Ananda Village
2014 Water Conservation and Groundwater Management

Memorandum prepared by:

Ananda Village Planning and Water Department

December 2014

Ananda Village 2014 Water Conservation and Groundwater Management

December 4, 2014

Ananda Village is a cooperative spiritual community located about 15 miles northeast of Grass Valley and Nevada City, California. Approximately 200 adults and children live in the 706-acre Village.

The community is served by the Ananda Village Water System (#2900562), a community water system permitted by the State of California since the 1980s. The Village's water needs are supplied primarily by two groundwater wells, Dairy and St Francis. Two additional wells, Ballpark and Badrinath, have been permitted as active and standby wells, respectively. A fifth well, Turtle well, is sealed to public water system standards but is not connected to the water system as yet.

This report describes measures implemented by Ananda Village during 2014 to reduce water consumption and protect the community's groundwater resources.

2014 Water Conservation Program

When it became evident California was entering its third consecutive year of drought, the Ananda Water Department closely monitored Village water consumption and water levels in system wells. January saw unprecedented winter consumption driven by irrigation demand and resulting in well levels below winter norms. The need for water conservation was brought to a meeting of Ananda's Village Council[1], and in February 2014, the Council agreed to ask residents to reduce water consumption by 20%. This action was taken even considering that per capita water use at Ananda Village is already low, compared to State and County averages.

Over the course of the summer and fall, the Council and Village staff implemented the measures described below, and monitored the community's water use and groundwater levels in the community's supply wells. This data was used adaptively to manage demand and adjust pumping to protect the wells.

The Village Council established the following guidelines, prioritizing outdoor water uses:

- Lawns, water features, and swimming pools would be the lowest priorities.
- Ornamental landscaping, especially annuals at individual residences would be lower priorities than community landscaped areas, such as the Expanding Light Retreat and Crystal Hermitage.
- Maintaining existing perennial landscaping would be a higher priority than planting annuals.
- Food producing gardens would have priority over ornamental gardens.

The Council also agreed to replace inefficient toilets in Village workplaces, extended an offer to share costs on the replacement of toilets in community residences, and retired the Village swimming pool. A total of about 25 toilets were replaced as part of this program.

[1] Ananda Village Council is a forum for discussion and decision making regarding policies that affect the life of members of Ananda Village. It is comprised of key village managers and six elected members.

On February 26, the community held a meeting to discuss water conservation goals. Despite heavy rain, the meeting was well attended, with around 100 village residents present (out of a total of around 200). Residents whose water use was already very low spoke about the ways they conserve water. Village management asked residents and those who manage non-residential areas, such as the Expanding Light Retreat, to conserve 20% inside and outside. Residents were told they would receive monthly reports showing how much water they were using and providing residential water use goals, based on historic water use and the 20% conservation goal.

Village management met separately with the community's big irrigation users, asking them to be as efficient as possible and to reduce water use.

In March, the Village increased the frequency of reading water meters from every other month to monthly, and began sending monthly water use reports to residential, commercial, and agricultural water users (see Attachment 1, Sample Reports). The reports showed water use and how it compared to other users in the same category. Residential reports included consumption from the previous month, current month, and water use per capita. Notes attached to the reports reminded residents of the water conservation goal and gave updates on how the community was responding as a whole. Monthly reporting continued until mid-November 2014.

Water and planning department staff initiated a number of other measures in spring 2014 including:

- Publishing notices in the community's weekly newsletter, reporting on current rainfall conditions and suggesting ways to conserve water. Submissions to the Villager continued into August (see Attachment 2 for sample notices).
- Activating the annual "Garden Meters Group" for 2014, where each week the Village's big irrigators call in water meter readings to Ananda's Water Department. This allows the Village to closely monitor usage by these customers to quickly identify potential leaks or excessive water use. The program, which has been in effect every irrigation season since 2009, continued until the end of October. Attachment 3 is a sample Garden Meters weekly report.
- Making rice straw available to Village residents to mulch areas around their homes.
- Offering free irrigation consultations to residents, looking at irrigation hardware, timing, and duration, as well as helping to track down leaks.

On July 17, the Village held a second community meeting to discuss water conservation. Steve Baker of Hydrosolutions of California, a hydrogeologist that has been working with Ananda since 2006, made a presentation to the community about the importance of monitoring water use and the need to conserve water during this third year of drought. His presentation included background on fractured rock aquifers as well as information putting Ananda's programs in the context of what is happening in other areas around the Western United States.

Monthly water conservation at Ananda Village is summarized in Table 1, below. Peak conservation occurred between mid-July and mid-August, when water demand was 26% less than average use between 2006 and 2013, and was 31% less than demand during the same period in 2013. (The increase in water use between March and May 2014, compared to other years is because irrigation started much earlier this year. Without conservation efforts, the figure would have been much higher.)

