and subsequently rise to an altitude equal to or near that existent before pumping.

For practical reasons it is best to maintain the pumping water level in the wells at about two-thirds of the original thickness of the aquifer at each well. This consideration maximizes production relative the decline in the pumping water level in the well and to pumping cost. For well 1, this suggests that the maximum depth to water should be about 155 ft. For well 2, the maximum depth should be about 133 ft.

ICR Well 1

Depth to water below land surface at ICR 1 in 2012 ranged from about 34 ft. to 65 ft., figure 2. Water levels in figure 2 represent non-pumping conditions at the well and with one exception, the 65 ft. depth to water, non-pumping conditions at ICR 2 also.

As discussed above, the water level at ICR 1 was about 18 ft. below land surface when it was completed on August 5, 1994. The minimum water level at the well of 34 ft. below land surface is 16 ft. lower than that originally measured at completion of the well. This decline is within that which would be considered acceptable for long-term viability of the well.

2011 and 2012 water levels are shown in figure 3. As discussed in the 2011 report, water levels above a depth of 50 feet represent non-pumping conditions in that year, and as evident in figure 3, there is no significant difference between non-pumping water levels at ICR 1 for the two year period.

Figure 2

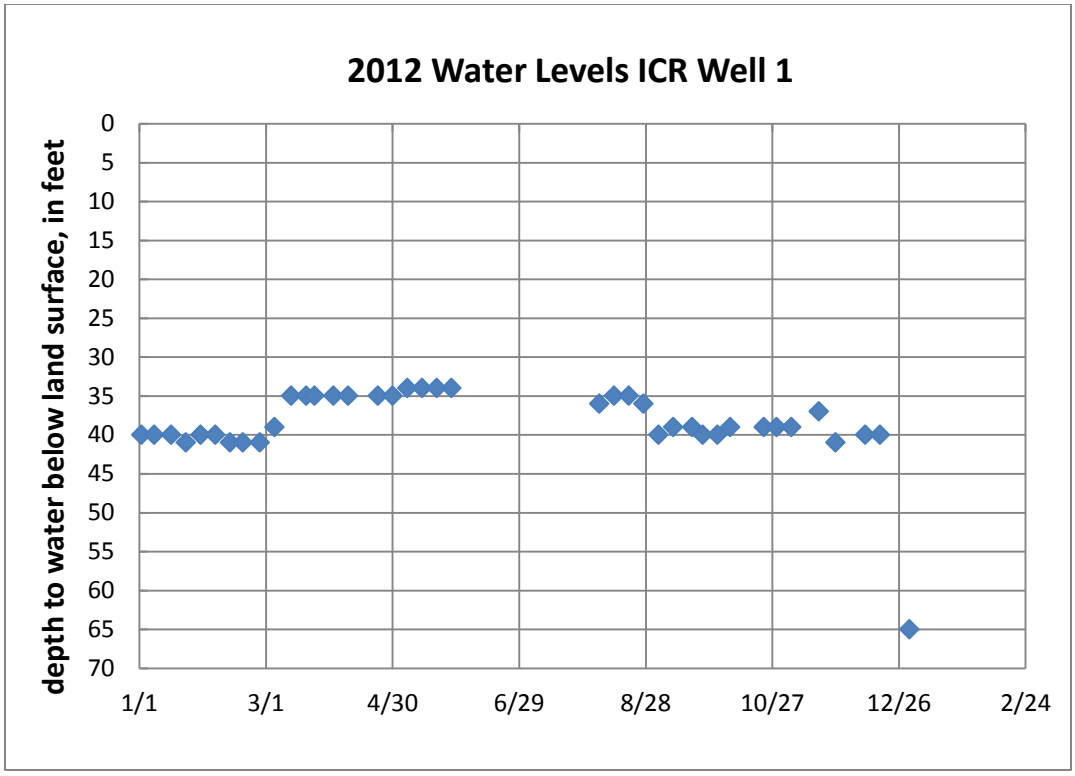
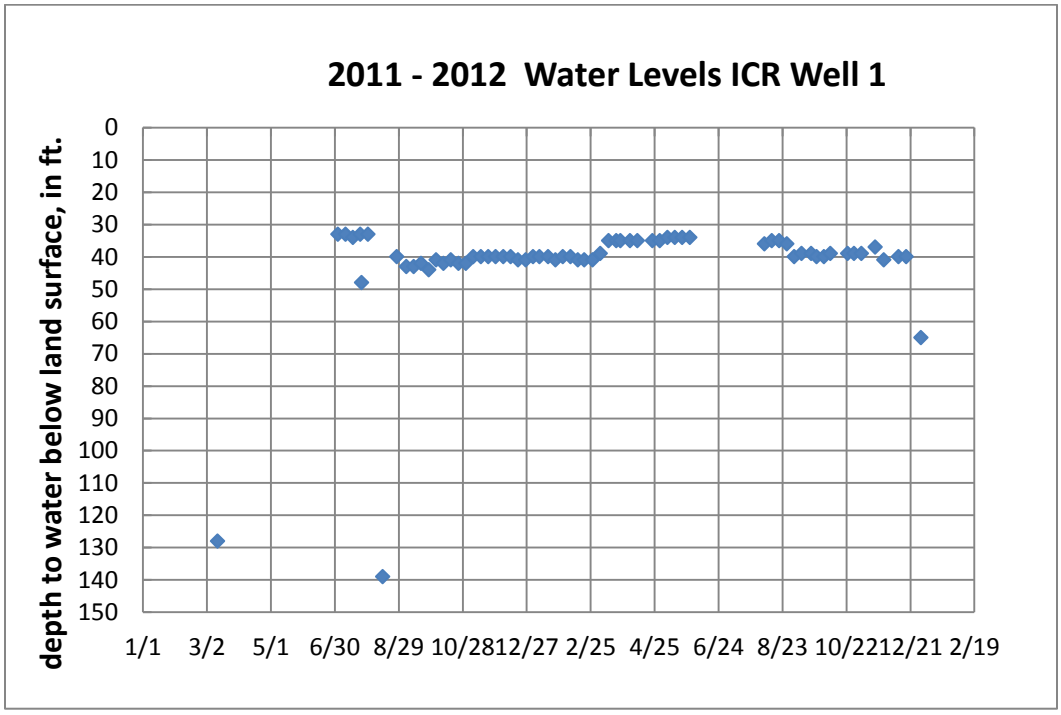


Figure 3



ICR 2

Depth to water below land surface at ICR 2 ranged from about 34 ft. to 79 ft., figure 4. All of the water levels shown in figure 4, with the exception of the 79 ft. reading, are for non-pumping conditions. The maximum depth to water of 79 ft. is 54 ft. above that required for practical reasons.

