EXHIBIT "A"

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MEMORANDUM

To: Chris Campbell

From: David McGlasson, PE

Subject: Gunnar Ranch West Water Balance Analysis

Date: July 17, 2014

This memo documents the calculations we made on behalf of Root Creek Water District, analyzing the anticipated water use and water balance of the Gunner Ranch West Project (GRW).

We have been asked to prepare similar analyses in the past. Our original assignment in 2011 was to analyze the prospective water demand for GRW in the same manner as we had done for the Gateway Village Specific Plan and Water Supply Assessment in 2006 and 2007. Since that time we have refined the calculations to account for changes in project land use totals and in groundwater recharge assumptions. In 2013 we prepared a major update to our summary based on new State laws affecting both indoor and outdoor water use which have come into effect since 2011. What follows is a discussion of the current version of the two-page worksheet, dated July 17, 2014 and entitled Water Demand and Balance Calculations - Gunner Ranch West Development. A copy of that worksheet is included with this memo.

A. Table 2-1 Projected Residential Unit Water Demand Factors

Table 2-1 shows the water demand factors used in the GRW Infrastructure Master Plan (prepared by Boyle Engineering), the revised GRW Water Supply Assessment, and the most recent factors prepared by this office. Our numbers are based upon demand factors used for other infrastructure master plans that we have prepared for Valley developments and are originally drawn from actual water use experience from the City of Clovis. We have used Clovis as an established water system in a similar climate that is fully metered and so is reasonably comparable to new developments in the Valley.

Because of the requirement in the 2013 CalGreen Building Code that future buildings reduce indoor water use by 20%, we have reduced overall indoor demand projections by that same amount. There are specific limitations on plumbing fixture water use in the CalGreen code which make achievement of the 20% reduction goal attainable, so reducing demand projections is reasonable.

As well, we have reduced overall outdoor demand projections by 20% based on the outdoor watering limitations in the Model Water Efficient Landscape Ordinance legislation of 2009, which are expected to provide real reductions in observed outdoor water use in new developments as they come on line.

B. Table 2-3 Projected Water Demands (Build-Out Only)

Table 2-3 restates the demand projections which appear in Table 2-1, summarizing those demand factors in terms of acre-feet (AF) of water use per year. Table 2-3 contains important assumptions about which land uses will receive potable water and which will receive recycled water, which are based on the actual commitments made by the GRW project to date. If the project does not provide recycled water to the noted uses, overdraft will be greater than these calculations conclude.

The last line of Table 2-3 is the total consumptive water use according to each of the documents cited and our own calculations. These total demands are carried to Section D. of the worksheet, at the top of the second page.

C. Difference in Applied Water Demands (Build-Out Only)

This section of the worksheet provides subtotals of estimated water applied net of recharge, and is not an "apples-to-apples" comparison because of differences in the methodologies used in the three documents. The data presented in Sections D. and E. of the worksheet provide a more complete comparison and should be carefully reviewed.

D. Divisions of Water Balance

In this Section the differences between the approach and methodology used in each document become apparent. In parts 1 and 2 of this table, the P&P 2014 and GR IMP columns are blank in numerous rows which the GRW WSA uses to account for losses and "recharges" that P&P does not consider valid and so did not include. These include the assumption that 25% to 30% of all outdoor residential, parkway and landscape irrigation percolates and benefits the overall water balance. The percentages shown in black on these rows are from the 2009 WSA, while the percentages in red are from the revised 2012 WSA.

Part 3 of this Section calculates total inflow to the WWTP, less recycled water demand, less evaporation from the Effluent Storage Ponds, to arrive at the estimated quantity of treated effluent available to percolate to the groundwater. Note there is a full order of magnitude difference between the evaporation losses shown in the two GRW WSAs versus the P&P 2014 evaporation value.

The P&P 2014 evaporation total is based upon the given WWTP effluent pond acreage and standard evaporation values for the Madera area, assuming the pond is wet year-round, the most generous assumptions we can justify. We have no explanation as to how the WSAs arrived at values so much larger than these accepted standards.