Table 1. Ananda Water System Total Water Pumped
2014 Compared to Previous Year and Previous Seven Years

	2014	2013		2006-2013	
	Total Pumped in Period (MG)*	**Total Pumped in Period (MG)***	**Percent Change 2014 vs 2013**	**7-yr Average Total Pumped in Period (MG)***	**Percent Change 2014 vs 2006-2013**
Mar 17 - Apr 15	0.69	0.66	+5%	0.61	+13%
Apr 16 - May 14	0.89	1.19	-25%	0.86	+3%
May 15 - Jun 19	1.44	1.71	-16%	1.54	-6%
Jun 20 - Jul 15	1.21	1.39	-13%	1.49	-19%
Jul 16 - Aug 14	1.39	2.02	-31%	1.87	-26%
Aug 15 - Sep 15	1.42	1.84	-23%	1.89	-25%
Sep 16 - Oct 15	1.09	1.39	-22%	1.33	-18%

*MG = million gallons

Groundwater Monitoring & Management

The goals and methods that guide Ananda's groundwater pumping are described in Section 6.4, "Adaptive Groundwater Management Program," in the Ananda Village Master Plan Update Source Capacity Planning Study.

A key component of the groundwater management plan is monitoring of water levels in Ananda's wells, using automated pressure transducers and data loggers that record depth to water at least every 45 minutes. Operation of the water system in 2014 was informed by monthly review of the data from the two wells (Dairy and St Francis) that supplied the community's potable water. Pumping from the wells was adjusted as needed to maintain pumped water levels above the water producing fractures and to keep pumped and static water levels within the ranges observed in historical data (see Attachment 4 for a sample of this data). Based on this data, pumping from the Dairy and St Francis wells was adjusted during 2014, as described below.

In January, residents began irrigating outdoor landscaping in response to a long spell of warm, dry weather. The unusually high water demand increased pumping above normal levels for this time of year, and depth-to-water declined in the Dairy well, which was supplying the whole community at the time. Ananda shifted some of the demand on the Dairy well to the St Francis well, and water levels in the Dairy well recovered to near normal. Static water levels in the St Francis well remained about the same as they were in October through December 2013, although lower than in previous years.

In September, pumping was shifted from the St Francis well to the Dairy well, when monitoring showed that, on some days, pumped water levels in the St Francis well were within five feet of the first water producing fracture. Once pumping was adjusted, static water levels in St Francis well recovered to near 2013 levels, while water levels in Dairy well declined slightly as of mid-October, but remained within an historically acceptable range.

Conclusion

The experience gained during the drought of 2014 demonstrates that the organizational structure and size of Ananda Village give it the ability to quickly communicate the need for water conservation to its residents and to provide targeted conservation support to special customers (e.g., big irrigators and householders needing guidance in irrigation management). Village residents and non-residential customers were willing to cooperate with the Village Council's goals by reducing water demand by as much as, or more than, other areas of the state.

Ananda's newly adopted Adaptive Groundwater Management Program proved invaluable in providing feedback on the effectiveness of the community's water conservation efforts and indicating whether greater reductions were warranted. Monitoring data also showed Village managers when to adjust the distribution of pumping to protect the community's two primary supply wells.

The experience of 2014 provides a model for water management that can be used during future droughts or other times of water scarcity.

Table 2 shows water reductions during June through September 2014 for Ananda Village, Nevada Irrigation District, and average statewide water demand. It should be noted that measurements, calculation methods, and regional conditions are not identical across the three sets of numbers in the table. The numbers are presented here to show that, generally, water conservation at Ananda Village compares favorably with regional and statewide efforts.

Table 2. 2014 Local & Statewide Water Demand, Compared to 2013

	Ananda Village[1]	Nevada Irrigation District[2]	Statewide Average[3]
June	-13%	-10.5%	-4.0%
July	-31%	-14.2%	-7.5%
August	-23%	-18.0%	-11.6%
September	-22%	-7.6%	-10.3%

[1]Ananda water system, total water pumped. Data is from the middle of the month shown to the middle of the following month.

[2] Total monthly potable water production 2013, 2014 for Nevada Irrigation District from "September Urban Water Suppliers Report" as posted on http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/conservation_reporting_info.shtml. NID serves a 287,000-acre area within Nevada and Placer counties, including Grass Valley, Nevada City, and Lake Wildwood.

[3]Statewide Water Conservation Rate compiled from mandatory reports from Urban Water Suppliers statewide, as reported in State Water Board media release 11/4/14, http://www.waterboards.ca.gov/waterrights/water_issues/programs/drought/conservation_reporting_info.shtml.

Attachment 1: Sample Water Use Reports

(2 residential & 1 non-residential)

To: Box:

Village Residential Water Use

The attached page shows the amount of water used by each Village household between January 15 and March 17, 2014. For your convenience, water use is shown in three ways:

- Total volume of water used during the period,
- Average number of gallons used daily during that time (GPD), and
- Average number of gallons used daily by each person in the household (GPPD)

Average residential use between March and May has been 58 GPPD. During this third year of drought, the Village is aiming for a 20% reduction, or an average of **46 GPPD**, between now and mid-May.

Most of this water use is inside the home, and that is where we are asking people to focus for the next two months. If you had to irrigate in January, or if we have a dry spring, your numbers will include some irrigation, and will be a little higher. We are asking everyone to do their best, be conscious about your water use, check your water meter weekly, and do what you can to save. Please call Ramu at 2350, if you have any questions.

