Views from the South. Views across the Lake from the south shore and the Lake itself to the north shore consist primarily of mountainsides covered in dense forest vegetation, with small areas of sporadic developed areas, such as the Community of Fawnskin. As shown in Exhibit 5.4-3, *Plan View*, the majority of the existing Jeffrey pine trees located between the high-water line of the Lake and immediately adjacent to or on the southern boundary of the project would remain. The lakefront residences, and residences to the north, would be partially screened by the existing trees when viewed from the south. The potential size and massing of residential buildings and change in visual character of the lake from the proposed marina facility (marina facility discussed in "views from west") would constitute a significant and unavoidable impact for views across the lake, from the south shore, and the lake itself to the north.

Views from the North. Views in this subsection are considered for those residents located along Flicker Road to the north of the project site. Exhibit 5.4-7, *View 2 – View South from Flicker Road*, is a simulated view looking south across the project site. The view simulation shows the project site at full build-out. Flicker Road is located at a higher elevation than the project site, as the mountainside slopes considerably from Flicker Road to the lakefront. The simulated view indicates a substantial change to the visual character and views, as compared to the existing view. It should be noted that the simulation utilized large, two-story homes to present a worst-case scenario to determine obstruction of views. The construction of new residences to the south of Flicker Road would partially obstruct views from existing Flicker Road residences to the lake and distant mountains. Additionally, the relocation of State Route 38 would involve the removal of Jeffrey Pine trees located adjacent to the current roadway alignment and future home sites. The removal of such trees would diminish the forested nature of the site. However, the removal of the trees may also enhance views of the Lake for some residents along Flicker Road. Since the views to the south of the Lake and distant mountain ranges would be altered and viewshed characteristics would be permanently changed, impacts are concluded as significant and unavoidable.

LONG-TERM SCENIC HIGHWAY IMPACTS

5.4-3 *Implementation of the Moon Camp project would impact views of Big Bear Lake, the distant mountain ranges to the south and adjacent forest areas from North Shore Drive (State Route 38) which is a County and Federally recognized Scenic Highway/Byway. Analysis has concluded that significant and unavoidable impacts would occur as a result of project development.*

With development of the proposed project, viewshed and visual characteristics along State Route 38 would be permanently modified. Currently, State Route 38 is the only visible on-site improvement. With the introduction of 92 residential lots, local streets and associated infrastructure, and a 100 boat slip marina facility on Big Bear Lake, current viewshed characteristics would be modified and in some cases dominate the visual features along State Route 38. Distant views of the mountain ranges and Big Bear Lake to the south would be affected by the proposed uses.

The alteration of the area would be permanent and would continue throughout the life of the project. Based upon the density of the proposed residential uses south of the realigned State Route 38 and view simulation data depicted in Exhibits 5.4-4, *View East from State Route 38*, Exhibit, 5.4-5, *View South from Proposed Realignment of State Route 38*, and Exhibit 5.4-6, Vi*ew West from State Route 38*, it is concluded that viewshed characteristic impacts along State Route 38 looking south across the project site are significant and unavoidable, given the current characteristics of the area. Exhibit 5.4-2, *View* Map, indicates the field of view for each of the views presented in Exhibits 5.4-4, 5.4-5, 5.4-6 and 5.4-7. This analysis in based upon full build-out of the 95-lots (92 residences) associated with the project.

As stated in the Existing Conditions subsection, State Route 38 (North Shore Drive) is designated by the County of San Bernardino as a Scenic Highway. As such, the highway is subject to additional land use and aesthetic controls under the County's Scenic Highway Overlay District. The provisions of the Scenic Resources Overlay District are provided within the *Scenic Corridor* discussion above. The following describes the views across the project site from State Route 38 at various locations with buildout of the Moon Camp development. The discussion includes analysis that considers the provisions of the Scenic Resources Overlay District.

This portion of the analysis considers views for people utilizing State Route 38 and traversing the project site in an east/west direction. Exhibit 5.4-4, *View East from State Route 38*, is a simulated view from State Route looking east across the project site. Exhibit 5.4-6, *View West from State Route*, is a simulated view from State Route 38 looking west across the project site. As shown in the simulations, several Jeffrey Pine trees would be removed with realignment of State Route to the north. The building and structure placement of the homes on the northern side of the highway appear compatible with and do not substantially detract from the visual setting of the area or obstruct significant views, as the mountain slopes upward to the north.

The placement of homes was based on the regulations set forth in the County Development Code, including setback requirements, height limitations, lot coverage, etc. The homes shown in the simulations are at or near the maximum size allowed on each parcel. The design of the homes is reflective of the "newer" homes in the Fawnskin area.

The removal of native vegetation appears minimal and replacement vegetation would supplement the loss of natural vegetation. Utilities, parking and storage areas appear to be screened from view, to the maximum extent possible. Despite the necessary grading for construction of the local streets and custom-built homes, the site would maintain varying topography, which would maintain a mountain community setting.

Building and structure placement on the southern side of the Highway (lakefront properties), while appearing compatible with the visual setting on the north side of the Highway, results in obstructed views of the distant mountain ranges and immediate views of the Lake to the south. This is depicted in Exhibit 5.4-6, *View West from State Route 38*. As shown in Exhibit 5.4-6, upon entering the project area on State Route from the east, views of the Lake are obstructed.

In some cases, as shown in Exhibit 5.4-5, *View South from Proposed Realignment of State Route 38*, views of the Lake and distant mountains would be maintained. In Exhibit, 5.4-5, the existing view shows State Route 38, and is clearly evident that while traversing this section of the Highway, views of the Lake would be unobstructed. The location of the simulated view is from the north side of State Route 38, as realigned (refer to Exhibit 5.4-2, *View Map*). The simulated view shows that the realigned Highway would still provide views of the Lake, as the roadway would be located at a higher elevation compared to the existing alignment.

It is concluded that development on the north side of State Route 38 would not obstruct views of scenic vistas, nor would the construction of custom-built homes detract from the visual setting of the area. According to the provisions of the Scenic Resources Overlay District, the "Building and Placement" standard states that "the building and structure placement should be compatible with and should not detract from the visual setting or obstruct views." Since development on the south side of State Route 38 would disrupt Lake and distant mountain views to the south along State Route 38, the proposed project would not fulfill all of the Development Code standards such as building and structure placement not obstructing significant views, as outlined in the Scenic Resources Overlay District. Thus, significant and unavoidable impacts would occur as a result of the proposed project.

LONG-TERM LIGHT AND GLARE IMPACTS

5.4-4 *The proposed Moon Camp project would introduce additional light and glare on-site which may affect the surrounding residents. Analysis has concluded that potential impacts would be reduced to less than significant levels with implementation of the recommended mitigation measures.*

Long-term impacts are associated with the construction of new residences and street lighting, which may create nighttime light or daytime glare.

Night-time lighting impacts are significant when they interfere with or intrude into sensitive land use areas which include private residences and public access areas. Glare impacts can cause daytime interferences with activities at sensitive land use areas as defined above as well as public roadways where automobile drivers can be temporarily blinded by glare thus causing a safety concern. Residences to the east (along State Route 38) and west (along Oriole Lane) of the site would be partially shielded from new light sources by the existing Jeffrey Pine trees and associated vegetation. As indicated on Exhibit 5.4-3, *Plan View*, new residences located immediately south of Flicker Road would also be partially shielded from new sources of light by the existing Jeffrey pine trees. The *Plan* View presents an anticipated development scenario, thus, it is not representative of final development plans for the placement of new residences. The *Plan View* indicates that the new residences to the south of Flicker Road would likely be situated on the southernmost portions of the lots, thus, maximizing the distance to the existing residences located on Flicker Road. Implementation of the recommended mitigation measures would reduce potential impacts to less than significant levels.

Glare impacts are typically related to the use of modern, highly reflective surfaces such as gold, or silver glass, acrylic, and broad, flat surfaces that are painted with

highly reflective colors. A review of the visual simulations, renderings and the Site Plan indicates that the proposed residential subdivision would not cause significant glare impacts along State Route 38, Oriole Lane and Flicker Road. Although there are no proposed buildings or structures associated with the proposed project, the custom homes that would be built on the lots are not anticipated to incorporate highly reflective glass, or broad, flat surfaces. New residential development is anticipated to be consistent with existing residential structures in the local area and is subject to approval by the County of San Bernardino. The surrounding residences architectural theme consists of materials indicative of wood siding and traditional log homes. Future homes are anticipated to utilize similar architectural themes as seen in the existing Community of Fawnskin. Implementation of the recommended mitigation measures would reduce potential impacts to less than significant levels.

In addition, future residential development will be required to comply with the glare and outdoor lighting provision of the County of San Bernardino Development Code (i.e., Section 87.0921 et. seq.). The intention of this section is:

- To encourage effective, non-detrimental lighting;
- To maintain night time safety, utilizing security and productivity; and
- To encourage lighting practices and systems, which will minimize light pollution, glare and light trespass, conserve energy and resources and curtail the degradation of the night time visual environment.

