

Cucamonga Creek Watershed Regional Water Quality Proposal

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Cultural Resources

The APE has had numerous prior studies, including most recently The Chino Preserve 2003 EIR. In addition to The Chino Preserve 2003 EIR, twenty-six (26) cultural resource investigations have been completed in the study area between 1975 and 2005. These studies consisted of a variety of investigations including field surveys, test excavations, and overview reports. The most comprehensive study of the area is an archaeological investigation by Langenwaller and Brock (1985) of the Prado Flood Control Basin. Their investigation covered the Proposal site and a much larger area within the Prado Basin. Specific sites were tested and evaluated for National Register of Historic Places (NRHP) eligibility.

The Cultural Resource Inventory included the following analysis:

- A search of California Historical Resources Information System (CHRIS) maps, records, and reports.
- A Historical Resources Information System records search conducted by the Archeological Information Center (AIC), San Bernardino County Museum. The AIC is the official cultural resource records repository for San Bernardino County and part of the California Historical Resource Information System.
- A Native American Heritage Commission (NAHC) Sacred Lands Inventory files check.
- Consultation with Native American contacts identified by NAHC.
- A review of historical U.S. General Land Office (GLO) and U.S. Geological Survey (USGS) maps.
- A search of historical GLO land patents.
- Geological and Paleontological reviews of publications, reports, maps, and records were conducted by the San Bernardino County Museum (SBCM) and by the Natural History Museum of Los Angeles County (LACM).
- A systematic on-site pedestrian archaeological field survey of the Proposal site.

The records and literature search identified 16 prehistoric and historic-period archaeological sites within the study area, but outside of the area of potential effects (APE). One of those previously recorded archaeological sites (CA-SBR-2845H) is located within the Proposal site. Another large historic-period site (P871) is located within a one-mile radius of the Proposal site. CA-SBR-2845H was originally discovered by S. Hammond in 1978 during a Caltrans survey. Two years later a large cultural resources study conducted for the Serrano Substation to Mira Loma Substation Transmission Route Alternatives Corridor Right-of-Way (Foster and Greenwood 1980) revisited the site.

In 1985, as part of the Prado Flood Control Basin study, Langenwaller and Brock (1985) conducted an archaeological Phase II test and evaluation program to determine NRHP eligibility of CA-SBR-2845H. During the re-survey of the site, Langenwaller and Brock noted the site had been thoroughly disturbed by long-term plowing and dumping of several tons of manure. Additionally, the western edge of CA-SBR-2845H was found obscured or destroyed by ranch and residential construction. The study included test

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excavations, which yielded a minimal amount of prehistoric and historic-period artifacts. Langenwalter and Brock concluded the site offered sparse subsurface cultural resources and the site was not eligible for listing on the NRHP.

As part of preliminary project design a site investigation included 75 geotechnical cone penetration test (CPT) and borehole locations. Several of these CPT and borehole locations were situated within and along the boundaries of CA-SBR-2845H. The investigation encountered dense vegetation and as a result, no artifacts or features associated with CA-SBR-2845H were found.

A Cultural Resource Inventory was prepared by Stantec Consulting (Stantec) on November 20, 2008. The purpose of the study was to determine whether the Proposal would have an adverse effect on significant historical, archaeological, and paleontological resources and to make recommendations for the conservation of such resources, and to recommend measures to mitigate any potential adverse effects associated with the Proposal.

The pedestrian field survey of the APE by Stantec produced negative results for potential cultural resources. Dense vegetation limited ground visibility throughout a majority of the APE. A fire in July, 2008, burned the vegetation in the eastern portion of the site and the eastern portion of site CA-SBR-2845H. The fire allowed for increased visibility of the ground surface, however no evidence of artifacts was found. Because of the lack of adequate surface visibility, an additional test excavation and National Register of Historic Places evaluation is being conducted,

Sacred Lands Inventory / Native American Consultation

The Native American Heritage Commission (NAHC) reported that the Sacred Lands Inventory did not include records of cultural resources on the Proposal site. The NAHC did note that the area is in close proximity to the locations of previously discovered prehistoric human burials. Letters were sent to Native American contacts provided by NAHC. The responses received from the Native American contacts are included in the Cultural Resource Inventory.

4.4 Cultural Resources

5.4.1 Environmental Effects

Basis of Significance. The Proposal would be considered to have a significant adverse effect on historic properties if it diminishes characteristics that would qualify the resource for the NRHP. Examples include effects to the integrity of the resource's location, design, setting, materials, workmanship, feeling, or association. Types of effects include physical destruction, damage, or alteration; isolation or alteration of the character of the setting; introduction of elements that are out of character; neglect; and transfer, lease, or sale.

No Action Alternative. Under the no action alternative, the Proposal site would retain its current character and no improvements would occur. The current undeveloped character of the land would remain and no construction or improvements

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would take place. Therefore, the No Action Alternative have no significant impact on cultural resources.

Alternative 2A. The Cultural Resources Inventory determined that one recorded prehistoric site, CA-SBR-2854H, is located within the boundaries of Alternative 2A. This prehistoric archeological site may contain intact cultural deposits. A subsurface investigation and National Register of Historic Places evaluation is in the process of being implemented.

The Cultural Resources Inventory did not identify any evidence of human remains located within the APE. Furthermore, the Native American Heritage Commission (NAHC) reported that the Sacred Lands Inventory did not include records of cultural resources. However, the NAHC did note that the area is in close proximity to the locations of previously discovered prehistoric human burials.

Alternative 2B. The area of potential effects for Alternative 2B is slightly larger than Alternative 2A, but still covered by the Cultural Resources Inventory. Therefore, the same potential adverse effects exist for archaeological resources.

5.4.2 Mitigation

Both Alternative 2A and 2B have the potential to cause significant adverse effects to historic properties eligible for listing on the National Register of Historic Places.