Next month, you'll receive another water use report, so you can see how you're doing.

To protect everyone's privacy, each household has been given a water use ID number on the attached sheet. ***Your ID number is:***

Thank you! from Ananda Water Department and Property Services.

Village Residential Water Use, Jan 15 - Mar 17, 2014

Target = 46 gallons per person per day

ID #	# Persons	Total Gallons Used	GPD[1]	GPPD[2]
1	1	3,000	49	49
2	5	13,000	213	43
3	11	36,000	590	54
4	2	4,000	66	33
5	2	14,960	245	123
6	2	6,000	98	49
7	1	3,000	49	49
8	2	5,000	82	41
9	6	27,000	443	74
10	1	8,000	131	131
11	3	10,000	164	55
12	4	9,000	148	37
13	2	15,000	246	123
14	3	3,333	55	18
15	2	2,667	44	22
16	3	11,000	180	60
17	2	4,000	66	33
18	2	3,000	49	25
19	2	6,000	98	49
20	1	2,000	33	33
21	2	5,000	82	41
22	2	7,000	115	57
23	1	5,000	82	82
24	2	5,000	82	41
25	2	7,000	115	57
26	1	2,000	33	33
27	2	7,000	115	57
28	9	26,000	426	47
29	2	7,000	115	57
30	2	12,000	197	98
31	2	5,500	90	45
32	1	2,750	45	45
33	1	2,750	45	45
34	2	4,667	77	38
35	1	2,333	38	38
36	1	2,000	33	33
37	2	4,000	66	33
38	2	4,000	66	33
39	1	3,000	49	49
40	2	3,000	49	25
41	1	1,500	25	25
42	1	1,500	25	25
43	2	4,000	66	33
44	2	10,000	164	82
45	2	3,333	55	27
46	1	1,667	27	27
47	1	4,000	66	66
48	2	6,000	98	49
49	4	14,000	230	57
50		2,000	33	
51	2	6,000	98	49
52	2	8,000	131	66
53	2	8,000	131	66
54	2	9,000	148	74
55	2	4,000	66	33
56	1	2,000	33	33
57	2	5,000	82	41
58	1	20,000	328	328
59	1	11,000	180	180
60	2	9,000	148	74
61	1	2,000	33	33
62	3	5,000	82	27
63	6	12,000	197	33
64	2	2,667	44	22
65	1	1,333	22	22
66	2	4,000	66	33
67	2	9,000	148	74
68	2	17,000	279	139
69	3	9,000	148	49
70	6	14,000	230	38
71	15	57,596	944	63
72	2	4,500	74	37
73	2	4,500	74	37
74	2	7,000	115	57
75	2	3,000	49	25
76	2	10,000	164	82
77		11,000	180	
78		35,000	574	
79	2	11,000	180	90
80	2	7,000	115	57

[1]GPD = gallons per day

[2]GPPD = gallons per person per day

Starting:	1/15/14
Ending:	3/17/14
Total days	61

To: Box:

Residential Water Use Report, August 14-September 15, 2014

Once again, this community has done an outstanding job of conserving water. From mid-August to mid-September, water demand was down 25% compared to historic levels. It was 23% less than last year at this time. Thank you for your concerted response during this drought!

Please try to sustain these conservation gains through the end of the irrigation season. It's still important to check irrigation systems for leaks and to reduce irrigation times as the weather cools. Also, please refrain from hosing down outside surfaces and washing cars with hoses. It's better to wash cars in town, where they use recycled water.

Given the water use reductions we've seen this summer, it's obvious many of you have found effective and creative ways to save water. We're very interested to hear the ways you found to conserve water. Are there water saving practices that you feel you can adopt permanently? Please send your experiences and suggestions to me at atman@ananda.org, or leave me a message at 7639.

Thank you all again for a resounding water conservation success! Many hands make a miracle.

Atman

Note: If you are on the Village email distribution list, you will receive the residential water use report in electronic form, in addition to this printed version. If you would like to receive just the electronic version, make a note of your ID# (it's not printed on the electronic version), and email leah@ananda.org with your preference.

The following page shows the amount of water used by each Village household during the last two months. To protect everyone's privacy, each household has been given a water use ID number. ***Your ID number is:***

Village Residential Water Use, August 14-September 15, 2014

Residential Conservation Targets:
Extensive pre-existing gardens: **200 gppd**
Limited or no outdoor landscaping: **30-65 gppd**
Moderate pre-existing gardens: **100-130 gppd**