CUMULATIVE

5.4-5 *Build-out of the Moon Camp development, together with cumulative projects, may alter the nature and appearance of the area and contribute to the loss of undeveloped areas. Analysis has concluded that no significant impacts beyond the analysis contained in the County of San Bernardino General Plan and General Plan EIR are anticipated.*

As development occurs throughout the Fawnskin area, residents and visitors in the area would notice the visual effects of development projects. However, the significance of these visual/aesthetic changes is difficult to determine, since aesthetic value is subjectively determined and potential impacts are site-specific. Construction of currently approved and pending projects in the vicinity would permanently alter the nature and appearance of the area through the loss of undeveloped areas. Security and street lighting would introduce light and glare potential to the area. Impacts are typically evaluated on a project-by-project basis. Cumulative impacts can be mitigated to less than significant levels with use of building materials that are consistent with the general character of the area, landscaping design, and proper lighting techniques to direct light on-site and away from adjacent properties.

MITIGATION MEASURES

The following mitigation measures directly correspond to the identified impact statements in the Impacts discussion.

SHORT-TERM AESTHETIC/LIGHT AND GLARE IMPACTS

5.4-1a Construction equipment staging areas shall be located away from existing residential uses. Appropriate screening (i.e., temporary fencing with opaque material) shall be used to buffer views of construction equipment and material, when feasible. Staging locations shall be indicated on project Grading Plans.

5.4-1b All construction-related lighting associated with the construction of new roadways, the realignment of State Route 38, and the installation of utilities shall be located and aimed away from adjacent residential areas. Lighting shall use the minimum wattage necessary to provide safety at the construction site. A construction safety lighting plan shall be submitted to the county for review concomitant with Grading Permit applications for the subdivision of the lots.

LONG-TERM AESTHETIC IMPACTS

5.4-2a Roof pitches shall not exceed 9/12 and no higher than two-story for any portion of the structure footprint for lots 62-92.

5.4-2b All homes shall provide a two-car garage with automatic garage doors.

5.4-2c A view envelope for each property shall be established by creating a line starting at 6 feet at each side lot line and moving up at a 30 degree angle until both lines meet at the middle of the property. The area located under these lines is the view envelope. Structures shall not protrude outside the view envelope. The view envelope orients the building ridgeline parallel to the view corridors on narrower lots providing views for residents located behind the property.

5.4-2d New development shall be subordinate to the natural setting and minimize reflective surfaces. Building materials including siding and roof materials shall be selected to blend in hue and brightness with the surroundings. Colors shall be earth tones, shades of grays, tans, browns, greens, pale yellows, and shall be consistent with the mountain character of the area.

5.4-2e Outside parking/storage areas associated with the boat dock activities shall be completely screened from view by the placement of landscaping and plantings which are compatible with the local environment and, where practicable, are capable of surviving with a minimum of maintenance and supplemental water.

5.4-2f Construction plans for each individual lot shall include the identification and placement of vegetation with the mature height of trees listed. Landscaping and plantings should not obstruct significant views, within or outside of the project, either when installed or when they reach mature growth. The removal of existing vegetation shall not be required to create views.

5.4-2g A Note shall be placed on the Composite Development Plan stating that during construction plans review and prior to issuance of building permits for each lot, the building inspector shall refer to the Mitigation Monitoring and Compliance Program regarding these aesthetic impact mitigation measures. The building inspector shall coordinate with the Advance Planning Division the review and approval of building plans in relation to these aesthetic impact mitigation measures, prior to approval and issuance of building permits.

LONG-TERM SCENIC HIGHWAY IMPACTS

5.4-3a Any entry sign for the development shall be a monument style sign compatible with the mountain character, preferably, rock or rock-appearance.

5.4-3b Prior to recordation of the tract map (and/or any ground disturbance, whichever occurs first), landscaping plans for lettered lots B and C shall be submitted to and approved by the San Bernardino County Planning Department.

LONG-TERM LIGHT AND GLARE IMPACTS

5.4-4a All exterior lighting shall be designed and located as to avoid intrusive effects on adjacent residential properties and undeveloped areas adjacent to the project site. Low-intensity street lighting and low-intensity exterior lighting shall be used throughout the development to the extent feasible. Lighting fixtures shall use shielding, if necessary to prevent spill lighting on adjacent off-site uses.

5.4-4b Lighting used for various components of the development plan shall be reviewed for light intensity levels, fixture height, fixture location and design by an independent engineer, and reviewed and approved by the County Building and Safety Division.

5.4-4c The project shall use minimally reflective glass. All other materials used on exterior buildings and structures shall be selected with attention to minimizing reflective glare.

5.4-4d Vegetated buffers shall be used along State Route 38 to reduce light intrusion on residential development and on forested areas located adjacent to the project site.

5.4-4e Mitigation Measures 5.4-4a through 5.4-4d shall be included within the Conditions, Covenants and Restrictions (CC&Rs) of the Home Owner's Association (HOA).

5.4-4f All outdoor light fixtures shall be cutoff luminaries and shall only use high- or low-pressure sodium lamps.

5.4-4g The Project Applicant/Developer shall install light colored, reflective roof products. Such roofs shall utilize light colored, reflective materials that meet the performance standards developed by the Energy Star Labeled Roof Program, as well as the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standards 90.1 and 90.2 on energy efficient buildings. This condition shall be verified by the County of San Bernardino Building and Safety Division prior to issuance of building permits.

CUMULATIVE

5.4-5 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Significant and unavoidable impacts related to Aesthetics/Light and Glare have been identified for viewshed alterations involving existing residents to the north, east and west of the project site. Additionally, significant and unavoidable impacts have been identified for views from State Route 38, a scenic highway, to the south and from the south shore of Big Bear Lake. If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with section 15093 of CEQA.

No additional significant impacts related to Aesthetic/Light and Glare have been identified following implementation of mitigation measures and/or compliance with applicable standards, requirements and/or policies by the County of San Bernardino.

5.5 TRAFFIC AND CIRCULATION

This Section is based upon the project Traffic Analysis prepared by Kunzman Associates, September 2003 (refer to Appendix 15.3, *Traffic Data*.) RBF Consulting conducted a peer review of the Kunzman Associates Study to confirm accuracy. The evaluation considers impacts to local roadways, intersections, regional transportation facilities and ingress/egress locations on-site. Mitigation measures are recommended to reduce impacts to less than significant levels.

EXISTING CONDITIONS

STUDY AREA STREET SYSTEM

Exhibit 5.5-1, *Highway Designations*, shows the common name, as well as the Highway number for each roadway in the study area. Roadways that would be utilized by the development include North Shore Drive, Stanfield Cutoff and Big Bear Boulevard. In the vicinity of the project site, the following roadway conditions exist:

- North Shore Drive. This east-west two-lane roadway, also referred to as State Route 38, currently has a peak monthly volume of 4,750 vehicles per day. North Shore Drive is the only on-site improvement. The roadway has a shoulder of varying widths that allows for emergency parking. There are no designated bike lanes on North Shore Drive, and there are no bus turnouts.

- Stanfield Cutoff. This north-south two-lane road currently has a peak monthly volume of 5,625 vehicles per day.

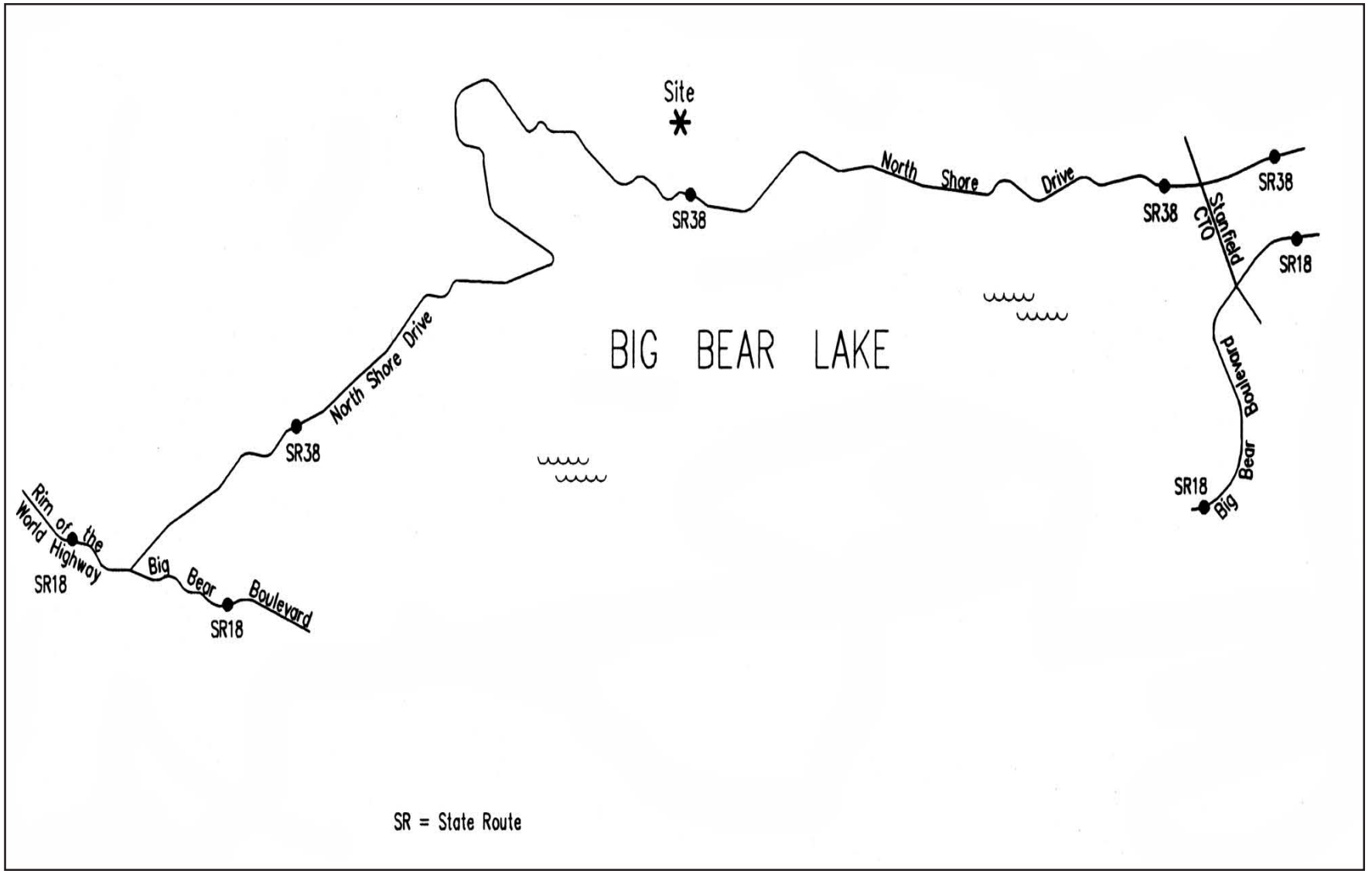
- Big Bear Boulevard. This east-west road, also referred to as State Route 18, consists of four lanes west of Stanfield Cutoff, and two lanes east of Stanfield Cutoff. It has a peak monthly volume of 20,500 vehicles per day, west of Stanfield Cutoff.

