MEMO

LP05-2096

Date: February 6, 2017

To: Telma B. Moreira, Principal Planner
Contra Costa County
Department of Conservation and Development
30 Muir Road
Martinez, California 94553

From: ***P/A Design Resources, Inc.***

RE: **Creekside Memorial Park – Water Efficient Plan**
Preliminary Anticipated Maximum Yearly Water Demand

Attachments

1) **Creekside Memorial Park, Water Efficient Plan – Conceptual Landscape Plan** dated February 6, 2017 prepared by P/A Design Resources, Inc.
2) **Creekside Memorial Park, Water Efficient Plan – Preliminary Grading and Drainage Plan** dated February 6, 2017 prepared by P/A Design Resources, Inc.
3) **Creekside Memorial Park – Sustainable Alternative Plan – Proposed Landscape Irrigation System and Hydrozone Chart** dated February 2017 prepared by Russell D. Mitchell & Associates.

As requested by the Department of Conservation and Development, we are presenting for consideration revised plans entitled "Water Efficient Plan" for the proposed Creekside Memorial Park project. As determined by the Creekside Memorial Park Final EIR, the project as previously submitted will have significant and unavoidable impacts on groundwater supply and potential impact to neighboring groundwater wells. This "Water Efficient Plan" is being provided to the County to demonstrate how the project can accomplish the goal set by the Department of Conservation and Development to reduce the water usage of the project to a maximum of 2.5 acre feet per year (AFY) to reduce the significance of groundwater impacts.

This memo lays out the anticipated groundwater usage that will be required by the operations of the Creekside Memorial Park cemetery project if the Water Efficient Plan is approved by Contra Costa County. It should be noted that this plan differs from previously proposed plans in that the demand for landscape irrigation is greatly reduced by this plan's requirement for the entire cemetery area to be natural xeriscape type landscaping. This new project landscaping includes the deletion of the previously proposed lake, the minimizing of ornamental landscaping, deletion of the traditional use of grass lawn in favor of xeriscape, and deletion of the originally proposed riparian corridor and oak woodland enhancements on the site, particularly along the creek. All other aspects of the originally proposed plan remain (buildings, internal roadways, etc.) to allow for the cemetery's operation and functionality.

Water Source Availability: Groundwater

At the request of Contra Costa County, this "Water Efficient Plan" is being contemplated to require a maximum of only 2.5 AFY (acre-feet per year) of groundwater which will be pumped from a number of new wells to be located throughout the site. This groundwater will be the sole source of water for the project during its operation, as conditioned by this Land Use Permit. The project applicant understands that the Creekside Memorial Park project will be conditioned to a maximum groundwater use of 2.5 AFY. Should the long term testing and monitoring of on-site and neighboring groundwater wells show that an additional amount of groundwater is available without impact to the groundwater sources in the vicinity of the project, the applicant may in the future request, and the County may consider, following the appropriate environmental analysis, an amendment to this Land Use Permit to increase the maximum amount of groundwater available for the project to use.

Project Construction Demand

The project site will be graded, the roadways and infrastructure will be constructed, the required emergency fire protection water will be stored in the proposed on-site water tank, the first phase of each of the buildings will be constructed and the landscaping will be installed in one initial effort. Construction of the project site improvements is projected to occur over a two (2) year period as originally proposed. Subsequent phases of the Administration Building to add the second chapel, and additional phases of both the indoor and outdoor mausoleums will be constructed as need arises and project operations ramp up over time.

Construction Water

Water required for grading and construction of site improvements will be trucked to the site and no groundwater will be required.

Emergency Fire Protection Water (Storage)

Based on preliminary correspondence with the San Ramon Valley Fire Protection District (SRVFPD)[1], it is assumed that 180,000 gallons of storage for emergency fire protection water will be necessary to meet the requirement of 1,500 gallons per minute for 2 hours. The final storage volume will be determined by the SRVFPD at the time of final engineering. Filling the on-site water tank with 180,000 gallons of emergency fire protection water will occur sometime after the beginning of construction and prior to the cemetery opening for operations will require 0.55± acre-feet. This demand is likely to be a one-time need.

180,000 gallons ÷ 7.48 gal/cu. ft. ÷ 43,560 sf./acre = 0.55 acre feet

Operational Demands: Non-Irrigation Demand

Emergency Fire Protection Water (Maintenance)

In late 2016, a phone call was placed to Code Three Fire Safety of Fairfield, California to understand the annual maintenance requirements for building sprinkler systems and on-site fire hydrants and FDC's (Fire Department Connections). We spoke with Kevin Reynolds and he indicated that quarterly inspections are "No Flow" inspections, annual inspections require

"Forward Flow" testing for 1 minute for each sprinklered building, and 5-year inspections require a "Drain and Fill" and a "Backflow" test at the FDC for approximately 1 minute. At 1,500 gallons per minute of fire flow, it is therefore anticipated that annual maintenance of the on-site fire safety facilities will require approximately 0.01± AFY.

4,500 gallons ÷ 7.48 gal/cu. ft. ÷ 43,560 sf./acre = 0.01 AFY

Domestic Water

To determine the maximum amount of water required for domestic use for the Water Efficient Plan, it must be assumed that the project is fully built and that the cemetery is fully functioning. It is anticipated that the maximum number of employees working at the proposed facilities at any single time would number approximately 10. The previous plans for the project anticipated 19 employees due to the continual maintenance required by the originally proposed grass lawns, lake and ornamental landscaping. Since the Water Efficient Plan includes low maintenance xeriscape landscaping, little ornamental planting and no longer includes the lake, the number of landscaping employees needed for operation has been reduced accordingly.