ID #	# Persons	Jul-Aug GPD[1]	Aug-Sep GPD[1]	Aug-Sep GPPD[2]
1	1	43	95	95
2	5	306	270	54
3	11	759	727	66
4	3	205	159	53
5	2	1,573	1,409	704
6	2	116	64	32
7	1	58	32	32
8	2	251	234	117
9	7	394	408	58
10	1	112	137	137
11	3	109	103	34
12	4	277	233	58
13	2	408	474	237
14	3	31	47	16
15	2	25	37	19
16	4	197	258	64
17	2	72	75	38
18	3	105	110	37
19	2	74	75	38
20	1	16	22	22
21	2	141	148	74
22	2	303	205	102
23	1	77	152	152
24	2	216	261	130
25	2	58	63	31
26	1	21	29	29
27	2	57	49	24
28	9	512	471	55
29	2	110	97	48
30	2	177	254	127
31	2	261	475	237
32	2	261	475	237
33	1	20	20	20
34	2	82	94	47
35	1	41	35	35
36	1	40	38	38
37	2	84	83	41
38	2	100	115	58
39	1	42	46	46
40	2	68	93	46

ID #	# Persons	Jul-Aug GPD[1]	Aug-Sep GPD[1]	Aug-Sep GPPD[2]
41	1	34	46	46
42	1	34	46	46
43	3	179	131	44
44	2	410	330	165
45	2	69	55	28
46	0	0	0	
47	1	43	46	46
48	2	78	73	37
49		2,017	2,432	
50	1	118	85	85
51	3	71	111	37
52	4	270	280	70
53	2	610	184	92
54	3	400	226	75
55	2	109	92	46
56	1	54	46	46
57	2	254	254	127
58	1	1,208	1,097	1,097
59	1	202	632	632
60	2	456	343	171
61	1	81	47	47
62	3	241	228	76
63	7.5	252	251	33
64	2	56	61	31
65	1	28	31	31
66	2	45	56	28
67	2	405	408	204
68	2	516	532	266
69	3	165	125	42
70		167	211	
71	14	1,349	1,152	82
72	2	132	105	53
73	2	132	105	53
74	2	220	219	110
75	2	52	58	29
76	2	223	172	86
77	2	349	575	288
78	2	83	80	40
79	2	117	81	41
80		365	624	

[1]GPD = gallons per day
[2]GPPD = gallons per person per day

Starting: 8/14/14
Ending: 9/15/14
Total days 32

School, Rajarshi Park, & Village Center Water Use, October 15-November 17, 2014

(GPD = gallons per day)

	May 14-Jun 19 (36 days)		Jun 19-Jul 15 (26 days)		Jul 15-Aug 14 (30 days)		Aug 14-Sep 15 (32 days)		Sep 15-Oct 15 (30 days)		Oct 15-Nov 17 (33 days)		2013 9/16-11/18
Ananda School	**Gallons**	**GPD**	**Gallons**	**GPD**	**Gallons**	**GPD**	**Gallons**	**GPD**	**Gallons**	**GPD**	**Gallons**	**GPD**	**GPD**
Main Campus Buildings	6,840	190	10,780	415	8,110	270	8,850	277	10,240	341	52,010	1,576	190
Irrigation Well (NP)* 6 days	36,000	1,000	42,172	1,622	38,428	1,281	13,300	416	9,600	320	600	18	
Living Wisdom Center	670	19	990	38	570	19	530	17	1,060	35	1,260	38	32
LWC Irrigation	8,920	248	1,650	63	6,350	212	9,300	291	5,190	173	0	0	286
Total	***52,430***	***1,457***	***55,592***	***2,138***	***53,458***	***1,782***	***31,980***	***999***	**26,090**	**869**	**53,870**	**1,632**	***508***
Rajarshi Park	**Gallons**	**GPD**	**Gallons**	**GPD**	**Gallons**	**GPD**	**GPD**	**GPD**	**Gallons**	**GPD**	**Gallons**	**GPD**	**GPD**
Buildings													
Lahiri	3,230	90	1,570	60	1,790	60	4,440	139	2,180	73	1,840	56	159
St Lynn	1,340	37	790	30	1,040	35	3,260	102	790	26	1,060	32	175
Om Building	2,900	81	2,210	85	2,820	94	2,340	73	2,050	68	1,960	59	143
Hansa Temple	4,370	121	3,210	123	1,700	57	6,580	206	3,620	121	340	10	159
Total	***11,840***	***329***	***7,780***	***299***	***7,350***	***245***	***16,620***	***519***	**8,640**	**288**	**5,200**	**158**	***636***
Landscape													
Irrigation	24,910	692	11,570	445	12,400	413	9,600	300	8,320	277	0	0	810
Fountain	4,430	123	2,350	90	4,300	143	4,570	143	2,950	98	60	2	63
Orchard	0	0	0	0	0	0	0	0	0	0	0	0	0
Total	***29,340***	***815***	***13,920***	***535***	***16,700***	***557***	***14,170***	***443***	**11,270**	**376**	**60**	**2**	***873***
Village Center	**Gallons**	**GPD**	**Gallons**	**GPD**	**Gallons**	**GPD**	**GPD**	**GPD**	**Gallons**	**GPD**	**Gallons**	**GPD**	**GPD**
Maintenance Barn	2,040	57	1,890	73			4,920	154	920	31	720	22	32
Laundry	8,580	238	7,850	302	6,840	228	6,120	191	6,520	217	5,740	174	254
N. Lights/Ananda Bell	420	12	430	16			430	14	240	8	4,560	138	16
Joy Symbol	6,980	194	7,430	286	2,850	95	14,650	458	4,890	163	450	14	778
Market	6,590	183	4,300	165	4,290	143	3,760	118	3,360	112	3,220	98	143
Downtown Lawn	35,240	979	38,460	1,479	43,950	1,465	51,420	1,607	13,820	461	500	15	794
Total	***59,850***	***1,663***	***60,360***	***2,321***	***57,930***	***1,931***	***81,300***	***2,541***	**22,310**	**744**	**15,190**	**460**	***2,017***