Part 4 of this Table is the calculation of overall overdraft attributable to the project. The formula used for this is total consumptive use, less effective recharge, less aquifer safe yield (or "natural recharge.")

Both WSAs assume 100 percent of all possible recharge actually takes place effectively. We have been more conservative, given the complex geology underlying the project area and the dearth of detail provided for the project's proposed facilities. We have extensive borings in and near the project area, carried out for Root Creek Water District, which show the presence of intermittent clay lenses in the subsurface.

These lenses (or layers) of clay are irregularly interspersed throughout southeast Madera County, found at various depths from approximately five feet below ground surface to hundreds of feet deep, and varying in thickness from ten feet to nearly 100 feet depending upon the

specific instance. Because of their very low permeability, these lenses constitute a barrier to effective percolation from the surface to the groundwater aquifer. There have been a few areas in the area which have been determined to be relatively free of clay lenses and thus suited to groundwater recharge, including an area along Root Creek near Road 38, and an area near Avenue 12 and Road 38 that the County is working to develop. There may be areas of Gunner Ranch West which prove suitable as well, but the geological work has not yet been done and the assumption that 100 percent of all the designated areas will provide effective recharge is unreasonably optimistic.

The different assumptions of recharge effectiveness create the large difference in line 4a, Percolation to Groundwater. This makes the bottom line overdraft very different as well, with the revised WSA actually predicting a small (140 AF per year) groundwater benefit from the project while we calculate an 833 AF annual overdraft.

In our opinion, there is no way for a development project to benefit the aquifer without bringing in water from outside of the area. This is the logical flaw in the WSAs. Every consumptive use of any kind takes water from the aquifer, and only a portion of that consumption can be returned through recharge. Any benefit from storm water falling on the project area is already occurring, and while the project may, if carefully designed, be able to maintain that benefit, it won't be increased. No matter the project there will be net water use. That use may be less than the natural "safe yield" within the area, but that is highly unlikely in Madera County where the safe pumping yield approximately 1.0 AF/acre. Mixed development water use in the region ranges as high as 3.0 AF/acre, while the most water-efficient recent proposals are just below 2.0 AF/acre, very near the net use we have calculated for GRW. The revised WSA concludes the project will use approximately 0.85 AF/year, which we believe to be unrealistically low.

While no one can predict with certainty the actual water consumption of the project, we are confident that our projections are appropriate as an initial target for the project's water recharge program. Given that the applicant will be required to do annual monitoring and adjust his recharge plan to provide the needed performance, we believe that level of confidence is an adequate starting point.

Water Demand and Balance Calculations
Gunner Ranch West Development
Provost Pritchard Consulting Group

July 18, 2014 Prepared: DMcG

A. Table 2-1 Projected Residential Unit Water Demand Factors

Residential Land Uses	Density (units/acre)	Demand (af/du/yr) 2009 GR IMP	2012 GR WSA	P&P 2014	Demand (gal/du/day) 2009 GR IMP	2012 GR WSA	P&P 2014
Very Low Density Residential	0.3 - 2.0	0.91	0.53	1.48	813	475	1323
Low Density Residential	1.0 - 7.0	0.71	0.53	0.64	634	475	574
Medium Density Residential	7.0 - 20.0	0.60	0.45	0.50	534	400	444
High Density Residential	12.0 - 25.0	0.43	0.30	0.29	382	267	260