EXISTING TRAVEL LANES AND INTERSECTION CONTROLS

Exhibit 5.5-2, *Existing Through Travel Lanes and Intersection Control*, identifies the existing roadway conditions for highways near the site, the number of through lanes for existing roadways, and the existing intersection controls.

EXISTING DAILY TRAFFIC VOLUMES

Exhibit 5.5-3, *Existing Daily Traffic Volumes – Average Month*, and Exhibit 5.5-4, *Existing Daily Traffic Volumes – Peak Month*, depict the average and peak month daily two-way traffic volumes. Traffic volumes were obtained from the weekday peak hour intersection turning movement counts conducted by Kunzman Associates in March, 2001.



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-1

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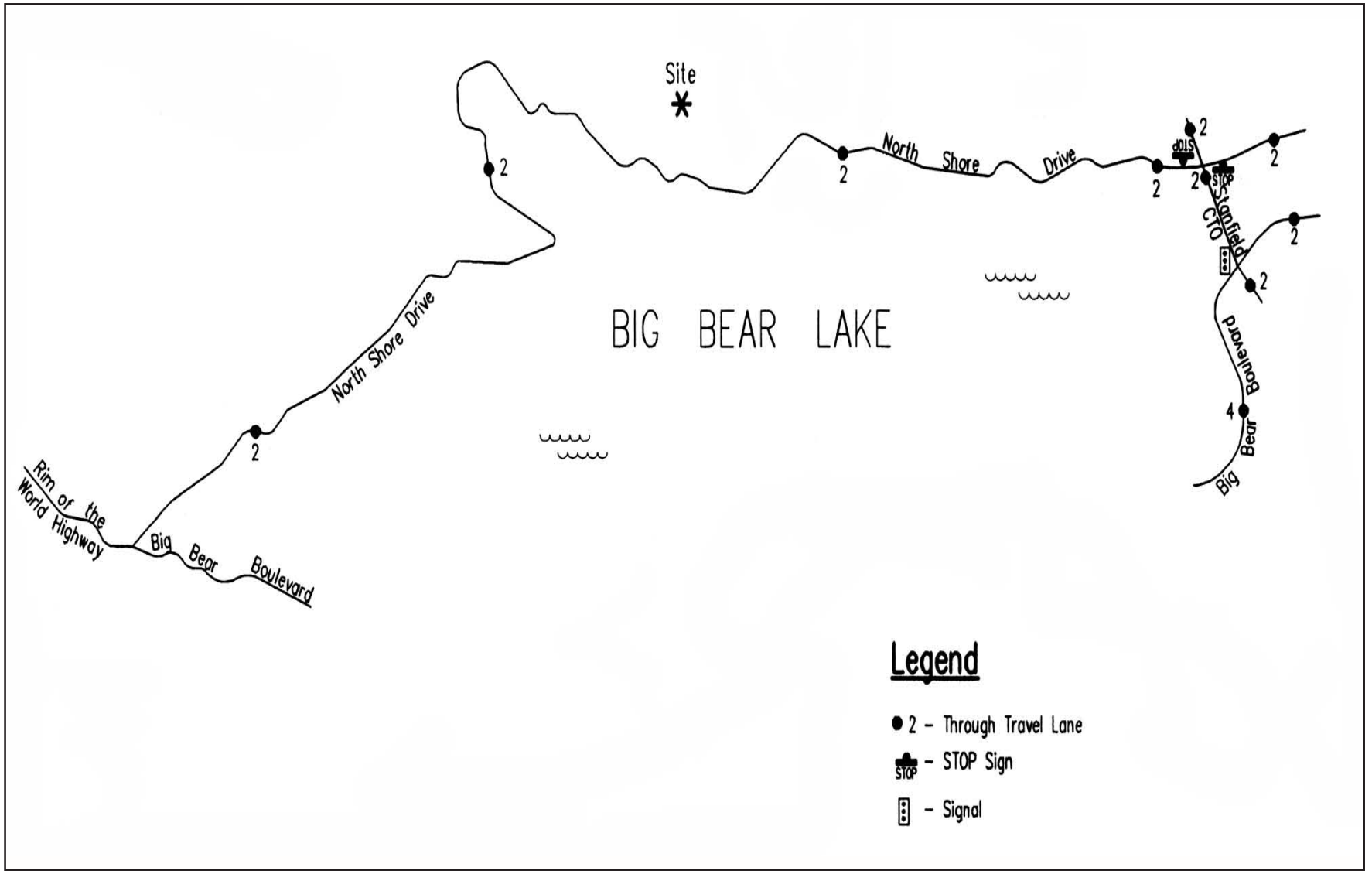
MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Highway Designations



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-2

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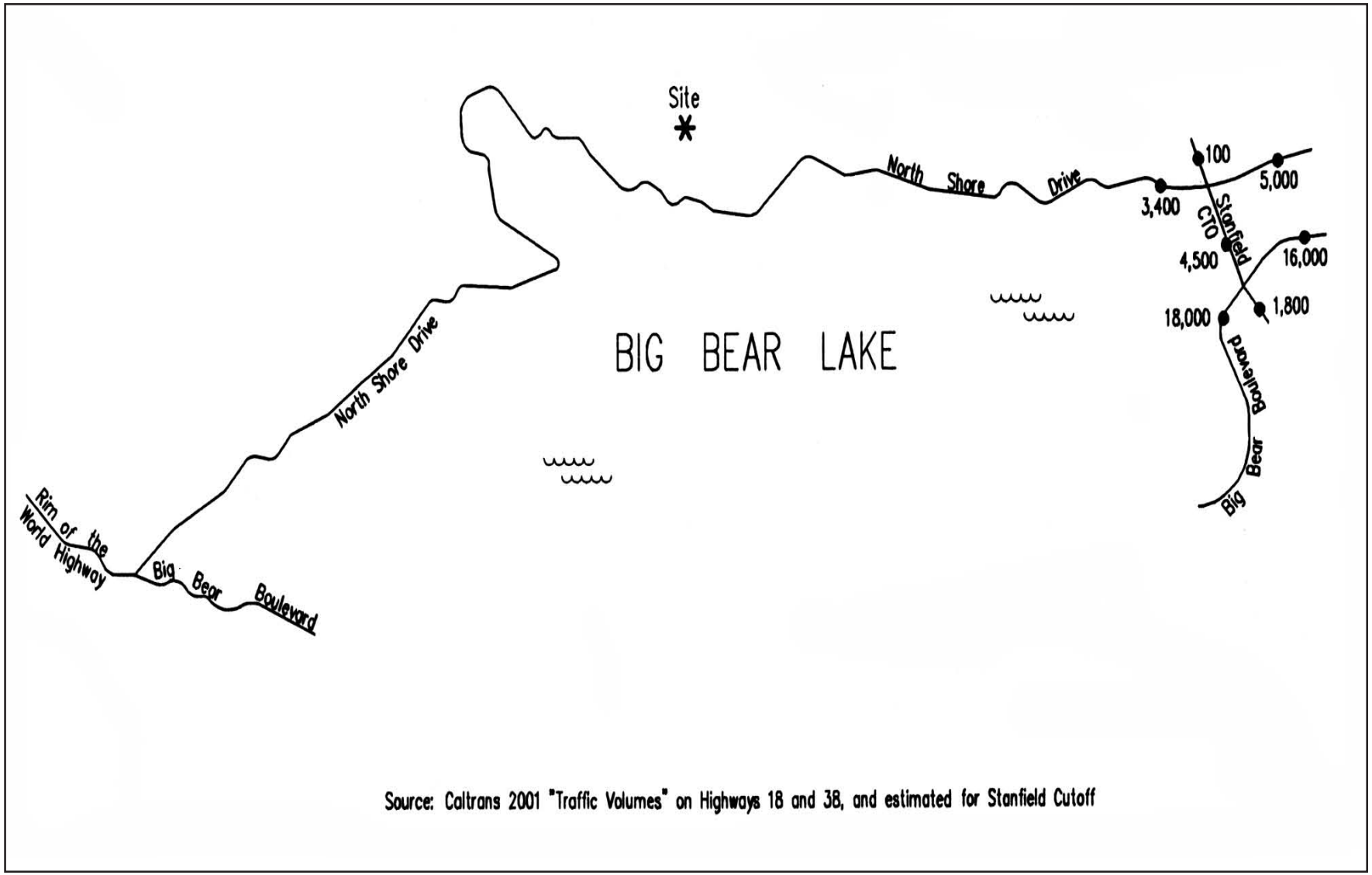
12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Existing Through Travel Lanes and Intersection Control