Attachment 2: Sample Ananda Villager Newsletter Submissions

March 6-13, 2014 Villager:

Know Your Water Use:

The Village is asking residents to tune into their water meters and to track their water use each week. The log sheets distributed at the last community meeting are designed to make tracking easy. You can also get log sheets at the Village Office, or call 7500 to have one put in your box. The Village will also be emailing the log sheets to those on the Village email list. Begin tracking your water use now, so that you can see how it changes from winter to summer.

One way to see if there's a hidden water leak somewhere in your home is to watch your meter when no water is being used inside or outside the house. If the meter is registering water use, call Property Services at 7508 and someone will come by to check it out.

If you don't know where your water meter is, call Ramu at 2350. Ramu is going to flag everyone's meters in mid-March.

The Village is looking for volunteers to read water meters in their housing clusters once each month. Contact the Village Office (7500), if you'd like to help.

April 3-10 Villager:

This Week's Rainfall Update
(Brought to you courtesy of Ramu,for the Village Water Department)

- Average rainfall for Grass Valley, through April 1st: 47.54"
- Rainfall for Ananda Village, through April 1st, 2013: 30.5"
- Rainfall for Ananda Village through April 1st, 2014: 30.5"

The average annual rainfall for Grass Valley is about 53 inches a year. Rainfall totals at Ananda Village for the last two years were 35 inches in 2011-12, and 33 inches in 2012-13.

April 24-May 1 Villager:

Water Conservation

Want to keep your water consumption down? Consider installing a low flow toilet in your house. Property Services has found an excellent low flow toilet for $130. You provide the $130, we will buy, transport, install the toilet, and dispose of the old one for no additional charge. Call 7508 if interested.

June 19-26 Villager:

Water Conservation

This week's tip: Water during the cool hours of the day to minimize evaporation loss. Thank you for all your conservation efforts. An update on your current water usage along with a report on our well health will be out at the beginning of next week.

And for those interested, there is a **free workshop at 10am this Saturday, on "Efficient Home Irrigation and Watering,"** at the Nevada City Veterans Memorial Building. Contact Sara at (707) 338-1191 for more info.

June 26-July 3 Villager:

Water Conservation Update

Look for this month's water numbers in your box. Some people are making incredible efforts—14 gallons per person per day!

Tip for the week: Mulch wherever you irrigate to slow evaporation and allow plants to absorb water. Straw for mulching is available for sale from Property Services. Composted leaves are also available in the recycling area. Call 7508 if interested.

July 31-August 7 Villager:

Water Conservation Tips (Courtesy of the EPA)

The drought is giving us an opportunity to become more aware of the ways that we use water. When it comes to water use, small changes can make a big difference.

Here are some simple water conservation tips from the Environmental Protection Agency's Water Sense website ***(http://www.epa.gov/watersense/***).

In the yard—where up to 70% of summer water use takes place:
• Use regionally appropriate, low water-using or native plants.
• Group plants according to their water needs.
• Know when and how much to water to keep a healthy landscape. Call Ramu at 2530 for advice on streamlining your irrigation system.
• Sweep, rather than hosing off, driveways, sidewalks, and steps.
• Wash the car with water from a bucket, or use a commercial car wash.

In the bathroom—where over half of all water use inside a home takes place:
• Turn off the tap while shaving or brushing teeth.
• Short showers use less water than baths. A 5-minute shower uses 10 to 25 gallons of water, while a full tub requires about 70 gallons.
• Switch to a water-saving showerhead. Many brands are available that use no more than 2 gallons per minute, while providing a shower that's equal to or better than conventional showerheads, which use 2.5 gpm or more.

In the kitchen–whip up some big water savings:
• Plug up the sink or use a wash basin, if washing dishes by hand.
• Use a dishwasher, and when you do, make sure it's fully loaded. Scrape plates instead of rinsing before loading them into the dishwasher.
• Keep a pitcher of drinking water in the refrigerator instead of letting the faucet run until the water is cool.

Thank you all for your conservation efforts this summer. You're helping to preserve the health of our groundwater resource.