Visitors will come to the cemetery for family gravesite visitations, chapel services, graveside interment services and while service arrangements are being made at the Administration Office. It is likely that a few times a day, delivery persons may make deliveries to the Administration Office or the Corporation Yard. These visitors and deliver persons may or may not use restroom facilities.

While many visitors and delivery persons may come and go throughout the course of the day, those most likely to use the available restroom facilities on-site will be those attending services in the chapels. It will be assumed that two chapel services, at full capacity of 138 seats, will occur 5 days a week throughout the year, resulting in an average of 197 visitors per day in the chapels. Based on average domestic water consumption rates provided by the (Alameda County) Zone 7 Water Agency, and verified with criteria supplied by EBMUD, employees such as day workers in offices typically require approximately 15 gallons per person per day and attendees to conference facilities typically require approximately 3 gallons per person per day. Therefore, the maximum anticipated demand for domestic water supply is approximately 0.83± acre-feet per year (AFY).

10 employee × 15 gallons per person per day × 365 days = 54,750 gallons per year

197 visitors × 3 gallons per person per day × 365 days = 215,715 gallons per year

54,750 + 215,715 gallons = 270,465 gallons per year

270,465 gallons per year ÷ 7.48 gal/cu. ft. ÷ 43,560 sf./acre = 0.83 AFY

Lake Static Water Surface Water

The lake is no longer included in the Water Efficient Plan, therefore no water is required.

Wildland Fire Management Water

The originally proposed plan anticipated cattle grazing on-site for the purposes of wildland fire management. The Water Efficient Plan, based on discussion in the Final EIR, and with support

from the County, calls for the more environmentally friendly alternative of goats be used for grazing for the task of wildfire management, instead of cattle. It is widely known that goats require significantly less water than cattle. It is anticipated that the goat grazing will focus on creating 50 or 100 foot wide fire breaks throughout the site versus grazing of the entire open space areas. These fire breaks would be around the perimeter of the project site and around the perimeter of the cemetery areas where human activity and vehicles are anticipated. As a result, approximately 30 acres of the approximately 180 acres of open space on the site would be grazed. We spoke with Mike Canaday of California Grazing in late 2016, and according to him, 450 goats can provide weed/grass abatement for approximately 1 acre per day with an average of 1.25 gallons of water required per head per day depending on whether the grass is green or brown. To create 30 acres of fire breaks, the grazing would last for approximately 30 days sometime between May and August each year. Therefore, the amount of water necessary for the goats equates to approximately 0.06± acre-feet per year (AFY).

450 goats × 30 days × 1.25 gal./day = 16,875 gal./year

16,875 gallons ÷ 7.48 gal/cu. ft. ÷ 43,560 sf./acre = 0.05 AFY

It should be noted that the Final EIR requires mitigation to reduce the threat of wildfire through weed abatement on the project site. A wildfire management plan outlining the grazing methods and livestock used (whether cattle, goats or sheep, or a combination) will be prepared in consultation with, and approved by, the San Ramon Valley Fire Protection District and the Department of Conservation and Development. Whichever combination of livestock is used, the maximum groundwater usage allotted to grazing animals will not exceed 0.15 AFY.

Operational Demands: Irrigation Demand

Riparian Corridor Enhancement Water

The Water Efficient Plan calls for no Riparian Corridor Enhancement plantings, however, some minimal riparian corridor planting is shown on the Water Efficient Plan - Conceptual Landscape Plan dated February 6, 2017 and the water required is accounted for in the analysis by Russell D. Mitchell & Associates. (see below).

Oak Woodland Enhancement Water

The Water Efficient Plan calls for no Oak Woodland Enhancement plantings, however, some minimal oak woodland planting is shown on the Water Efficient Plan - Conceptual Landscape Plan dated February 6, 2017 and the water required is accounted for in the analysis by Russell D. Mitchell & Associates. (see below).

Cemetery Landscape Water

The Water Efficient Plan would require the entire project to be xeriscaped. In-ground entombment areas would be native grassland, and plantings would be limited to primarily California native, drought tolerant species of grasses, shrubs and trees. Some ornamental trees and plants will be used around the entrances to the Administrative Building and Chapels and the Indoor and Outdoor Mausoleums, and some at the project entry, but these areas will be designed in such a way as to require as little water as possible. Some very small water features (reflecting pools) will remain at the entrance to the Administrative Building and Chapels.

In late 2016, we tasked Chris Mitchell of Russel D. Mitchell & Associates, experts in irrigation design, consultation, supervision and evaluation, to estimate the water required for the establishment and in-perpetuity irrigation of the landscaping shown on the Water Efficient Plan - Conceptual Landscape Plan (attached). In his detailed evaluation of this Conceptual Landscape Plan, Mr. Mitchell determined that using high efficiency irrigation methods, planting and landscaping for this plan would require approximately 1.45± acre feet per year (AFY). See the attached Creekside Memorial Park Hydrozone Chart perpared by Russel D. Mitchell & Associated dated February 2017 for detailed analysis and calculation.

Project Water Demand Summary

The Creekside Memorial Park – Water Efficient Plan will require 0.55± AFY during construction and a maximum of 2.34± AFY of groundwater in perpetuity.

cc: Pete Klein, Corrie Development Corp.
Sid Corrie, Corrie Development Corp.

[1] Emailed memo from Deputy Fire Marshal, Michael Mentink of the San Ramon Valley Fire Protection District (SRVFPD) received Tuesday, December 19, 2006.