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-3

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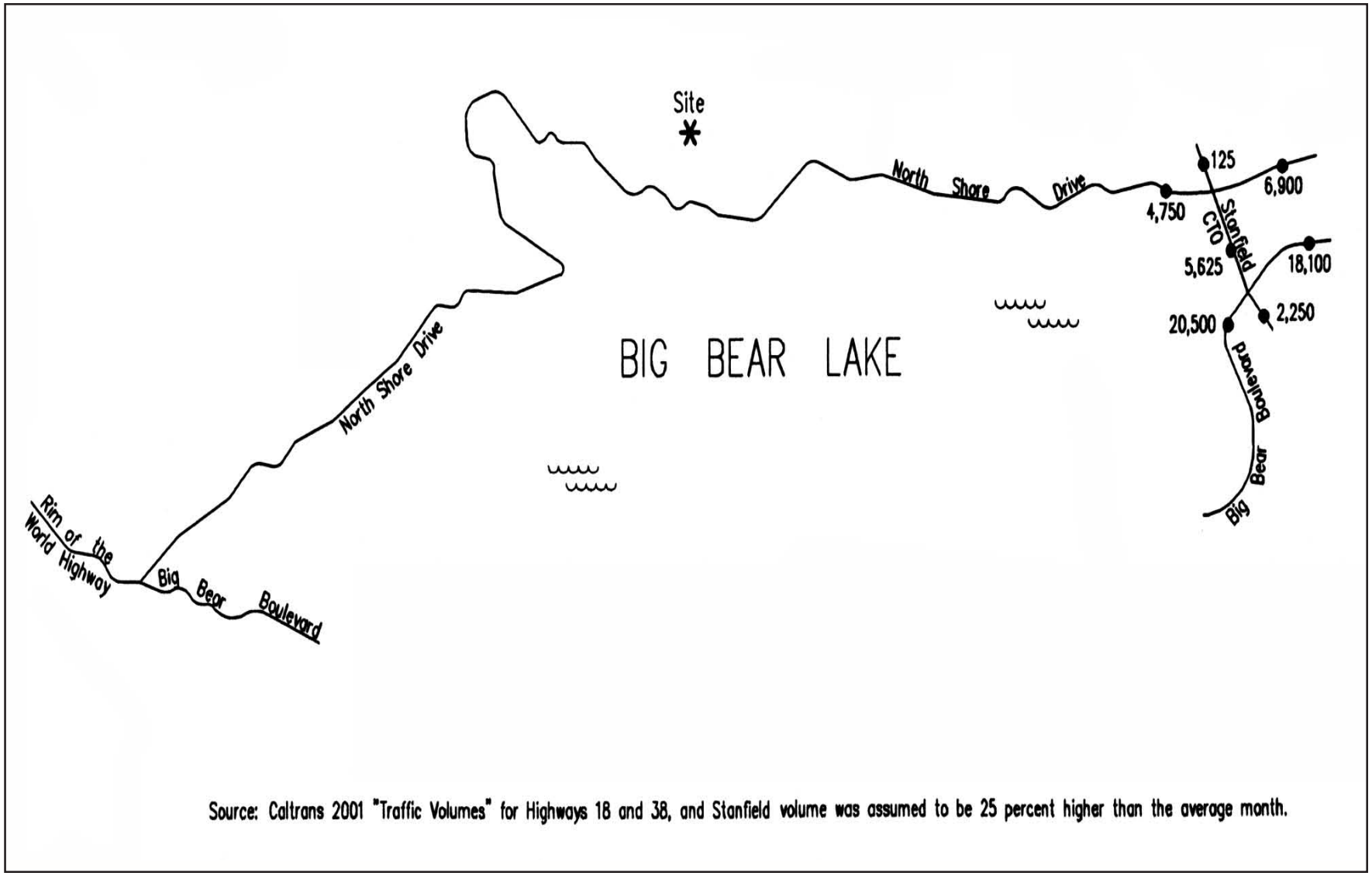
12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Existing Daily Traffic Volumes - Average Month



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-4

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MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Existing Daily Traffic Volumes - Peak Month

Table 5.5-1, *Determining Annual Growth Rates and Peak Month Factors*, shows daily traffic volumes, as reported by Caltrans in traffic volumes for state highways in 1989 and 1999. From this data, it has been determined by Kunzman Associates that a reasonable factor to convert typical month volumes to peak month volumes is 1.25.

The County of San Bernardino recommends a growth rate of 1.0 percent per year for the Big Bear area based on a recent analysis by the County. Typically an annual growth rate approach is better than a cumulative projects approach because the cumulative projects approach typically leads to double counted trips thus there is a compounding of errors consideration. The double counting occurs for instance when homes are proposed and the cumulative projects list includes a retail commercial center. The trip added from the home that goes to the store is the same trip added a second time from the store to the home. The compounding of errors leads to erroneous results when for instance in the case of residential the density is over estimated, then the trip generation is overestimated (this is particularly problematic in Big Bear where most houses are not inhabited full time, and then the trip distribution is overestimated in that the local trips are under reported and the longer trips are over reported. The County of Los Angeles uses the compounded growth rate approach. Also, it should be noted that the County of Riverside formerly used the compounded growth rate approach, then switched to the cumulative projects approach, and is now reconsidering going back to the compounded growth rate approach.

Year 2001 traffic volume estimates were obtained by factoring the sum of the morning and evening peak hour volumes. A factor of 5.5 was used. According to the Kunzman Associates report, this method of estimating daily traffic volumes produces reasonable results. Refer to Appendix B of the *Traffic Analysis* report for more details.

EXISTING PEAK HOUR TURNING MOVEMENT VOLUMES

Existing manual peak hour turning movement counts were conducted by Kunzman Associates in March 2001. Appendix C of the *Traffic Analysis* report contains plots of the peak hour intersection turning movement volumes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

There are two peak hours in a weekday. The morning peak hour is between 7:00 a.m. and 9:00 a.m., and the evening peak hour is between 4:00 p.m. and 6:00 p.m. The actual peak hour within the two-hour interval is the four consecutive 15-minute periods with the highest total volume when all movements are added together. Thus, the evening peak hour at one intersection may be 4:45 p.m. to 5:45 p.m., if those four consecutive 15-minute periods have the highest combined volume.

EXISTING INTERSECTION LANES

Appendix B of the *Traffic Analysis* shows the number of existing through and turning movement lanes and peak hour turning movement volumes for each intersection. The lanes are also listed in Tables 1A and 1B, *Summary of Intersection Delay for the Unsignalized Intersection of North Shore and Stanfield Cutoff*, and *Summary of*

Intersection Delay and Level of Service (LOS) (Assumes North Shore and Stanfield Cutoff are Signalized), respectively, of the *Traffic Analysis* report.

Table 5.5-1
Determining Annual Growth Rates and Peak Month Factors

Road Location (See Figure 3 for Location References)	Year 1991			Year 2001			Growth Ratio	
	Annual Daily Traffic Volume	Peak Month Daily Traffic Volume	Peak Month Divided by Annual Daily Traffic Volume	Annual Daily Traffic Volume	Peak Month Daily Traffic Volume	Peak Month Divided by Annual Daily Traffic Volume	2001 Annual Volume Divided by 1991 Annual Volume	Annual Growth Rate (Percent)
1. Rim of the World Highway (SR-18) west of North Shore Drive (SR-38)	5,200	6,000	1.15	6,100	7,100	1.16	1.173	1.73%
2. Big Bear Boulevard (SR-18) east of North Shore Drive (SR-38)	6,900	8,000	1.16	6,300	7,300	1.16	0.913	-0.87%
3. Big Bear Boulevard (SR-18) west of Stanfield Cutoff	16,000	19,100	1.19	18,000	20,500	1.14	1.125	1.25%
4. Big Bear Boulevard (SR-18) east of Stanfield Cutoff	13,000	15,300	1.18	16,000	18,100	1.13	1.231	2.31%
5. North Shore Drive (SR-38) north of Big Bear Boulevard (SR-18) and Dam	2,000	2,350	1.18	1,600	2,300	1.44	0.800	-2.00%
6. North Shore Drive (SR-38) west of Stanfield Cutoff (SR-18)	3,000	3,450	1.15	3,400	4,750	1.40	1.133	1.33%
7. North Shore Drive (SR-38) east of Stanfield Cutoff	3,300	3,750	1.14	5,000	6,900	1.38	1.515	5.15%
Average			1.16			1.26		
Value Which Will Be Used for Traffic Study			1.25			1.25		

Note: SR = State Route

The peak month conditions are for a typical day in a peak month and do not necessarily include peak weekend conditions such as the Fourth of July.

EXISTING INTERSECTION DELAY

The technique used to assess the operation of an intersection is known as the Intersection Delay Method. To calculate the Intersection Delay value the volume of traffic using the intersection is compared with the capacity of the intersection. The Intersection Delay value is usually expressed as the average seconds of delay per vehicle using the intersection.