Attachment 3: Sample Garden Meters Group Weekly Report

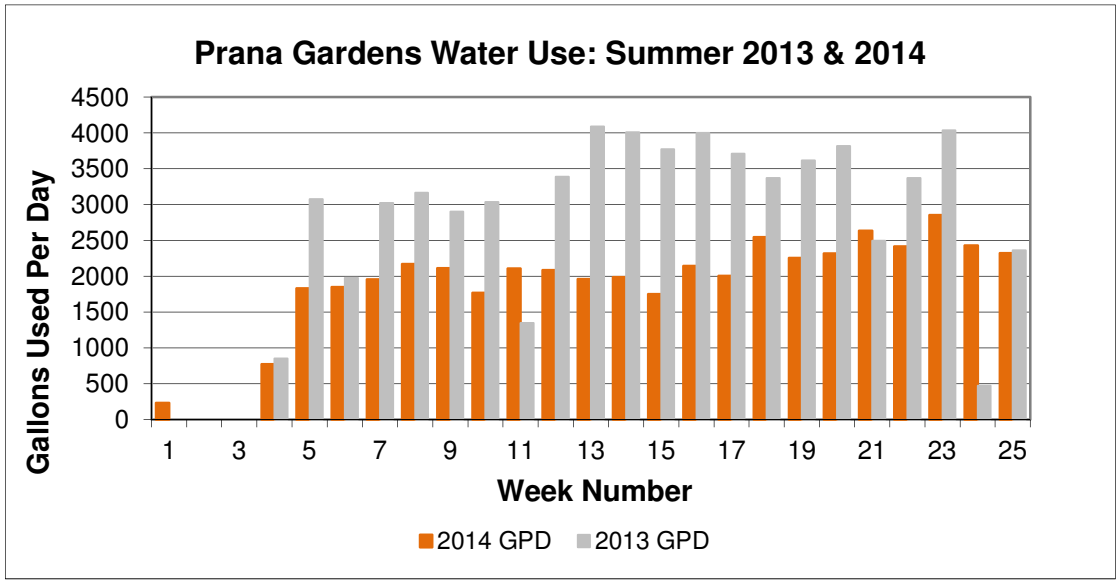
Prana Gardens Water Use - Summer 2014

From Potable System

Week number	1	2	3	4	5	6	7	8	9	10
Beginning date	1/15/2014	3/17/2014	3/17/2014	3/17/2014	5/11/2014	5/18/2014	5/25/2014	6/2/2014	6/8/2014	6/15/2014
End date	3/17/2014	3/17/2014	3/17/2014	5/11/2014	5/18/2014	5/25/2014	6/2/2014	6/8/2014	6/15/2014	6/22/2014
2014 GPD	**230**	**#DIV/0!**	**#DIV/0!**	**770**	**1,831**	**1,850**	**1,955**	**2,172**	**2,110**	**1,767**
2013 GPD				**853**	**3,074**	**1,979**	**3,022**	**3,165**	**2,900**	**3,034**

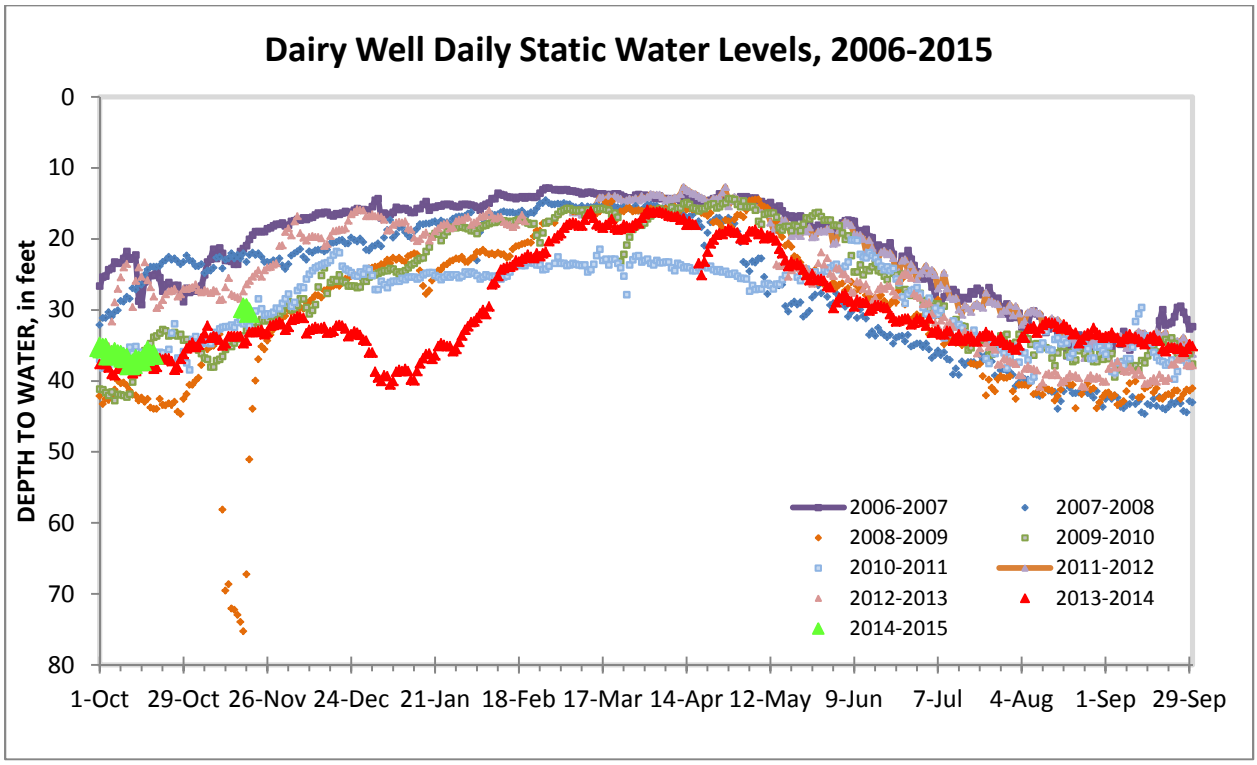
Week number	11	12	13	14	15	16	17	18	19	20
Beginning date	6/22/2014	6/29/2014	7/6/2014	7/15/2014	7/20/2014	7/26/2014	8/1/2014	8/11/2014	8/17/2014	8/24/2014
End date	6/29/2014	7/6/2014	7/15/2014	7/20/2014	7/26/2014	8/1/2014	8/11/2014	8/17/2014	8/24/2014	9/1/2014
2014 GPD	**2,106**	**2,086**	**1,958**	**1,988**	**1,750**	**2,142**	**2,003**	**2,547**	**2,254**	**2,316**
2013 GPD	**1,347**	**3,389**	**4,090**	**4,009**	**3,774**	**4,001**	**3,709**	**3,373**	**3,616**	**3,819**

