CLARIFICATIONS AND REVISIONS TO THE DRAFT ENVIRONMENTAL IMPACT REPORT

This Section consists of clarifications and revisions to the RELOOC Strategic Plan – Frank R. Bowerman Landfill Implementation Draft Environmental Impact Report (DEIR) that have resulted from responses to comments received from agencies and the public on the DEIR. The DEIR was released for a 45-day public review period (January 24, 2006 through March 9, 2006). Those parts of text that are underlined/crossed out indicate revisions by reference to the text of the DEIR.

SECTION 1.0 – EXECUTIVE SUMMARY

The following discussion replaces the first paragraph of Section 1.1.4.1 on page 1-4 of the DEIR by reference to clarify the proposed capacity of the landfill.

"The expansion of the FRB Landfill would provide an additional MSW capacity of ~~130~~104 million cubic yards (mcy) over the current permitted capacity or total airspace of 130 mcy. This would extend the life of the landfill from its permitted closure date of 2022 to approximately 2053, based on an annual average refuse inflow rate at the currently permitted limit of 8,500 TPD in accordance with the existing City of Irvine Settlement Agreement for the landfill."

The following discussion replaces the first paragraph of Section 1.1.4.4 on page 1-6 of the DEIR by reference to clarify the number of equipment needed for the project and hours of operation.

"The project may require that additional buildings and structures be constructed at the FRB Landfill and will require relocation of existing entrance facilities, scales/scale house, LFG control facilities and other landfill support facilities in a later phase of development (Phase X to begin filling operations in approximately 2041). The number of employees and equipment at the landfill is not expected to change substantially as a result of the proposed project. However, for purposes of environmental impact analysis, an increase in personnel by seven employees and, in equipment use, ~~by up to six~~ by three pieces of equipment was assumed for a continuous operation at 11,500 TPD. The proposed project is to accept 11,500 TPD on a periodic basis to accommodate high tonnage days and to maintain an annual average of 8,500 TPD. Employees would continue to perform landfill operations including administration, landfill cover operations and other landfill related operations. As part of the proposed project environmental analysis, an evaluation was made of ~~IWMD is considering~~ changing ~~in~~ the landfill operating hours from 7:00 A.M. - 5:00 P.M. to 6:00 A.M. - 4:00 P.M. in the event IWMD proposes that change in hours in the future. Appropriate approvals for a change in operating hours will be pursued at that time. The landfill will continue to operate six days per week, Monday through Saturday, and will be closed on the six major holidays."

The following rows in Table 1-1 on page 1-12 of the DEIR are replaced by reference to clarify the LOS at the intersections of Sand Canyon Avenue at Trabuco Road and Jeffrey Road at Walnut Avenue before and after implementing mitigation measure T-1 and T-2.

Summary of Impacts Related to Transportation and Circulation			
Sand Canyon Avenue at its intersection with Trabuco Road will experiences a significant adverse impact as a result of project traffic in 2030.	T-1	Sand Canyon Avenue at Trabuco Road. Extend the Advanced Transportation Management System (ATMS) strategies to encompass the intersection of Sand Canyon Avenue at Trabuco Road. The ATMS strategies at Sand Canyon Avenue at Trabuco Road will be installed in 2025 but will be discontinued at buildout conditions in 2030 based on information provided by the City of Irvine. The ATMS strategies apply the latest traffic control systems to improve traffic flow through the intersections. These traffic control systems include the use of interconnect, closed circuit television and communication system, upgraded traffic signal cabinets, controllers and detection systems, and a changeable message board. The ATMS strategies will only be operational during the A.M. and P.M. peak periods, when the intersection experiences the most traffic. This improvement will result in an A.M. peak hour ICU of 0.882 (LOS D) with mitigation compared to an ICU of 0.932 (LOS E) without mitigation.	Less than significant.
Jeffrey Road at its intersection with Walnut Avenue will experience~~s~~ a significant adverse impact as a result of project traffic in 2030.	T-2	Jeffrey Road at Walnut Avenue. Provide the westbound right-turn lane with a protected right-turn phase that is overlapped with the southbound left-turn phase in 2030. This improvement will result in an A.M. peak hour ICU of 0.830 (LOS D) with mitigation compared to an ICU of 0.982 (LOS E) without mitigation.	Less than significant.

The following row in Table 1-1 on page 1-13 of the DEIR is replaced by reference to clarify the freeboard height.

		• All trucks hauling dirt, sand, soil, or other loose materials should have a cover over the top of the material, spray water to minimize wind blown dust, or should maintain at least six inches ~~two feet~~ of freeboard in accordance with the requirements of California Vehicle Code section 23114 (freeboard means vertical space between the top of the load and top of the trailer).	

The following rows in Table 1-1 on page 1-15 of the DEIR are inserted after mitigation measure AQ-2 by reference to include additional measures that may reduce NO_x and PM_{10} emissions during operational activities.

	AQ-3 Implementation of the following measures will help reduce NO_x and PM_{10} emissions during operational activities: • The IWMD shall purchase four, single engine, articulating dump trucks in fiscal year 2006/2007 to replace four, twin engine scrapers. The trucks will meet United States EPA Tier 3 emissions standards. In addition, IWMD will purchase one excavator. • The IWMD shall routinely train employees in efficient scheduling and load management to eliminate unnecessary queue and idling of trucks with the landfill. • Continue to be proactive in notifying truck drivers of the designated truck route. • Make sure signage at the exit of the landfill indicating the turn direction to follow the designated truck route to the freeway is visible to all truck drivers. • Continue to monitor wind speed and direction through the landfill's on-site weather station.	

The following row in Table 1-1 on page 1-24 of the DEIR is replaced by reference to correct spelling.

	In order to pre-mitigate for FRB MDP impacts to the IML, IWMD is already implementing a long-term mitigation plan ~~as~~at the FRB site that includes the excavation and transplantation of bulbs, seed collection, nursery propagation, experimental studies and long term performance monitoring. The first phase of the IML Mitigation Plan was completed in August 2004, when 234 IML bulbs were transplanted to four receptor sites in the northeast corner of the FRB property, outside of the future FRB MDP development limits.	

The following rows in Table 1-1 on page 1-25 and 1-26 of the DEIR are replaced by reference to include County SCAs.

Two previously recorded cultural resources sites outside ~~within~~ the proposed project's disturbance limits were ~~are~~ located. ~~considered potentially eligible for NRHP status.~~ No additional cultural resources were noted within the project disturbance limits. However, there is the potential for uncovering previously unknown cultural resources during ground disturbing activities.	CR-1	Prior to the issuance of grading permit(s), and in compliance with County SCA A04, the County will ~~project developer(s) shall~~ retain a qualified cultural resource specialist~~, to the satisfaction of the County of Orange IWMD,~~ to monitor the project's subsurface areas during grubbing and land disturbance from construction activities ~~that previously were not effectively surveyed~~. The cultural resource specialist shall, consistent with County SCA A03, examine, evaluate, and determine the most appropriate disposition of any potential artifact and shall have the authority to temporarily halt work until any identified artifacts can be recovered, handled, and/or surveyed in the appropriate manner.	Less than significant.
	CR-2	Prior to issuance of grading permit(s) and prior to excavation in undisturbed geological units ~~to a depth of more than 15 feet below the modern ground surface~~, the County will ~~project developer(s) shall~~ retain a~~n archaeological and~~ paleontological resource specialist~~, to the satisfaction of the County of Orange IWMD,~~ to conduct ~~archaeological and~~ paleontological resource monitoring consistent with County SCA A07.	Less than significant.

SECTION 4.0 – PROJECT DESCRIPTION

The following discussion replaces the first numbered item under the first paragraph of Section 4.3.2 on page 4-4 of the DEIR by reference to clarify the proposed capacity of the landfill.

1. "Maximize capacity at the FRB Landfill which would be accomplished with phased vertical and horizontal expansions of the FRB refuse footprint within the existing property boundary, as shown on Figure 4-3. These phased expansions would result in increased capacity (approximately 130 mcy of total airspace or 104 mcy of additional refuse capacity over the permitted capacity) at this landfill and would result in an extension of the life of this landfill from the current effective closure date of 2014 (and the permitted closure date of 2022) to approximately 2053. An increase in refuse density is also proposed to maximize capacity due to the use of better compaction equipment."

The following discussion replaces the second paragraph of Section 4.3.3.1 on page 4-6 of the DEIR by reference to clarify the proposed capacity of the landfill.

"The expansion of the FRB Landfill would provide an additional MSW capacity of ~~130~~104 ~~million cubic yards (~~mcy~~) over the current permitted capacity~~ or additional total airspace of 130 mcy which would extend the remaining life of the landfill from its current effective closure date of 2014 (based on remaining capacity reduction without landslide stabilization) and permitted closure date of 2022 to approximately 2053, based on an annual average refuse inflow rate at the currently permitted limit of 8,500 TPD. The annual average refuse inflow rate of 8,500 TPD is the base assumption for the proposed project and all the alternatives except those that propose an increase in the annual average to 11,500 TPD when Olinda Alpha Landfill closes."

The following discussion replaces the first paragraph of Section 4.3.6 on page 4-15 of the DEIR by reference to clarify the number of equipment needed for the project and hours of operation.

"The project may require that additional buildings and structures be constructed at the FRB Landfill and will require relocation of existing entrance facilities, scales/scale house, LFG control facilities and other landfill support facilities in a later phase of development (Phase X to begin filling operations in approximately 2041). The number of employees and equipment at the landfill is not expected to change substantially as a result of the proposed project. However, for purposes of environmental impact analysis, an increase in personnel by seven employees and, in equipment use, ~~by up to six~~ by three pieces of equipment was assumed for a continuous operation at 11,500 TPD. The proposed project is to accept 11,500 TPD on a periodic basis to accommodate high tonnage days and to maintain an annual average of 8,500 TPD. Employees would continue to perform landfill operations including administration, landfill cover operations and other landfill related operations. The operating hours and schedule at the FRB Landfill may change in the future as a result of the proposed project. IWMD is considering changing the hours of operation at the landfill from 7:00 A.M. to 5:00 P.M. to 6:00 A.M. to 4:00 P.M. in the event IWMD proposes this change in future operating hours, appropriate approvals will be pursued at that time. The site would continue operating six days a week, except for holidays (307 days a year)."

The following discussion replaces the second paragraph of Section 4.4.2 on page 4-17 of the DEIR by reference to clarify MSW and non-MSW exempt waste material amounts.

"It should be noted that the 8,500 TPD inflow rate is for MSW only. Approximately 900 tpd (annual average for 307 days) of exempt waste (asphalt, ~~demolition, dirt,~~ processed green ~~waste~~ material, and ~~shredder waste~~ soil) was accepted at the site in 2004 which rate fluctuates from day to day. For the proposed expansion project, the traffic, air and noise analysis evaluated impacts due to truck trips supporting a total of 12,975 tpd of total materials (general MSW and non-MSW exempt material) brought to the site on a given day. The amount of general MSW and non-MSW exempt material will fluctuate on a daily basis but is not projected to exceed a total amount of 12,975 tpd. This would allow for 1,475 tpd of exempt material at the MSW peak rate of 11,500 tpd and up to 4,475 tpd at the MSW annual average rate of 8,500 tpd."

The following discussion replaces the second paragraph of Section 4.4.3 on page 4-17 of the DEIR by reference to clarify compostable material.

"Typical residential non-hazardous waste includes household refuse, tree and lawn clippings, leaves and brush, scrap lumber and metal, appliances, furniture, wood chips, plastic containers, newspapers, cardboard and glass containers. Commercial and industrial waste typically includes food wastes, paper, corrugated cardboard, plastic, rubber, glass, mixtures of concrete, asphalt, wood, steel, brick and block. Cathode ray tubes (CRTs) are not accepted at the FRB Landfill, which was effective for all IWMD sites as of August 2001. Universal Waste (fluorescent lamps, CRTs, instruments that contain mercury, batteries, electronics) will be prohibited for disposal at the site as of February 9, 2006. The FRB Landfill ~~also~~ does not handle compostable material defined in 14 CCR, Section 17850 as "any organic material that when accumulated will become active compost as defined in 14 CCR, Section 17852 (a)(1)."

SECTION 5.1 – LAND USE AND PLANNING

The following discussion replaces the first paragraph in Section 5.1.1.1 on page 5.1-1 of the DEIR by reference to clarify the correct name of the Limestone Canyon & Whiting Ranch Wilderness Park.

"The FRB Landfill is generally located in the central and eastern portion of Orange County. Access to the landfill is available from the Santa Ana Freeway (Interstate 5, I-5) and the San Diego Freeway (Interstate 405, I-405). The major cross streets in the vicinity of the landfill are Sand Canyon Avenue and Portola Parkway, with access to the landfill from Bee Canyon Access Road. Figure 4-1 in the Project Description shows the location of the FRB Landfill. Much of the area surrounding the project site consists of undeveloped land, open space, agricultural, commercial and residential land uses. Limestone Canyon & Whiting Ranch Wilderness Park ~~Limestone Canyon Regional Park~~ is located to the north and east of the landfill."

The following discussion replaces the first complete paragraph on page 5.1-2 of the DEIR by reference to clarify the correct name of the Limestone Canyon & Whiting Ranch Wilderness Park.

"As stated above, surrounding land uses in the project vicinity consist of undeveloped land, open space, agricultural, commercial and residential land uses. Limestone Canyon & Whiting Ranch Wilderness Park ~~Limestone Canyon Regional Park~~ is located to the north and east of the landfill and Round Canyon watershed is located immediately east of the landfill. Local access to the FRB Landfill is provided via Bee Canyon Access Road, Sand Canyon Avenue and Portola Parkway, and regional access is provided via I-5 and I-405. A number of planned residential communities have been constructed in proximity to the landfill. These residential uses were subject to the County of Orange and City of Irvine planning procedures and land use controls which considered their proximity to this active landfill. In addition, a number of residential communities have been planned and proposed for future development in proximity to the landfill. Much of the planned and proposed new development will occur adjacent to Sand Canyon Avenue in the City of Irvine. The FRB Landfill is located in an area of Orange County that is experiencing rapid urbanization; Table 5.1-1 summarizes planned and proposed development in the project vicinity at various stages of approval within both the City and County surrounding jurisdictions. As shown in Figure 5.1-1, the immediately surrounding land use is designated for preservation by the City of

Irvine General Plan. As shown in Figure 5.1-2, the immediately surrounding land use is designated for open space reserve by the County of Orange General Plan."

The following rows in Table 5.1-1 on page 5.1-3 of the DEIR are replaced by reference to clarify that Planning Area 2 has been merged into Planning Area 1.

Name/Location	Jurisdiction	Type of Development	Acres/DU/SF/TSF	Status
PA1~~, PA2~~ and PA 9	City of Irvine			Approved
PA 1 ~~& 2~~		Conservation/Open Space	2,789 Acres	
		Residential	1,388 or 1,369[1] Acres	
		Institutional	45 Acres	
		Commercial	13-32[2]	
PA 9		Residential-Medium	221 Acres	
		Residential-High	60 Acres	
		Multi-Use	60 Acres	

SECTION 5.3 – HYDROLOGY AND WATER QUALITY

The following discussion replaces the third paragraph of Section 5.3.1.1 on page 5.3-1 of the DEIR to correct the reference to beneficial uses, as cited by the Santa Ana Regional Water Quality Control Board.

"According to the Santa Ana Regional Water Quality Control Board Amended Basin Objectives Plan (~~RWQCB, 1995~~Resolution R8-2004-0001), the Bee Canyon drainage is a tributary of San Diego Creek which is in turn a tributary of the upper Newport Bay~~. The hydrologic unit is classified as the East Coastal Plain of~~ within the ~~1~~ Lower Santa Ana River Basin, Irvine, Groundwater Management Zone with ~~(RWQCB, 1995). According to the RWQCB (1995), the~~ beneficial uses ~~for the East Coastal Plain of the lower Santa Ana River hydrologic unit are~~ as follows:

- Municipal and Domestic ~~Water~~ Supply (MUN)
- ~~Groundwater Recharge~~
- ~~Recreational Use 1 (includes body contact with water)~~
- ~~Recreational Use 2 (no body contact with water)~~
- ~~Warm Freshwater Habitat~~
- ~~Wildlife Habitat~~
- Agricultural Supply (AGR)
- Industrial Service Supply (IND)
- Industrial Process Supply (PROC)"

SECTION 5.4 – SURFACE WATER HYDROLOGY

The following discussion replaces the second paragraph of Section 5.4.1 on page 5.4-1 of the DEIR to correct the reference to beneficial uses, as cited by the Santa Ana Regional Water Quality Control Board.

"According to the ~~FRB Landfill's Waste Discharge Requirements, the~~ Santa Ana Regional Water Quality Control Board~~'s~~ (RWQCB), ~~Water Quality Control Plan, Santa Ana River Basin (1995), identifies~~ the beneficial uses of Inland Surface water downgradient of the FRB Landfill, which is the ~~Bee Canyon Wash and~~ San Diego Creek, Reach 1~~, 2~~ includ~~ing~~es:

~~a) Groundwater recharge,~~
a) Recreational Use 1 - ~~(body~~ Water ~~c~~Contact ~~with water~~ Recreation (REC1),
b) Recreational Use 2 – ~~(no body~~ Non-contact ~~with w~~ Water Recreation (REC2),
c) Warm Fresh ~~w~~ Water Habitat (WARM), and
d) Wildlife habitat (WILD)."