The Intersection Delay for the existing traffic conditions have been calculated and are shown in Table 5.5-2, *Summary of Intersection Delay and Level of Service for Unsignalized Intersection of North Shore and Stanfield Cutoff* and Table 5.5-3, *Summary of Intersection Delay and Level of Service (LOS) for Signalized Intersection of Big Bear Boulevard and Stanfield Cutoff*. Existing Intersection Delay values are based upon manual peak hour turning movement counts, factored up to represent peak month counts.

Table 5.5-2
Summary of Intersection Delay and Level of Service
for the Unsignalized Intersection of Stanfield Cutoff and North Shore

Intersection	Land Use Scenario	Peak Hour	Lanes	Intersection Control	Two Way Stop Worst Level of Service (LOS)	
					Movement(s)	Level of Service
1. Stanfield Cutoff and North Shore – Average Month	Year 2001 Without Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2001 Without Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2001 With Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2001 With Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Peak Month	Year 2001 Without Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Peak Month	Year 2001 Without Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Peak Month	Year 2001 With Project	AM	Existing	2 Way Stop	NL, SL	B
1. Stanfield Cutoff and North Shore – Peak Month	Year 2001 With Project	PM	Existing	2 Way Stop	NL, SL	B
1. Stanfield Cutoff and North Shore – Average Month	Year 2006 Without Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2006 Without Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2006 With Project	AM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Average Month	Year 2006 With Project	PM	Existing	2 Way Stop	All	A
1. Stanfield Cutoff and North Shore – Peak Month	Year 2006 Without Project	AM	Existing	2 Way Stop	SL	B
1. Stanfield Cutoff and North Shore – Peak Month	Year 2006 Without Project	PM	Existing	2 Way Stop	SL	B
1. Stanfield Cutoff and North Shore – Peak Month	Year 2006 With Project	AM	Existing	2 Way Stop	NL, SL	B
1. Stanfield Cutoff and North Shore – Peak Month	Year 2006 With Project	PM	Existing	2 Way Stop	SL	B

Movement: NT = Northbound Through, NR = Northbound Right, NL = Northbound Left
ST = Southbound Through, SR = Southbound Right, SL = Southbound Left
ET = Eastbound Through, ER = Eastbound Right, EL = Eastbound Left
WT = Westbound Through, WR = Westbound Right, WL = Westbound Left

Table 5.5-3
Summary of Signalized Intersection Delay and Level of Service (LOS)

Intersection	Land Use Scenario	Peak Hour	Lanes												Delay in Seconds and Level of Service (LOS)	Inter-section Capacity Utiliza-tion (ICU) and LOS	Lanes
			Northbound			Southbound			Eastbound			Westbound					
			Thr	Rt	Lt	Thr	Rt	Lt	Thr	Rt	L	Thr	Rt	Lt			
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	35.2 D+	0.813 D+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	38.6 D+	0.913 E+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	36.5 D+	0.822 D+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	39.9 D+	0.918 E+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	28.3 C	0.643 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	26.8 C	0.669 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	29.2 C	0.654 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Average Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	27.5 C	0.675 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	49.3 D-	0.942 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	64.3 E	1.067 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	51.7 D-	0.951 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	66.1 E	1.072 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	31.7 C-	0.729 C+	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	30.2 C-	0.762 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	32.7 C-	0.741 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2001 Peak Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	31.0 C--	0.768 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	37.0 D+	0.839 D	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	42.0 D	0.943 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	38.4 D+	0.847 D	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	43.4 D	0.949 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	28.8 C	0.660 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	27.3 C	0.687 B-	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	29.9 C	0.671 B	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Average Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	28.1 C	0.693 B-	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	55.3 E+	0.975 E-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	73.6 E-	1.104 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	57.8 E+	0.987 E-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	75.5 E-	1.110 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	32.7 C-	0.752 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	31.1 C-	0.784 C-	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	33.8 C-	0766 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2006 Peak Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	31.9 C-	0.790 C-	Widen

Table continue on next page

NOTES
The Level of Service (LOS) for the Delay Method and Intersection Capacity Utilization Method differ because they are calculated entirely differently and LOS is defined differently. See Appendices for further discussion.

Table 5.5-3 - Continued
Summary of Signalized Intersection Delay and Level of Service (LOS)

Intersection	Land Use Scenario	Peak Hour	Lanes												Delay in Seconds and Level of Service (LOS)	Inter-section Capacity Utiliza-tion (ICU) and LOS	Lanes
			Northbound			Southbound			Eastbound			Westbound					
			Thr	Rt	Lt	Thr	Rt	Lt	Thr	Rt	L	Thr	Rt	L			
1. Stanfield Cutoff (NS) and North Shore	2025 Average Month Without Project	AM	1	1	0	1	1	0	1	1	0	1	0	0	12.0 B+	0.456 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Average Month Without Project	PM	1	1	0	1	1	0	1	1	0	1	0	0	17.8 B-	0.359 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Average Month With Project	AM	1	1	0	1	1	0	1	1	0	1	0	0	12.2 B+	0.456 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Average Month With Project	PM	1	1	0	1	1	0	1	1	0	1	0	0	19.3 B-	0.359 A+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	48.4 D-	0.937 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	62.5 E+	1.060 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	50.8 D-	0.946 E	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	2	1	1	64.3 E	1.065 F	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	31.5 C-	0.726 C+	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	30.0 C	0.757 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	32.6 C-	0.737 C	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Average Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	1	1	30.7 C-	0.763 C	Widen
1. Stanfield Cutoff (NS) and North Shore	2025 Peak Month Without Project	AM	1	1	0	1	1	0	1	1	0	1	0	0	12.0 B+	0.456 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Peak Month Without Project	PM	1	1	0	1	1	0	1	1	0	1	0	0	17.8 B-	0.359 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Peak Month With Project	AM	1	1	0	1	1	0	1	1	0	1	0	0	12.2 B+	0.456 A+	Existing
1. Stanfield Cutoff (NS) and North Shore	2025 Peak Month With Project	PM	1	1	0	1	1	0	1	1	0	1	0	0	19.3 B-	0.359 A+	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	86.9 F+	1.110 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	119.0 F-	1.250 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	AM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	90.4 F	1.122 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	PM	0.5	0.5	1	1	0	1	1	1	1	1	1	1	121.1 F-	1.255 F-	Existing
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	37.9 D+	0.846 D	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month Without Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	36.1 D+	0.872 D	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	AM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	39.4 D+	0.860 D	Widen
2. Stanfield Cutoff (NS) and Big Bear Blvd. (EW)	2025 Peak Month With Project	PM	0.5	0.5	1	1	0	1	2	0	1	2	0	1	37.1 D+	0.877 D-	Widen

NOTES
The Level of Service (LOS) for the Delay Method and Intersection Capacity Utilization Method differ because they are calculated entirely differently and LOS is defined differently. See Appendices for further discussion.

Appendix B of the *Traffic Analysis* report contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

PARKING

The portion of State Route 38 that traverses the project site contains a shoulder of varying widths, which allows for temporary and emergency parking.

BIKE ROUTES

The portion of State Route 38 that traverses the project site does not include any County designated bike routes.

TRANSIT

The portion of State Route 38 that traverses the project site does not include any public transit facilities (i.e., bus turnouts).

EXISTING LEVEL OF SERVICE

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 5.5-4, *Level of Service Description For Delay Method (1997 Methodology)*, shows how LOS is related to Intersection Delay, and describes LOS. Existing intersections in the vicinity of the site currently operate a LOS D capacity or better based on delay. However, the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization (ICU) greater than 100 percent in the peak month weekday evening peak hour.

Table 5.5-4
Level of Service Description for Delay Method (1997 Methodology)

Level of Service	Description	Stopped Delay Per Vehicle (Seconds)
A	Level of Service A occurs when progression is extremely favorable and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.	0 to 10.0
B	Level of Service B generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.	10.1 to 20.0
C	Level of Service generally results when there is fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level. The number of vehicles stopping is significant at this level, although many still pass through the intersection without stopping.	20.1 to 35.0
D	Level of Service D generally results in noticeable congestion. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high volume to capacity ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.	35.1 to 55.0
E	Level of Service E is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high volume to capacity ratios. Individual cycle failures are frequent occurrences.	55.1 to 80.0
F	Level of Service F is considered to be unacceptable to most drivers. This condition often occurs with over-saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high volume to capacity ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.	80.1 +

Source: Highway Capacity Manual, Special Report 209, Transportation Research Board, National Research Council, Washington, D.C., 1997, pages 9-6 to 9-7.

IMPACTS

SIGNIFICANCE CRITERIA

The traffic issues related to the proposed land use and development have been evaluated in the context of the California Environmental Quality Act (CEQA) and the San Bernardino County Congestion Management Program (CMP). The County of San Bernardino is the lead agency responsible for preparation of the traffic impact analysis, in accordance with both CEQA and CMP authorizing legislation.

Environmental impact thresholds as indicated in Appendix G, *Initial Study Checklist*, of the CEQA Guidelines were also used as significance thresholds in this analysis. As such, the project would create a significant impact if it would cause one or more of the following to occur:

- Cause an increase in traffic which is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections) (refer to Impact Statements 5.5-1, 5.5-2 and 5.5-3);

- Exceed, either individually or cumulatively, a LOS standard established by the County CMP agency for designated roads or highways (refer to Impact Statements 5.5-1, 5.5-2 and 5.5-3);

- Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks (refer to Section 10.0, *Effects Found Not To Be Significant*);

- Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment) (refer to Impact Statement 5.5-4);

- Result in inadequate emergency access (refer to Impact Statement 5.5-4);

- Result in inadequate parking capacity (refer to Impact Statement 10.0, *Effects Found Not To Be Significant*); and/or

- Conflict with adopted policies, plans or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks) (refer to Section 10.0, *Effects Found Not To Be Significant*).