Prior to implementation of the project the Corps shall comply with Section 106 of the National Historic Preservation Act (36 CFR 800). At this time, final mitigation measures cannot be determined pending a National Register of Historic Places (NRHP) evaluation of archaeological site CA-SBR-2845. If the site is determined to be eligible for the NRHP mitigation measures would be developed between the Corps and the California SHPO. These measures would be detailed in a memorandum of agreement. Possible mitigation measures in that case would include a data recovery (additional subsurface investigation), and monitoring during construction by an archeologist meeting the *Secretary of the Interior's Professional Qualification Standards*.

4.5 Community Impacts

4.5.1 Baseline Conditions

The Proposal site is located in a rural area of San Bernardino County. The area is dominated by agriculture, with dairy, goat, and dry farming being most prevalent surrounding the Proposal site. Given the rural nature of the area, very few residents are located adjacent to the Proposal site. A goat farm is located to the west of the Project site and another farm to the south. Southeast of the Proposal Site, across Mill Creek, a large dairy farm operates. North of Chino Corona Road, west of the Proposal Site, several farms and dairies operate. Therefore, less than five residences are potentially affected by the Proposal. No residences or structures are located on the Proposal site. There is evidence the site was previously farmed, however, there is no evidence of current or recent farming activities. The County of San Bernardino currently holds a lease over the Proposal site for recreational activities. However, that no recreation facilities or programs have been developed or implemented on the Proposal site.

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The Proposal site is located within Census Tract 19 in San Bernardino County (Figure 4.5-1). Census 2010 data are not available yet, therefore, Census 2000 data are provided to describe the area, as summarized in Table 4.5-a.

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Figure 4.5-1 - Census Tract 19 in San Bernardino County



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Table 4.5-a: Census 2000 Data

	Census Tract 19	City of Chino	County of San Bernardino
Population	25,778	80,285	1,986,635
Race			
White	55.80%	59.60%	61.20%
Non Hispanic or Latino	57.10%	47.90%	53.40%
Hispanic	42.90%	52.10%	46.60%
Housing Units	4,653	21,520	676,158
Vacancy rate	3.50%	4.30%	12.90%
Owner occupied	67.20%	72%	65.30%
Renter occupied	32.80%	28%	34.70%
Median household income	\$65,421	\$72,546	\$55,461
Families below poverty	4.60%	3.70%	11.40%
SOURCE: Census 2000			

4.5.2 Environmental Effects

Basis of Significance. An Alternative would be significant if it would result in adverse community impacts, such as destruction or disruption of human-made resources, community cohesion, and the availability of public facilities and services.

No-Action Alternative. Under the no action alternative, the Proposal site would retain its current character. The current undeveloped character of the land would remain and no construction or improvements would take place. Neither farming or agricultural activities would be impacted. The site is reserved for recreation and could be developed for such purposes in the future by the County of San Bernardino. The No Action Alternative would perpetuate the baseline condition and as such have no significant impact on the environment.

Alternative 2A.

Neighborhood Impacts. An assessment of the community character and cohesion of the neighborhood surrounding the Alternative 2A indicates a rural neighborhood with a history of dairy, goat, and dry farming. There are very few residences in close proximity to Alternative 2A. There are no commercial buildings or community facilities in close proximity to the Alternative 2A. According to the Census data, the Census tract in which Alternative 2A is located has a lower vacancy rate and a higher median household income than both the City of Chino and the County of San Bernardino.

Alternative 2A would convert vacant undeveloped land into a natural water treatment facility, which would also include recreational features. The water treatment facility would include a series of ponds designed to hold and treat flows from Cucamonga Creek. This change in the use of the land would not require the acquisition of any properties or right-of-way, or displacement of residences or businesses although the treatment ponds would make a significant portion of the

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land unavailable for recreation although the trail system would provide a limited amount of recreation. The treatment ponds would not add noise, light and glare, or emissions that would affect the surrounding residences. Finally, the Proposal would add over 24 acres of new native vegetation to an area that has primarily non-native disturbed vegetation.

Because very few residences surround the Alternative 2A footprint Alternative 2A would not cause significant environmental impacts that would affect existing residences. There would be no impacts to neighborhood character. The proposed addition of vegetation and a trail system would incrementally benefit the community and enhance the character of the area.

Environmental Justice. All projects involving a Federal action (funding, permit, or land) must comply with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, signed by President Clinton on February 11, 1994. This EO directs Federal agencies to take the appropriate and necessary steps to identify and address disproportionately high and adverse effects of federal actions on the health or environment of minority and low-income populations to the greatest extent practicable and permitted by law. Low income is defined based on the Department of Health and Human Services poverty guidelines. The following four measures are used as the basis to evaluate environmental justice:

- Percentage of non-white residents in the Proposal site census tracts;
- Percentage of Hispanic residents (the United States Census Bureau considers Hispanic or Latino ethnicity distinct from racial background) in the Proposal site census tracts;
- Percentage of population below the poverty level in the Proposal site census tracts; and
- Median household income in the Proposal site census tracts.

Guidance for environmental justice from the Council on Environmental Quality (1997) defines minority populations as those communities that meet at least one of the following criteria.

- The minority population is greater than 50 percent of the total population.
- The minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.

The effects of granting either Alternative 2A or 2B would be disproportionately high and adverse if the effects are (1) borne predominantly by a minority or low-income population in the study area; or more severe or greater in magnitude to minority and low-income populations when compared with the same effects on non-minority or non-low income populations in the area.

Based on the Census data presented in Table 3.5-a, the Census Tract for the Proposal Site has a majority of its residents White and 42.9 percent Hispanic. These data are consistent with the demographics for the City of Chino and the County of San Bernardino. The data also show the vicinity of Alternatives 2A and 2B has a very low poverty rate of 4.6% of families, which is similar to the 3.7% in the City of Chino and far less than the 11.4% in the County of San Bernardino. The median household income also follows this same trend.