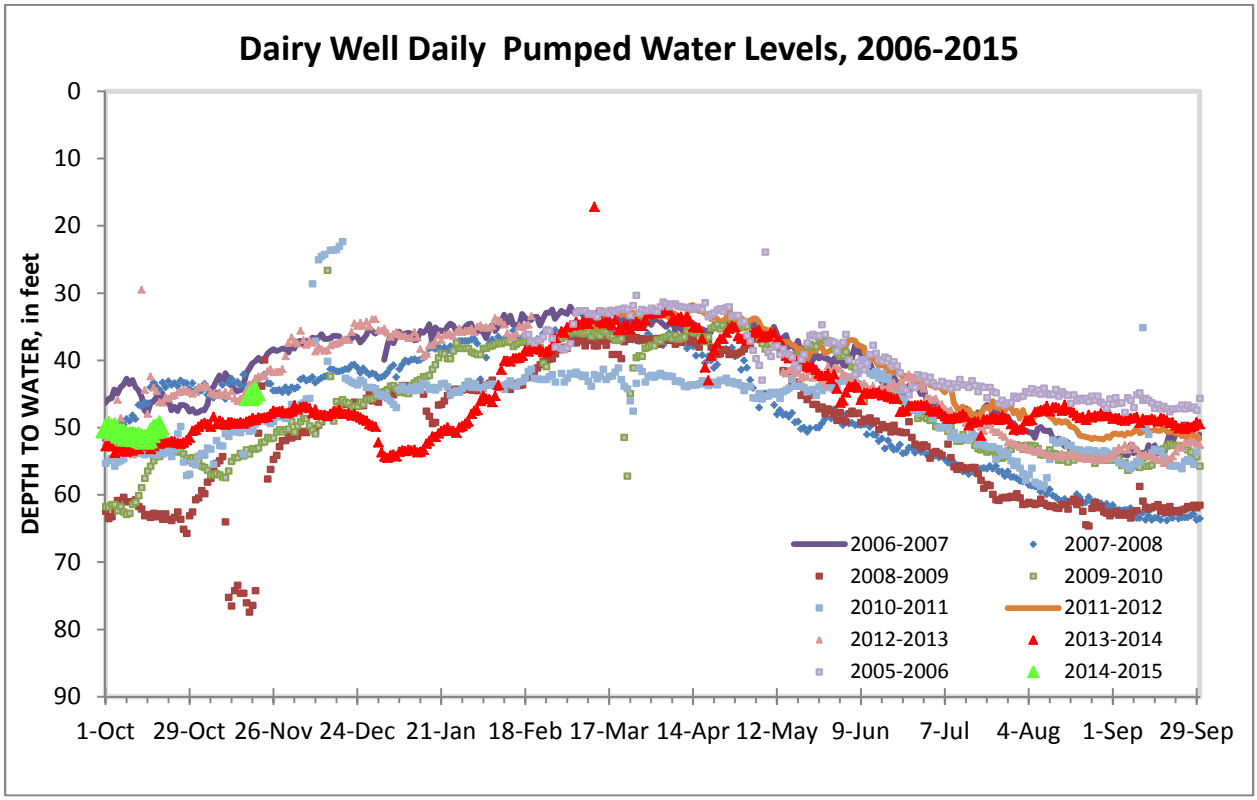
Week number	21	22	23	24	25	26
Beginning date	9/1/2014	9/6/2014	9/15/2014	9/23/2014	9/29/2014	10/6/2014
End date	9/6/2014	9/15/2014	9/23/2014	9/29/2014	10/6/2014	##########
2014 GPD	**2,632**	**2,416**	**2,854**	**2,428**	**2,323**	**1,689**
2013 GPD	**2,494**	**3,373**	**4,038**	**474**	**2,360**	