CONGESTION MANAGEMENT PROGRAM (CMP) METHODOLOGY

California legislation requires that a Traffic Impact Analysis (TIA) be prepared for new development. The TIA is prepared to monitor and fix traffic problems anticipated by new development.

The general approach for conducting a TIA is to count existing weekday peak hour traffic and determine the percent of roadway capacity currently used. The percentage growth in traffic is accounted for and added to existing traffic and the percent of roadway capacity used is again determined. Then, the project traffic is added and the percent of roadway capacity used is again determined. If the new project adds traffic to an overcrowded facility, then the new project has to mitigate the traffic impact so that the facility operates at a level which is no worse than before the project traffic was added.

In San Bernardino County, a project requires a TIA if it generates more than 250 new peak hour trips. The Moon Camp project would generate 93 new peak hour trips (approximately). Although this project does not generate 250 new peak hour trips, the County of San Bernardino has requested that the SANBAG TIA requirements be met, with one exception. That exception is that engineering judgment can be used for determining the project's peak hour traffic distribution rather than determining the traffic distribution using the East Valley Traffic Model.

PRESCRIBED METHODOLOGY FOR A TRAFFIC IMPACT ANALYSIS (TIA)

A TIA must include all monitored intersections to which the project adds traffic above a certain minimum amount. In San Bernardino County, the monitored intersections are all arterial-to-arterial intersections. The CMP requires that all arterial links and their CMP intersections be included in the analysis when the anticipated project volume equals or exceeds 80 two-way trips in one peak hour. For freeways, it is 100 two-way trips in the peak hour. Based on this requirement and the distribution of project-generated trips, the project-generated arterial link volumes are less than 80 trips on all roadway links and their intersections. Thus, the intersections of Stanfield Cutoff and North Shore Drive, and Stanfield Cutoff and Big Bear Boulevard are not CMP intersections.

If a project adds more traffic than the minimum threshold amount to an intersection, then that intersection has to be analyzed for deficiencies. If the intersection has to be analyzed for deficiencies, then mitigation is required if the existing traffic plus anticipated traffic growth plus project traffic causes the Intersection Delay to go above a certain point.

In San Bernardino County, mitigation is required if the intersection operates at worse than Level of Service C (i.e., Level of Service D), which corresponds to a maximum acceptable delay of 35 seconds for signalized intersections. The TIA guidelines require Level of Service E.

In San Bernardino County, impacted intersections are analyzed using the Delay Methodology and the ICU Methodology. Although the Delay Method is required per TIA guidelines, the ICU Method is also used per TIA requirements to assure that there are no operational problems. An intersection mitigation measure shall either fix the deficiency, or reduce both the delay and ICU so that they are below the level which occurs without the project.

Project traffic is generated using rates and procedures contained in the Institute of Transportation Engineers, *Trip Generation* manual. Project traffic distribution is provided by the reviewing agency or is agreed to in advance of the TIA being prepared. The TIA has to be prepared by a licensed Traffic Engineer.

The traffic analysis has been prepared in accordance with the TIA requirements except as noted. The TIA not only examined the CMP system of roads and intersections, but also other roads and intersections. The project generated traffic was added to intersections, and a full intersection analysis was conducted, even when the project added traffic failed to meet the minimum thresholds that require an intersection analysis.

The *Traffic Analysis* report prepared by Kunzman Associates includes the following: project generated traffic added to intersections and a full intersection analysis, even when the project added traffic failed to meet the minimum thresholds that require an intersection analysis. As stated in the Traffic Analysis report, the County of San Bernardino has requested that the following intersections be analyzed:

- Stanfield Cutoff and North Shore Drive
- Stanfield Cutoff and Big Bear Boulevard

Impacts to traffic and circulation are analyzed below according to topic. Mitigation measures at the end of this Section directly correspond with the identified impact.

Summary of Findings

- For existing traffic conditions, the intersection of Stanfield Cutoff and North Shore Drive operates at Level of Service A capacity based on delay. The intersection of Stanfield Cutoff and Big Bear Boulevard operates at Level of Service E based on Delay, which is unacceptable. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection. This may involve widening of the intersection and may involve the taking of right of way.

- For existing plus project traffic conditions, the intersection of Stanfield Cutoff and North Shore Drive operates at Level of Service B capacity based on delay. The intersection of Stanfield Cutoff and Big Bear Boulevard with the recommended mitigation measure operates at Level of Service D based on Delay, which is acceptable for a State Highway. Although based on established threshold of significance criteria, the project has an insignificant traffic impact on Stanfield Cutoff and Big Bear Boulevard, it nevertheless contributes to the utilization deficiency at the weekday evening peak hour.

- After project completion and in the year 2006, the intersection of Stanfield Cutoff and North Shore Drive operates at Level of Service B capacity based on delay. The intersection of Stanfield Cutoff and Big Bear Boulevard with the recommended mitigation measure operates at Level of Service D based on Delay, which is acceptable for a State Highway.

- Although the project does not have a significant impact on the intersection of Stanfield Cutoff and North Shore Drive, this intersection will require a traffic signal by 2025 because of background traffic growth.

- Project-related traffic would not warrant the installation of a traffic signal at any location.

EXISTING CONDITIONS WITH PROJECT TRAFFIC ANALYSIS

5.5-1 *The intersection of Stanfield Cutoff and Big Bear Boulevard currently operates above 100 percent utilization in the peak month weekday evening peak hour. Although the Project does not generate significant traffic volumes, it would contribute to the intersection utilization at the weekday evening peak hour. Pro-rata share payment for intersection improvements to the intersection would reduce project affects to less than significant levels.*

PROJECT TRAFFIC

To estimate project-related traffic volumes at various points on the street network, a three-step process is utilized. First, the traffic that would be generated by the proposed development is determined. Second, the traffic volumes are geographically distributed to major attractions of trips, such as employment centers, commercial centers, recreational areas or residential areas. Finally, the trips are assigned to specific roadways and the project-related traffic volumes are determined on a route-by-route basis.

Traffic Generation

The traffic generated by the project is determined by multiplying an appropriate trip generation rate by the quantity of land use. Trip generation rates are expressed in terms of trip ends per person, trip ends per employee, trip ends per acre, trip ends per dwelling, or trip ends per thousand square feet of floor space. For instance, if a particular land use generates six outbound trips per acre in the morning peak hour, then six vehicles are expected to leave the site in the morning peak hour for each acre of development.

Significant research efforts have been made by the Institute of Transportation Engineers and others to establish the correlation between trips and land use. From this body of information, trip generation rates have been estimated by Kunzman Associates with reasonable accuracy for various land uses.

Trip generation rates are predicated on the assumption that energy costs, the availability of roadway capacity, the availability of vehicles to drive, and our life styles remain similar to what we know today. A major change in these variables may affect trip generation rates.

Trip generation rates were determined for daily traffic, morning peak hour inbound and outbound traffic, and evening peak hour inbound and outbound traffic for the

proposed land uses. The trip generation rates are from Trip Generation, Sixth Edition, Institute of Transportation Engineers, 1997.

By multiplying the traffic generation rates by the land use quantities, traffic volumes are determined. Table 5.5-5, *Project Traffic Generation*, shows the traffic generation rates and the peak hour and daily traffic volumes.

Table 5.5-5
Project Traffic Generation

Descriptor	Trip Generation Rate	Trips Generated by 92 Dwellings
Units	Dwellings	Dwellings
Daily	9.57	880
Morning Peak Hour - In	0.19	17
Morning Peak Hour - Out	0.56	52
Total	0.75	69
Evening Peak Hour - In	0.65	60
Evening Peak Hour - Out	0.36	33
Total	1.01	93
Source: Trip Generation, 6th Edition, Institute of Transportation Engineers, 1997, Category 210.		

The project also includes 100 boat slips. The boat slips are to be used by residents who live there, and are not expected to generate additional external traffic.