Therefore, the vicinity of Alternatives 2A and 2B is not considered a minority area or a low-income area. As such, there would be no disproportionately high or adverse temporary or permanent impacts to environmental justice populations associated with either Alternative.

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Growth. **Alternative 2A** does not include structures or facilities that would directly generate population growth. Alternative 2A could be considered growth inducing because it would provide a natural water treatment facility that would treat runoff from future development in the City of Ontario.

The City of Ontario is subject to its MS4 Permit requirements that require jurisdictions and/or developers to provide treatment of stormwater runoff prior to its release into protected drainages, such as Cucamonga and Mill Creeks. The purpose of the Proposal is to provide a regional water treatment facility in the Cucamonga Creek watershed that treats at least 1,500 acres or 25% of the 6,059 undeveloped acres located in the City of Ontario that are tributary to Cucamonga Creek and subject to the MS4 permit requirements. The 6,059 acres of undeveloped land in the City of Ontario subject to the MS4 requirements has already been planned for development through the City's General Plan. Land use designations and densities have been identified. Therefore, if neither Alternative is approved, the City of Ontario would be required to implement local stormwater treatment measures for that future development, which would likely occur on each future development site. Such local facilities would be feasible and satisfy the MS4 requirements but would not provide a regional water quality benefit.

While future development in the City of Ontario could rely on either alternative to satisfy the MS4 Permit requirements, future development is not dependent on approval of either Alternative. Furthermore, future development in the City of Ontario has already been planned through the City's General Plan process. Approval would not change development intensities or allow new unplanned areas to be developed. Therefore, approval of either alternative would not contribute to future growth that would not have otherwise occurred. The City of Ontario has numerous options for treating stormwater runoff in compliance with the MS4 permit. Therefore, development may proceed regardless of whether the Proposal is approved and as such, the Proposal is not considered growth inducing.

Alternative 2B. The location and operation of Alternative 2B is very similar to Alternative 2A. Both alternatives are located in the same Census Tract and would have the same effect on the community. Alternative 2B has the same temporary and permanent environmental effects and the same potential for inducing growth. Therefore, the potential Community Impacts for Alternative 2B are the same as those described for Alternative 2A.

4.5.3 Mitigation

Neither Alternative 2A or 2B would cause significant impacts. No mitigation is required.

4.6 Geology and Soils

4.6.1 Baseline Conditions

The Proposal site is underlain by late Pleistocene to Holocene-age alluvial deposits. These alluvial deposits fill the western portion of a deep structural depression known as the upper Santa Ana River Valley. The alluvial deposits on site can be divided into two categories: young alluvium and old alluvium.

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Young alluvium was deposited along Mill Creek and consists of a mixture of clay, elastic silt, silty sand, poorly graded sand, and clayey sand. The thickness of young alluvium varies from 15 to 25 feet. Old alluvium underlies the young alluvium at depths ranging from 15 to 25 feet. The old alluvium consists of sands and gravels, which are likely cemented.

Groundwater was encountered in each of the five exploratory borings and encountered during the cone penetration test (CPT) soundings. Groundwater ranges from an approximate elevation of 516 to 525 feet above MSL, which places groundwater approximately 17 to 32 feet below ground surface. However, groundwater levels can vary depending on a number of factors. Seasonal rainfall, Prado Dam reservoir fluctuations, local irrigation, and groundwater extraction in the vicinity of the Proposal site, can all influence groundwater levels.

Seismicity

The Proposal site is not located within a State of California Fault Zone (formerly referred to as an Alquist-Priolo Special Studies Zone) (Hart and Bryant, 1997) and no active or potentially active faults are known to underlie the Proposal site. However, the Proposal site, like the majority of Southern California, is located in a seismically active area. Therefore, it may be subject to strong ground motions generated by local and/or more distant large magnitude earthquakes occurring during the expected life span of the Proposal. A list of significant seismic sources within 50-mile (80-km) radius of the site is presented in Table 4.6-a.

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<i>Table 4.6-a – Seismic Sources</i>		Approximate Distance ⁽¹⁾	Maximum Earthquake
Abbreviated Fault Name	Miles	(km)	Mag. ⁽²⁾ (M _w)
Chino-Central Ave (Elsinore)	2.4	(3.9)	6.7
Whittier	6.3	(10.1)	6.8
Elsinore-Glen Ivy	6.4	(10.3)	6.8
San Jose	11.6	(18.7)	6.5
Cucamonga	14.0	(22.5)	7.0
Sierra Madre (Central)	14.2	(22.8)	7.2
Elysian Park Thrust	15.5	(25.0)	6.7
San Jacinto-San Bernardino	18.8	(30.2)	6.7
San Jacinto-San Jacinto Valley	22.4	(36.0)	6.9
Compton Thrust	23.7	(38.1)	6.8
Clamshell-Sawpit	24.2	(39.0)	6.5
San Andreas – Southern	24.4	(39.2)	7.4
San Andreas – San Bernardino	24.4	(39.2)	7.4
San Andreas – 1857 Rupture	25.7	(41.4)	7.8
San Andreas – Mojave	25.7	(41.4)	7.1
Elsinore – Temecula	26.0	(41.8)	6.8
Cleghorn	26.7	(43.0)	6.5
Raymond	27.0	(43.4)	6.5
Newport – Inglewood (L.A. Basin)	29.0	(46.6)	6.9
Newport – Inglewood (Offshore)	29.8	(48.0)	6.9
North Frontal Fault Zone (West)	31.6	(50.8)	7.0
Verdugo	33.0	(53.1)	6.9
Hollywood	37.1	(59.7)	6.5
Palos Verdes	38.8	(62.4)	7.1
San Jacinto-Anza	42.6	(68.5)	7.2
Sierra Madre (San Fernando)	45.1	(72.6)	6.7
San Gabriel	45.9	(73.9)	7.0
Santa Monica	46.3	(74.5)	6.6

¹ Shortest distance from the site as evaluated based upon the Jennings et al. ([1994] map.

