



## Board Agenda Item 8

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DATE: August 23, 2016

TO: Board of Supervisors

SUBMITTED BY: Steven E. White, Director  
Department of Public Works and Planning

Robert W. Bash, Director  
Director of Internal Services/Chief Information Officer

SUBJECT: Geotechnical Investigation of the Elkhorn Farm Property for Proposed Groundwater Recharge Facility

RECOMMENDED ACTION(S):

**Receive report on the results of a Geotechnical Investigation of the Elkhorn Farm Property, prepared by Moore Twining Associates, Inc., for potential use as a groundwater recharge facility; and provide direction to Internal Services staff for disposition of the Elkhorn Farm Property.**

This item comes before the Board based on direction received at a hearing on February 9, 2016, to initiate a geotechnical investigation for the Elkhorn Farms Property to determine whether groundwater recharging at the site was favorable. In general, the geotechnical investigation found that the subsurface soils encountered were indicative of generally favorable conditions for infiltration of water.

ALTERNATIVE ACTION(S):

This item is intended to provide information and receive direction therefore there is no alternative action.

FISCAL IMPACT:

The cost (\$14,200) of the geotechnical investigation was charged to appropriations related to the costs of vacant properties within the Interest and Miscellaneous Expenditures Org 2540 FY 2016-17 Adopted Budget.

DISCUSSION:

On February 9, 2016, the Board directed the Department to initiate a geotechnical investigation for the Elkhorn Farms Property (Property) to determine whether groundwater recharging at the site was favorable. The Department contracted with Moore Twining Associates, Inc. (Moore Twining), to conduct an investigation and prepare a geotechnical report on the subsurface exploration and preliminary assessment of infiltration characteristics of the project site.

The purpose of the investigation was to conduct a limited field exploration and laboratory testing program, evaluate the data collected during the field and laboratory portions of the investigations, and provide a general discussion of the subsurface soil conditions, a discussion of groundwater depths at and near the site based on field data and/or readily available public data, an assessment of the potential for infiltration based on general correlations of permeability with the soil types encountered, and final test boring logs and laboratory test results.

A limited field exploration, consisting of site reconnaissance, drilling test borings, collecting soil samples, and conducting standard penetration tests, was performed as part of the investigation. The site reconnaissance was performed by a Moore Twining staff engineer who visually surveyed and logged the surface features on the site. The borings consisted of two borings drilled to a depth of roughly 100 feet and one to a depth of roughly 150 feet. The soils encountered were logged and later classified in accordance with the Unified Soil Classification. Laboratory testing was performed on the samples to generate a soil profile.

The soil profile identified the majority of the subsurface soils encountered in the borings to be granular soils described as silty sands, poorly graded sands, and poorly graded sand with silt. These soils were interbedded with clay soils in layers typically estimated to be 5 to 10 feet thick located 25 to 50 feet below site grade (BSG). The granular soils encountered were typically loose to medium dense to depths of 30 feet BSG and medium dense further below. The clayey soils were predominantly stiff to medium stiff while the silts were generally stiff to very stiff.

Groundwater was not encountered in the borings drilled. According to the investigation, groundwater depth in the site area declined from about 115 feet BSG to a depth of 130 feet BSG during the period of 2006 to 2011. According to the Department of Water Resources Groundwater Information Center, Department staff was able to determine that the groundwater depths of water wells have further declined in the site area by approximately 120 feet based upon the latest spring 2016 measurements. As a result, groundwater depth at the site ranges from approximately 235 feet BSG to approximately 250 feet BSG.

A preliminary assessment of the infiltration characteristics of the soils encountered was prepared by Moore Twining based upon the information obtained from the limited field exploration and the laboratory testing program. In general, the subsurface soils encountered to the maximum depth of roughly 150 BSG were indicative of generally favorable conditions for infiltration of water. Approximately three quarters of the soils encountered consisted of favorable granular soils. The clayey soils encountered, based on the thickness, depth, and lack of continuity, did not appear to present a significant lateral restriction to the downward migration of water when considering the overall size of the basin anticipated (40 to 80 acres).

Because of the limited scope of the investigation, Moore Twining recommends, and Department staff concurs, that additional borings be completed as part of future investigations to confirm the lack of continuous layers which if present, could reduce the recharge capabilities of the basin. In addition to the borings, it is recommended that additional field and laboratory testing, including permeability testing be conducted, as part of future investigations in order to provide estimates of the infiltration capacity of the subsurface soils.

REFERENCE MATERIAL:

BAI #10, February 9, 2016

ATTACHMENTS INCLUDED AND/OR ON FILE:

Geotechnical Investigation

CAO ANALYST:

John Hays