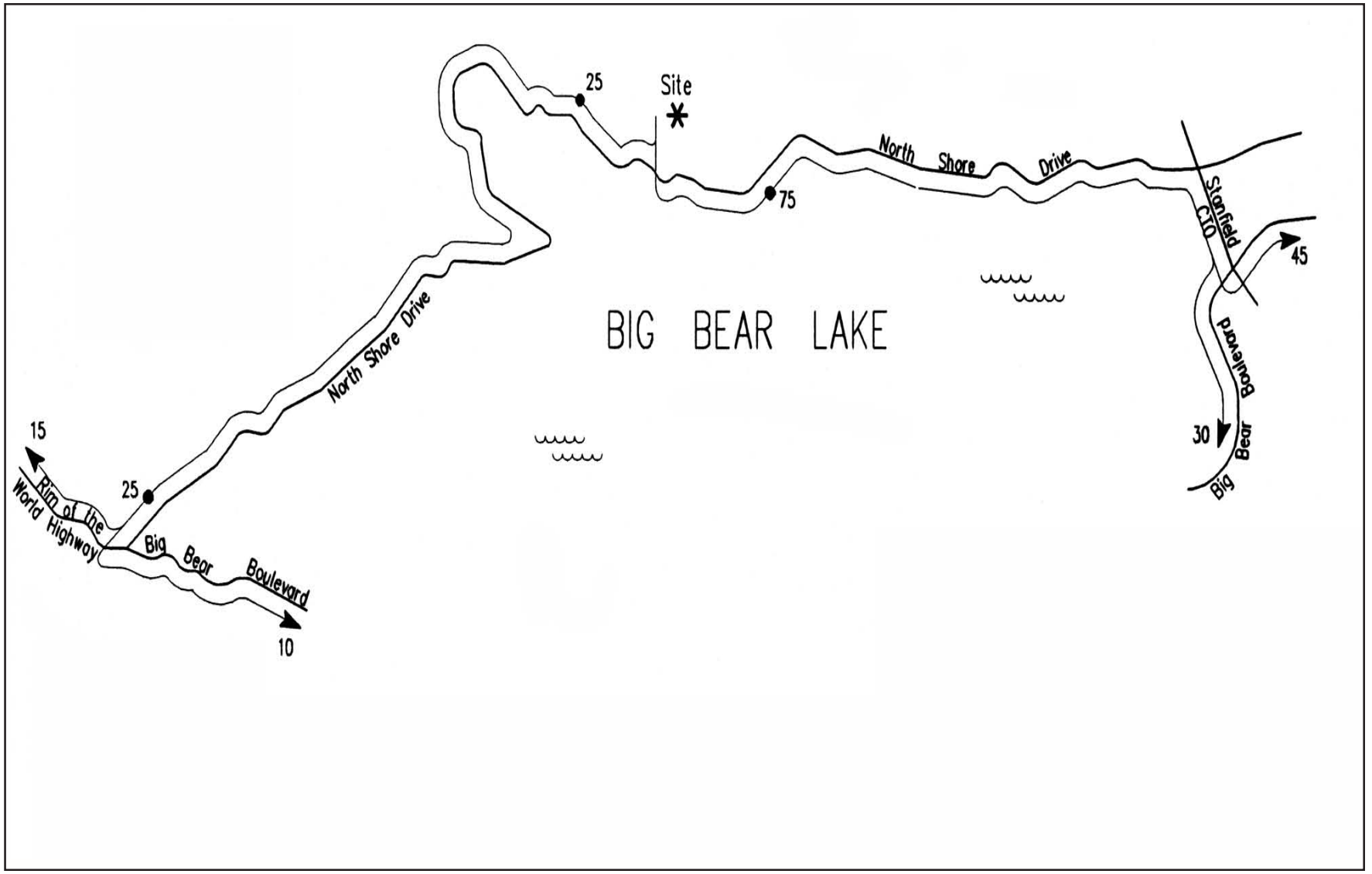
For the purposes of the traffic analysis, it is assumed that the homes are lived in year round by persons who commute to work. This is a maximum, or worst case, scenario. It is likely that some homes would be second homes and that those who do live there would tend to be retired, more than typically found in Southern California.

Traffic Distribution and Assignment

Traffic distribution is the determination of the directional orientation of traffic. It is based on the geographical location of employment centers, commercial centers, recreational areas, or residential area concentrations.

Traffic assignment is the determination of which specific route development traffic would use, once the generalized traffic distribution is determined. The basic factors affecting route selection are minimum time path and minimum distance path.

Exhibit 5.5-5, *Project Traffic Distribution (Weekday Peak Hours)*, contains the directional distribution and assignment of the project traffic for the proposed land uses. As shown on Exhibit 5.5-5, the majority of project traffic distribution (75%) would occur to the east of the project site, along State Route 38. All of the trips



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-5

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ENVIRONMENTAL IMPACT REPORT

Project Traffic Distribution (Weekday Peak Hours)

generated on State Route 38, east of the project site, are distributed to Stanfield Cutoff, then to Big Bear Boulevard. Big Bear Boulevard, east of Stanfield Cutoff, would receive 45 percent of the project-generated traffic, while Big Bear Boulevard, west of Stanfield Cutoff, would receive 30 percent of the project-generated traffic. State Route 38, west of the project site, would receive 25 percent of the project-generated traffic. Traffic from State Route 38, west of the project site would distribute on to Rim of the World Highway (15 percent) and Big Bear Boulevard (10 percent).

Project-Related Traffic

Based on the identified traffic generation and distributions, project related daily traffic volumes are shown in Exhibit 5.5-6, *Project Generated Daily Traffic Volumes*. As shown on Exhibit 5.5-6, the majority of project-generated traffic (660 trips) would be distributed to the east of the project site, along State Route 38. All of the trips generated on State Route 38, east of the project site, are distributed to Stanfield Cutoff, then to Big Bear Boulevard. Big Bear Boulevard, east of the project site, would receive 396 trips from Stanfield Cutoff, while Big Bear Boulevard, west of Stanfield Cutoff, would receive 264 trips from Stanfield Cutoff. State Route 38, west of the project site, would receive 220 project-generated trips. Trips from State Route 38, west of the project site would be distributed to Rim of the World Highway (132 trips) and Big Bear Boulevard (88 trips).

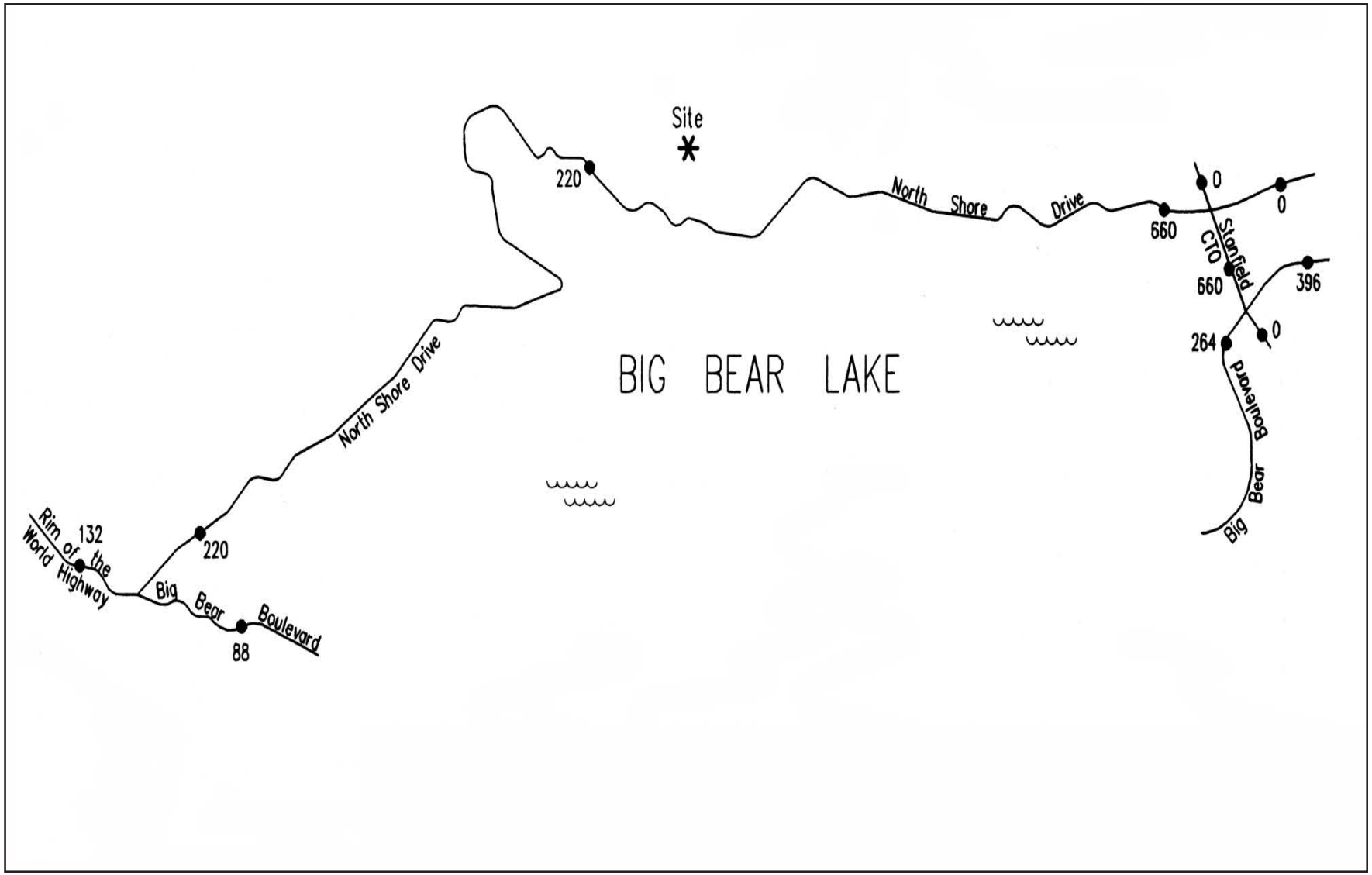
EXISTING PLUS PROJECT TRAFFIC CONDITIONS

Once the project-related traffic is assigned to the existing street network and added to existing volumes, the traffic impact can be assessed. Exhibit 5.5-7, *Existing Plus Project Daily Traffic Volumes – Peak Month*, illustrates the existing plus project traffic conditions for the peak month. As shown on Exhibit 5.5-7, the traffic volume on State Route 38, east of the project site and west of Stanfield Cutoff, is 5,417. The traffic volume on Stanfield Cutoff is 6,292, which includes traffic distributed from State Route 38 and Big Bear Boulevard. The highest traffic volumes occur on Big Bear Boulevard, with volumes of 20,767 west of Stanfield Cutoff, and volumes of 18,500 east of Stanfield Cutoff. Traffic volumes along State Route 38 (east of Stanfield Cutoff) and Stanfield Cutoff (north of State Route 38 and south of Big Bear Boulevard) would not be impacted by project generated traffic (refer to Exhibit 5.5-6).