B. Table 2-3 Projected Water Demands (Build-Out Only)

Land Use Designation	DU	Demand (AF/yr) 2009 GR WSA	2012 GR WSA	P&P 2014
Low-Density				
Very Low Density Residential	174	148	92	258
Low Density Residential	1192	787	632	763
Medium Density Residential*	454	508	408	454
High Density		*MDR Demand in both LDR and HDR zones accounted for in Low Density Residential Above		
Medium Density Residential*	453			
Mixed Use (HDR)	485	194	146	141
Medical Campus (HDR)	256	102	77	74
Residential Subtotal	**3014**	**1739**	**1355**	**1689**
CHCC Including Expansion		212	209	209
Medical Office Building		5	5	5
Medical Campus Office				40
Medical Campus Flex Zone		88	79	89
Ronald McDonald House Expansion		3	3	3
Regional Commercial		148	139	279
Elementary Schools (2)		45	42	54
Parks (adjacent to elementary schools)		Recycled	Recycled	Recycled
Government Center / Fire Station		5	4	4
Park / Drainage Basin		Recycled	Recycled	Recycled
Sports Park / Drainage Basin		1	1	1
Recreation Centers		2	2	2
Mini Parks		Recycled	Recycled	Recycled
Central Green		Recycled	Recycled	Recycled
WWTP		12	12	Recycled
Street / Parkway Landscaping		Recycled	Recycled	Recycled
Non-Residential Subtotal		**521**	**496**	**646**
Total Demand =		2260	1851	2335
Unaccounted for Water (Residential) =		122	95	Incl
Unaccounted for Water (Non-Residential) =		37	35	Incl
Total Water Demand =		**2419**	**1981**	**2335**

C. Difference in Applied Water Demands (Build-Out Only)

Land Use Designation	Demand (AF/yr) 2009 GR WSA	2012 GR WSA	P&P 2014
Total Water Demand =	2419	1981	2335
Less Amount of Potable Recharged (WSA Section 2.5.3):	316	225	0
Net Applied Potable Water =	2103	1756	2335

Water Demand and Balance Calculations
Gunner Ranch West Development
Provost Pritchard Consulting Group

D. Divisions of Water Balance

			2009 GR WSA	2012 GR WSA	2011 GR IMP	P&P 2014	
1.	Potable Water Demand						
	Section 2.5.3	Total Water Demand	2,419	1,985	2449	2,335	
		WWTP Effluent	-1,365	-1,088	1365	1088	
		Outdoor Irrigation with Potable Water	1,054	897	Not Analyzed	Not Analyzed	
		(70%) Evapotranspiration (71%)	739	637			
		(4%) Wind Spray and Runoff	-	35			
		(30%) Percolate to Groundwater (25%)	315	225			
						P&P	
2.	Recycled Water Demand (Table 2-4)		GR WSA	GR WSA		2014	
	Section 2.5.3	**Parks, Street landscaping, WWTP open space**	**278**	**217**	Not Analyzed	**245**	
		(70%) Evapotranspiration (71%)	195	154		-	
		(4%) Wind Spray and Runoff	-	9			
		(30%) Percolate to Groundwater (25%)	83	54		-	
						P&P	
3.	Waste Water Effluent Use		GR WSA	GR WSA		2014	
	Section 2.5.3	WWTP Effluent	1,365	1,088	Not Analyzed	1,088	
		Recycled Water Demand	278	217		216	
		Evaporation from Percolation Ponds	20	20		213	
		Groundwater Recharge - Deep Percolation	1,067	851		833	(3)
						P&P	
4.	Water Balance Summary		GR WSA	GR WSA		2014	
		Total Groundwater Demand	2,419	1,985	Not Analyzed	2,335	
4.a		Percolation to Groundwater -	1,466	1,130		417	(2)
		Table 2-5 Estimated Consumptive Use =	954	855		1,918	
4.b		Annual Safe Aquifer Yield	1,025	995		1085	
		Difference (AF Overdraft is positive)	-71	-140		833	

E. Effect upon Groundwater

	Demand (AF/yr) GR WSA	GR WSA	P&P 2014	
Total Groundwater Demand	2,419	1,985	2,335	
Less Water Recharged	1,466	1,130	417	(2)(5)
Total Consumptive Use	954	855	1,918	
Annual Safe Aquifer Yield	1,025	995	1,085	
Difference (AF Overdraft is positive)	-71	-140	833	(4)
	(1)		(1)(2)	

Notes:

(1) Assumes full credit for percolation from effleunt storage ponds
(2) Assumes 50% of percolated water will reach groundwater aquifer
(3) WWTP Effluent -- Evaporation + 12% of Parks, Street, Open Space Landscaping
(4) Target Overdraft for GRW Groundwater Program
(5) Recycled water accounted for in demand reduction in Table 2-3. Assumes all public open spaces, parks and street landscaping are irrigated with recycled water. If freshwater is used, additional water balance measures will be required.