As discussed above, the water level at ICR 2 was about 19 ft. below land surface when it was completed on April 10, 2002. The minimum water level at the well of 34 ft. below land surface is 15 ft. lower than that originally measured at completion of the well. This decline is within that which would be considered acceptable for long-term viability of the well.

2011 and 2012 water levels are shown in figure 5. As discussed in the 2011 report, water levels above a depth of 50 feet represent non-pumping conditions in that year, and as evident in figure 5, there is no significant difference between non-pumping water levels at ICR 2 for the two year period. The 2012 pumping water level of 79 feet is for all practical purposes the same as the two pumping water levels in 2011 of 73 and 76 feet also.

Figure 4

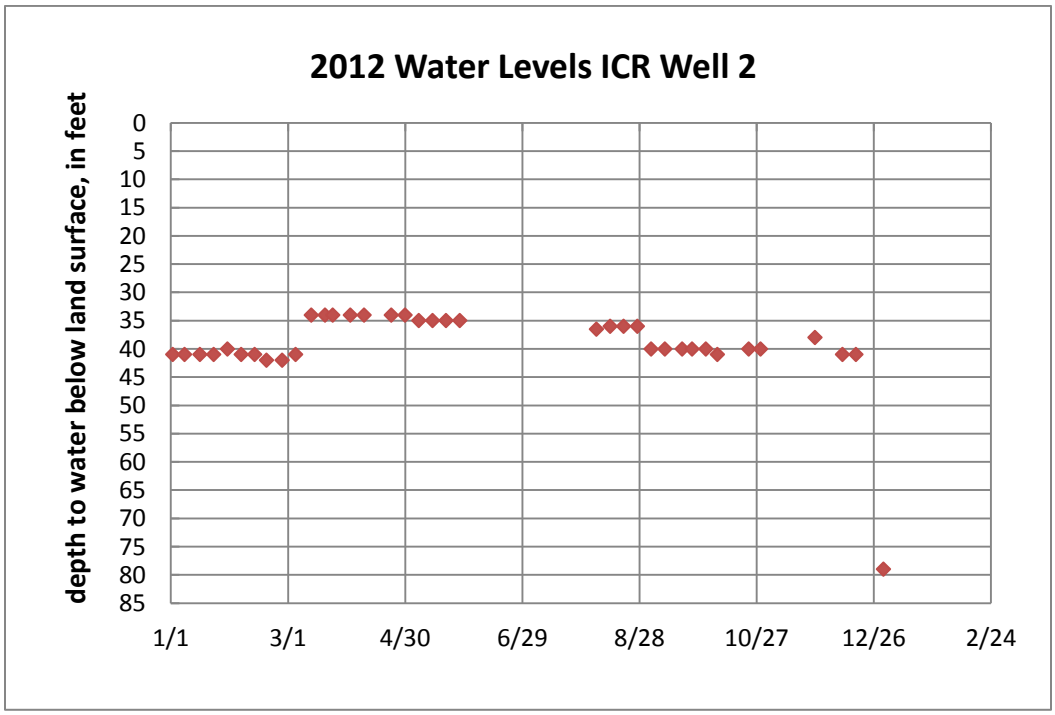
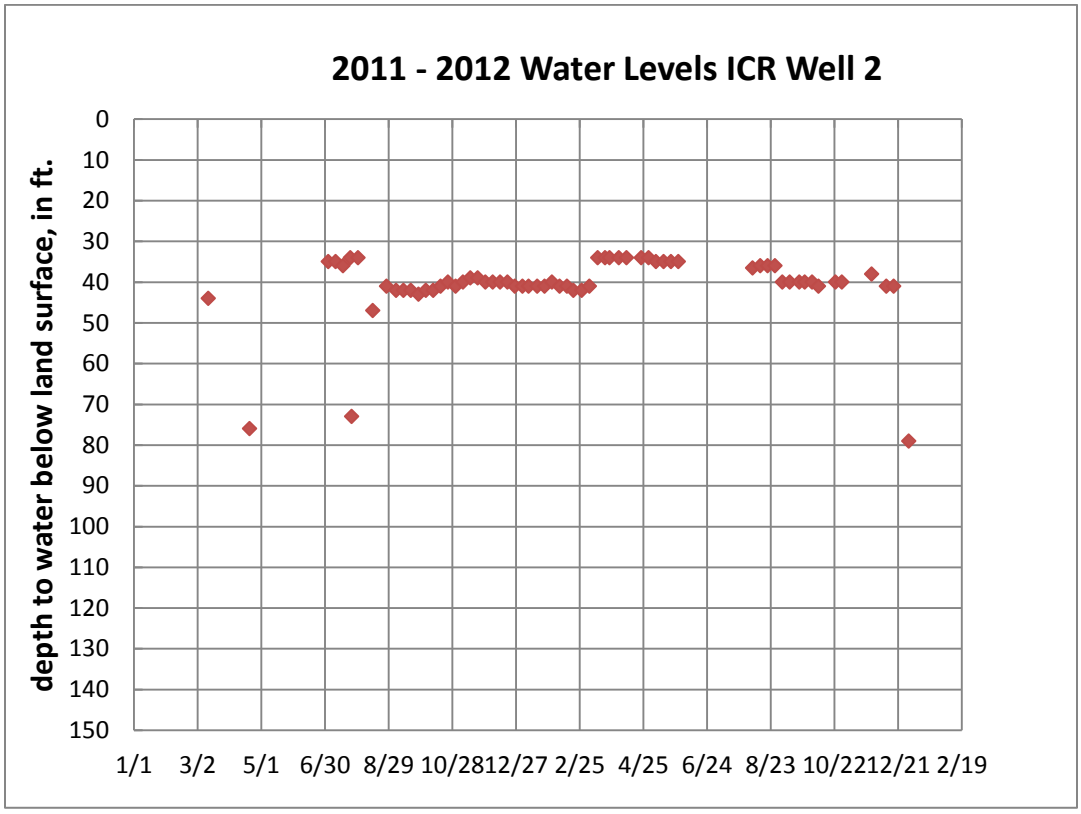