The following discussion replaces the last paragraph of Section 5.4.1 on Page 5.4-2 of the DEIR to clarify maintenance responsibilities for the Bee Canyon Retarding Basin downstream of the FRB Landfill.

"The existing Bee Canyon Retarding Basin (see Figure 5.4-1) located immediately south of the FRB Landfill property boundary provides for storage of sediment and debris from the landfill area not contained by the on-site erosion control measures and desilting basins. This downstream retarding basin is owned and operated by the Orange County Flood Control District. After each major storm and annually, all drainage facilities are inspected and required maintenance is performed so that the on-site drainage channels and the desilting ~~and retarding~~ basins function properly. A Memorandum of Understanding between the IWMD and RDMD, dated 7/10/90, identifies maintenance responsibilities for each agency with regard to the Bee Canyon Retarding Basin.

The following discussion replaces the first paragraph of Section 5.4.3 on Page 5.4-6 of the DEIR to include additional method utilized for hydrological analyses in the Final EIR.

"The Orange County Hydrology Manual and the Advance Engineering Software (AES, 2005) computer program Rational and Unit Hydrograph Methods were used to calculate the 100-year, 24-hour run-off peak for the entire FRB Landfill with the proposed expansion. The AES computer program was specifically designed for Orange County and uses the latest rainfall data, nomographs, charts and equations for the Rational Method required in the hydrology manual. AES is also the accepted software used by RDMD which is the agency responsible for the major flood control facilities downstream of the landfill."

The following paragraph is added to the end of Section 5.4.4.2 on Page 5.4-9 of the DEIR to clarify that the potential effects of the diversion of flows from Hicks Canyon into Bee Canyon proposed for the MDP will not have a significant impact on the Bee Canyon Retarding Basin.

"The 17-acre diversion of flows from the Hicks Canyon tributary into the Bee Canyon tributary proposed for the MDP comprises approximately two percent of the Bee Canyon watershed. Although the increase in tributary was expected to have an insignificant effect on the watershed, additional analysis was performed for the entire Bee Canyon watershed (included in Appendix E) to verify potential downstream effects on the Bee Canyon Retarding Basin due to peak stormwater flows and stormwater volume. Results of the additional analysis for the Bee

Canyon watershed (added to Appendix E) found that the peak runoff value for the MDP is less than the existing permitted plan peak runoff value, consistent with the conclusions in Table 5.4-1 of the DEIR, and that the MDP runoff volume is lower than the design volume of the Bee Canyon Retarding Basin (as well as the permitted plan). Therefore, the effects of the MDP on the Bee Canyon Retarding Basin due to peak stormwater flow and volume would be less than significant."

The following paragraph is added between the third and fourth paragraph of Section 5.4.4.3 on Page 5.4-13 of the DEIR to clarify that the potential effects of sediment and debris flow due to the MDP will not compromise the flood control function of the Bee Canyon Retarding Basin

"An evaluation was made of the original sediment/debris design capacity of the Bee Canyon Retarding Basin (added to Appendix E) and it was found that the volume potential for sediment/debris would decrease (from the original design assumptions) as the landfill footprint enlarges due to BMPs and enhanced vegetative cover for the landfill operations. Ongoing measures to employ BMPs (including treatment control BMPs) and maintenance of the Bee Canyon Retarding Basin will provide additional assurance that the flood control function of the basin is not compromised due to sediment/debris from the MDP project."

The following discussion replaces the last paragraph of Section 5.4.4.3 on page 5.4-13 of the DEIR to clarify that IWMD will continue to comply with the municipal NPDES requirements in the County Drainage Area Management Plan and associated Water Quality Management Plan, as necessary, for full implementation of the MDP.

"The FRB Landfill will continue to comply with its industrial and construction NPDES permit requirements including implementation of a SWPPP and employment of BMPs. Annual reports will continue to be submitted to the RWQCB and will be updated as the landfill development progresses. In addition to ongoing compliance with industrial and construction NPDES permit requirements, IWMD will continue to coordinate with RDMD on compliance with municipal NPDES permit requirements of the County's Drainage Area Management Plan and associated Water Quality Management Plan, as necessary, for full implementation of the MDP."

SECTION 5.5 – TRANSPORTATION AND CIRCULATION

The following discussion replaces the third paragraph of Section 5.5.3.4 on page 5.5-9 of the DEIR by reference to clarify that 152 daily trips are related to non-MSW exempt material.

"In 2004, the landfill generated 1,346 daily truck trips for MSW on the 85th percentile day and 152 daily truck trips for non-MSW (1,475 TPD) on the 85th percentile day for a total of 1,498 daily truck trips. The summary of daily truck trips can be found in Appendix F. The landfill currently has 90 employees that generate 180 daily trips. It was assumed that the increase in trips was directly proportional to operations at the landfill in 2004. This assumption was considered conservative for the number of employees required because the increase in employees would be less than proportional. The landfill would generate 1,806 daily truck trips for MSW if the landfill accepts the maximum of 10,625 TPD of MSW and 152 daily truck trips for non-MSW for a total of 1,958 daily truck trips. No increase for non-MSW was anticipated because the operations for non-MSW would remain the same as existing conditions. Of the 1,958 daily

truck trips, approximately 315 trucks trips would occur during the A.M. peak hour and 303 truck trips would occur during the second landfill peak hour. It was assumed that the employees arrived before the A.M. peak hour. Table 5.5-3 summarizes the daily, A.M. peak hour and second landfill peak hour trip generation if the landfill accepts the maximum of 10,625 TPD of MSW without (Raw) and with the applied PCE factor of 2.24. These landfill trips will remain on the circulation network until the landfill permitted closure in 2022."

The following discussion replaces the second and third paragraphs of Section 5.5.3.5 on page 5.5-11 of the DEIR by reference to clarify trip distribution and the designated truck route.

"Approximately 13 percent of the waste hauling trucks travel on Portola Parkway west of Jeffrey Road, approximately 15 percent on Irvine Boulevard east of Sand Canyon Avenue, approximately 15 percent on Jeffrey Road and approximately 50 percent on Sand Canyon Avenue between I-5 and Irvine Boulevard. Based on the waste hauling truck traffic counts, approximately five percent of the trucks travel on Sand Canyon Avenue south of I-5. Therefore, the intersections on Sand Canyon Avenue south of I-5 were not included in the study area."

Based on field observations, most of the transfer trucks traversed on the designated truck route to the landfill. The designated ~~transfer~~ truck route to the landfill are I-5, I-405, Sand Canyon Avenue, Portola Parkway, and Bee Canyon Access Road as established in the Settlement Agreement between Orange County and the City of Irvine. The remaining packer trucks and self-hauling trucks ~~are permitted to~~ use alternative routes other than the designated truck route to the landfill.

The following discussion replaces the second paragraph of Section 5.5.4.4 on page 5.5-37 of the DEIR by reference to include clarification for the CMP Traffic Analysis.

"A CMP Traffic Analysis is required when a proposed project generates more than 2,400 daily trips or more than 1,600 daily trips with direct access to a CMP Highway. The CMP Highways in the vicinity of the FRB Land fill are I-5, I-405, SR 133 and Irvine Boulevard. Therefore, the FRB Landfill does not have direct access to a CMP Highway. The proposed project would result in an additional ~~162~~ 346 daily PCE trips in 2010 and ~~2,300~~ 4,911 daily PCE trips in 2030. The daily trips generated in 2010 ~~and 2030~~ would be less than the minimum 2,400 daily trips required for a CMP Traffic Analysis. Therefore, a CMP Traffic Analysis is not required for the proposed project for year 2010. The daily trips generated in 2030 would be greater than the minimum 2,400 daily trips required for a CMP Traffic Analysis. Therefore, a CMP Traffic Analysis is required for the proposed project for year 2030.

Orange County has established LOS E or better as the acceptable LOS for road segments and intersections on a CMP Highway System (CMPHS). Any road segment or intersection operating at LOS F was considered to be deficient.

A significant adverse traffic impact would occur on a CMPHS if implementation of the proposed project would result in one or more of the following:

- The road segment to operate at an unacceptable LOS, and an increase of the daily V/C ratio of greater than 0.03.
- The intersection to operate at an unacceptable LOS, and an increase in the ICU of greater than 0.03.

As shown in Section 5.5.4.2, all road segments and intersections on the CMPHS operates at an acceptable LOS D or better. Therefore, implementation of the proposed project would create no significant adverse impacts to the CMPHS and would be in compliance with the CMP performance standards."

The following discussion replaces mitigation measure T-1 on page 5.5-38 of the DEIR by reference to clarify the LOS at the intersection of Sand Canyon Avenue at Trabuco Road before and after implementing mitigation measure T-1.

"T-1 Sand Canyon Avenue at Trabuco Road. Extend the Advanced Transportation Management System (ATMS) strategies to encompass the intersection of Sand Canyon Avenue at Trabuco Road. The ATMS strategies at Sand Canyon Avenue at Trabuco Road will be installed in 2025 but will be discontinued at buildout conditions in 2030 based on information provided by the City of Irvine. The ATMS strategies apply the latest traffic control systems to improve traffic flow through the intersections. These traffic control systems include the use of interconnect, closed circuit television and communication system, upgraded traffic signal cabinets, controllers and detection systems, and a changeable message board. The ATMS strategies will only be operational during the A.M. and P.M. peak periods, when the intersection experiences the most traffic. This improvement will result in an A.M. peak hour ICU of 0.882 (LOS D) with mitigation compared to an ICU of 0.932 (LOS E) without mitigation."

The following discussion replaces mitigation measure T-2 on page 5.5-39 of the DEIR by reference to clarify the LOS at the intersection of Jeffrey Road at Walnut Avenue before and after implementing mitigation measure T-2.

"T-2 Jeffrey Road at Walnut Avenue. Provide the westbound right-turn lane with a protected right-turn phase that is overlapped with the southbound left-turn phase in 2030. This improvement will result in an A.M. peak hour ICU of 0.830 (LOS D) with mitigation compared to an ICU of 0.982 (LOS E) without mitigation."

SECTION 5.6 – AIR QUALITY

The following discussion replaces the first paragraph of Section 5.6.3.1 on page 5.6-14 of the DEIR by reference to clarify construction impacts assessment methodology.

"Construction impacts to air quality were evaluated using the calculation of worst-case daily emissions. These calculations were then compared with the SCAQMD significance criteria pollutant thresholds established for construction activities to determine if impacts to air quality will be significant and adverse. Based on data provided by the project engineers, the maximum daily quantity of earth that may be moved in support of landslide remediation and new cell

construction combined will not exceed 40,000 cy. However, the average volume of earth moving over an extended period will be about half this level, or about 20,000 cy per day. Accordingly, the estimates developed for the maximum daily and annual emissions are based on these assumptions. Note that as a worst-case scenario, annual emissions associated with landfill operations account for the extra construction equipment that is required on peak days (i.e., 11,500 TPD) would operate 154 days per year and typical equipment for the remainder of the year. Thus, the construction impacts on air quality compares the worst-case daily emissions with the SCAQMD significance criteria pollutant thresholds established for construction activities. Specific activities that have been included in the estimation of construction emissions include:"

The following discussion was inserted after the first paragraph of Section 5.6.3.4 on page 5.6-16 of the DEIR by reference to clarify worst case scenario for the Methodology related to CO Hotspots Analysis.

"Three intersections were selected for the hot spots analysis. Sand Canyon Avenue at Trabuco Road and Jeffrey Road at Walnut Avenue were selected because, according to the traffic study, they will be degraded to an unacceptable level of service (LOS). Sand Canyon Avenue at Irvine Boulevard was also selected because it had the second highest traffic counts of the intersections analyzed in the traffic study. These three intersections would be considered worst-case scenario because the intersections with the worst LOS and highest vehicle volume would generate the highest amount of pollutants."

The following discussion replaces the third paragraph of Section 5.6.3.4 on page 5.6-16 of the DEIR by reference to clarify the parameters used in the EMFAC2002 model Version 2.2.

"CARB's Emission Factors (EMFAC2002) model Version 2.2 was used to generate aggregate emission data for waste hauling trucks and employee commuters during morning peak hours at the selected intersections. The model default parameters for Orange County in the year 2030 was run to generate vehicle emission factors for the CO hot spot model, CALINE4. ~~vehicular mix for the SCAB and equipment model years ranging from 2000 through 2030 were selected in developing the input to this emissions model. Model default options were used for all other input parameters. At each intersection, one set of emission factors was selected for through traffic and a second set was selected for turning traffic. The idling or turning traffic used the highest emission factors for 0 to 5 mph and the through traffic used the highest emission factors for 10 to 45 mph.~~"

The following discussion replaces bullets two and five under the fourth paragraph of Section 5.6.3.4 on page 5.6-19 of the DEIR by reference to clarify the CALINE4 model inputs.

- "~~Twelve r~~Receptors were placed at street corners and along the roadway~~least 10 feet (3 m) from the road~~."

- "The projected ~~baseline~~ ambient 1-hour and 8-hour CO concentrations of 5.9 ppm and 3.9 ppm, respectively, for the Anaheim monitoring station year 2020 was derived from the SCAQMD web site~~ for year 2020 was used – specifically, the highest expected hourly~~

~~concentration in the vicinity of the project site (5.8 ppm at the Anaheim monitoring station) was used to define a worst-case future baseline condition~~."

The following discussion replaces the two bullets in the first paragraph of Section 5.6.4.3 on page 5.6-29 of the DEIR by reference to update the results of the CO Hotspots Modeling Analysis.

- "CO ~~Normal running~~ emission factor~~s~~ for approaching vehicles ~~CO were~~ was calculated as 1.43 ~~3.14~~ grams/mile.

- CO emission factor for departuring vehicles was ~~Normal idling emissions for CO were~~ calculated as 1.38~~13~~ grams/mile~~hour~~."

The following table replaces Table 5.6-18 on page 5.6-29 of the DEIR by reference to clarify CO concentrations predicted by the CALINE4 model.

Intersection	**Locations of Receptors with Highest Concentrations**	**Without Project CO Concentrations 1-hour/ 8-hour**	**With Project CO Concentration 1-hour/8-hour**	**Change in CO Concentration 1-hour/8-hour**
Sand Canyon Avenue & Trabuco Road	SE	6.2/4.1	6.2/4.1	0.0/0.0
	NW	6.3/4.2	6.3/4.2	0.0/0.0
	SW	6.3/4.2	6.3/4.2	0.0/0.0
	NE	6.2/4.1	6.2/4.1	0.0/0.0
Jeffrey Road & Walnut Avenue	SE	6.2/4.1	6.2/4.1	0.0/0.0
	NW	6.2/4.1	6.2/4.1	0.0/0.0
	SW	6.3/4.2	6.3/4.2	0.0/0.0
	NE	6.2/4.1	6.2/4.1	0.0/0.0
Sand Canyon Avenue & Irvine Boulevard	SE	6.3/4.2	6.3/4.2	0.0/0.0
	NW	6.2/4.1	6.2/4.1	0.0/0.0
	SW	6.3/4.2	6.3/4.2	0.0/0.0
	NE	6.2/4.1	6.2/4.1	0.0/0.0

Source: URS Corporation
Notes:
CAAQS – 1-hour = 20 ppm; 8-hour = 9.0 ppm
* ppm = parts per million
** Estimated CO concentrations are the same for "with Project" and "without Project" scenarios
8-hour background concentration incorporates 0.7 persistence factor applied to 1-hour background concentration
CO concentrations shown includes projected 1-hour and 8-hour ambient background concentrations at the SCAQMD Anaheim monitoring station in year 2020

The following discussion replaces the first paragraph on page 5.6-30 of the DEIR by reference to clarify the results of the CO Hotspots Modeling Analysis.

"As described for the EMFAC2002 model and as shown in Table 5.6-18 for the CALINE4 model, the CO hot spots analysis indicates that no adverse CO impacts are expected from an

increase in traffic at the any of the three intersections analyzed for CO. Since these intersections were selected as worst-case intersections, no adverse CO impacts are expected from any intersections in the vicinity of the FRB Landfill. The results of the CO hot spot analysis for the "with Project" and "without Project" scenarios indicate there is virtually no change in the maximum predicted CO concentrations, because the morning peak traffic counts for the two scenarios differ by only a small percentage. In either case, the projected maximum impacts at all modeled intersections are well below the state and federal ambient standards for CO."

The following mitigation measure was inserted into Section 5.6.5 after Mitigation Measure AQ-2 on page 5.6-34 by reference to address NOx and PM10 emissions.

"AQ-3 Implementation of the following measures will help reduce NO_x and PM_{10} emissions during operational activities:

- The IWMD shall purchase four, single engine, articulating dump trucks in fiscal year 2006/2007 to replace four, twin engine scrapers. The trucks will meet United States EPA Tier 3 emissions standards. In addition, IWMD will purchase one excavator.
- The IWMD shall routinely train employees in efficient scheduling and load management to eliminate unnecessary queue and idling of trucks with the landfill.
- Continue to be proactive in notifying truck drivers of the designated truck route.
- Make sure signage at the exit of the landfill indicating the turn direction to follow the designated truck route to the freeway is visible to all truck drivers.
- Continue to monitor wind speed and direction through the landfill's on-site weather station."