² Cao et al. [2003]

Surface Fault Rupture

Surface fault rupture is the offset or rupturing of the ground surface by relative displacement across a fault during an earthquake. No active or potentially active faults are known to underlie or project toward the Proposal site. The closest active fault to the Proposal site is the Chino-Central Avenue fault approximately 2.4 miles (3.9 km) to the south-southwest. Therefore, the potential for surface fault rupture is considered to be low.

Seismic Hazard Parameters

Seismic hazard parameters for structural evaluations at the site were evaluated in accordance with the 2007 edition of the California Building Code (CBC 2007). Relevant information is provided in Table 4.6-b.

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Table 4.6-b – Seismic Hazard Parameters for Structural Evaluations	
2007 CBC Seismic Design Parameters	
Site Latitude (decimal degrees)	33.9453
Site Longitude (decimal degrees)	-117.6174
Site Class Definition (Stiff Soil Profile)	D
Mapped Spectral Response Acceleration at 0.2s Period, S_s	1.558
Mapped Spectral Response Acceleration at 1.0s Period, S_1	0.600
Short Period Site Coefficient at 0.2s Period, F_a	1.0
Long Period Site Coefficient at 1.0s Period, F_v	1.5
Adjusted Spectral Response Acceleration at 0.2s Period, S_{MS}	1.558
Adjusted Spectral Response Acceleration at 1.0s Period, S_{M1}	0.900
Design Spectral Response Acceleration at 0.2s Period, S_{DS}	1.039
Design Spectral Response Acceleration at 1.0s Period, S_{D1}	0.600
Design Moment Magnitude (M_w ; by de-aggregation; Chino-Central Ave)	6.7

For geotechnical evaluations at the site (e.g., evaluation of soil liquefaction), the following seismic hazard parameters may be used:

- Peak Ground Acceleration (free-field; stiff soil conditions), $PGA = 0.42$ g; and
- Design Moment Magnitude, M_w : 6.7

These seismic hazard parameters for geotechnical evaluations at the Proposal site were evaluated for site conditions cited above in accordance with CBC [2007]. The corresponding seismic hazard level is 2% Probability of Exceedance (P.E.) in 50 years (2,475-year return period).

Expansive Soils

The fill and native soils at the site are generally characterized as silty sand, clay sand, and poorly graded sand. The potential for significant expansive behavior for these types of soil is considered low. No significant potentially expansive, high plasticity clay or silt layers were identified in the explorations within the depths of the proposed improvements.

Soil Liquefaction Potential

Seismically induced soil liquefaction is a phenomenon in which loose to medium dense, saturated granular materials undergo matrix rearrangement, develop high pore water pressure, and lose shear strength due to cyclic ground motions induced by earthquakes. This rearrangement and strength loss is followed by a reduction in bulk volume. Manifestation of soil liquefaction can include loss of bearing capacity for foundations, surface settlements, and tilting in level ground. Soil liquefaction can also result in instabilities and lateral spreading in embankments and areas of sloping ground.

Within the pond footprint, below groundwater elevation, cohesionless alluvium is dense and firm. Standard penetration test (SPT) blow counts range from 27 (at only one location) to over 50. Consistent with dense soil condition, results of the soil liquefaction potential evaluation indicate that soil liquefaction potential within the pond footprint is low.

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Other Geologic Hazards

Other potential geologic hazards evaluated that could affect the site include landslides, tsunamis, and seiches. Given the relatively level topography of the site, landslides are not considered to be a potential hazard at the site. Locally generated tsunamis are unlikely to pose a threat to the site as the site is over 60 miles (100 km) from the ocean. Seiches typically occur when enclosed bodies of water are seismically shaken to generate oscillations and waves resulting in overtopping. No enclosed water bodies other than ponds and forebay are located adjacent or near to the Proposal site. Only “Dry Weather Flow Wetland” component of the ponds will be permanently filled with water. Depth of “Dry Weather Flow Wetland” component is approximately 10 percent of pond depth. Therefore seiches are not considered to be a potential hazard at this site.

4.6.2 Methodology

Geosyntec Consultants performed the geotechnical analysis of the Proposal site. Appendix D includes the geotechnical report titled, “Geotechnical Report, Mill Creek Wetlands Recreation and Restoration Demonstration Project, December 2008.” In addition, Geosyntec prepared a report titled “Existing and Proposed Conditions Related to Scour” dated December, 2008, which is included as Appendix E.

The subsurface exploration consisted of:

- 5 hollow stem auger borings to depths of approximately 30 to 50 feet below ground surface
- In-hole Standard Penetration Test (SPT) sounding (at 5-ft intervals) in all of the borings advanced by Geosyntec
- 18 Cone Penetration Test (CPT) soundings to depths ranging from 5 to 50 feet below ground surface
- 3 piezometers (two within the footprint of the wetland ponds and one in the forebay)
- Falling-head infiltration tests in two of the piezometers
- Laboratory testing of soil samples

4.6.3 Environmental Effects

Basis of Significance. Approval to use Federal land for either Alternatives 2A or 2B would cause a significant adverse effect on geology and soils if it would expose people or structures to substantial adverse effects involving rupture of an earthquake fault, strong seismic ground shaking, or an unstable geologic unit.

No Action Alternative. Under the no action alternative, the Proposal site would retain its current character. The current undeveloped character of the land would remain and no construction or improvements would take place. There would be no additional exposure to rupture, strong seismic ground shaking or instability. The No Action Alternative would perpetuate the baseline condition and have no significant impact on geology and soils.