Figure 5


2011 - 2012 Water Levels ICR Well 2
depth to water below land surface, in ft.
0
10
20
30
40
50
60
70
80
90
100
110
120
130
140
150
1/1
3/2
5/1
6/30
8/29
10/28
12/27
2/25
4/25
6/24
8/23
10/22
12/21
2/19

THE TALKING ROCK WELL FIELD

The Talking Rock Ranch (TRR) well field consists of three wells referred to as TRR wells TRR 1, 2, and 3. Construction of TRR 1 began on January 3, 2001 and was completed on February 5, 2001; construction of TRR 2 began on March 27, 2001 and was completed April 20, 2002; construction of TRR 3 began May 13, 2002 and was completed May 15, 2002. The wells are situated along the eastern edge of the Mint Wash floodplain immediately east of Williamson Valley road where the road crosses the wash. The well field services the TRR subdivision and the TRR golf course. The well field and the land it is on are owned by the ICR Water Users Association.

The aquifer tapped by the TRR well field consist of medium to coarse sand with small amounts of intermixed gravel and layers of gravel and sand mixed with minor amounts of silt and clay. Interbedded within this material is a layer of basalt that is encountered at depths ranging from 70 ft., 108 ft., and 118 ft. below land surface at wells 1, 2, and 3 respectively. Thickness of the basalt ranges from 41 ft. to 50 ft. Geologic logs of nearby wells indicate that the areal extent of the basalt is limited and does not extend to the ICR Well Field. The base of the aquifer is formed by granitic and metamorphic rocks occurring at depths ranging from about 300 ft. below land surface at well 1, 262 ft. at well 2, and 240 ft. below land surface at well 3.

The regional water table lies in the unconsolidated sands and gravel above the basalt. In the absence of pumping, the altitude of the water table varies naturally in accordance with the seasonal pattern of precipitation. Measured depth to water at completion of drilling for each well was 20 ft., 57 ft., and 23 ft. below land surface at wells 1, 2, and 3 respectively. Wells 1 and 3 are at about the same elevation above sea level whereas well 2 is about 10 ft. higher. Subsequent non-pumping measurements at the well field have shown that depth to water at well 2 is about 8-10 ft. greater than that at wells 1 and 3. This difference is consistent with the difference in elevation of well 2 compared to wells 1 and 3 the wells. This suggests that the initial water level measurement at well 2 was not representative of non-pumping conditions at the well field.

The pumping capacity at all three wells has been downsized from that originally installed at all three wells due to initial overly optimistic estimates of the long-term yield of each well that resulted in unacceptable decline in water levels and air entrainment at all three wells. The pump at well 3 was downsized from 430 gpm to about 260 gpm in 2003 after which the well has been highly reliable. The pump at well 2 was downsized from about 530 gpm to a pump capacity of about 285 gpm in 2009. Since then, this well has also been highly reliable. The pump at well 1 was downsized in February 2012 and, as reported herein, the well reliably yields about 330 gpm.

The well field is managed so that the wells are called up sequentially as demand increases. As a result, on a given day, only one well is initially in service until demand requires an additional well. In general any two wells can meet daily demand except during the hottest and driest part of

the year when the water demand for the TRR golf course is at its greatest. The general practice is to use either well 1 or 2 as the initial well on call followed by well 3.

Demand

Demand at the TRR well field in 2012 was 104,613,000 compared to 106,658,000 gallons in 2011. Annual demand in 2008, 2009, and 2010 was 115,289,000, 108,222,500, and 116,091,800 gallons respectively. Average daily demand in 2012 was 286,610 gallons which corresponds to an average well yield of about 199 gpm. Total pumpage at wells 1, 2, and 3 for the year were 43,667,000 gallons, 37,937,000 gallons, and 23,009,000 gallons respectively.

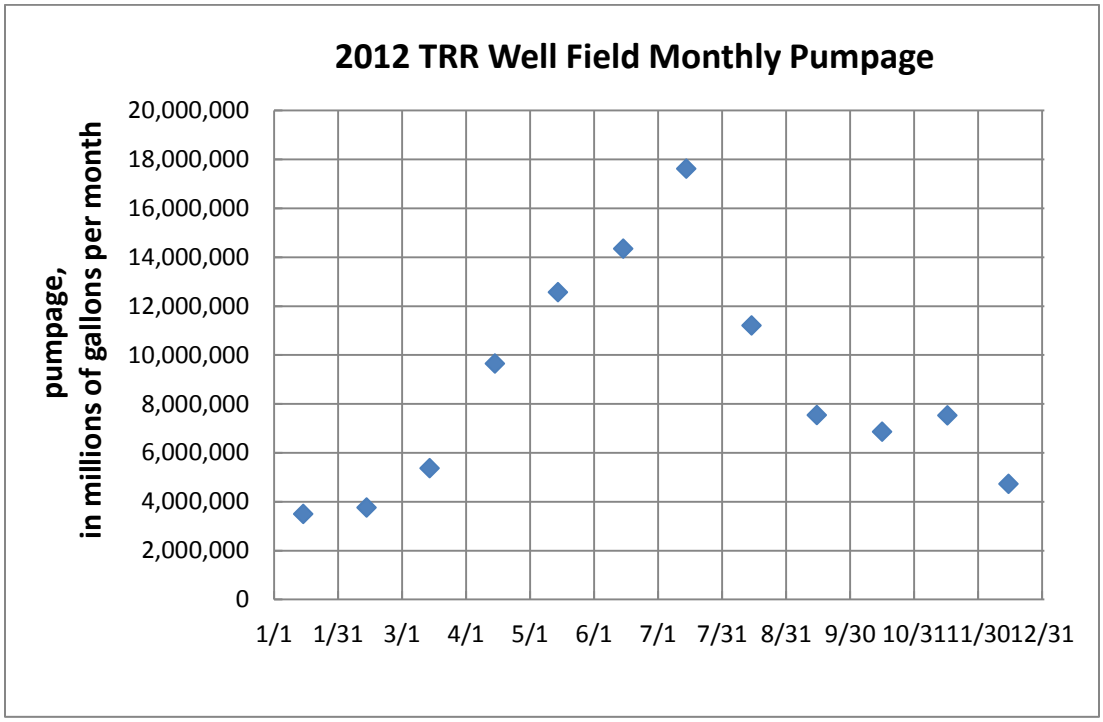
2012 demand varied significantly during the year with greatest demand occurring from April through August due to increasing golf course demand at this time. Golf course demand was approximately 94.7 million gallons; about 91 percent of the annual pumpage and identical to the percentage for 2011.