The following discussion replaces the paragraph in Section 5.6.6 on page 5.6-34 of the DEIR by reference to include Mitigation Measure AQ-3.

"Implementation of Measures AQ-1, AQ-2 and AQ-~~2~~3 would reduce construction-and operational emissions further, as required by SCAQMD. However, after mitigation, fugitive dust, as well as NO_x and VOC emissions will remain above the SCAQMD's daily construction and operation emission thresholds. Therefore, construction and operation of the project would have significant unavoidable adverse impact on regional air quality."

It should be noted that Appendix G (Air Quality Analysis) of the DEIR was revised to reflect a new CO hotspots analysis, minor discrepancy in the tables pertaining to the Annual numbers (daily emissions), and typos/errors in the model input (2.46 feet equals 0.75 meters). These revisions were based on comments from the South Coast Air Management District.

SECTION 5.8 – BIOLOGICAL RESOURCES

The following paragraph replaces the second paragraph of mitigation measure B-11 of Section 5.8.5 on page 5-38 of the DEIR by reference to correct spelling.

"In order to pre-mitigate for FRB MDP impacts to the IML, IWMD is already implementing a long-term mitigation plan ~~as~~at the FRB site that includes the excavation and transplantation of bulbs, seed collection, nursery propagation, experimental studies and long term performance monitoring. The first phase of the IML Mitigation Plan was completed in August 2004, when 234 IML bulbs were transplanted to four receptor sites in the northeast corner of the FRB property, outside of the future FRB MDP development limits."

SECTION 5.9 – AESTHETICS

The following discussion replaces the second paragraph in Section 5.9.1.1 on page 5.9-1 of the DEIR by reference to clarify the correct name of the Limestone Canyon & Whiting Ranch Wilderness Park and the location of existing and planned residential uses.

"Land uses in the vicinity of the landfill include plant nurseries, agriculture, park, and existing and planned residential and commercial/industrial uses. Limestone Canyon & Whiting Ranch Wilderness Park ~~Limestone Canyon Regional Park~~ is north and east of landfill property. The closest existing and planned residential uses are in the City of Irvine south, ~~and~~ southwest, and west of the landfill."

The following discussion replaces the third paragraph in Section 5.9.1.1 on page 5.9-1 of the DEIR by reference to clarify the correct name of the Limestone Canyon & Whiting Ranch Wilderness Park.

"From most developed residential, park, and commercial/industrial locations south, southeast, and southwest of the landfill, views of the landfill are blocked by buildings, landscape trees, and/or intervening topography. However, the landfill can be seen from the following locations where topography, vegetation, or structures do not obstruct views: points along I-5, I-405, SR 241, and SR 261; areas in the southwest part of Limestone Canyon & Whiting Ranch Wilderness Park ~~Limestone Canyon Regional Park~~; community parks, existing residential and planned residential, commercial, industrial, and transportation land uses in the City of Irvine; residential and commercial land uses in the City of Lake Forest; areas, including residential uses, in the Cities of Laguna Hills, Laguna Woods, and Aliso Viejo; and areas in Tustin. Visible parts of the landfill, depending on the viewing location, include soil stockpiles, graded and filled areas, the emergency landslide repair area, and the Bee Canyon Access Road. From elevated areas north and northeast of the landfill in the southwest part of Limestone Canyon & Whiting Ranch Wilderness Park ~~Limestone Canyon Regional Park~~ the existing landfilling operations are visible including refuse deposition, application of daily cover, waste hauling vehicles, and operations equipment including compactors, bulldozers, and earthmovers."

The following discussion replaces the fourth paragraph in Section 5.9.1.1 on page 5.9-1 of the DEIR by reference to clarify the correct name of the Limestone Canyon & Whiting Ranch Wilderness Park.

"With the exception of Limestone Canyon & Whiting Ranch Wilderness Park ~~Limestone Canyon Regional Park~~ that is on the Santiago Hills, views of the landfill from most land uses to the north, east, and west are obstructed by the topography of the Santiago Hills."

Figure 5.9-1 on page 5.9-2 of the DEIR was revised to reflect the correct name of the Limestone Canyon & Whiting Ranch Wilderness Park and to identify recent annexation of Planning Area 1. Figure 5.9-1 is provided as Attachment A of this clarifications document.

The following discussion is added after the third paragraph in Section 5.9.1.9 on page 5.9-10 of the DEIR by reference to clarify Natural Character Scenic Highways.

"The City of Irvine General Plan, Land Use Element identifies Sand Canyon Avenue, Jeffrey Road, and Culver Drive as Natural Character Scenic Highways with Major Views of the Lomas de Santiago ridgeline."

The following discussion replaces the first paragraph in Section 5.9.3 on page 5.9-11 of the DEIR by reference to clarify City designated scenic highways.

"To determine the visual impacts related to the proposed landfill expansion, sensitive viewers who would have views of the expansion areas of the landfill property were identified. These sensitive viewers include viewers from existing and planned residential and park uses, and viewers from City-designated scenic highways. Four sensitive viewer locations close to the landfill were selected as locations for visual simulations. Visual simulations were developed from each of these locations that represent what the views of the landfill will be when the currently permitted height of 1,100 feet is reached and the views with the proposed expanded height of 1,350 feet. The change in the view between the currently permitted height and the proposed height was evaluated for each location against the thresholds of significance for aesthetics."

The following discussion replaces the paragraph in Section 5.9.4.6 on page 5.9-19 of the DEIR by reference to clarify the correct name of the Limestone Canyon & Whiting Ranch Wilderness Park.

"As described earlier, the landfill is visible from the southwest part of Limestone Canyon & Whiting Ranch Wilderness Park ~~Limestone Canyon Regional Park~~ that is on Loma Ridge at an elevation above the landfill. Views from the park of the landfill also include extensive areas of the surrounding communities and developed land uses in these communities described earlier in this section. The proposed landfill will be below Loma Ridge and will obscure some of the lower elevations of the Santiago Hills, but would not substantially change the views of the surrounding urban area. Therefore, implementation of the proposed landfill expansion would not result in adverse visual impacts from Limestone Canyon & Whiting Ranch Wilderness Park ~~Limestone Canyon Regional Park~~."

The following discussion replaces the second paragraph in Section 5.9.4.8 on page 5.9-19 of the DEIR by reference to clarify impacts to scenic highways.

"There are no state- or County-designated scenic highways in the immediate vicinity of the landfill. Santiago Canyon Road north and east of the landfill is designated by the County of Orange as a scenic viewscape corridor. However, there would be no views of the proposed landfill from this road, as the Santiago Hills including Loma Ridge would block views of the landfill. Therefore, there would be no visual impacts related to the scenic viewscape corridor of Santiago Canyon Road ~~designated scenic highways~~ associated with implementation of the proposed landfill expansion. The City of Irvine General Plan, Land Use Element identifies Sand Canyon Avenue, Jeffrey Road, and Culver Drive as Natural Character Scenic Highways with Major Views of the Lomas de Santiago ridgeline. Therefore, users of these roads would be considered sensitive viewers to visual changes. Views of part of Loma Ridge from points along these roads would be blocked by the proposed landfill expansion. As described previously for visual simulations 1, 2 and 3, impacts to views of Loma Ridge would be considered adverse and significant. There would be no impact related to resources within a state scenic highway because Sand Canyon Avenue, Jeffrey Road, and Culver Drive are City of Irvine designated scenic highways, rather than state designated scenic highways."

The following discussion replaces the first paragraph in Section 5.9.6 on page 5.9-20 of the DEIR by reference to clarify impacts to scenic highways.

"Mitigation measure AS-1 requires that the landfill expansion areas be vegetated with native CSS species occurring in adjacent areas to assist in blending the expanded landfill with surrounding undeveloped hills. With implementation of this measure, the appearance of the expanded landfill will be as shown in the visual simulations on Figure 5.9-4. However, as described earlier for visual simulations 1, 2, and 3, and points along Canyon Avenue, Jeffrey Road, and Culver Drive, which are City-designated scenic highways, the adverse visual impacts of the proposed expansion would be significant even with implementation of mitigation measure AS-1. This is because the proposed landfill expansion would obstruct part of the Santiago Hills and Loma Ridge, which are scenic resources, from view points 1, 2, and 3 and points along the City-designated highways. Also, these views would change from an undeveloped curvilinear ridgeline to that of a large, man-made form that highly contrasts with the adjacent rolling hills."

SECTION 5.10 – CULTURAL AND SCIENTIFIC RESOURCES

The following discussion replaces the first paragraph of Section 5.10 at the top of page 5.10-6 of the DEIR by reference to clarify the source of the information in Section 5.10.

"This section describes the existing cultural and ~~scientific~~ paleontological resources on the project site and in the project area, potential environmental impacts, recommended mitigation measures to help avoid or reduce ~~or avoid~~ impacts to ~~identified~~ cultural and ~~scientific~~ paleontological resources, and the level of significance after mitigation. The analysis in this section was summarized from the Cultural Resource Assessment for the Frank R. Bowerman Landfill Master Development Plan (URS, 2005) and the Paleontological Resource Assessment Report for the Frank R. Bowerman Landfill Master Development Plan (Conkling and Smith,

2006). Because these reports contain sensitive information about the locations of cultural and paleontological resources, these reports are not available for public review. Copies of the technical reports can be reviewed by qualified archaeologists and paleontologists at the FRB Landfill office. ~~This report is included as Appendix J of this EIR.~~"

The following title replaces the section title under Prehistory of the Project Area of Section 5.10.1.1 on page 5.10-1 by reference.

"~~Chronological Overview~~ Overview"

The following paragraph replaces the second paragraph under Section 5.10.1.1 on page 5.10-1 by reference to clarify the source of the cultural setting.

"Several regional cultural chronologies have been developed for the Orange County area (Rogers 1941; Wallace 1955; True 1958, 1966; Meighan 1959; Moriarty 1966). The cultural setting within this report has been adapted from Strudwick (2004b). Early archaeological sites in southern California are associated with the Paleoindian Period (Period I) (Wallace 1955) and date to roughly 10,000 B.P. In the region, this cultural period is referred to as the San Dieguito tradition and is characterized by stemmed projectile points, leaf-shaped knives and crescents (Wallace 1955). The San Dieguito tradition is best documented in areas where sites dating to this period are associated with nomadic hunter-gatherers who focused on large game, shellfish collection and fishing as primary subsistence resources (Wallace 1955). Prior to the Late Period occupation by Shoshonean-speaking peoples, the region was occupied for millennia based on discoveries in the Ballona Creek area of the Los Angeles Basin, the La Brea Tar Pits, and Malaga Cove. Work at the La Brea Tar Pits as well as other sites points to a rather generalized hunting and gathering economy in existence at a very early time."

The following paragraphs replace the fourth and fifth paragraphs on page 5.10-2 of the DEIR by reference to clarify the dates of the Intermediate Period and the Late Period.

"The Intermediate Period dates from roughly ~~1000 B.C. to A.D. 1000~~ ca. 2000 to 1000 B.P. Sites attributed to this time period indicate an increased reliance on coastal resources with continued reliance on hunting and collecting. Around 500 B.P., the region saw another major shift in technological innovation with the introduction of the bow and arrow, which is identified by the appearance of very small projectile points in archaeological assemblages (William Self Associates [WSA] 1999). In addition, the appearance of increased quantities of bone tools, and increased reliance on the mortar and pestle, typify this time period. Ceramics also became widely used during this period, millingstone assemblages are more prevalent, obsidian from the Salton Sea appears with greater frequency, and the dead were cremated rather than buried (Moratto 1984).

"The Late Period, which begins around ca. 1250 to 1000 B.P.~~A.D. 750-1000~~, is characterized by increasing political-economic-social complexity. Villages tend to be larger, with a more varied assemblage, and there appears to be an increase in smaller satellite sites, established to support the main village, and reflecting seasonal use of a particular area. There seems to be more intensive exploitation of localized resources, and social contacts and economic influences appear

accelerated through trade and social interaction. There is an increase in the number of sites in the area which some researchers believe is the result of a population increase."

The following title was added before "Paleoindian Period (Period I)" on page 5.10-2 of the DEIR by reference.

"Cultural Chronology"

The following discussion was inserted after the 1st paragraph under "Paleoindian Period (Period I) on page 5.10-3 of the DEIR by reference to clarify artifacts found in Paleoindian sites.

"Artifacts, faunal remains and features (e.g. hearths, fire pits) associated with Paleoindian Period sites suggest a predominantly hunting culture (Wallace 1955). Radiocarbon data suggest that two sites in the Upper Newport Bay region, ORA-64 and ORA-195, have such components. In addition to ORA-64, other Early Period sites from the San Joaquin Hills area, including ORA-246, ORA-339, and ORA-386, contain quantities of California mussel shell *(Mytilus californianus;* Erlandson 1994:218−221). It is likely that *Mytilus californianus* shells were collected from the open, rocky coast beginning at a very early time in prehistory."

The following discussion replaces the discussion under "Millingstone Period (Period II and III)" on page 5.10-3 of the DEIR by reference to clarify artifacts found in Millingstone Period sites.

"In Southern California, the Millingstone Period, also called the Millingstone Culture, extends to at least 6,000 B.P. and probably as far back to 8,500 B.P. (Warren 1968; Wallace 1955). Hard seed processing became one of the major components of subsistence during this period. Overall, the economy was based on plant collecting, but was supplemented by fishing and hunting. By the late Milling Stone Period, the artifact assemblage, distribution and range of features and faunal remains unearthed at excavated sites indicate relatively permanent settlement at Newport Bay. Subsistence strategies included intensive hunting of small mammals, large mammals, sea mammals, and birds; shellfish collecting; nearshore fishing with bipointed bone pieces known as barbs or gorges (Reinman 1964; Schwartz 2003). At other ~~Evident in~~ near-shore and coastal sites~~locations~~, marine and estuarine resources ~~there also~~ appear~~s~~ to have been ~~in~~frequently exploitat~~ion~~ed ~~of marine and estuarine resources~~ (Wallace 1955).

"The Millingstone Period is typified by large, heavy ground stone milling tools such as deep basin metates and wedge-shaped manos, and large core/cobble choppers and scrapers (Dillon 1990:8). The portable manos and metates that characterize the Millingstone lithic assemblage were undoubtedly used as portable processing equipment for collected plant materials. The reliance on this subsistence strategy and associated tools is further supported by the apparent scarcity of faunal remains at Millingstone sites. The flaked lithic tools generally represent a larger and cruder assemblage than is characteristic in the later periods. Projectile points and apparent hunting-type tools tend to be absent from Millingstone Culture assemblages. The so-called cogged stones, made by a characteristic pecking and grinding process, are shaped much like discoidals (found later in time, but they have grooves or cogs, giving them an appearance similar to gears with teeth, also are present in the Millingstone Horizon assemblages (Eberhart 1961:361-370). Several Milling Stone Period sites have been identified in the Orange County

area. The best known is the Irvine site (ORA-64), dating to about 6000 BC8000 B.P. Drover et al. (1983) suggest that Milling Stone Period sites represent refuse from mobile hunters and gatherers who utilized coastal resources during the winter months and inland resources throughout the remainder of the year.

"~~Millingstone Horizon sites are found from Santa Barbara to Los Angeles County and into San Diego County, in both coastal and inland settings. In the Los Angeles area, the Millingstone Culture is typified by the so-called Topanga Culture, with type sites from the Topanga Canyon area just south of Malibu (Wallace 1955; Leonard 1971). Topanga Culture sites have the typical Millingstone assemblage materials such as core/cobble tools and an abundance of ground stone implements (manos, metates), while projectile points tend to occur less frequently.~~

"~~Meighan indicated that the Topanga Culture sites may date as far back as 8,000 B.C. (1959:289), and excavations at CA-LAN-1, also known as the 'Tank Site', have revealed a multi-phase evolution of the Millingstone Culture probably going back to the aforementioned date (Treganza and Bierman 1958:75). Based on the excavations at the Tank Site, it appears that Phase I ranges from roughly 8,000 and 4,000 B.C., while Phase II ranges roughly between 5,000 B.C. and 2,500 B.C. Excavations at the nearby CA-LAN-2 site indicate that the Millingstone cultural tradition may have prevailed until 1,000 B.C. - much later than previously thought - though it is important to note that pestles and mortars (as opposed to mano/metates) prevail in the assemblage (Johnson 1966).~~"

The following discussion replaces the discussion under "Intermediate Period" on page 5.10-4 of the DEIR by reference to clarify artifacts found in Intermediate Period sites.