Alternative 2A. No active or potentially active faults are located in the proximity of the Alternative 2A. Alternative 2A is not within the Alquist-Priolo Earthquake Fault Zone. It is also not located in an area of high liquefaction risk because of the dense and firm alluvium.

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Alternative 2A does not include the construction of any structures or buildings, therefore, no adverse effects would occur because of structure failure. The potential adverse effect associated with Alternative 2A is the construction of the berm along the eastern portion of the wetland/extended detention facilities. The berm extends approximately 3 to 4 feet above the existing ground surface elevation and when the ponds are full, the berm would function as a levee to detain water. Therefore, potentially significant adverse effects could occur if the berm were subjected to excessive ground shaking from seismic events.

Alternative 2B. Alternative 2B has the same potential adverse effects as Alternative 2A, except that Alternative 2B would be constructed entirely in a cut condition without the need for a manufactured berm. Therefore, Alternative 2B would not cause a potential adverse effect associated with the integrity of a berm.

4.6.4 Mitigation

The following mitigation measure would apply to Alternative 2A to reduce the potentially significant adverse effects to less than significant.

GEO1: Alternative 2A and 2B

- a. Prior to grading, final construction drawings shall be prepared and shall incorporate the recommendations from Geosyntec's report titled "Geotechnical Report, Cucamonga Creek Watershed Regional Water Quality Project" and "Existing and Proposed Conditions Related to Scour" dated December, 2008. The City of Ontario's geotechnical engineer shall review the final construction drawings and issue a final geotechnical report. The final geotechnical report shall be submitted to the USACE for review and approval.
- b. Prior to grading, an exploration trench shall be dug along the entire alignment of the berm. The exploration trench shall be at least as deep as the planned height of the berm, and not less than 6 feet deep. The purpose of the exploration trench is to locate seepage paths or other material unsuitable for the berm's foundation. The City of Ontario's geotechnical engineer shall inspect the exploration trench and include recommendations in the final geotechnical report.
- c. Construction of the berms surrounding the wetland ponds/ extended detention ponds requires benching of fill material. The final design shall include the design criteria for benching of compacted fill over natural and over cut found in Figure 2-5 of the Geotechnical Report (Geosyntec 2008).
- d. The City of Ontario's geotechnical engineer shall be on-site during grading activities to inspect and certify construction of the Proposal in accordance with the final plans and final geotechnical report.

4.7 Greenhouse Gas / Global Warming

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4.7.1 Baseline Conditions

The analysis of potential effects from the Proposal determine what affect on global warming would be caused by construction emissions. . The baseline condition for calculating Greenhouse Gas emissions is a baseline carbon dioxide concentration of 380 ppmv (parts per million by volume) as determined by the *Third Assessment Report of Working Group I* of the Intergovernmental Panel on Climate Change (IPCC), 2001.

4.7.2 Methodology

Greenhouse gas emissions associated with diesel engine combustion from mass grading construction equipment will be assumed to occur for engines running at the correct fuel to air ratios. Of principal interest are the emission factors for CO₂ and NO_x. For a four-stroke diesel-cycle engine, the combustion byproducts are approximately 1.5-percent-by-volume O₂, 0.5-percent-by-volume CO, and 13.5-percent-by-volume CO₂. Thus, the ratio of CO₂ to CO production in a property mixed diesel stroke would be 13.5/0.5 to 27:1.

To address the potential greenhouse gas emissions and global warming potential of the Proposal per AB 32, the entire State of California was modeled as a thermodynamically closed system, subject only to increasing CO₂ concentrations and their equivalents (denoted as CO_{2e}). This approach creates a type of Urban Heat Island dependant only on CO₂ whereby the effective temperature increase on the State due to the Proposal action can be quantified using the methodology identified in the U.N.'s Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC).

4.7.3 Environmental Effects

Basis of Significance. There is no established baseline condition from which to measure change. The analysis of potential effects from the Proposal determine what affect on global warming would be caused by construction emissions.

No Action Alternative. Under the no action alternative, the Proposal would not be approved and therefore, no change to current conditions. The No Action Alternative would cause the release of greenhouse gas emissions. Therefore, no impacts would occur.

Alternative 2A. Greenhouse gas emissions associated with diesel engine combustion from mass grading construction equipment will be assumed to occur for engines running at the correct fuel to air ratios. Of principal interest are the emission factors for CO₂ and NO_x. For a four-stroke diesel-cycle engine, the combustion byproducts are approximately 1.5-percent-by-volume O₂, 0.5-percent-by-volume CO, and 13.5-percent-by-volume CO₂. Thus, the ratio of CO₂ to CO production in a property mixed diesel stroke would be 13.5/0.5 to 27:1.

Construction equipment used to grade Alternative 2A constitutes the primary source of greenhouse gas emissions, namely CO₂. Construction vehicle emission levels for Alternative 2A has an equivalent CO₂ level (denoted as CO_{2e}) of 5,633,994.6 pounds over the construction period. This represents the projected greenhouse gas emission budget for Alternative 2A.

By modeling the State of California as a thermodynamically closed system and assuming all of the CO_{2e} mixes within the Troposphere, Alternative 2A would cause an increase of 0.00029708 ppmv of CO_{2e}. Based on methodology established by the IPCC, Alternative 2A would cause a

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temperature increase of $4.1826 \times 10^{-7} \text{ }^{\circ}\text{C}$. This temperature increase is infinitesimal and considered less than significant. Since Alternative 2a would generate even less CO_2 from operations, such as periodic maintenance activity and recreation users, the temperature warming would be even less than that calculated for construction and therefore also infinitesimal and less than significant.

Alternative 2B. The location and operation of Alternative 2B is very similar to Alternative 2A. Both alternatives would generate a similar amount of temporary construction CO_2 and operational CO_2 . Therefore, the global warming effects, both temporary and long-term, of Alternative 2B are the same as those described for Alternative 2A.