Monthly demand on the well field in 2012 increased from about 3,499,000 gallons in January to about 5,363,000 gallons in March, 9,641,000 gallons in April, and 17,613,000 gallons in July when pumpage peaked. Demand slowly decreased from this level falling to about 4,717,000 gallons in December, table 3 and figure 6. Columns 2, 3, and 4, table 3, show monthly pumpage from wells 1, 2, and 3 respectively; Column 5 shows total monthly pumpage from all three wells in gallons. Column 6 shows average daily pumpage in gallons per day, and column 7 shows average demand at the well field during the month in gallons per minute.

Table 3. Average 2012 Daily, Monthly and Annual TRR Well Field Pumpage, in Gallons

1	2	3	4	5	6	7
Month	**Well 1**	**Well 2**	**Well 3**	**Total**	**Daily**	**GPM**
Jan	605,000	2,260,000	634,000	3,499,000	112,871	78
Feb	49,000	2,283,000	1,418,000	3,750,000	133,929	93
March	1,309,000	2,713,000	1,341,000	5,363,000	173,000	120
April	8,173,000	0	1,468,000	9,641,000	321,367	223
May	10,336,000	19,000	2,205,000	12,560,000	405,161	281
June	13,019,000	0	1,323,000	14,342,000	478,067	332
July	5,561,000	6,915,000	5,137,000	17,613,000	568,161	395
August	0	7,233,000	3,970,000	11,203,000	361,387	251
Sept	227,000	4,448,000	2,865,000	7,540,000	251,333	175
Oct	56,000	5,875,000	929,000	6,860,000	221,290	154
Nov	20,000	5,828,000	1,677,000	7,525,000	250,833	174
Dec	4,312,000	363,000	42,000	4,717,000	152,161	106
Total	43,667,000	37,937,000	23,009,000	104,613,000		

Figure 6.



Yield

In general the TRR well field is operated with only two wells pumping during a given day. As discussed above, well 1 or well 2 serves as the primary well on call while well 3 is used to provide additional water if required. Thus if well 1 is primary, only wells 1 and 3 are used for that day. If well 2 is primary, only wells 2 and 3 are used. As discussed above, a new pump was installed at well 1 in early 2012 resulting in Well 2 being primary until late March when well 1 was put in the lead. Well 1 remained primary until late July. Golf course demand in July resulted in the use of all three wells for several weeks, however, after which wells 2 and 3 alone were able to meet demand. Well 1 was idle from late July until December, when it alone was able to meet demand.

Yield from the well field varies with the water level at the well field, falling as water levels generally decline during the summer. The decline is relatively small and therefore the range in yield is also relatively small. Yield of well 1, after installation of the new pump, averaged about 350 gpm with little variation during the year. The yield of well 2 averaged about 275 gpm with little variation as well; the yield of well 3 varied between 235 to 265 gpm with the normal yield falling between 250 to 260 gpm.

Water Levels

As discussed in the 2011 Annual Report, the pumping water level in the wells should be limited to about two-thirds of the original thickness of the aquifer to maximize production relative the pumping water level in the well and to pumping cost. Under this consideration, the maximum depth to water at well 1 should be about 185 ft. For well 2 the maximum depth should be about 155 ft. and about 145 ft. at well 3. An additional consideration however, is that in order to limit problems with air entrainment at wells 1 and 2, the pumping level in well 1 should not be more than about 165 ft. below land surface and the pumping water level in well 2 should be no more than about 155 ft. below land surface. The purpose behind the installation of a new pump at well 2 in 2011 and at well 1 in 2012 was to maintain pumping water levels at or above that required to limit air entrapment issues.

The pump intakes at TRR wells 1 and 2 are set at approximately 262 ft. below land surface. Maintaining a pumping level of 165 ft. or less at well 1, although not maximizing production relative to pumping cost, assures at least 97 ft. of water above the pump intakes. Maintaining a pumping level of 155 ft. or less at well 2 assures at least 107 ft. of water above the intakes and also meets the two-thirds rule. The pump intake at well 3 is set at approximately 230 ft. below land surface. Maintaining a pumping level of 145 ft. assures at least 85 ft. of water above the intakes.

TRR Well 1

Depth to water below land surface at TRR 1 in 2012 ranged from about 18 ft. to 177 ft., figure 7. Water levels that are less than 80 ft. below land surface represent non-pumping conditions at the well, but not necessarily at one or both of the other wells. Water levels deeper than 80 ft. represent pumping conditions at well 1.

Following the replacement of the pump in early 2012, the pumping water level rose from a maximum depth of 177 feet below land surface prior to replacement to somewhere between 90 and 120 below land surface afterwards. These depths are considerably above 165 feet below land surface required to preclude air entrapment.