"This period has also been called the 'Hunting Period' or 'Middle Horizon.' About 5,000 years ago, people of the Millingstone traditions (which relied heavily on vegetal food sources) began increasing utilization of animal proteins and marine resources. Procurement of plants for caloric intake was not necessarily replaced in kind by game hunting, but rather the local Millingstone dietary regimen began to expand in breadth to incorporate additional resources. Coastal populations began relying more on marine resources, and the remains of estuarine and saltwater shellfish, marine mammals and nearshore and deep-sea fish are much more common in site refuse. Reflecting this emphasis toward increased fishing, circular-shell fishhooks first appear at coastal sites. It is believed that extremely circular hooks fouled less frequently on rocks, since this artifact occurs in prehistoric contexts most abundantly in areas adjacent to rocky coastlines (Strudwick 1986:283–284). ~~In the Los Angeles Basin, a higher percentage of projectile points and smaller chipped stone tools appear. Marine resources such as estuarine and saltwater shellfish, marine mammals, and fish were now abundant in the diets of the local inhabitants.~~

"The use of the mortar and pestle represents an important innovation in seed-processing technology and may indicate a diversification in seed-collecting strategies. Archaeological researchers have had difficulty identifying Intermediate Period sites, since tool categories, even the mortar and pestle, appear in earlier and later periods. As a result, few sites in the area have been placed in this time period. At present, Intermediate Period site components have been identified at ORA-121 (Crownover et al. 1990; Clevenger 1986; Strudwick 1998b), ORA-196/H (Strudwick et al. 1996), ORA-221/222 (Rosenthal and Padon 1986), ORA-226 (Mason et al.

1987), and ORA-269 (Strudwick 2004a). ~~However, as excavations at sites such as the Little Sycamore shellmound in coastal Ventura County (Wallace *et al.* 1956), the CA-LAN-2 site in Topanga (Johnson 1966), and the Gilmore Ranch site in eastern Ventura County (Wallace 1955) indicate, t~~The transition in the archaeological record from the typical Millingstone assemblage to the Intermediate mortar/pestle and hunting tool kit is not well-marked. Specifically, manos and pestles appear in some instances as being contemporaneous, while at other sites, there is an adherence to the traditional Millingstone lifestyle. It is possible that the relative dearth of Intermediate Period sites near Newport Bay may be due to the fact that Newport Bay was not a productive marine shellfish habitat during this time period. Intermediate Period radiocarbon dates from ORA-294 and ORA-366, Locus B, located on the southeast side of Bolsa Bay at Huntington Mesa, support this hypothesis (Strudwick and Sturm 1995).~~At Gilmore Ranch, more refined stemmed projectile points (unlike those in the Millingstone Horizon) are present and yet the types are not necessarily akin to refined points typical of the Late Prehistoric Period.~~"

The following discussion replaces the discussion under "Late Prehistoric Period" on page 5.10-4 of the DEIR by reference to clarify ethnography of Late Prehistoric Period sites.

"Meighan (1954) first characterized the Late Prehistoric Period in Southern California. The period probably began sometime around the ~~B.C./A.D.~~1500 B.P. transition, but probably expanded culturally around ~~500 A.D.~~600 B.P. with the introduction of the bow and arrow. The end of the period is recognized as the end of the 18th Century, when the Spanish mission system was fully implemented. During the Late Prehistoric period, Native Americans associated with the ~~ethnographic~~ Gabrieliño, Luiseño and Juaneño ethnographic groups lived in large villages along the southern California coastline, which included northern San Diego County and lands south of Los Angeles in Orange County. In addition, their lands extended for about 30 miles to the wide valleys leading into the California interior. Neighboring groups to the north, east and south included the Gabrieliño, Serrano, Cahuila, Cupeño, and the Diegueño. ~~Both the Luiseño and Juaneño are included among the groups of so-called Mission Indians. They are considered Mission Indians since the Spanish named them after the Mission San Luis Rey, and the Mission San Juan Capistrano. The Luiseño and Juaneño languages derives from Takic branch of the Uto-Aztecan stock, which suggests that the group may have originated from the southeast, perhaps from the eastern California deserts or the southern Great Basin (Kroeber 1925:578-580). Unfortunately, there is not much archaeological evidence for the Gabrieliño occupation of the Los Angeles Basin, because rapid development within the last century has destroyed much of the archaeological database of the area.~~

"Certain indicators such as diagnostic shell beads and finely worked projectile points help identify the relative age and cultural affiliation of many Late Prehistoric sites in Southern California ~~archaeologically~~ (Bean and King 1974). Among the coastal Luiseño and Juaneño, a maritime tradition ~~at least~~was partially carried over from the Millingstone and Intermediate Period cultures (Harrington 1978). By 1,000 B.P. the Canaliño/Chumash/Gabrielino/ Luiseño/Juaneño maritime traditions were using blue-water vessels in an exploitation strategy partially based on deep-sea fishing and marine mammal hunting. During the Late Period, ~~circa~~ca. 900 to 200 years ago, a highly advanced fishing and hunting strategy developed that included the exploitation of a wider variety of fish and shellfish. These new subsistence strategies, coupled

with the appearance of the bow and arrow, enabled a substantial increase in local populations, the development of permanent settlements, and a 'money' economy based on the shell trade."

The following discussion was inserted at the top of page 5.10-5 of the DEIR by reference to clarify existing conditions.

"Ethnography: The Gabrielino

At European contact, the project area was inhabited by the Shoshonean-speaking peoples. The project area falls within the traditional boundaries of California Indians that were associated with the Mission San Gabriel during the Spanish Period (1769-1821) (Bean and Vane 1979). The name Gabrielino was applied due to their association with Mission San Gabriel which was founded in the Los Angeles Basin in 1771. These Native Americans were known as Gabrielino (Kroeber 1925) and spoke a language that falls within the Cupan group of the Takic subfamily of the Uto-Aztecan language family. This language family is extremely large and includes the Shoshonean groups of the Great Basin. Due to the close geographic proximity of Gabrielino bands living in the area and linguistic similarities, ethnographers suggested that they shared the same ethnic origins (Kroeber 1925; Bean and Smith 1978). The Gabrielino are considered one of the most distinctive tribes in all of California, occupying a large area which was bordered on the west by Topanga and Malibu, the San Fernando Valley, the greater Los Angeles basin, the coastal strip south to Aliso Creek south of San Juan Capistrano. Gabrielino territory extended from the San Bernardino Mountains to the islands of Catalina, San Clemente, and San Nicolas and occupied most of modern day Los Angeles and Orange Counties, which is incredibly fertile land (Bean and Smith 1978).

Very little is known about early Gabrielino social organization because the band was not studied until the 1920s (Kroeber 1925) and had already been influenced by missionaries and settlers. Kroeber's (1925) work indicates that the Gabrielino were a hierarchically ordered society with a chief who oversaw social and political interactions both within the Gabrielino culture and with other groups. The Gabrielino had multiple villages ranging from seasonal satellite villages to larger more permanent villages. Resource exploitation was focused on village-centered territories and ranged from hunting deer, rabbits, birds, and other small game to sea mammals. Fishing for freshwater fish, saltwater mollusks, and crustaceans and gathering acorns and various grass seeds were also important (Bean and Smith 1978). Fishing technology included basket fish traps, nets, bonefish hooks, harpoons, and vegetable poisons, and ocean fishing was conducted from wooden plank canoes lashed and asphalted together (Blackburn 1962-63; Johnson 1962). Gabrielino houses were large, circular thatched and domed structures of tule, fern, or carrizo that were large enough to house several families (Johnson 1962). Smaller ceremonial structures were also present in the villages and were used in a variety of ways. These structures were earth-covered, and different ones were used as sweathouses, meeting places for adult males, menstrual huts, and ceremonial enclosures (*yuva'r*) (Blackburn 1962-63; Heizer 1968). Additional information about the Gabrielino comes from: Boscana (1933), Weinman-Roberts and Stickel (1978)."

The following discussion replaces the discussion under "Ethnography: The Luiseño and Juaneño" on page 5.10-5 of the DEIR by reference to clarify ethnography of the Luiseño and Juaneño.

"At the time of European contact, the project area was also inhabited by the Luiseño and Juaneño~~(Figure 2)~~. The Luiseño and Juaneño territory comprised an area stretching from Aliso Creek to Agua Hedionda Creek and from the Pacific Ocean to the Sierra Santa Ana, in the north, and Polamar, in the south, Mountains. Originally believed to be two distinct sub-linguistic groups, the Luiseño and Juaneño were likely only divided based on their association with Spanish Missions—the Luiseño were nearest the San Luis Rey Mission (southern portion of their territory), while the Juaneño were located ~~nearer~~ closer to the San Juan Capistrano Mission (northern portion of their territory)~~; Bean and Shipek consider the Juaneño part of the Luiseño ethnological and linguistic group (1978:550)~~. ~~In either case, b~~Both groups may have been so similarly related, that modern historians, archaeologists and ethnographers would not be able to distinguish one village or group from another based on their cultural remains. The Juaneño (and Luiseño) spoke a dialect of the Uto-Aztecan language family and were closely related to many of the southern coastal groups, including the Ipai, to the south, and Gabrielino, to the north.

"Ethnographic accounts of the Luiseño from early contact through the 20th century provide a pretty good idea, although likely a bit flawed, of how this culture existed for several hundred years before the arrival of Europeans. Population estimates of pre-European Luiseño and Juaneño village sizes range approximately 4,000 to 5,000 people (Bean and Shipek 1978:557; Kroeber 1925:646) to nearly 10,000 people (Bean and Shipek 1978:557; White 1963:104). Villages were located along streams in narrow valleys and typically sheltered from the harsh climate and in a defensible location. The houses of the Luiseño and Juaneño were conical and partially subterranean, with thatched brush roofs.

"Most ethnographers agree that the single most important food source for these groups was the acorn. ~~Although t~~The acorn is high in protein, but the flour derived from the grinding of the acorn requires a tremendous amount of energy, through flushing repeatedly the acorn-mush with water to remove the tannins. The Luiseño and Juaneño ~~used~~ also exploited a wide variety of ~~foodstuffs~~ other subsistence resources found locally in their environment~~ other than just acorns however~~. Meat was derived from rabbits, deer, antelope, quails, ducks, even small vermin and lizards; small bows with wooden-shafted, stone projectile-tipped arrows were used to hunt game, including rabbits and deer. Meat dishes were often accompanied with yucca, which when cooked is rather starchy, various cacti, sunflower, pine nuts and fruits and berries. Food items were ~~then~~ processed in clay bowls ~~, stored in coiled baskets~~ and possibly ~~processed~~ in steatite bowls originating from the Chumash of the Catalina Islands and stored in coiled baskets."

The following discussion replaces the discussion under "The Colonial Period (1769 to 1821)" on page 5.10-6 of the DEIR by reference to clarify the history of the project area during the colonial period.

"The Spanish arrival on the west coast of North America had one primary purpose: the search for the illusive "Northwest Passage" that would enable European merchants a quick route to markets of the Far East. In 1542, Juan Jimenez Cabrillo landed in California (New Spain), where he first encountered the local native Ipai population. Cabrillo continued sailing north past Santa Catalina Island and San Pedro, near present day Los Angeles, in an attempt to find this northwest passage. Although unsuccessful, the Spanish would return to this region in the 18th century with a two-fold objective: attempt to Christianize the native population and to block ~~the~~ Russian~~s~~ fur-trading

merchants; Russian fur traders~~, who~~ had already expanded their fur-trade monopoly throughout northwestern North America and ~~had already~~ established a foothold in northern California, thus, threatening Spain's colonial enterprise in the New World (Weber ~~1992~~1982:246-247). With the establishment of missions within the Gabrielino territory—Mission San Gabriel (1771); Luiseño territory—Mission San Luis Rey ~~was constructed in~~ (1776) and within Juaneño territory—Mission San Juan Capistrano ~~was constructed in~~ (1796), Spain asserted a strong hold on the region.~~—t~~ The native population was immediately moved, sometimes forcibly, into the missions; however, several Friars at various times attempted to leave the ~~Luiseño~~ native populations in existing villages but the Native Americans couldn't sustain themselves because their movement was restricted (hunting, gathering, etc.). ~~In any case, one~~A result~~ant~~ of contact with Europeans was the introduction of contagions to a population who had no natural self-defense, ultimately decimating a large percentage of the native populations throughout the New World.

"~~By the first decade of the 19th century, Spain's colonial enterprise in North America was waning. Spain ceded the entire Mississippi drainage to the French, who in turn sold it to the newly formed United States. By 1810, Anglo-Americans had established settlements throughout the middle of the continent and were encroaching on the Spanish colony of Mexico. In 1812, the first of a long series of drawn out battles was begun over Texas. In 1819, Spain and the United States opened formal negotiations to arrange delineation of their borders in the Americas. As a component of this treaty, known as the Adams-Onis Treaty, the 42nd parallel was used as a demarcation line between United States territory, to the north, and Spanish territory, to the south. The 42nd parallel remains the northern boundary of present day California.~~ Although Spain was still a powerful and wealthy country, by the end of the first decade of the 19th century, Spain's colonial enterprise in North America was waning. In 1800 Spain had returned holdings west of the Mississippi drainage to the French in exchange for portions of Tuscany, and "a guarantee that France would maintain Louisiana as a buffer between American and Spanish settlements" (Axelrod and Phillips 1992:80). The French in turn sold the roughly ninety thousand square miles of trans-Mississippi territory to President Jefferson in the Louisiana Purchase. Conflicts between Spanish and American settlements followed and by 1810, Anglo-Americans had established settlements throughout the middle of the continent and were encroaching on the Spanish colony of Mexico. In 1812, the first of a long series of drawn out battles was begun over Texas. In 1819, Spain and the United States opened formal negotiations to arrange delineation of their borders in the Americas. As a component of this treaty, known as the Adams-Onis Treaty, the 42nd parallel was used as a demarcation line between United States territory, to the north, and Spanish-Mexican territory, to the south. The 42nd parallel remains the southern boundary of present day California; this boundary excluded the region called Texas from the United States—which in later years would lead to war between the two countries."

"The early 1800s in California was marked by Spanish army officers and veterans receiving grants of land to establish large private grazing areas. In 1801, Manuel Perez Nieto was granted grazing rights to a "place by Santiago" Creek just east of the Santa Ana River. However, his actual holdings apparently ended at the river, and José Antonio Yorba and his father-in-law, Juan Pablo Grijalva, were pasturing cattle on the east bank of the river. In 1809, Yorba petitioned the Governor, requesting that the grant be conveyed to him and his nephew, Juan Pablo Peralta, under the title *Rancho Santiago de Santa Ana*. At the about the time of the U.S.-Mexican

conflict, Hipolito Bouchard, a pirate from Argentina, docked his fleet in the cove, now known as Dana Point Harbor, and released his sailors to pillage the countryside. In the process, San Juan Capistrano, for some unknown reason, was set to the torch."

The following was added to the end of the first paragraph under "Mexican Independence (1821 to 1848)" on page 5.10-6 of the DEIR by reference to clarify the citation used for paragraph.

"(Cleland 1962:xiii)"

The following discussion was added after the paragraph under "Mexican Independence (1821 to 1848)" on page 5.10-7 of the DEIR by reference to further describe the history of the Mexican Independence.

"It was during the period from 1821 to 1848 that large tracts of land termed ranchos were granted by the various Mexican Governors of alta California, to individuals who worked in the service of the Mexican Government. In 1833, 12 years after gaining independence from Spain, the Mexican government's Secularization Act changed missions into civil parishes, and those natives who had inhabited regions adjacent to a Spanish Period mission were to obtain half of all mission possessions, including land. However, in most instances this did not occur, and the Secularization Act resulted in the transfer of large mission tracts to politically prominent individuals.

"In 1840, Mexico confirmed the claims of José Antonio Yorba to Rancho Santiago de Santa Ana. The Secularization Act also forced Yorba's relative, Don Teodocio, who had cattle pastured in the hills east of Rancho Santiago de Santa Ana, to request ownership of the land on which he was grazing. Governor Pio Pico granted this petition in 1846, and Rancho Lomas de Santiago was created (Avina 1932; Cleland 1941:24). The current project area is located within what was once Rancho Lomas de Santiago.

"Another rancho, San Joaquin, included two Spanish Mission Period ranchos within its territory: Rancho Cienega de las Ranas (Swamp of the Frogs) and Rancho Bolsas de San Joaquin. Rancho Cienega de las Ranas was granted to Don José Andrés Sepúlveda in 1837 and extended from Red Hill to the ocean; it included Newport Beach and Laguna Beach, north of Laguna Canyon. Rancho Bolsas de San Joaquin, located on Upper Newport Bay, was granted to Sepúlveda in 1842. The combined property was known as Rancho San Joaquin and included 48,803 acres of land. Although Sepúlveda planted grain and maintained gardens on part of his land, most of the property was devoted to cattle ranching. Cattle ranching was a highly profitable enterprise for several years during the Gold Rush due to the massive influx of immigrants (Cleland 1941:102−108; Liebeck 1990:2, 3)."

The following was added after the paragraph under Early California Period (1848 to 1880) on page 5.10-7 of the DEIR by reference to provide additional historical context to the study area.

"The cattle industry in California reached its greatest prosperity during the first years of the California Period. Mexican Period land grants had created large pastoral estates in California, and a high demand for beef during the Gold Rush led to a cattle boom that lasted from 1849 to

1855. Cattle ranching remained a profitable business until the mid-1850s, when declining prices and a series of disastrous droughts destroyed the cattle barons of Southern California (Cleland 1941:134−135).

"In 1855, however, the demand for California beef began to decline as a result of sheep imports from New Mexico, cattle imports from the Mississippi and Missouri valleys, and the development of stock breeding farms. When the beef market collapsed, the California ranchers were unprepared. Many had borrowed heavily during the boom, mortgaging their land at interest rates as high as ten percent per month. The collapse of the cattle market meant that many of these ranchos were lost through foreclosure, while others were sold to pay debts and taxes (Cleland 1941:108−114).

