

February 18, 2013

Mr. Demian Hardman, Planner
Contra Costa County Department of Conservation and Development
Address: 30 Muir Road, Martinez, CA 94553
Email: demian.hardman@dcd.cccounty.us

Subject: Creekside Memorial Park Cemetery (LP05-2096) Projected Water Demand

Dear Demian:

After reviewing the proposed cemetery's water calculations with HydroFocus, we now have a complete picture of the cemetery's total water consumption, including both the riparian and oak woodland areas. As we discussed, we believe that it is important to understand these numbers since they reveal a potentially unrecognized large water draw.

As shown in the table below, the water consumption in the riparian and the oak woodland areas would be 43 AFY (for the riparian area) plus 5.7 AFY (for the oak woodland area) for a total of 48.7 AFY consumed by these areas. These numbers are based on the assumption that the trees in the oak woodland area would intercept all of the rainfall recharge, but would not tap into any ground water. HydroFocus feels this is a conservative (i.e. on the low side) estimate of the transpiration that would occur.

WATER DEMAND (AFY)

Water Use Type	Net demand per DEIR	Net demand corrected	Reference
Fire Protection	0.14	0.14	DEIR Appendix D, Table 7
Cemetery turf 9.4 acres	37.25	37.25	4 AFY per acre (48" per acre)
Riparian 13.5 acres; 18 oak, 45 buckeye, 75 willow, 165 shrubs - 303 total/acre	0	35 (*1) 43	HydroFocus 10-24-11 DEIR response HydroFocus 02-11-13 email
Oak Woodland 31.5 acres; 18 oak, 45 buckeye - 63 total/acre	0	0 5.7 (*2)	Was not considered in HydroFocus 10-24-11 DEIR response HydroFocus 02-11-13 email
Domestic Supply	0.0	0.0	Returned by septic
Lake Replenishment	4.97	4.97	
Cattle Watering	0.66	0.66	
Total Net Water Demand	43.02	78.02 91.72	HydroFocus 10-24-11 DEIR response HydroFocus 02-11-13 email

Notes:

(*1) HydroFocus increased the water consumption for the riparian area from 35 AFY in the DEIR response of 10-24-11 to 43 AFY in their 02-11-13 email as a result of fine-tuning their model.

(*2) The estimate of 5.7 AFY for the 1,985 trees in the 31.5 acre oak woodland means that each tree only has access to 2.6 gallons of water per day on average (see calculation below). However, it is commonly known that oaks with a crown diameter of 17 feet use about 50 gallons of water per day (ref http://www.oakplus.com/Oak_Tree_Facts.htm and http://ucanr.edu/sites/oak_range/Oak_Articles_On_Line/Oak_Woodland_Products_Range_Management_Livestock/Summer_Irrigation_of_Established_Oak_Trees/). This discrepancy between the 50 gpd water usage and 2.6 gpd water availability must be addressed.

The calculation is as follows:

Gallons available per year: 5.7 AFY * 326,000 gallons/AF = 1,858,200 gallons per year
Gallons available per day: 1,858,200 gpy / 365 days/year = 5,091 gallons per day
Gallons available per day per tree: 5,091 gpd / 1,985 trees = 2.56 gallons per day per tree.

Regards,

Bill and Holly Newman
415-518-7131 cell