Non pumping water levels also varied throughout the year being deeper in the summer months when well field use was greatest. Non-pumping water levels varied from highs of about 35 feet below land surface in January and 18 feet in March to about 75 feet in July. Non-pumping water levels rose to about 45 feet below land surface by the end of the year.

2011 and 2012 water levels at the well are shown in figure 8. The reduction in the depth to water under pumping conditions following installation of the new pump in early 2012 is quite evident (water levels at a depth of 180 feet in 2011 and 90 to 120 feet in 2012). As can also be seen in

the figure, non-pumping water levels are similar for both years. Depth to water below land surface at TRR 1 in 2011 ranged from about 30 feet to about 196 feet with water levels in less than 75 ft. below land surface represent non-pumping conditions at the well while water levels deeper than 75 ft. represent pumping conditions.

As discussed in the 2011 report, the water level at TRR 1 was about 20 ft. below land surface when it was completed on February 5, 2001. Minimum non-pumping water levels at the well in the range of 18 to 37 feet below land surface measured in 2012 and discussed above fall within the range that which would be considered acceptable for long-term viability of the well.

Figure 7

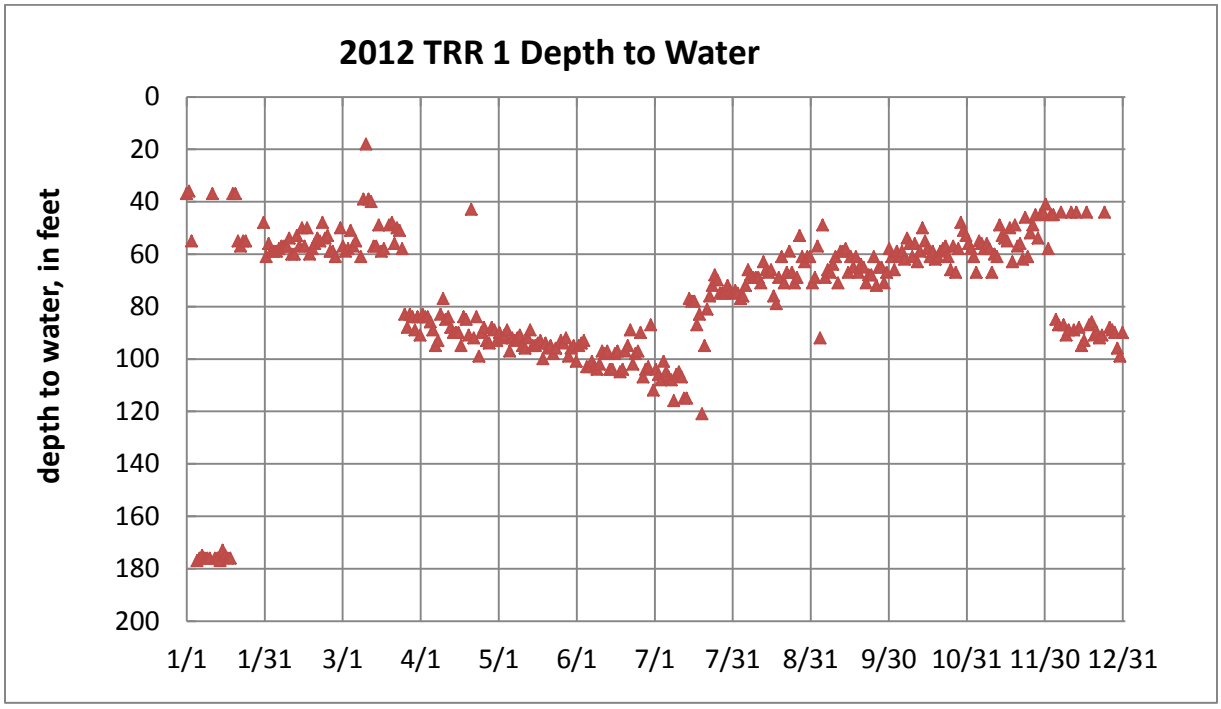
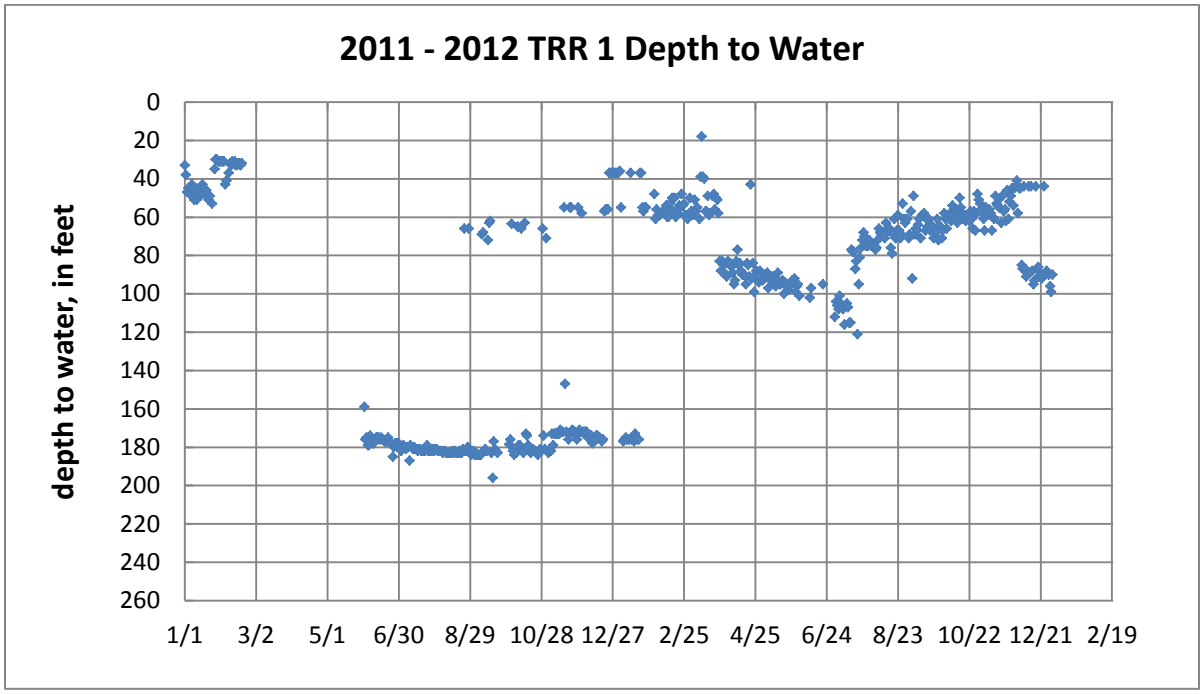