"During the winter of 1861−1862, a disastrous series of floods struck California. According to rainfall statistics, more than 45 inches of rain fell in parts of California between November 1861 and February 1862 (Brewer 1930:253). It has been estimated that the 1862 flood was the largest in the recorded history of the Santa Ana River. At Agua Mansa, the high water line marked on the front steps of the church was used to estimate a flow rate of 320,000 cubic feet per second, more than three times the estimated high water maximum recorded in 1938 (Sidler 1973:19 in URS 1988:VIII-81). Lesser flooding episodes along the Santa Ana River also occurred in 1867 and 1891.

"This unprecedented deluge was then followed by two years of drought (Cleland 1941:130−131). The drought of the 1860s was a turning point in the economic history of Southern California. The era of the great cattle ranchos ended and many of the landowners who survived the collapse of the cattle industry were forced to sell their property due to the drought. Southern California's economic transition continued through the 1870s. During this period, many of the large landholdings were subdivided, and a diversified agriculture centered on citrus fruits, grapes, and grains appeared. Interest rates declined to a modest ten percent per year, helping spur continued growth and development. However, drought continued to plague ranchers. The years 1870−1871 and 1876 are reported as particularly dry years in Southern California (Cleland 1941:208−218).

"In 1860, Don Teodocio Yorba sold *Rancho Lomas de Santiago* to William Wolfskill. The 47,227-acre property extended from the Santa Ana River south to Rancho Aliso, and from the Santa Ana Mountains west to *Rancho San Joaquin*. Although Wolfskill originally purchased the land to graze cattle, he began converting his ranch to raise sheep following the disastrous drought of the early 1860s. (Liebeck 1990: 9−10).

"After purchasing *Rancho Lomas de Santiago*, Wolfskill acquired an interest in *Rancho Santiago de Santa Ana* through a curious set of circumstances. When Wolfskill decided to build a home for his ranch foreman, Joseph Pleasants, a location was chosen near Santiago Creek. Unfortunately, the building site was located within the boundary of *Rancho Santiago de Santa Ana*, owned by the Yorba family. Rather than abandon construction of the home, Wolfskill purchased an interest in *Rancho Santiago de Santa Ana* from several Yorba heirs. Through this purchase, Wolfskill obtained the right to complete the house and run cattle on Yorba land (Liebeck 1990: 9).

"James Irvine I and the Irvine Ranch

"James Irvine immigrated to New York from Ireland in 1846, and he soon became one of many young men who took part in the 1849 gold rush in California. After California was admitted to the Union (September 9, 1850), James Irvine worked in his uncle's San Francisco produce business, becoming a co-owner in 1854 (Cleland 1952:60). Irvine used the profits from this business to purchase real estate throughout Southern California.

"Following the collapse of the cattle industry during the late 1850s and early 1860s, many landowners turned to sheep ranching. In 1854, California produced 175,000 pounds of wool, but by 1870 the total had grown to 11.4 million pounds. The industry reached its greatest prosperity during the Civil War, when the disruption of the national cotton trade created a huge demand for wool (Cleland 1941:139−141).

"Foremost among the pioneer wool growers in California was Flint, Bixby & Company. The company originally began in 1853 when Llewellyn Bixby and his cousins Thomas and Benjamin Flint drove their first flock of sheep from Illinois to California. In October 1855, they established their headquarters at *Rancho San Justo* in Monterey County (Smith 1931:31−39) and, with James Irvine, began the partnership of Flint, Bixby & Company.

"In 1864, Don José Andrés Sepúlveda sold *Rancho San Joaquin* to Flint, Bixby & Company. Two years later, in 1866, Flint, Bixby & Company also purchased William Wolfskill's *Rancho Lomas de Santiago*, as well as Wolfskill's interest in *Rancho Santiago de Santa Ana*. By 1867, with James Irvine's financial support, the company was grazing 30,000 sheep on the 125,000-acre rancho. In 1876, James Irvine bought out the partnership and became sole owner of *Rancho San Joaquin*. Although the rancho retained the name *Rancho San Joaquin* for a time, it eventually became known as the Irvine Ranch (Liebeck 1990:6−14). Thus, at its greatest extent, the Irvine Ranch included 125,000 acres of land that were once part of three ranchos: *Rancho San Joaquin*, *Rancho Lomas de Santiago*, and *Rancho Santiago de Santa Ana* (Liebeck 1990:2−4).

"The 1880s were a period of change at the Irvine Ranch. In 1882, James Irvine I began subdividing 1,440 acres southeast of Tustin and selling the land in 40-acre parcels. In 1886, James Irvine I died and his brother, George Irvine, took over as ranch manager, a position he retained until 1892. Following the death of James Irvine I, the ranch began the transition from raising sheep to farming.

"When the Santa Fe Railroad was completed in 1884, a new wave of settlers came to Orange County. The Santa Ana-Orange-Tustin Railway opened in 1886, increasing access to the Irvine Ranch. It was during the 1880s that extensive agricultural operations were initiated. In 1888, tenant farming leases were established. At that time, more than 5,000 acres of the Irvine Ranch were leased to farmers raising hay and grain. In 1889, an olive orchard was planted by ranch manager George Whidden (Liebeck 1990:18−20). Between 1890 and 1934, The Irvine Company built homes for the tenant farmers on the land they farmed (Liebeck 1990:14, 16−17, 19).

"In 1892, James Harvey Irvine (James Harvey Irvine, Sr. or James Irvine II), son of James Irvine I, inherited the Irvine Ranch. In 1894, James Irvine II incorporated the Irvine Company and became its sole stockholder (Liebeck 1990:25, 58). Under his direction, the Irvine Ranch continued its transition from sheep ranching to a diversified economy based on cattle ranching, agriculture, and tenant farming. Beans and barley, as well as corn, potatoes, and wheat were grown. By the turn of the century, celery, peanuts, and flax also had become profitable crops. Employment grew as more crops were grown. Soon, sugar beets became important, and vegetables such as tomatoes, lettuce, cabbage, mustard, peas, and rhubarb were harvested by both the Ranch and its tenant farmers (Cleland 1941).

"Another crop grown on the ranch was lima beans; the Irvine Ranch became the world's leading producer of lima beans. In addition to managing his own crop holdings, Irvine insisted that the tenant farmers on the ranch reserve a portion of their farmland for the production of lima beans, according to a share cropper management agreement (Liebeck 1990:55).

"As the Irvine Ranch expanded, so did the need to ensure they had the water resources available. Irvine realized early on that the devastating droughts could threaten the ranch's success. During the Mexican Period, the Santa Ana River provided ample water to the ranchos. However, since that time, the river's flow had depleted. In 1893, Irvine began diverting water from the Santiago Creek through a series of canals and pipelines. In 1910, he began drilling a series of deep water wells on the ranch. A total of 1,200 wells were sunk in the Santa Ana Basin. In addition, he laid down a total of 50,000 feet of concrete pipelines and irrigation ditches (Liebeck 1990:35, 41-42).

"Orange County's modern agricultural foundation was finally established in 1906, when C. E. Utt, Sherman Stevens, and James Irvine II formed the San Joaquin Fruit and Investment Company. They planted 600 acres of walnuts and apricots and 400 acres of oranges and lemons and initiated both irrigation and swamp-draining projects (Liebeck 1990:48). Cooperative marketing became the standard on the Irvine Ranch, selling fruit through the California Fruit Growers Exchange. Irvine formed a variety of associations to market the various crops farmed on the Irvine Ranch. Everything grown on the Irvine Ranch was marketed through cooperatives, with each product being handled by a separate cooperative. By 1916, the orange groves were yielding so much fruit, a 48,000-square-foot packing house and railroad spur were built.

"In 1921, the Irvine Citrus Association was formed to handle lemon sales and distribution. The directors of the Irvine Citrus Association were Ray Lambert, C. E. Utt, James Irvine Jr., George Jeffrey, and W. A. Cook. The same year, The Frances Citrus Association was established. The headquarters were located in Tustin, and many of the prominent orange growers were on the board. Ray Lambert was Vice President. The Association produced three grades of oranges under the brand names "President," "Senator," and "Mark Twain" (Los Angeles Times 1921, 1926).

"By the 1920s, citrus production had become the most profitable crops grown on the Irvine Ranch. Hundreds of acres of lemons and oranges were planted, shifting the primary crop from dry lima bean farming to water-intensive citrus.

"The expanding agricultural industry caused a resurfacing of concerns about the future of water sources. Irvine knew that the groundwater supply was quickly being exhausted. In 1913, Irvine created the Frances Mutual Water Company to further ensure a reliable water supply. Starting in the late 1920s, the Frances Mutual Water Company initiated several important projects to stabilize water supplies. This program of water conservation and incidental flood control through construction of dams and storage reservoirs included Lambert Reservoir near Tomato Springs, which was built in 1929. Named after Ray C. Lambert, The Irvine Company directed the drainage of Bee and Round Canyons in the reservoir (Meadows 1966:77). Santiago Dam (which created Irvine Lake) was completed in 1932. Peters Canyon Dam Number 1, Laguna Dam, and Bonita Dam were all constructed between 1937 and 1938. A second Peters Canyon Dam was constructed in 1940, and two years later the Sand Canyon Dam was built. Syphon Dam was built between 1949 and 1949. Rattlesnake Canyon Dam was built in 1960 (Liebeck 1990:35).

"Urbanization

"James Irvine II died in 1947, before he could observe the post-World War II Orange County housing expansion that transformed the pastoral and agricultural landscape into a suburban and urban scene. Upon his death, ownership of 51 percent of Irvine Company stock was assigned to the James Irvine Foundation (Liebeck 1990:42, 94). Myford Irvine inherited The Irvine Company operations from his father in 1947, and The Irvine Company continued its diverse agricultural operations with a mixture of tenant fruit and vegetable farms and company-controlled cultivation (Cleland 1952:140).

"Agriculture remained the primary land use on the Irvine Ranch until World War II. The United States Navy purchased 2,318 acres located in the middle of Irvine's prized lima bean fields for the construction of the El Toro Marine Base. An additional 1,600 acres in Tustin was purchased for the construction of the Lighter-than-Air Base (Cleland 1941:132, Liebeck 1990:60).

"Myford Irvine died in 1959, and control of the Irvine Company went back to the Foundation. The regents of The Irvine Company continued to move away from agricultural ventures and closer into property development. Pressure for urbanization came from the rapid post-World War II Orange County housing expansion that was occurring in nearby cities. In 1957, The University of California system hired the firm of Pereira & Luckman to find a location for a new campus. Pereira was successful, and in 1960, The Irvine Company gifted 1000 acres to the University and an additional 500 acres were sold (Liebeck 1990:86–87).

"In 1960, The Irvine Company hired William Pereira and Associates to create a master plan for development of the Irvine Ranch. His master plan for the Irvine Ranch became the largest master-planned area in North America, and Pereira was known as the father of this undertaking. The plan was divided into a northern, southern, and central planning area, and it called for planned residential communities and industrial complexes. The Irvine Company continues the trend of development today, as further projects are completed in commercial, housing, and transportation industries (Liebeck 1990:88–89).

"Due to the temperate environment, the development of irrigation systems in Orange County allowed farming to occur on a year-round basis. Agriculture was the predominant land use for

the first half of the 20th Century. Development in Orange County noticeably accelerated during the 1950s as land was converted from agriculture to more lucrative planned residential and commercial uses. In 1948, irrigated agriculture covered 130,000 acres of Orange County land, while only 28,000 acres were devoted to urban use. By 1963, agricultural land had been reduced to 65,000 acres, and urbanized areas burgeoned to over 100,000 acres. Orange County continues to urbanize rapidly, although less land remains available for development.

"Bee Canyon History

"The rise of apiculture (beekeeping) in Orange County during the 1870s was an outgrowth of the economic diversification taking place in southern California during that decade. As early as 1869, Samuel Shrewsbury was raising bees in Villa Park; two years later, in 1871, he moved his operation to Santiago Canyon. During the 1870s and 1880s beekeeping activities spread to Hall, Modjeska, Bell, Trabuco, Silverado, and Black Star canyons (Pleasants 1911;1931). Hicks Canyon, immediately northwest of the project area, was the site of apiculture beginning in the 1880s (Meadows 1966:70).

"These early beekeeping endeavors were confined primarily to the mountains and foothills, a zone known to beekeepers as the "sage belt," to take advantage of the abundance of native plants in that region. These plants yield large quantities of nectar, and honey produced from this nectar is reported to have an especially delicate flavor (Pleasants 1911;1931).

"Beekeepers experienced difficult times from 1876 until 1885, due largely to a lack of efficient transportation. Honey produced in southern California had to be shipped by water to San Francisco (the only market at that time), and prices were low. The situation improved dramatically after 1885 with the expansion of the railroads and the growth of a local market in Los Angeles. In 1911 it was reported that Orange County had 10,000 colonies of bees (Pleasants 1911).

"During the twentieth century the urbanization of southern California, and most particularly Orange County, has led to a decline in beekeeping. In 1982 the number of producing bee colonies in Orange County was 10,000; by 1990 less than half that number were still in production (Los Angeles Times 1991).

"The original purpose of the wooden structure at the mouth of Bee Canyon (CA-ORA-1350H), as well as its date of construction, remain uncertain. The earliest historic account regarding single room ranch structures in Orange County was written in 1869 by Harvey Rice, the father-in-law of James Irvine I. A portion of this account, which describes the small buildings used as sheep stations on Irvine Ranch, is reproduced below.

> "The sheep with which this ranch is stocked, are subdivided in flocks of three thousand to five thousand, and each division placed in charge of a shepherd, who watches over them, by day and by night, like the shepherds of old, but with this difference, perhaps, that he gathers the sheep into a corral or pen at night, and then betakes himself to his eight-by-ten board cabin, next the enclosure, and there cooks, eats and sleeps as best he can, with no other associates than his sheep and faithful dog" [Cleland 1952:70].

"It must be noted that no archival data were found to demonstrate a link between sheep raising on Irvine ranch and ORA-1350H. However, archaeological remains (such as postholes for corrals and pens) might substantiate such a connection.

"Hicks Canyon, immediately north of Bee Canyon, was named for Jim Hickey, a local bee farmer. In the late 1880s Hickey moved his hives from Hickey Canyon, located in the Santa Ana Mountains near Trabuco, to Hicks Canyon (Meadows 1966:70). Prior to this move Hickey apparently worked in partnership with another local beekeeper named Edwin Honey. In 1936 Edwin Honey recalled that "Jim Hickey and he [Edwin Honey] settled in 1877 at the head of Aliso Canyon, where they had eighty stands of bees" (Works Progress Administration 1936). The Daily Evening Blade for July 28, 1903 reported that E.A. Honey owned 200 stands of bees; Hickey's name is not included in the list of beekeepers operating in the county as that time (Daily Evening Blade 1903). It is possible that ORA-1350H was used by local beekeepers during the 1880s, although this cannot be documented from the data presently available. In 1995, Strudwick and others conducted a National Register evaluation of a similar structure found in East Hicks Canyon. As part of that evaluation, William McCawley interviewed Ray Dinnan, who had been the president of the Orange County Gun Club at the time they moved into East Hicks Canyon in the early 1970s. Mr. Dinnan was interviewed by telephone on September 21, 1994 at his home in Reno, Nevada.

"According to Mr. Dinnan, in the early 1970s the shack in East Hicks Canyon was used by two brothers who raised bees in the canyon. Mr. Dinnan was unable to recall the name of the family, but he believes that the brothers had leased the land from the Irvine Company for approximately 30 years. Mr. Dinnan also reported that the shacks may have been used as a cattle station by the Irvine Ranch.

"Among gun club members East Hicks Canyon was called "Bee Canyon" [the actual Bee Canyon, the subject of this study, is located immediately southeast of Hicks Canyon]; according to Mr. Dinnan, an earlier name may have been Rattlesnake Canyon [Rattlesnake Canyon is located immediately north of Hick Canyon on local 7.5 minute topographical maps].

"Mr. Dinnan's information was corroborated by an aerial photograph of East Hicks Canyon dated August 8, 1970 (on file, Orange County Archives). The clearing surrounding the beekeepers' shack is visible, as are five rows of hives. The wooden shack is situated near the southwest edge of the clearing; the hives, arranged in north-south rows, fill the open space northeast of the shack.

"Bill Miller, Deputy Agricultural Commissioner of Orange County, also corroborated Mr. Dinnan's information. Mr. Miller worked as a bee inspector for Orange County from approximately 1969 until 1981, and he remembers the two brothers who raised bees in Hicks Canyon. They lived in Santa Ana, on 4th Street east of Grand Ave; Mr. Miller once met them at their home and drove out to inspect their hives. They were in their 80s at that time. Mr. Miller recalls that the brothers referred to Hicks Canyon as "Bee Canyon." Mr. Miller cannot remember their names. Meadows (1966:26) indicates that Bee Canyon was named for an apiary once located in the canyon.

"Those earlier author's efforts to determine the beekeepers names were unsuccessful. Irvine Company lease records were not available for review, and inquiries directed to local historians and several members of the Orange County Beekeepers Association were also unsuccessful. It is unlikely that further research on ORA-1350H would reveal additional information on the history of the area, or use of the area for apiculture.