4.7.4 Mitigation

Approval of either Alternative 2a or Alternative 2b would not cause any significant impacts, therefore, no mitigation is required.

4.8 Hazards and Hazardous Materials

4.8.1 Baseline Conditions

The Proposal site and the surrounding properties appear to have been used for agricultural purposes, dry-land farming, and dairy operations since the 1930s. The database search analyzed properties within a one-mile radius from Alternative 2A for known or suspected releases of hazardous substances or petroleum hydrocarbons. The database search identified 40 properties within a one-mile radius of the Proposal site. An additional 21 properties were identified as potentially being in the area, but were not mapped due to poor or inadequate address information. Each listing was reviewed to evaluate its potential to impact the Proposal site and to be a recognized environmental condition (REC). The Environmental Site Assessment (ESA) concluded that none of these properties has the potential to significantly impact the Proposal site.

The records search with the San Bernardino County Fire Department did not identify any records pertaining to the Proposal site. However, the record search identified the Liberty Ranch facility located off-site at 8484/8486 Chino Corona Road, which was reported to have expired hazardous material handling and hazardous waste generator permits. Two hazmat incident responses were listed for this facility. One incident occurred on April 5, 2007, related to unknown chemical substances abandoned in several 55-gallon containers. A second incident was reported on January 17, 2002, related to drug lab chemicals.

Geosyntec performed a site reconnaissance on October 30, 2008 to assess the present conditions and note obvious evidence of RECs. Geosyntec made the following observations:

- No evidence of the use of hazardous substances or petroleum products.
- No evidence of hazardous substance containers, with the exception of an empty 55-gallon plastic drum observed north of Chino Corona Road.
- No evidence of underground or aboveground storage tanks or other storage containers.

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- One pole-mounted transformer likely containing polychlorinated biphenyls (PCBs) was observed off-site on the south side of Chino Corona Road. No evidence of ground staining was observed.
- No evidence of the use, storage, or mixing of pesticides.
- Debris piles consisting of construction debris and miscellaneous household trash such as wooden pallets, crates, buckets, chairs, a mattress, and plastic sheeting was observed north of Chino Corona Road. An old abandoned vehicle, a television monitor, and miscellaneous trash was observed south of Chino Corona Road.
- No drainage culverts or surface drainage conveyances.
- Three piezometers are located on the Proposal site. They were installed as part of the subsurface geotechnical investigation.
- No evidence of septic tanks.
- No structures.

4.8.2 Methodology

Geosyntec Consultants (Geosyntec) prepared a Phase I Environmental Site Assessment (ESA) for the Proposal. The report, which is included as Appendix G, was prepared in accordance with the American Society Testing and Materials (ASTM) Standard E 1527-05, *Standard Practice for Environmental Assessments: Phase I Environmental Site Assessment Process*. The purpose of the ESA is to identify, to the extent feasible, recognized environmental conditions (RECs) in connection with the Proposal site. ASTM provides the following definition of RECs:

In defining a standard of good commercial and customary practice for conducting an environmental site assessment of a parcel of property, the goal of the processes established by this practice is to identify recognized environmental conditions. The term recognized environmental conditions means the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, ground water, or surface water of the property. The term includes hazardous substances or petroleum products even under conditions in compliance with laws. The term is not intended to include de minimis conditions that generally do not present a threat to human health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be de minimis are not recognized environmental conditions.

Preparation of the ESA included a records review, site reconnaissance, and interviews. The records review included a review of the previous environmental reports completed for the site; a database search of federal, state, county, and municipal records; a review of select historical aerial photographs; a review of select historical topographic maps; a review of available historical Sanborn maps; and a review of city directory listings.

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4.8.3 Environmental Effects

Basis of Significance. Approval of the Proposal would cause a significant adverse effect if it would cause any substances identified as potentially hazardous by the EPA in 40 CFR 302.4 to (1) expose workers to hazardous substances in excess of OSHA standards, or (2) contaminate the physical environment, thereby posing a hazard to humans, animals, or plant populations by exceeding federal exposure, threshold, or cleanup limits.

No Action Alternative. Site inspection identified debris and trash piles on the Proposal Site. Pesticides may exist in the soil or other unknown substances as a result of the debris and trash. Historical record searches also indicate spreading associated with previous dairy operations onsite that could generate methane gas. At present, continued use of the Proposal site for open space is not anticipated to disturb debris, trash or manure and therefore, is not expected to lead to future releases. The No Action Alternative would not have a significant impact on hazardous waste.

Alternative 2A. The Proposal Site was historically used for agricultural activities, dairy operations, and dry-land farming purposes and is currently leased to San Bernardino County for recreational development. The site reconnaissance identified debris and trash piles on the Proposal Site. Pesticides may exist in the soil, which is considered a REC. The reported manure spreading associated with previous dairy operations has the potential to generate methane gas and may pose construction issues. The potential presence of manure is also considered a REC. Finally, due to the presence of debris and trash piles, it is possible that materials may exist that were not identified during the ESA. Therefore, Alternative 2A could cause a significant adverse impact from the release or exposure to hazardous materials.

Alternative 2B. Alternative 2B has a slightly larger footprint than Alternative 2A. The larger Alternative 2B footprint was analyzed in the ESA. The potential adverse effects may be greater for Alternative 2B than those for Alternative 2A.

4.8.4 Mitigation

The following mitigation measure applied to both Alternative 2A and 2B would reduce the potentially significant adverse impacts from Hazardous Materials to less than significant.