Figure 8



TRR Well 2

Depth to water below land surface at TRR 2 in 2012 ranged from about 48 feet to about 150 feet, figure 9. Water levels that are less than 100 feet below land surface represent non-pumping conditions at the well, but not necessarily at one or both of the other wells. Water levels deeper than 100 feet represent pumping conditions. The maximum depth to water of about 150 feet is 5 feet above that required for practical reasons and for problems associated with air entrainment. For the most part pumping water levels were above 135 feet during the year. As at well 1, pumping water levels remained above the depth necessary to preclude air entrapment issues. Non-pumping water levels recovered to about 50 feet below and surface at the end of the year.

2011 and 2012 water levels at the well are shown in figure 10. As discussed in the 2011 report, depth to water below land surface in 2011 ranged from about 42 feet to about 140 feet. For the most part pumping water levels were above 130 feet during the year. These values are similar to those of 2012 although pumping levels in 2012 averaged about 5 feet lower than those in 2011.

As discussed above, the water level at TRR well 2 was about 57 ft. below land surface when it was completed on April 20, 2002. The minimum water level of 48 ft. below land surface is about 9 ft. higher than that originally measured at completion of the well. Assuming an initial

water level of about 8-10 ft. greater than that at well 1, there has been a long-term decline at well 2 of about 18 ft. that is within the range of that which would be acceptable.

Figure 9

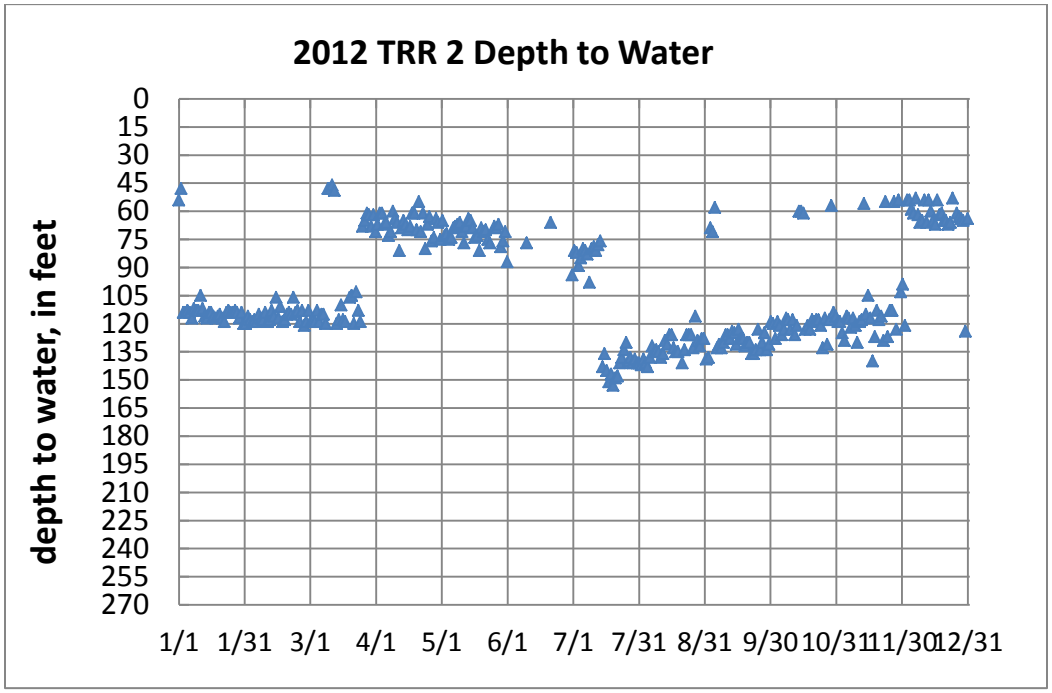
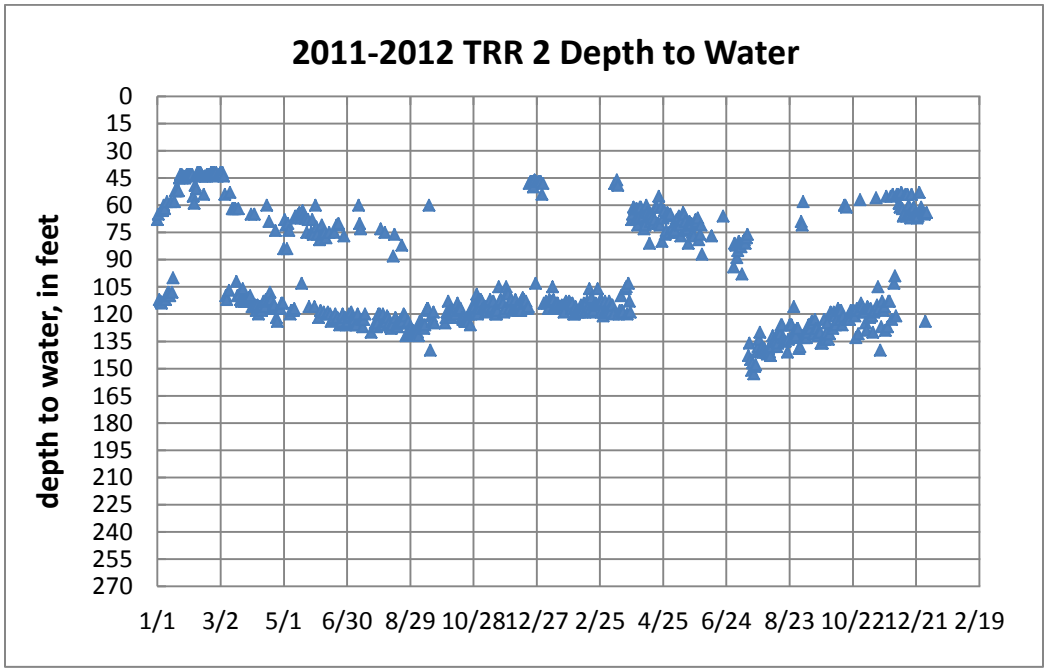