"In the mid-1970s, the County of Orange proposed potential landfill locations in Bee and Round Canyons. Since that time, the central project area has operated as a sanitary landfill and the surrounding areas have remained in their natural state. Cattle grazing in this portion of the Irvine Ranch was suspended in 1995."

The following discussion replaces the discussion under Regional Paleontology History in Section 5.10.1.2 on page 5.10-7 of the DEIR by reference to clarify existing conditions pertaining to paleontological resources.

"FRB Landfill is located at the northern end of the Peninsular Range geomorphic province, a 900-mile (1,450 kilometer [km]) long northwest-southeast trending structural block that extends from the tip of Baja California to the Transverse Ranges and includes Los Angeles Basin (Norris and Webb, 1976). The total width of the province is approximately 225 miles (362 km), with a maximum landbound width of 65 miles (105 km) (Sharp, 1976). It contains extensive pre-Cretaceous (> 65 million years ago) igneous and metamorphic rocks covered by limited exposures of post-Cretaceous sedimentary deposits. Within Orange County, these post-Cretaceous sedimentary deposits are believed to be some of the most important Tertiary marine fossil producing areas in the world due to the completeness of the geologic record and general abundance of the fossils (Raschke, 1984). Belyea and Minch (1989) report that the Santa Ana Mountains contain exposures of the most complete section of Late Mesozoic and Cenozoic (approximately 150 million years ago to the present) stratigraphy in the entire Peninsular Ranges.

"Specifically, FRB Landfill is located within Bee Canyon, a tributary of the San Diego Creek Watershed. This area of the foothills of the Santa Ana Mountains is known as Lomas de Santiago. The Lomas de Santiago are a low set of hills located between the Tustin Plain to the west and Santiago Canyon to the east. These hills generally contain older geologic formations from the Cretaceous through the Middle Miocene (75 million to 15 million years).

"Within the active cut areas of the FRB Landfill during the 2001 to 2006 period, Morton and Miller (1981) and Morton and others (1999) describe three geologic formations, the Middle to Late Eocene Santiago Formation, the Late Eocene to Miocene Undifferentiated Sespe/Vaqueros Formation, and the Middle Miocene Topanga Formation. They also recorded two surficial units: Quaternary Landslides and Alluvium. Quaternary Colluvium is known to exist on many of the natural slopes within the landfill. The proposed expansion of the FRB Landfill would potentially impact exposures of the Pleasants Sandstone Member of the Williams Formation (Cretaceous) and the Soquel and/or La Vita Members of the Puente Formation (Miocene). All of these units are described in more detail below.

"Williams Formation, Pleasants Sandstone Member. The Pleasants Sandstone is Late Cretaceous [middle to late Campainian] in age (Popenoe et al., 1960). The Formation consists of pale olive-gray to pale yellow-brown, very fine grained, shaly and silty sandstone; fine- to

medium-grained sandstone; and siltstone. In the central Santa Ana Mountains, it reaches a thickness of 97 meters (320 feet) at the type locality (Popenoe, 1942). Morton (1974) reports that it has a thickness of up to 396 meters (1,300 feet) in a well hole in the southern Santa Ana Mountains. It is common along Santiago Creek near Santiago Reservoir and along Bell Canyon to the east. The Williams Formation is not widely exposed on the western side of the Lomas de Santiago and is exposed in the surface only near the mouth of Bee Canyon within the project area. Faulting in this area has uplifted the isolated portion of the Williams Formation to its current position.

"Schoellhamer et al. (1981) reported 38 localities within the Pleasants Sandstone Member of the Williams Formation that include a diverse genera of invertebrates such as gastropods, bivalves, and cephalopods. Most of these are located in the northern Santa Ana Mountains, as most exposures are there. However, his locality F-44 (UCLA Locality 2415) is located 0.3 mile to the northeast of the project area and includes gastropods (8 genera), bivalves (17 genera), and cephalopods (4 genera). Popenoe (1937 and 1942) has also reported fossil mollusk localities throughout Santa Ana Mountains, and Cooper and Sundberg (1976) and Westec (1982) have reported Nautiloid remains from some localities in the northern Santa Ana Mountains. Recently, during grading for the Eastern Transportation Corridor (SR-241), Lander (2003) reported possibly the first occurrence of the bivalve *Leptosolen* sp. in Orange County and the Williams Formation, possibly the second occurrence in California for the ammonite *Baculites occindentalis*, the first fossil occurrence from the Pacific Coast states, and the second occurrence from the Pacific coast region of a Mesozoic therian (marsupial or mammal).

"The Santiago Formation. The Santiago Formation (Tsa) ranges in age from the Middle to Late Eocene. It contains both marine and nonmarine sediments. Tsa is widely exposed in the northern Santa Ana Mountains from the Santa Ana River to Santiago Creek, with a narrow band exposed along Santiago Creek and an outcrop along the western side of Dove Canyon. A wide exposure also exists from Trabuco Oaks south to the Orange/San Diego County line. Morton et al. (1976) reports thickness for Tsa ranging from 2,700 feet in the northern portion, 300 feet in the central portion, and 1,200 feet in the southern Santa Ana Mountains. Tsa has an unconformable contact with the underlying Silverado Formation and a gradational contact with the overlying Sespe Formation. Fossils of mollusks and foraminifera have been found, mostly in the lower unit of the formation (Yerkes et al. 1965).

"The Undifferentiated Sespe/Vaqueros Formation. The Undifferentiated Sespe/Vaqueros Formation (Tvs) ranges in age from the Latest Eocene to Early Miocene (Conkling and others, 1997). Tvs represents an interfingering of the nonmarine Sespe Formation and marine Vaqueros Formation. Because of their interfingering, Schoellhamer et al. (1981) viewed the Vaqueros and Sespe Formations as contemporaneous units. Tvs units are composed of a varied sequence of interbedded marine and nonmarine siltstones, sandstones, and conglomerates.

"The depositional environment for Tvs is one of a transitional zone between a generally braided/meandering river alluvial plain (the Sespe Formation of Belyea and Minch, 1989) and a shallow sea (Vaqueros Formation of Belyea and Minch, 1989). Tvs is distinguished from the Sespe and Vaqueros Formations in the San Joaquin Hills and in the southern Santa Ana Mountains, beginning approximately two miles south of Modjeska Canyon. The units there range

from 300 to 900 m thick within the Santa Ana Mountains. Within the San Joaquin Hills, Tvs has been measured at over 2,200 ft (Conkling and others 1997). Within the Santa Ana Mountains the Tvs overlies the Santiago Formation and is overlain by the Miocene Topanga Formation (Morton and Miller 1981).

"Paleontological sites within these units are of high significance. In the Tvs in the Santa Ana Mountains, Chester Stock (Schoellhamer et al. 1981) found a locality near Bolero Lookout, three miles to the east, that yielded mammalian bone fragments. These compared with, and are assumed to represent, proebrotheriid camels (Schoellhamer et al. 1981). In 1986–87, RMW Paleo Associates (RMW) discovered a large deposit of terrestrial and marine vertebrates from the FRB Landfill (RMW, pers. comm.). These finds include cetacean (whale), oreodont (early artiodactyl), subhyracodon rhino, proebrotheriid camel, and rodents. In 1991–1993, PEA, Inc. uncovered another large deposit of terrestrial and marine vertebrates from similar sediments at Santiago Canyon Landfill, four miles to the northwest (Lander, 1994). These finds included sharks, rays, bony fish, frogs, snakes, lizards, tortoises, dogs, rabbits, shrews, hedgehogs, squirrels, mice, gophers, camels, oreodonts, deer, rhinoceros, and primitive three-toed horses. Many of these remains indicate an Arikareean Land Mammal Age for these sediments.

"**Topanga Formation.** The Topanga Formation (Tt) is a marine sediment that was deposited in the Middle Miocene. It is identified as Middle Miocene by the presence of the *Turritella ocoyana* fauna of that age. The Formation rests disconformably on the Sespe and Vaqueros Formations and is overlain by the El Modeno Volcanics, the Puente Formation, and the Monterey Formation (Schoellhamer et al. 1981). Thicknesses range from 800 feet in the Puente Hills to 2,500 in the northern Santa Ana Mountains, 500 feet in the southern Santa Ana Mountains (Morton et al. 1976), and 300 feet in the southern San Joaquin Hills (Vedder 1970).

"The basal unit of Tt within the Northern Santa Ana Mountains is described as a conglomerate. This unit ranges from tan to gray and ranges in thickness from two to more than nine meters. The conglomerate is erosion-resistant and well-cemented. Within this unit marine mollusks, including large pectinids (scallops) and oysters, are common (Schoellhamer et al. 1981). Marine mammals are well documented from this Formation. Included within the fossil vertebrates collected near this area are a desmostylid (Raschke 1978), sharks, rays, bony fish, seals, sea lions, walruses, whales, sea cows, rodents, and birds. All vertebrates from these sediments represent significant and important fossil resources. The invertebrates that may be found are also assumed to be of high paleontological significance. In 1991, during paleontological monitoring of a construction site in the Northern Santa Ana Mountains, John Minch and Associates encountered a rare "Bone Bed" within the Tt (Pers. comm.). Fossils collected included a large number of well-preserved marine mammals such as cetaceans and pinnipeds. Also collected were shark teeth and bat ray tooth plates.

"**Puente Formation.** The late Miocene, Marine, Puente Formation is divided into four members: the La Vida Member, predominantly siltstones; the Soquel Member, predominantly sandstones; the Yorba Member, predominantly siltstones; and the Sycamore Canyon Member, predominantly sandstones.

"The Puente Formation ranges in thickness from 575 in the central Santa Ana Mountains, near El Toro, to over 4100 meters in the Puente Hills (Yerkes et al., 1965 Schoellhamer et al., 1981). It is exposed in the Santa Ana Mountains and the Puente Hills and was deposited in a deep water basin. The Puente Formation was named by Eldridge and Arnold (1907) from exposures in the Puente Hills. Davies and Woodford (1949) divided the Puente Formation into four members, only one of which was named. The La Vida Member was named by Schoellhamer and others in 1954. The siltstone units of the Puente Formation generally produce more fossils than the sandstone units, with the Yorba member producing the most fossils of the four.

"*La Vida Member.* The La Vida Member is early to late Miocene (lower Mohnian) in age and marine in origin. The La Vida Member has a maximum thickness of 3,000 feet in the Puente Hills and 600 feet on Burruel Ridge in the Santa Ana Mountains. South of Burruel Ridge the thickness is 500 feet. It has an angular unconformity with the underlying Topanga Formation and a conformable contact with the overlying Soquel Member in the Puente Hills and on Burruel Ridge. South of Burruel Ridge there is a local unconformity between the La Vida and Soquel Members. It is exposed in the Puente Hills and in the Santa Ana Mountains from Burruel Ridge south to the arbitrary boundary between the Puente Formation and the Monterey Formation drawn by Vedder et al. (1957). (East of the Cristianitos Fault, the boundary is Oso Creek; west of the Cristianitos Fault, it is an approximate east/west line from near Lambert Reservoir to the Cristianitos Fault.) It correlates to part of the Monterey Formation and possibly the Modelo Formation of Los Angeles County.

"The La Vida Member of the Puente Formation rests unconformably on the various underlying sediments. In some areas surrounding the study site, the La Vida overlies the Topanga and the undifferentiated Sespe and Vaqueros Formations. Where the La Vida overlies the Oligocene Sediments, the Topanga Formation is completely missing. Lithologically the La Vida Member is quite distinct from the underlying units. The La Vida Member has been known to produce significant paleontological records; fossils recovered include lower Mohnian foraminifera, other micro-fossils and mass mortality bony fish beds (Schoellhammer et al., 1981; Sundberg, 1984 and 1991), scallops, and vascular plants. Described as deep marine (bathyal) (Smith, 1960), it is characterized by platy, commonly diatomaceous, siltstone and interbedded sandstone; diabasic intrusive rocks occur locally at the base (Sundberg, 1991).

"*Soquel Member.* Generally, the Soquel member of the Puente Formation is derived from a deep marine (bathyal) environment. In the southern outcrop area, the Member is white to pale yellow orange, medium to coarse grained sandstone with occasional/interbeds of conglomerate, siltstone, and diatomaceous shale. Sandstones are massively bedded, while the minor interbeds of siltstone are thinly bedded and the shale platy.

"Fife (1974) reports that the thickness in the southern outcrop area reaches a maximum of only 700 feet. It generally has a conformable contact with the underlying La Vida Member. However, locally it has an unconformable contact with the La Vida member, Topanga and undifferentiated Sespe/Vaqueros Formations. The Soquel Member has been correlated to the Oso Member of the Capistrano. Fossils of red and brown algae, terrestrial vascular plants, invertebrates (bivalves and gastropods, bryozoans, echinoderms, barnacles and shrimp), and fish, as well as microfossils, have been found (Sundberg, 1991).

"**Quaternary Landslides (Qls).** These Landslides formed during the last two million years as canyon cutting and aqueous erosion caused slope failure. They consist of blocks and flows of the underlying sediments. There is a potential for fossils within these sediments; the fossils may be derived from the older sediments that have slid, or may represent organisms caught within the slide material as it moved.

"**Alluvium.** Quaternary Alluvium (Qal). This is a geologically recent deposit of gravel, sand, silt, or mud that is usually found on the bottom of canyons. These deposits are generally loosely consolidated and were deposited by flowing water. They are chiefly composed of detritus of the nearby or underlying bedrock formations.

"**Colluvium**. Colluvium (Qcol) is a geologically recent deposit of gravel, sand, silt, or mud that is usually found on the sides or at the base of slopes or cliffs. These deposits are generally loosely consolidated and were primarily deposited by gravity. Therefore, the sediments in Qcol generally did not travel far from their source and are chiefly composed of detritus of the nearby or underlying bedrock formations.

"Fossils are known in similar Qal and Qcol deposits from excavations for roads, housing developments, and quarries in the Los Angeles Basin (Miller 1971; Conkling 1988). Remains of Rancholabrean type animals such as elephants, horses, bison, camels, saber tooth cats, deer, and sloths are known from these activities. The potential exists to encounter similar fossils during ground-disturbing activities whenever these sediments are encountered.

"~~The proposed project is located on several different rock units ranging in age from the late Cretaceous (89-65 million years ago (mya)) through the Holocene (past 10,000 years). Each of these rock units have surface exposures in the project area. Fossils generally are recovered from rock formations that originated as either marine sediments (sands and silts) or terrestrial sediments (sands, silts and alluvium) that have not undergone significant deformation from volcanism or metamorphic processes. In Orange County, land emergence began during the late Mezosoic Era (the Cretaceous Period) and the county was covered by a warm shallow sea (http://www.ivc.edu/geology/ocgeo.aspx). This was the final period of the "Age of Reptiles."~~

"~~Formations located in the project area that have the potential to contain fossils and trace fossils include (from oldest to youngest) the: (1) Williams Formation, (2) Sespe Formation, (3) Vaqueros Formation, and (4) Puente Formation (including the Soquel and La Vida Members), and the Topanga Formation. Each of these formations and the types of fossils they contain is discussed in greater detail below. In addition to the aforementioned formations, Holocene fan deposits and recent landslide deposits are also present. Landslides from older geologic units may contain significant fossils and trace fossils even though these materials have been displaced from their original setting. Of all the units identified in the project area, the Holocene fan deposits are the only ones that have a low potential to contain significant nonrenewable paleontologic resources. These sediments are assigned a low paleontologic sensitivity. In contrast, the Williams Formation, the Sespe Formation, the Vaqueros Formation, the Puente Formation, and the Topanga Formation all have high potential to yield significant paleontologic resources, and so are assigned high paleontologic sensitivity.~~

"~~The Williams Formation (later Cretaceous Period: Senonian: 89-65 mya)~~

"~~The Williams Formation is divided into the Pleasants Silty Sandstone and the Schulz Ranch Sandstone Members (http://www.ivc.edu/geology/ocgeo.aspx). The Pleasants Sandstone Member is the only member mapped as being present within the project area (Morton 2004). This member consists of marine sandstones and locally has produced abundant fossil mollusks, and reflects pronounced shallowing of the Cretaceous sea. Fossiliferous concretions are common in the Pleasants Sandstone Member, and fossil remains of terrestrial vertebrates including hadrosaurian dinosaurs (Hilton 2003) have also been recovered. The Pleasants Sandstone Member of the Williams Formation is assigned high paleontologic sensitivity.~~

"~~The Sespe and Vaqueros Formations (late Eocene to early Miocene Epochs)~~

"~~In Orange County, the Sespe and Vaqueros Formations are interbedded and are almost impossible to separate. At locations where these deposits can be differentiated, the Sespe Formation is a red-colored continental deposit and the Vaqueros Formation is a buff-colored marine deposit. The formations represent a period of transition from a nonmarine to a marine depositional environment. These interbedded sediments appear to have accumulated along the shore of a fluctuating sea basin or deposition occurred in desert bays, "alternating with shallow sea incursions" (http://www.ivc.edu/geology/ocgeo.aspx).~~

"~~In Orange County, the Sespe Formation consists of massive- to thick-bedded, nonmarine conglomeratic sandstone and clayey and silty sandstone (Morton 2004). The sediments of the Sespe Formation were deposited millions of years before the inception of the San Andreas Fault in what today would be Baja California. The Sespe Formation contains a diverse and very significant vertebrate fossil assemblage of great importance to the understanding of the evolution of mammals in the early Tertiary Eocene and Oligocene times. The marine Vaqueros Formation has yielded shallow water marine megafossils (Morton 2004). Both of these formations are therefore assigned high paleontologic sensitivity.~~

"~~The Puente Formation (Miocene Epoch)~~

"~~The marine Puente Formation was originally divided into three members (English 1926): a lower shale, a middle sandstone, and an upper sequence of siltstone, sandstone and conglomerate. Nearly thirty years later, the overlying Sycamore Canyon conglomerate was identified as being a part of the formation (Schoellhamer et al. 1954). In ascending order, the four members include the: La Vida, Soquel, Yorba, and Sycamore Canyon. Of these, the La Vida and Soquel members have been mapped within the boundaries of the project area (Morton 2004). All the members of the Puente Formation are highly fossiliferous, and several varied assemblages of marine and terrestrial invertebrates, vertebrates, and plants have been observed and recovered. This formation is assigned high paleontologic sensitivity.~~

"~~The Topanga Formation (middle Miocene Epoch ca. 18 to 16 mya)~~

"~~The Topanga Formation is a sandstone unit which was deposited during the Early-Middle Miocene in a shallow, warm sea. It contains abundant marine fossils ranging from sharks' teeth~~

~~to sea shells and microfossils (http://www.ivc.edu/geology/ocgeo.aspx). Exposures of the Topanga Formation in Orange County are highly fossiliferous. Marine vertebrates found in the unit include pinnipeds, whales, dolphins and sea cows. Microplankton, clams, snails, bony fish, sharks, sea turtles and birds have also been collected. The Topanga Formation has a high paleontologic sensitivity throughout its extent.~~"

The following discussion replaces the discussion under Section 5.10.2 on page 5.10-9 of the DEIR by reference to clarify project thresholds of significance.