HAZ1:

- a. Prior to the start of grading, a State of California registered Professional Engineer or Professional Geologist with a minimum of five years experience in hazardous materials identification and handling, or personnel under the responsible charge of a such professional, shall conduct random soil sampling to test for the presence of pesticides and methane gas associated with manure spreading. A report shall be prepared that summarizes the findings of the testing and provides recommendations for any necessary remediation. A copy of the report shall be provided to the USACE for review and comment.
- b. During the clearing of the Proposal Site, observation of the site by a State of California registered Professional Engineer or Professional Geologist with a minimum of five years experience in hazardous

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materials identification and characterization, or personnel under the responsible charge of such a professional, to recognize potential environmental conditions shall occur. If any hazardous debris or trash is observed, the clearing shall be redirected around the affected area and the material of concern shall be disposed of in accordance with the California Code of Regulations (CCR) Title 22 – Characterization of Hazardous Materials, CCR Title 27 – Waste, Disposal; and any applicable guidance from the Regional Water Quality Control Board, the California Department of Toxic Substances Control (DTSC), and / or the California Department of Resources Recycling and Recovery (CalRecycle).

4.9 Hydrology and Water Quality

4.9.1 Baseline Conditions

Hydraulics of Mill Creek

According to a USACE report titled, “General Design for Flood Control and Recreation – Cucamonga Creek” dated June, 1973, the maximum probable flood event in Mill Creek is 52,000 cfs. The 100-year flow event is modeled at 32,000 cfs. The highest observed stream gage data in the last 20 years was 17,300 cfs (USGS, October 2004). During a 100-year flood event, water surface elevations in Mill Creek will vary from 544 to 548 feet MSL. It is possible that during a very wet season the Prado Dam might fill to its 100-year flood elevation of 552 feet MSL. During a 200-year plus event, the Prado Dam may fill to an elevation of 566 feet MSL, which is the current weir elevation of the dam. In the dry flow condition Cucamonga Creek typically flows at 35 cfs. However, this flow can range from 30 to 60 cfs according to historic data. The primary source of dry weather flow is IEUA’s wastewater treatment facility.

Water Quality

The existing water quality in Cucamonga / Mill Creek contains pollutants from runoff from existing communities, agricultural operations, dairies, and discharges from the Inland Empire Utilities Agency (IEUA) water reclamation facilities. The Santa Ana Regional Water Quality Control Board (RWQCB) has adopted and periodically amends the 1995 Water Quality Control Plan for the Santa Ana River Basin, which includes Mill Creek. The Water Quality Control Plan establishes beneficial uses and water quality objectives for surface and groundwater bodies. The beneficial uses for Mill Creek are listed in Table 4.9-a:

Table 4.9-a: Beneficial Uses in Mill Creek

REC1	Includes recreational activities that involve body contact with the water, such as swimming, wading, fishing, etc.
REC2	Includes recreational activities in proximity to water, but not involving water contact, such as sunbathing, beach combing, etc.
WARM	Includes water uses that support warm water ecosystems.
WILD	Includes water uses that support wildlife and terrestrial ecosystems

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RARE	Includes uses of water that support habitats necessary to support threatened or endangered species.
SOURCE: Regional Water Quality Control Board	

When designated beneficial uses of a receiving water body are compromised by water quality, Section 303 (d) of the Clean Water Act requires identifying and listing that water body as impaired. As such, Mill Creek is listed as impaired by nutrients and Total Suspended Solids (TSS), which likely originate from agriculture and dairies. Once a water body is listed as impaired, a Total Maximum Daily Load (TMDL) must be developed for the impairing pollutants. The RWQCB adopted a Basin Plan amendment to incorporate indicator bacteria TMDLs for Mill Creek.

Baseline water sampling has been conducted on the Proposal site during the dry weather condition. Geosyntec's water quality report (Appendix L) includes the monitoring data. The data show elevated levels of Total Dissolved Solids (TDS) and nutrients, low in organics and metals, and bacteria data that show both compliance and exceedance of the 30-day water quality objective. In the dry weather condition, the normal flow in Cucamonga / Mill Creek is generally 35 cfs, but can vary between 30 – 60 cfs. Pollutants commonly associated with urban runoff include pathogen indicators (coliform bacteria), nutrients (nitrate, ammonia, phosphorus), and salinity (TDS).

Salinity (TDS) – TDS is primarily made up of inorganic salts, generally including calcium, sodium, potassium, phosphate, nitrate, and chloride. TDS can potentially impact downstream groundwater beneficial uses. Sources of TDS include runoff from agricultural and dairy areas and IEUA discharges. Treatment of TDS can be difficult. Often treatment of TDS requires advanced technology such as reverse osmosis. Therefore, the TDS levels are not anticipated to substantial change in the wetlands.

Wet weather flows occur during storm events. The highest concentration of pollutants occurs during the initial stages of a storm event, often referred to as the “first flush.” Pollutants commonly associated with wet weather flows are target sediment (TSS), pathogen indicators (coliform bacteria), trace metals (copper, lead, zinc), nutrients (nitrate, ammonia, phosphorus), organic compounds (oil and grease, pesticides, etc.) and trash and debris, as follows:

Sediment (TSS) – Sediment in surface waters can impair aquatic habitat and transport other pollutants, such as metals and organic compounds, that tend to absorb to sediment particles. The primary source includes urban runoff, agricultural uses, and construction sites.

Pathogen indicators (coliform bacteria) – Coliform bacteria are used as indicator organisms of human pathogens. Domestic animal, wildlife, or human fecal wastes, primarily from urban and agricultural runoff, tend to cause the elevated levels of pathogen indicators.

Trace metals (copper, lead, zinc) – Urban stormwater runoff can be a significant source of metals. Copper, lead, and zinc are the most prevalent, however other metals such as cadmium, chromium, and mercury can be detected at low levels. Metals can cause potentially toxic effects on aquatic life and impair beneficial uses.