Figure 10



TRR Well 3

Depth to water below land surface at TRR 3 in 2012 ranged from about 28 feet to 183 feet, figure 11. The pumping water level varied from about 135 feet below land surface over much of the year to as much as 183 feet on August 5. For the most part the pumping depth to water fell between 110 and 160 feet below land surface and averaged about 140 feet.

Non-pumping water levels ranged from about 38 feet below land surface in January and March to about 70 feet in early July reflecting the continuous and relatively heavy pumpage at this time. The average non-pumping water level was about 60 feet below land surface.

The maximum depth to water of about 183 feet is about 40 feet lower than that required for efficiency reasons and only provides 47 feet of water above the pump intakes. This pumping level only occurred once however. The average pumping depth to water of about 140 feet is 5 feet above that required for practical reasons and provided about 90 feet of water above the pump intakes; both of which are highly acceptable.

2011 and 2012 water levels are shown in figure 12. As discussed in the 2011 report, depth to water below land surface in 2011 ranged from about 33 ft. during January and February to about 151 ft. in April. Use of the well in 2011 was discontinued after early May. The average pumping level in 2011 up to early May was about about142 feet. As discussed above, water levels in 2012 ranged from about 28 feet to 183 feet in with an average pumping level of approximately 140 feet. In further comparison, whereas the well was not used after early May in 2011, it was used throughout the year in 2012.

As discussed above, the water level at TRR well 3 was 23 ft. below land surface when it was completed on May 15, 2002. The minimum water level in figure 5 for the well is 28 ft. below land surface measured on February 3. At this depth the water level is about 5 ft. lower than that originally measured at completion of the well. As at wells 1 and 2, this decline is within that which would be considered acceptable for long-term viability of the well.

Figure 11

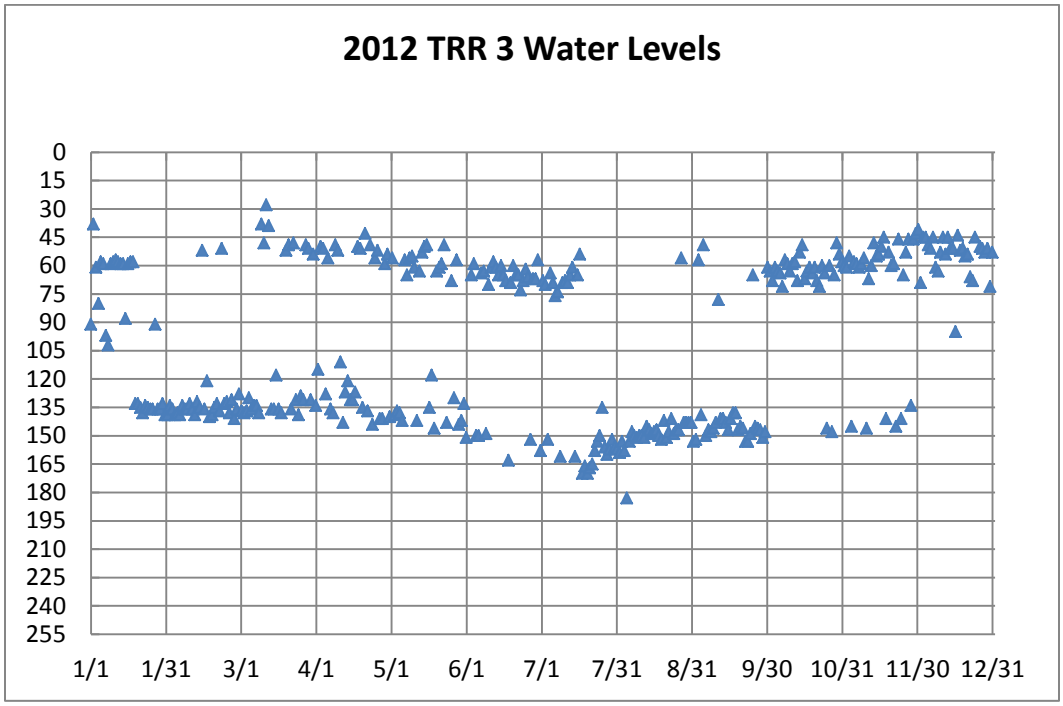
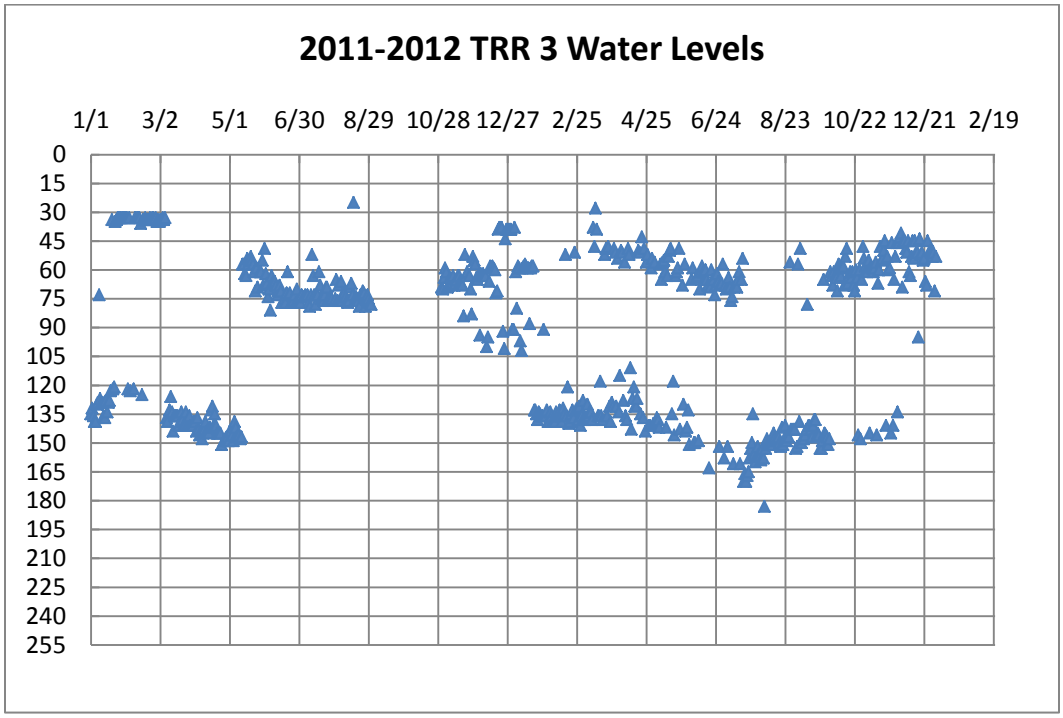