"~~The County has not established CEQA significance thresholds for cultural resources. Therefore, the CEQA Guidelines~~ Appendix G of CEQA (CCR Title 14, Chapter 3, §15000-15387) provides an environmental checklist that lead agencies can use to access the potential of a project to impact elements of the environment. This Appendix provides four thresholds of significance related to cultural and paleontological resources. ~~is used to identify potentially significant impacts on such cultural resources. For purposes of this analysis, an i~~Impacts of the proposed project would be ~~MDP is~~ considered significant if the project would:

- "Cause a substantial adverse change in the significance of a historical or archaeological resource as defined in §15064.5. ~~of the CEQA Guidelines.~~

- "Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5.

- "Directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

- "Disturb any human remains, including those interred outside of formal cemeteries.

"Eisentraut and Cooper (2002) provide an extensive discussion of the threshold of significance and suitable mitigation for impacts to Orange County cultural and paleontological resources. Recommendations for standard mitigations for these resources are found in the County Standard Conditions of Approval (§§A01-A07).~~For potential impacts to historical resources to be considered significant, the resources in question must be listed in or determined to be eligible for listing in the California Register of Historical Resources (CRHR), be included in a local register of historical resources, or be determined by the lead agency to be historical resources. The term historical resource may also apply to archaeological sites. However, for an archaeological site that does not meet the criteria of historical resources, a determination must be made as to whether it qualifies as a unique archaeological resource.~~"

The following discussion replaces the paragraphs after the first paragraph in Section 5.10.3.1 on page 5.10-10 of the DEIR by reference to clarify project methodology.

"The SCCIC records indicated that nine previous cultural resource surveys have been conducted for areas within the project boundaries. Key among them are the studies of Desautel (1978) and Bissel (1993) who conducted a complete survey of the landfill area. ~~within the Area of Potential Effect (APE).~~ In addition, fourteen previous cultural resource surveys have been conducted

within the half-mile search radius. One known historic and six prehistoric archaeological resources have been recorded within the ~~APE~~project boundary, while twelve known archaeological resources have been recorded within the half-mile radius of the project site.

"URS also reviewed the State of California Department of Parks and Recreation (DPR) 523A forms for previously recorded sites. Pertinent data from the forms were tabulated in the literature review prepared for the study. Locations of previous surveys and known cultural resources are plotted on the El Toro 7.5' USGS Quadrangle of the project study area and copies of the maps will be presented in an appendix to the technical report.

"Historic maps of the study area were reviewed to determine whether historic structures and roads were present in the project area, which may now be represented by archaeological remains. Additionally, relevant archaeological and historical literature was reviewed to develop a context for interpreting cultural resources encountered by the project. ~~The Survey Report is Confidential and will not be available for public review.~~

"A cultural resource reconnaissance survey was performed within the project ~~APE~~ boundary by URS staff archaeologist Dustin Kay on 22 September 2005. Information obtained from the literature review was used to identify areas within the project site that will require an intensive field survey. ~~Lands that will require survey will include areas within the APE that have never been surveyed or areas that have not been surveyed within five (5) years of the undertaking. Previously surveyed areas must be resurveyed after 5 years because they are subject to erosion which can expose cultural resources not formerly identified.~~ The archaeological survey was performed in conformance with the Secretary of Interior's Standards and Guidelines [36 CFR § 61.1 Sections 101(f), (g), and (h), and Section 110], by an archaeologist who met the Secretary of Interior's Professional Qualification Standards for Archaeology [36 CFR § 61]. Archaeological sites and isolates identified within the project area would be documented on DPR 523A and isolate forms, as appropriate, and their location would be plotted using a hand held GPS instrument accurate to within approximately 15 feet or 3 meters.

"5.10.3.2 Paleontology

"Locality searches have been conducted for the project area through the records of the Orange County Paleontological Localities files (maintained originally by the Natural History Foundation of Orange County and now by the volunteer Paleontology Curator of the Orange County Warehouse), Los Angeles County Museum of Natural History, and The Division of Geological Sciences of the San Bernardino County Museum. Numerous important paleontological localities have been identified within the project area and in the immediate vicinity. LSA Associates, Inc., who have provided cultural and paleontological resource monitoring for the landfill since 1997 has recorded about 15 localities within the landfill. RMW Paleo Associates, who monitored landfill operations prior to 1987, recorded about 40 localities, primarily from within the Sespe/Vaqueros Fms. and the Pleistocene Alluvium in canyon clean-outs. Schoellhamer et al. (1981) record 12 localities in their geological description of the area. Lander (2003) collected what he described as the "first dinosaur from the Williams Formation" in excavations of these sediments for the construction of SR-241 where it passes under the Bee Canyon haul road. Lander also described invertebrates from these excavations.

"Please note that the paleontological study conducted for this work serves only as documentation of the paleontological findings for the project area and in no way represents a geological assessment.

"~~The Cultural Resources Assessment addresses cultural resources within the project's APE, including archaeological sites, buildings, structures, or objects that are listed in or eligible for inclusion in the CRHR or National Register of Historic Places (NRHP). The report provides detailed information on the types of cultural resources located in the project area (previously recorded and newly recorded) and shows the locations of these resources.~~

"The cultural resources studies for the proposed Master Development Plan (MDP) for the Frank R. Bowerman Landfill were conducted by URS in compliance with the guidelines and regulations set forth by, and procedures within Section 106 of the National Historic Preservation Act as promulgated in 36 CFR Part 800, and in compliance with Appendix C of 33 CFR Part 325, the U.S. Army Corps of Engineers regulations implementing Section 106. Further, the cultural resource work conducted for this project was designed to meet or exceed the requirements of California Public Resources Code §21083.2 (Archaeological Resources), §21084.1 (Historical Resources); and Title 14, Chapter 2 of the California Code of Regulations §15064.5 (Determining the Significance of Impacts on Historical and Unique Archaeological Resources), and §15126.4(b) (Mitigation Measures Related to Impacts on Historical Resources). The County of Orange also has Board Resolutions directing the inventory, evaluation and treatment of cultural and paleontological resources (BOS 77-866 and 87-516). County Standard Conditions of Approval for these resources are provided in §A01-A07. This work was conducted under the direction of Deborah K.B. McLean, RPA (Orange County Certified Archaeologist) and Steven W. Conkling (Orange County Certified Paleontologist).

"The identification surveys conducted for this project, and previously conducted for the FRB Landfill fulfill the requirements of SCA A01 (Cultural Resource Survey) and A05 (Paleontological Resource Survey).

"It is anticipated that a Section 404 Permit of the Clean Water Act may be required for some operations anticipated by the MDP. Work to date has been designed to comply with the requirements of Section 106, but it is possible that the Corps may require additional measures to further ensure impacts to cultural resources are avoided or minimized. IWMD and their consultant will consult with the Corps on these additional studies as the 404 Permit process is initiated~~, and its implementing regulations, set forth at 36 Code of Regulations (CFR) Section (§) 800, and regulations implementing the National Environmental Policy Act (NEPA), set forth at 18 CFR § 380.12(f)(1)(i) and (2). Native American burials and burial goods, should they be encountered, will be dealt with in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA) as amended in 43 CFR § 10 (1999)~~.

"~~State Historic Preservation Office (SHPO) Consultation~~

"~~As a first step in the process, URS consulted with the Integrated Waste Management Department (IWMD) and the State Historic Preservation Office (SHPO) to determine the level of information the SHPO would like to receive regarding cultural resources during the course of the project. It is~~

~~anticipated that the SHPO will request the opportunity to review survey reports and monitoring and treatment plans to ensure that the proposed recommendations and methods are consistent with current SHPO requirements. SHPO may also request information pertaining to the results of Native American consultation.~~

"~~5.10.3.2 Paleontology~~

"~~The Division of Geological Sciences of the San Bernardino County Museum (SBCM) completed a literature review and records search for the FRB Landfill near El Toro in Orange County, California. The study area is located in and around Bee Canyon near Loma Ridge, as seen on the El Toro, California 7.5' United States Geological Survey topographic quadrangle map (1968 edition). The search identified the following paleontologically sensitive formations within the Project area: Williams Formation; the continental Sespe Formation; the marine Vaqueros Formation; the marine Puente Formation, including the Soquel and the La Vida Members; and the marine Topanga Formation. Holocene fan deposits are also present but these are not paleontologically sensitive. The search of SBMC records did not identify any previously-known paleontologic resource localities within the boundaries of the proposed project property, nor from within at least one mile in any direction.~~

"~~URS conducted a search of the Regional Paleontologic Locality Inventory (RPLI) at the SBCM. The results of this search indicate that no previously-known paleontologic resource localities are recorded by the SBCM from within the boundaries of the proposed project property, nor within at least one mile in any direction.~~

"~~In October 2005, a literature review and records search of paleontological resources located within the Project area was performed by the Division of Geological Sciences, San Bernardino County Museum (SBCM) (Appendix C). The search identified the following paleontologically sensitive formations within the Project area: Williams Formation; the continental Sespe Formation; the marine Vaqueros Formation; the marine Puente Formation, including the Soquel and the La Vida Members; and the marine Topanga Formation. Holocene fan deposits are also present but these are not paleontologically sensitive. The search of SBMC records did not identify any previously-known paleontologic resource localities within the boundaries of the proposed project property, nor within at least one mile in any direction.~~"

The following discussion replaces the paragraphs of Section 5.10.4.1 on page 5.10-14 of the DEIR by reference to clarify impacts to cultural and paleontological resources.

"~~Archaeological Survey~~

"The majority of the project study area is occupied by the continuing operations of the FRB Sanitary Landfill. Several previous archaeological studies have been conducted for the landfill and other developments in the region. ~~APE has previously been or is currently impacted by landfill construction activities.~~ A new reconnaissance survey of areas located southwest of the existing landfill that are designated for expansion of the landfill ~~previously unsurveyed or areas surveyed more than five years ago~~ was conducted by a URS archaeologist in 2005. Dense vegetation ~~added to extreme ground coverage making for poor~~ limited visibility ~~(~~to 0 – 5%~~)~~,

limiting the ability of the survey to identify cultural resources; no new cultural resources were identified during the survey. Although visibility was poor, ~~As stated in the Cultural Resources Assessment, due to poor ground surface visibility, the potential for identifying cultural resources was limited. In addition, large portions of the survey area are on ridge lines or in canyons of excessive slope (greater than 30 degrees). T~~the potential for ~~additional~~ previously unidentified cultural resources to be located~~is high due to the content of previously identified resources. There were no additional archaeological resources identified on the FRB Landfill site~~ within the study area is limited; the area has been extensively surveyed and monitored for cultural resources for on-going landfill operations and no new resources have been identified by any of these studies. The landfill was surveyed in 1978 and in 1993 (Desautel, 1978 and Bissel, 1993). Since opening, landfill operations that could impact cultural resources have been monitored by a qualified archaeologist.

"Seven known archaeological sites have been identified within the FRB lands, or immediately adjacent to the FRB project area. Two of these (CA-ORA-1349 and CA-ORA-1350H) are located within an area designated as a preserved space for biological mitigation, adjacent to the SW expansion proposed by the MDP. These sites were revisited by the URS Archaeologist and will not be impacted by this project because they are located in biological mitigation lands. The remaining five sites ~~As noted in the Cultural Resources Assessment, an attempt to relocate the previously recorded cultural resources was conducted. Only two previously recorded cultural resources of the seven known resources previously documented were relocated within the project APE. The additional five cultural resources~~ (CA-ORA-520, 521, 717, 718 and 1326) were treated during landfill operations as they were impacted, or as landslides adjacent to the landfill encroached on the site area. Brief descriptions of the known cultural resources and their current status~~were plotted incorrectly, destroyed by previous construction activities or destroyed by erosion conditions. The two relocated cultural resource sites consist of a prehistoric site (CA-ORA-1349) and a historic site (CA-ORA-1350H). Descriptions of the cultural resources~~ are provided below.

"Prehistoric Cultural Resources

"CA-ORA-520

"Site CA-ORA-520 ~~This site is~~was recorded as a flake scatter located on a small open terrace. This site was tested by Desautel in 1978 and determined to be not significant. ~~up slope from Bee Canyon Road, outside of the entrance gate to the landfill. Artifacts consist of waste flakes and possible chalcedony core. No evidence of the site exists.~~ The site area is heavily vegetated and is crossed by ~~consists of~~ concrete terraced drainage channels; no evidence of the site remains. ~~The site could not be relocated.~~

"CA-ORA-521

"CA-ORA-521 is a~~This site is a~~ milling station that was originally described as being comprised of four bedrock mortars an artifact scatter and faunal remains. Desautel (1978:29) was able to identify three of bedrock mortars when he conducted a test of the site in 1978. The site was radiocarbon dated at 1010±80 A.D. SRS excavated 24 1x1m units in the site. The artifact

assemblage from the site was diverse and included bone tools and utilized fossils. ~~The site consists of four identified and 10-15 possible bedrock mortars within a large sandstone outcrop and a flake scatter surrounding the outcrop.~~ Oral history states a burial was identified at the site, but Desautel states this discovery was identified as a deer metapoidial (Desautel, 1978:27).~~In addition, a possible burial was identified but bone was identified as human. Within the "burial", associated artifacts were found, consisting of a cardium shell bowl, ovate chert knife and lithic debitage.~~

"Desautel indicated ORA-521 was significant. In 2000, a large landslide began moving and threatened ORA-521. Strudwick and others (2000) excavated five additional 1x1m units within ORA-521. No bedrock mortars were observed during this research. During the survey conducted for the present project, s~~S~~everal sandstone bedrock outcrops were identified ~~with~~ in the area of the site. However, ~~N~~none of these ~~contained~~ exhibited mortars; no surface features or~~. In addition, no~~ artifacts were relocated. The area is within a recent ~~erosion slump~~landslide and has been heavily impacted. ~~The site was not relocated.~~

"CA-ORA-717

"CA-ORA-717 is a camp site located on the upland slopes above the main landfill. The site was identified by Desautel (1978:47). He reported a surface lithic scatter of metate fragments (large and small), handstones (whole/frags) and hammerstones. This site was also threatened by landslides in 2000. Strudwick and others (2000) excavated 10 1x1m units and numerous Shovel Test Pits across the site to characterize its contents and recover any significant information potentially contained in the site. The site contained some subsurface components but did not contain intact features or substantial cultural deposits. The site location was subsequently consumed by the landslide.~~This site is a camp site located above a large cliff face to the southwest. The site overlooked a large flat area next to the dirt road to mountain top. The artifacts included a surface lithic scatter of metate fragments (large and small), handstones (whole/frags) and hammerstones. The site was not relocated. When the site was recorded in 1977, the area was designated for refuse disposal. It is assumed the site was destroyed by erosion conditions and construction impacts.~~

"CA-ORA-718

"CA-ORA-718 is ~~This site is~~ a camp site with a surface scatter of ~~associated~~ lithic~~s~~ artifacts including, a large metate and metate fragment, five handstones and two hammerstones. The site was identified as being within the original impact area of the FRB Landfill and impacts to this site were mitigated as part of the environmental documentation conducted for the landfill (Bee Canyon Sanitary Landfill General Development Plan/Addendum to EIR O18 (IP 87-026, June, 1988)~~location of site is currently under concrete and paved access roads. No evidence of the site exists~~.