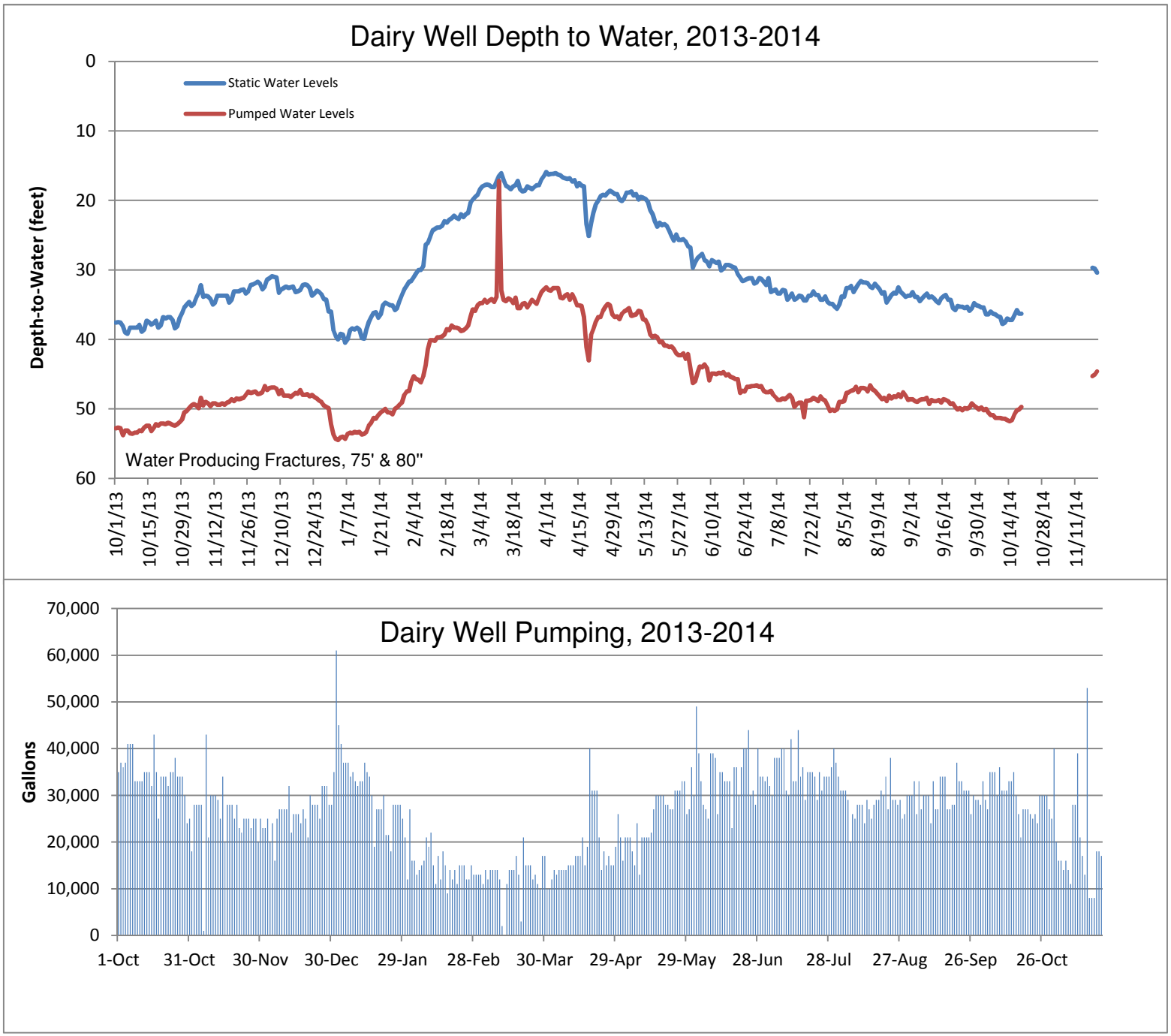


Attachment 4: Sample Hydrographs for Groundwater Management

Dairy Well: Yearly Comparison of Static & Pumped DTW
November 17, 2014






Dairy Well Depth to Water, 2013-2014
Depth-to-Water (feet)
0
10
20
30
40
50
60
Static Water Levels
Pumped Water Levels
Water Producing Fractures, 75' & 80"
10/1/13
10/15/13
10/29/13
11/12/13
11/26/13
12/10/13
12/24/13
1/7/14
1/21/14
2/4/14
2/18/14
3/4/14
3/18/14
4/1/14
4/15/14
4/29/14
5/13/14
5/27/14
6/10/14
6/24/14
7/8/14
7/22/14
8/5/14
8/19/14
9/2/14
9/16/14
9/30/14
10/14/14
10/28/14
11/11/14
Dairy Well Pumping, 2013-2014
Gallons
70,000
60,000
50,000
40,000
30,000
20,000
10,000
0
1-Oct
31-Oct
30-Nov
30-Dec
29-Jan
28-Feb
30-Mar
29-Apr
29-May
28-Jun
28-Jul
27-Aug
26-Sep
26-Oct