Figure 12



SUMMARY

The ICR Water Users Association (ICRWUA) is a private non-profit water company that provides water to the Inscription Canyon Ranch, Whispering Canyons, Preserve at the Ranch and Talking Rock subdivisions. The company also provides water to the Talking Rock golf course. Water for the first three subdivisions comes from the ICR well field while water for the Talking Rock subdivision and golf course comes from the TRR well field. The combined demand for all uses from both well fields for 2012 was 131,625,000 gallons, table 1. Of this amount some 27,012,000 gallons came from the ICR well field and another 104,613,000 gallons came from the TRR well field. The golf course use was 94,675,000 gallons, or about 91 percent of the total pumpage from the TRR well field. As shown in table 1, pumpage from the well fields for 2012 was lower than that for the previous four years.

There are two wells in the Inscription Canyon Ranch (ICR) well field about 30 feet apart; ICR 1 and ICR 2. In general the ICR well field is operated with only one well pumping during a given day. ICR 1 was used for 450 hours during the year for an average daily use of about 1.2 hours. ICR 2 was used for 800 hours for an average daily use of 2.2 hours. Yield from ICR 1 averaged 338 gpm while that from ICR 2 averaged 372 gpm.

Depth to water below land surface at ICR 1 in 2012 ranged from about 34 ft. to 65 ft. The minimum water level at the well of 34 ft. below land surface is 16 ft. lower than that originally measured at completion of the well. This decline is within that which would be considered acceptable for long-term viability of the well.

Depth to water below land surface at ICR 2 2012 in ranged from about 34 ft. to 79 ft. The minimum water level at the well of 34 ft. below land surface is 15 ft. lower than that originally measured at completion of the well. This decline is within that which would be considered acceptable for long-term viability of the well.

The Talking Rock Ranch (TRR) well field consists of three wells referred to as TRR wells TRR 1, 2, and 3. In general the TRR well field is operated with only two wells pumping during a given day. As discussed above, well 1 or well 2 serves as the primary well on call while well 3 is used to provide additional water if required. Thus if well 1 is primary, only wells 1 and 3 are used for that day. If well 2 is primary, only wells 2 and 3 are used. As discussed above, a new pump was installed at well 1 in early 2012 resulting in Well 2 being primary until late March when well 1 was put in the lead. Well 1 remained primary until late July.

Yield from the TRR well field varies with the water level at the well field, falling as water levels generally decline during the summer. The decline is relatively small and therefore the range in yield is also relatively small. Yield of TRR well 1, after installation of the new pump, averaged about 350 gpm with little variation during the year. The yield of TRR well 2 averaged about 275 gpm with little variation as well; the yield of TRR well 3 varied between 235 to 265 gpm with the normal yield falling between 250 to 260 gpm.

Depth to water below land surface at TRR 1 in 2012 ranged from about 18 ft. to 177 ft. Following the replacement of the pump in early 2012, the pumping water level rose from a maximum depth of 177 feet below land surface prior to replacement to somewhere between 90 and 120 below land surface afterwards. These depths are considerably above 165 feet below land surface required to preclude air entrapment.

The water level at TRR 1 was about 20 ft. below land surface when it was completed on February 5, 2001. Minimum non-pumping water levels at the well in the range of 18 to 37 feet below land surface measured in 2012 fall within the range that which would be considered acceptable for long-term viability of the well.

Depth to water below land surface at TRR 2 in 2012 ranged from about 48 feet to about 150 feet, figure 9. The water level at TRR well 2 was about 57 ft. below land surface when it was completed on April 20, 2002. The minimum non-pumping water level of 48 ft. below land surface is about 9 ft. higher than that originally measured at completion of the well. Assuming an initial water level of about 8-10 ft. greater than that at well 1, there has been a long-term decline at well 2 of about 18 ft. that is within the range of that which would be acceptable.

Depth to water below land surface at TRR 3 in 2012 ranged from about 28 feet to 183 feet. For the most part the pumping depth to water fell between 110 and 160 feet below land surface and averaged about 140 feet. Non-pumping water levels ranged from about 38 feet below land surface in January and March to about 70 feet in early July reflecting the continuous and relatively heavy pumpage at this time. The average non-pumping water level was about 60 feet below land surface.

The water level at TRR well 3 was 23 ft. below land surface when it was completed on May 15, 2002. The minimum water level in 2012 of 28 ft. below land is about 5 ft. lower than that originally measured at completion of the well. This decline is within that which would be considered acceptable for long-term viability of the well.