"CA-ORA-1326

"CA-ORA-1326 was identified by Becker (1997) as ~~This site is~~ a quarry and tool processing site. Bissel (1997) conducted preliminary evaluations of the site for the FRB Landfill. The site was

determined to not be eligible for inclusion on the CRHR and the NRHP in consultation with Corps archaeologist Richard Perry (Conkling 1998). The site was removed by subsequent landfill operations.~~The site was located west of a graded dirt road atop a finger ridge between two large ravines. The artifacts consist of a chert biface and point, denticulate and drill blanks, flakes, cores: felsite, flakes, scraper and a large granitic metate. The site area has been heavily impacted by erosion and grading activities. No evidence of the site exists; therefore, the site was not relocated.~~

"CA-ORA-1349

"CA-ORA-1349~~This site~~ is a sparse lithic scatter of groundstone and chipped lithic artifacts. ~~Artifacts include chert and metavolcanic cores; a metasedimentary hammerstone; chert and metavolcanic flakes; and a Granitic bifacial mano fragment. The site is located at the southern portion of the project APE, within an avocado orchard on the top of a steep sided ridge/hill approximately 320 feet (ft) (100 meters (m)) southeast of Bee Canyon Wash. The site is currently within a fence line and a row of Eucalyptus trees planted on the western bluff overlooking Bee Canyon.~~ The site was relocated by the survey conducted by the current project and is located outside of the proposed MDP for the FRB Landfill~~ boundary and slope stabilization areas~~. T~~herefore t~~he site will not be impacted by the project and no further work is necessary at this time~~justified~~.

"Historic/Historical Architectural~~ Cultural~~ Resources

"CA-ORA-1350H (Bee 2)

"CA-ORA-1350H (Bee 2)~~This site~~ is a historic ~~homestead~~complex~~, consisting~~ of two~~ standing~~ collapsed structures and a small refuse pile of construction debris.~~ Feature 1 is a front gabled single room structure constructed of tongue and groove vertical siding and plain board roof (see photos 6 and 7 in the Cultural Resources Assessment). The foundation of the structure is poured concrete pilings. A set of cabinets with shelves extends from the room to the east and a single shelf is built into the north wall. Another shelf is in the south wall. A single bed frame and springs is also located inside. The structure is in disrepair but still standing. Feature 2 is a shed roof single room structure with a small cellar (photos 8 thru 10). The structure is constructed of tar paper, chicken wire and hand applied stucco over a wood frame. The foundation is poured concrete. The structure is no longer standing. A cellar with an opening was noted below the east wall. Two retaining walls constructed of broken concrete chunks and mortar extend from both sides of the cellar entrance approximately 9 ft. A "Coolerator" brand icebox with the door removed is located within the structure. When the site was originally identified in 1993, a truck bed was also identified. No evidence of the truck bed was found. Dense vegetation made observation of the ground surface difficult.~~ The site is located outside of the proposed MDP for the FRB Landfill~~ boundary~~ and will not be impacted by any landfill activities~~slope stabilization areas~~. Therefore, ~~the site will not be impacted and~~ no further work on this resource is necessary.

"~~Architectural Historical Resources~~

"~~No architecturally historic resources were identified in the literature search or from the reconnaissance survey.~~

"5.10.4.2 Potential Impacts to Cultural and/or Paleontological~~NRHP Eligibility of~~ Resources

"There are no known cultural resources within the project area for the MDP. Further, there is only one cultural resource in proximity to the proposed undertaking (CA-ORA-1350H) that could be indirectly impacted by the project. While the history of the bee keeper/sheep herder cabins on the Irvine Ranch is interesting, these structures have not been found to meet the criteria for listing on either the CRHR or the NRHP (Strudwick, et al. 1995). Therefore, the proposed project will have NO EFFECT on known cultural resources.

"No archaeological resources were identified within the project area for the MDP through the records search or field survey. However, the project site may contain unknown subsurface archaeological resources. Potentially unique archaeological resources in the development areas, if any, could be significantly impacted by project construction. While unlikely, it is also possible that a buried site could contain a human burial.

"The rocks that underlie the project area have been determined by Eisentraut and Cooper (2002) to have a high paleontological sensitivity. Construction activities in these sediments could have an adverse impact on these non-renewable resources if mitigation is not incorporated.

"~~The intensive field survey of the project APE was positive for two previously recorded cultural resources (CA-ORA-1349 and CA-ORA-1350H). Of the two sites, only CA-ORA-1349 has potential for NRHP eligibility status, since no previous testing for size, depth and artifact content of the site have been conducted. No additional cultural resources were noted within the project APE, although dense vegetation added to extreme ground coverage making for poor visibility (0 – 5 %). Due to poor ground surface visibility, the potential for identifying cultural resources was limited. In addition, large portions of the survey area are on ridge lines or in canyons of excessive slope (greater than 30 degrees). The potential for additional cultural resources is high due to the content of previously identified resources within and surrounding the project APE. Although the potential for encountering prehistoric resources is high, potential effects to additional historic properties or historical resources (cultural resources listed, eligible, or potentially eligible for listing on the NRHP) are not anticipated.~~"

The following discussion replaces the first paragraph and the mitigation measures in Section 5.10.5 on page 5.10-14 of the DEIR by reference to clarify compliance with County of Orange Standard Conditions of Approval.

"As previously discussed, there are no known cultural resources within the project area. Therefore, implementation of the proposed project will not impact known cultural resources. However, due to the buried nature of archaeological and paleontological resources, the potential for impacts to unknown resources could occur during ground disturbing activities in these sensitive sediments. The County of Orange, in their Standard Conditions of Approval (SCA), has developed monitoring requirements for cultural (SCA A04) and paleontological (SCA A07)

resources. Further, the IWMD has established internal protocols requiring monitoring by these disciplines whenever ground disturbing activities are conducted in sensitive sediments. The following mitigation measures will ensure any potential impact to cultural and/or paleontological resources are mitigated below a level of significance.

"~~To minimize adverse impacts to cultural, historic, archaeological and paleontological resources the following measures shall be implemented:~~

"CR-1 Prior to the issuance of grading permit(s), and in compliance with County SCA A04, the County will ~~project developer(s) shall~~ retain a qualified cultural resource specialist~~, to the satisfaction of the County of Orange IWMD,~~ to monitor the project's subsurface areas during grubbing and land disturbance from construction activities ~~that previously were not effectively surveyed~~. The cultural resource specialist shall, consistent with County SCA A03, examine, evaluate, and determine the most appropriate disposition of any potential artifact and shall have the authority to temporarily halt work until any identified artifacts can be recovered, handled, and/or surveyed in the appropriate manner.

"CR-2 Prior to issuance of grading permit(s) and prior to excavation in undisturbed geological units ~~to a depth of more than 15 feet below the modern ground surface~~, the County will ~~project developer(s) shall~~ retain a~~n archaeological and~~ paleontological resource specialist~~, to the satisfaction of the County of Orange IWMD,~~ to conduct ~~archaeological and~~ paleontological resource monitoring consistent with County SCA A07."

SECTION 6.0 – CUMULATIVE IMPACTS

The following rows in Table 6-1 on page 6-2 of the DEIR are replaced by reference to clarify that Planning Area 2 has been merged into Planning Area 1.

Name/Location	Jurisdiction	Type of Development	Acres/DU/SF/TSF	Status
PA1~~, PA2~~ and PA 9	City of Irvine			Approved
PA 1 ~~& 2~~		Conservation/Open Space	2,789 Acres	
		Residential	1,388 or 1,369[1] Acres	
		Institutional	45 Acres	
		Commercial	13-32[2]	
PA 9		Residential-Medium	221 Acres	
		Residential-High	60 Acres	
		Multi-Use	60 Acres	

SECTION 9.0 – PROJECT ALTERNATIVES

The following discussion replaces the last paragraph on page 9-2 of the DEIR by reference to clarify language related to the Settlement Agreement.

"Alternative 1a would not have any significant adverse impacts on planned land uses or land use policies within Orange County or within the City of Irvine because there would be no landfill expansion or extended landfill life under Alternative 1a. ~~There would be no need to renegotiate~~

~~the Settlement Agreement between the County and the City of Irvine.~~ However, there would be land use policy impacts with out-of-County landfilling since the excess TPD of MSW would need to be disposed of out of Orange County. Negotiations between the Counties and development of a MOU to increase daily tonnage limits be required, pending tonnage limit surplus capacity at those landfills. Therefore, adverse impacts related to land use policy for out-of-County landfilling are anticipated under the Alternative 1a."

The following discussion replaces the first paragraph on page 9-3 of the DEIR by reference to clarify language related to the MOU.

"Alternative 1b would not have any significant adverse impacts on planned land uses or land use policies within Orange County or within the City of Irvine because there would be no landfill expansion or extended landfill life at the FRB Landfill under Alternative 1b. ~~However, because this Alternative assumes that expansion at Olinda Alpha Landfill would occur, the MOU between the County and the City of Brea would have to be renegotiated.~~ ~~Also,~~ However, there would be land use policy impacts with out-of-County landfilling since the excess TPD of MSW would need to be disposed of out of Orange County. Negotiations between the Counties and development of a MOU to increase daily tonnage limits would be required. Therefore, adverse impacts related to land use policy for out-of-County landfilling are anticipated under the Alternative 1b."

SECTION 11.0 – INVENTORY OF MITIGATION MEASURES

The following discussion replaces mitigation measure T-1 on page 11-3 of the DEIR by reference to clarify the LOS at the intersection of Sand Canyon Avenue at Trabuco Road before and after implementing mitigation measure T-1.

"T-1 Sand Canyon Avenue at Trabuco Road. Extend the Advanced Transportation Management System (ATMS) strategies to encompass the intersection of Sand Canyon Avenue at Trabuco Road. The ATMS strategies at Sand Canyon Avenue at Trabuco Road will be installed in 2025 but will be discontinued at buildout conditions in 2030 based on information provided by the City of Irvine. The ATMS strategies apply the latest traffic control systems to improve traffic flow through the intersections. These traffic control systems include the use of interconnect, closed circuit television and communication system, upgraded traffic signal cabinets, controllers and detection systems, and a changeable message board. The ATMS strategies will only be operational during the A.M. and P.M. peak periods, when the intersection experiences the most traffic. This improvement will result in an A.M. peak hour ICU of 0.882 (LOS D) with mitigation compared to an ICU of 0.932 (LOS E) without mitigation."

The following discussion replaces mitigation measure T-2 on page 11-3 of the DEIR by reference to clarify the LOS at the intersection of Jeffrey Road at Walnut Avenue before and after implementing mitigation measure T-2.

"T-2 Jeffrey Road at Walnut Avenue. Provide the westbound right-turn lane with a protected right-turn phase that is overlapped with the southbound left-turn phase in 2030. This

improvement will result in an A.M. peak hour ICU of 0.830 (LOS D) with mitigation compared to an ICU of 0.982 (LOS E) without mitigation."

The following mitigation measure was inserted into Section 11.6 after Mitigation Measure AQ-2 on page 11-5 by reference to address NOx and PM10 emissions.

"AQ-3 Implementation of the following measures will help reduce NO_x and PM_{10} emissions during operational activities:

- The IWMD shall purchase four, single engine, articulating dump trucks in fiscal year 2006/2007 to replace four, twin engine scrapers. The trucks will meet United States EPA Tier 3 emissions standards. In addition, IWMD will purchase one excavator.

- The IWMD shall routinely train employees in efficient scheduling and load management to eliminate unnecessary queue and idling of trucks with the landfill.

- Continue to be proactive in notifying truck drivers of the designated truck route.

- Make sure signage at the exit of the landfill indicating the turn direction to follow the designated truck route to the freeway is visible to all truck drivers.

- Continue to monitor wind speed and direction through the landfill's on-site weather station."

The following paragraph replaces the second paragraph of mitigation measure B-11 of Section 11.8 on page 11-9 of the DEIR by reference to correct spelling.

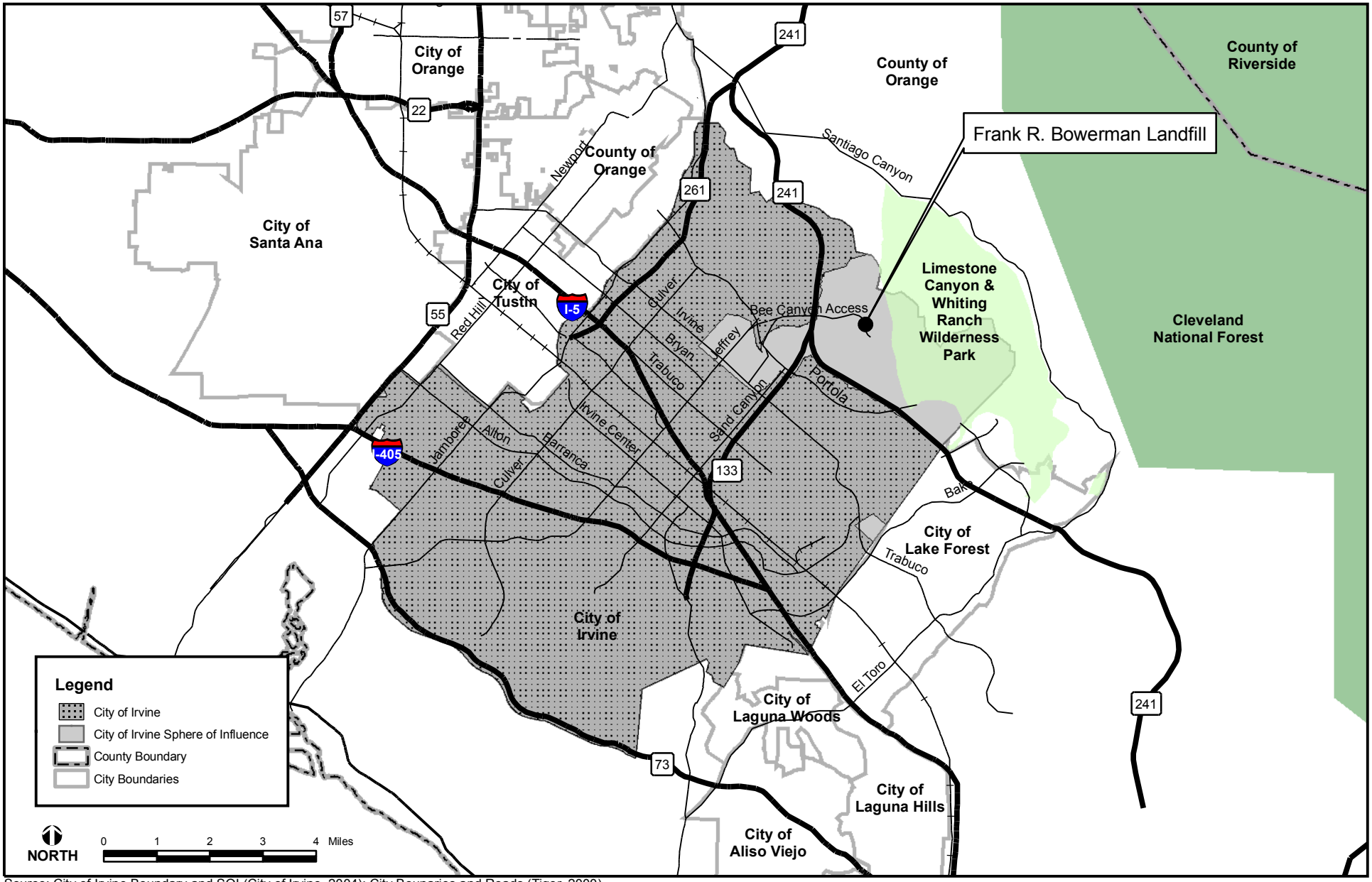
"In order to pre-mitigate for FRB MDP impacts to the IML, IWMD is already implementing a long-term mitigation plan ~~as~~at the FRB site that includes the excavation and transplantation of bulbs, seed collection, nursery propagation, experimental studies and long term performance monitoring. The first phase of the IML Mitigation Plan was completed in August 2004, when 234 IML bulbs were transplanted to four receptor sites in the northeast corner of the FRB property, outside of the future FRB MDP development limits."

The following discussion replaces mitigation measures CR-1 and CR-2 on page 11-10 of the DEIR by reference to include County SCAs.

"CR-1 Prior to the issuance of grading permit(s), and in compliance with County SCA A04, the County will ~~project developer(s) shall~~ retain a qualified cultural resource specialist~~, to the satisfaction of the County of Orange IWMD,~~ to monitor the project's subsurface areas during grubbing and land disturbance from construction activities~~ that previously were not effectively surveyed~~. The cultural resource specialist shall, consistent with County SCA A03, examine, evaluate, and determine the most appropriate disposition of any potential artifact and shall have the authority to temporarily halt work until any identified artifacts can be recovered, handled, and/or surveyed in the appropriate manner.

CR-2 Prior to issuance of grading permit(s) and prior to excavation in undisturbed geological units ~~to a depth of more than 15 feet below the modern ground surface~~, the County will ~~project developer(s) shall~~ retain a~~n archaeological and~~ paleontological resource specialist~~, to the satisfaction of the County of Orange IWMD,~~ to conduct ~~archaeological and~~ paleontological resource monitoring consistent with County SCA A07."

ATTACHMENT A



Source: City of Irvine Boundary and SOI (City of Irvine, 2004); City Bounaries and Roads (Tiger, 2000).

Figure 5.9-1
Landfill and Surrounding Area