Nutrients (nitrate, ammonia, phosphorus) – Nutrients are inorganic forms of nitrogen and phosphorus, which can cause accelerated growth of algae. High levels of nitrate are also a

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concern for aquifer replenishment in downstream recharge basins. The primary sources of nutrients in dry weather flows include agricultural and urban land uses and discharges from IEUA.

Organic Compounds (oil and grease, pesticides, etc.) – Studies have shown the presence of a wide variety of organic compounds in Cucamonga Creek in wet weather flows. Organic compounds can potentially impair aquatic habitat and the beneficial uses of the streams. Also, some organic compounds can persist in sediments for extended periods resulting in impacts on the diversity and abundance of benthic communities.

Trash and Debris – Trash and debris are common pollutants associated with urban runoff. Trash and debris can have significant impacts on the recreational value of a water body and aquatic habitat. Also, excessive organic matter associated with trash and debris can result in the growth of undesirable organisms and the release of odorous and hazardous compounds such as hydrogen sulfide.

4.9.2 Methodology

Five studies were conducted to analyze existing conditions and potential impacts to hydrology, hydraulics, water quality, and scour potential for the Proposal site. Detailed information regarding their findings may be found in Appendices E, H, I, J, and L.

4.9.3 Environmental Effects (Hydrology)

Basis of Significance. Approval of the Proposal would be considered to have a significant adverse effect on hydrology / hydraulics if the Proposal, (1) substantially depletes groundwater supplies; (2) substantially alters the existing drainage pattern such that it causes substantial erosion or flooding; (3) creates runoff that exceeds the capacity of stormwater facilities; (4) changes the hydrology of any USACE constructed channel or other structure; or (5) results in an incremental storage capacity loss to the authorized Prado Dam Flood Control Project.

No Action Alternative. Under the no action alternative, the Proposal site would retain its current character and no improvements would occur. Water surface levels in Cucamonga/Mill Creek are anticipated to be below the 544 to 548 ft elevation range estimated for the 100-year storm event. Flows could exceed 32,000 cfs in the maximum probable flood event. Waters will continue to be conveyed without diversion. The No Action Alternative would perpetuate the baseline condition and as such have no significant impact on hydrology.

Alternative 2A. Alternative 2A has the potential to cause significant adverse effects to hydrology / hydraulics under the following circumstances: dry weather diversion; wet weather diversion; outlet to Mill Creek; reduction of flood storage volume; and integrity of water quality facilities. Alternative 2A does not draw from groundwater supplies and does not contain substantial amounts of impervious surface that would significantly increase storm event runoff. Therefore, no adverse effects are anticipated from either potential effect.

Dry Weather Diversion

Alternative 2A proposes to divert dry weather flows from the rip-rap lined portion of Cucamonga Creek, ranging from 2.5 cfs to 15 cfs. During dry weather conditions, the maximum diversion of 15 cfs could reduce the water surface elevation a maximum of 4 inches, reduce the top flow width

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a maximum of 14 feet, and reduce the flow velocity a maximum of 3.2 cfs. Hydraulically, these changes are minor and would not adversely affect the function of Mill Creek. Therefore, the diversion of dry weather flows would not cause significant adverse effects to Mill Creek.

Wet Weather Diversion

Wet weather flows would also be diverted from the existing rip-rap lined portion of Cucamonga Creek. The amount of diversion would vary depending on the size of the storm event. The estimated diversion during a 2-year rain event is 145 cfs. During 100-year storm events the amount of diversion could range from 249 cfs to 269 cfs, depending on whether the ponds are full or empty. The diversion would increase when the ponds are empty because there would be less resistance compared to the hydraulic head.

The wetland/extended detention facilities would also receive storm event flows from Hellman Avenue and Chino Corona Road. The estimated peak flows from Hellman Avenue and Chino Corona Road are 50 cfs and 85 cfs, respectively. Added to the diversion from Cucamonga Creek, the total design peak flows through the Alternative 2A system is 384 cfs with full ponds and 404 cfs with empty ponds.

The calculated 100-year storm event in Cucamonga Creek is 32,000 cfs. The maximum diversion of 269 cfs from Cucamonga Creek during the 100-year storm event represents a small fraction of total flows and would not cause an adverse hydraulic effect on Mill Creek.

Outlet to Mill Creek

The outlet from the wetland/extended detention ponds is designed to accommodate the maximum peak flow of 404 cfs. However that is not the critical design flow. During the maximum peak flow, the water surface elevation would be at or near the 100-year storm event water surface elevation in Mill Creek. Therefore, the flows in Mill Creek would be at or overtopping the outlet structure. A more critical condition occurs during smaller storm events, such as the 2-year storm event (Q_2) and the 5-year storm event (Q_5). During these smaller events, the outflow channel would flow into a lower water surface within Mill Creek resulting in potentially higher velocities and higher erosion potential. Based on the channel design, including channel width and rip rap, Table 4.9-b summarizes the discharge and velocity conditions in the outlet channel under the 2-year and 5-year storm events.

Table 4.9-b:
Mill Creek Wetlands Outlet Velocities for Q2 and Q5 Design Storms

Design Storm	Flow in Mill Creek	Water Surface Elevation in Cucamonga Creek at Diversion	Flow Diverted	Water Surface Elevation in Mill Creek at Confluence with Outflow Channel	Velocity of Outflow Channel into Mill Creek	Flow Velocity in Mill Creek at Discharge
Q_2	1351 cfs	542.52 ft	105 cfs	524.52 ft	0.45 fps	5.05 fps
Q_5	4509 cfs	544.56 ft	145 cfs	527.71 ft	0.29 fps	3.30 fps

SOURCE: AECOM (2008)

During the Q_2 and Q_5 events the velocity of the discharge in the outlet channel would be non-erosive and substantially less than the velocity in Mill Creek. Therefore, the outlet of storm event flows into Mill Creek would not cause a significant adverse effect.