The *Traffic Analysis* report prepared by Kunzman Associates contains plots of the existing plus project peak hour intersection turning movement volumes and number of intersection through and turning movement lanes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Traffic Signal Warrants

Traffic signal warrants have been adopted by the Federal Highway Administration and Caltrans. These warrants are based upon the eight highest hour volumes in a day. It is assumed by Caltrans that the eighth highest hour is 62.5 percent of the



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-6

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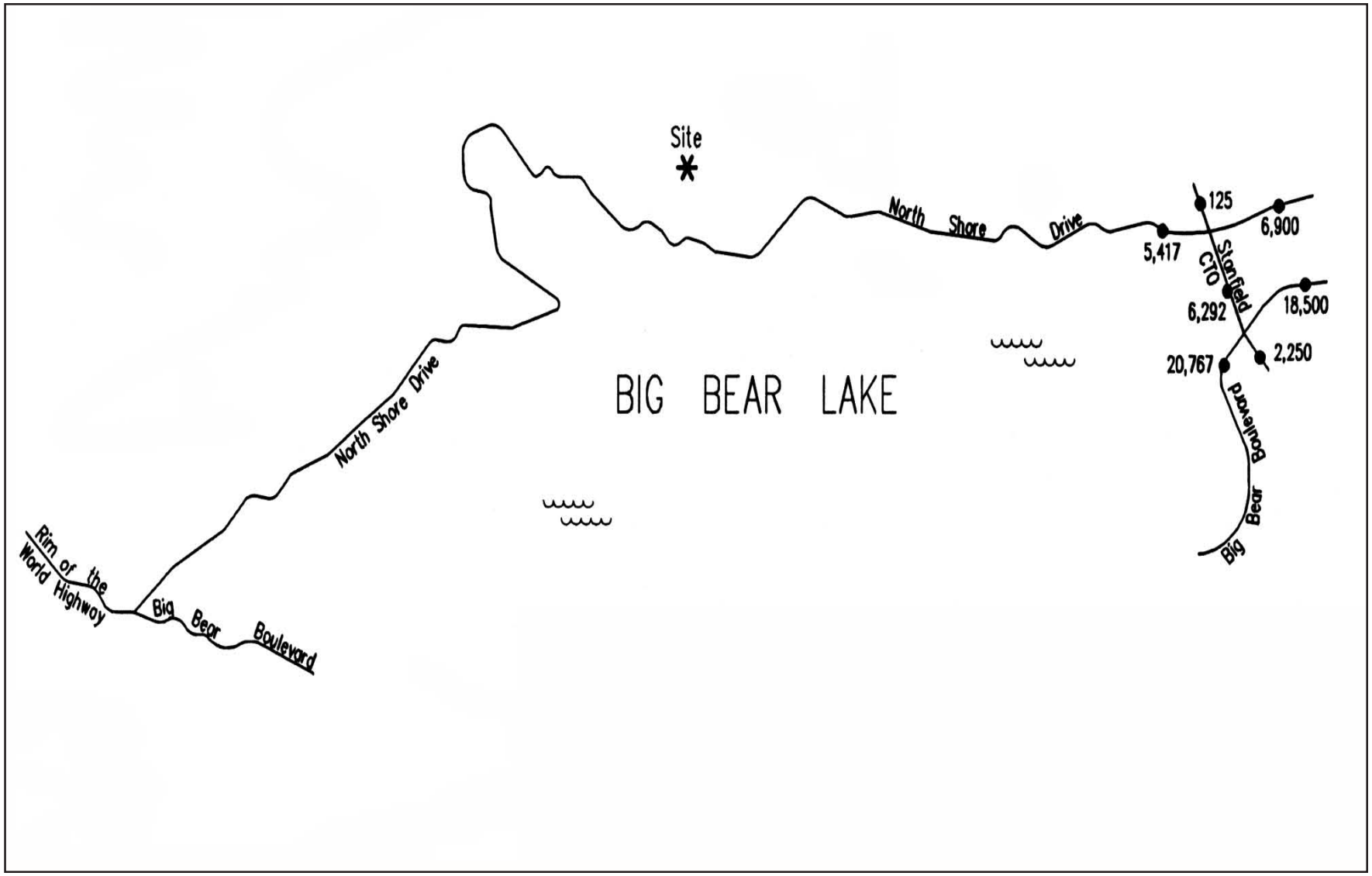
Project Generated Daily Traffic Volumes



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-7

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Existing Plus Project Daily Traffic Volumes - Peak Month

peak hour, and the peak hour is generally 10 percent of the daily traffic. Thus, the signal warrants can also be expressed in terms of daily traffic volumes. Rural traffic volume warrants are utilized when the 85th percentile speed of the major street traffic exceeds 40 miles per hour or when the intersection lies within the built up area of an isolated community having a population of less than 10,000. Table 5.5-6, *Traffic Signal Warrants (Based on Estimated Average Daily Traffic)*, shows the signal warrants in terms of daily traffic volumes.

When calculating signal volume warrants, the volumes of both the major and minor street must meet or exceed those listed in Table 5.5-6. Determining the major street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on both major street legs; usually the daily approach volume is 50 percent of the street's daily two-way volume on each leg. Finding the minor street daily signal warrant volume involves calculating the number of daily vehicles approaching the intersection on only the highest volume leg; usually the daily approach volume is 50 percent of the street's two-way daily volume. If the minor street forms a tee intersection with the major street, then the minor street volume is the highest volume because there is no other volume.

A traffic signal would not be warranted at the intersection of Stanfield Cutoff and North Shore Drive based on rural warrants. Rural warrants are applicable for rural areas and urban roadways with speeds over 40 miles per hour.

Existing Plus Project Intersection Delay and Level of Service

The Intersection Delay for the existing plus project traffic conditions have been calculated and are shown in Table 5.5-3. The Kunzman traffic report contains the Intersection Delay calculations. From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. Table 5.5-4 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 5.5-2 and 5.5-3, it can be seen that all intersections in the vicinity of the site operate at a LOS D or better for existing plus project peak hour traffic conditions, based on Delay. However, it should be noted that the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection. Although the project itself does not have a significant impact on this intersection it does contribute to an existing deficiency at the intersection. Pro-rata share payment for improvements to the intersection would reduce project affects to less than significant. It therefore is not required to mitigate this deficiency.

The Kunzman Associates traffic study references the need for the eastbound right turn lane to be converted to a through lane, which may require widening and an additional take of right of way. The widening and additional right of way may be needed before or after the intersection, or both. Whether widening and a take of right of way is required depends on lane widths and taper lengths required by Caltrans.

Table 5.5-6
Traffic Signal Warrants
(Based on Estimated Average Daily Traffic)

Signal Warrant	Minimum Requirements Estimated Average Daily Traffic (EADT)			
Urban . . . . . Rural . . . . . Use Rural if critical speed equals or exceed 40 MPH				
1. Minimum Vehicular Satisfied _____ Not Satisfied _____	Vehicles per day on major street (total of both approaches)		Vehicles per day on higher-volume minor-street approach (one direction only)	
Number of lanes for moving traffic on each approach				
Major Street / Minor Street	Urban	Rural	Urban	Rural
1 . . . . . 1	8,000	5,600 < < <	2,400	1,680 < < <
2 or more . . . . . 2 or more	9,600	6,720	2,400	1,680
2 or more . . . . . 2 or more	9,600	6,720	3,200	2,240
1 . . . . . 1	8,000	5,600	3,200	2,240
2. Interruption of Continuous Traffic Satisfied _____ Not Satisfied _____	Vehicles per day on major street (total of both approaches)		Vehicles per day on higher-volume minor-street approach (one direction only)	
Number of lanes for moving traffic on each approach				
Major Street / Minor Street	Urban	Rural	Urban	Rural
1 . . . . . 1	12,000	8,400 < < <	1,200	850 < < <
2 or more . . . . . 2 or more	14,400	10,080	1,200	850
2 or more . . . . . 2 or more	14,400	10,080	1,600	1,120
1 . . . . . 1	12,000	8,400	1,600	1,120
3. Combination Satisfied _____ Not Satisfied _____ No one warrant satisfied but following warrants fulfilled 80% or more . . . . . _____ (1) _____ (2)	2 Warrants		2 Warrants	

NOTES:

1. Heavier left turn movement from the major street may be included with minor street volume if a separate signal phase is to be provided for the left-turn movement.
2. To be used only for new intersections or other locations where actual traffic volumes cannot be counted.

<<<< These are the warrant volumes that apply to Stanfield Cutoff and North Shore Drive.

Source: Caltrans, Traffic Manual, page 9-8.

The available right-of-way in the mountains is restricted, the topography is difficult, and in many situations there are large pine trees in a location that may preclude the use of typical design criteria. There needs to be flexibility in design requirements in the mountains. Whatever design is accepted needs to meet minimum acceptable criteria which may be less than normal criteria.

The geometrics required is a Caltrans decision, and is subject to agreement by the County of San Bernardino.

YEAR 2006 TRAFFIC ANALYSIS

5.5-2 *Project implementation, with year 2006 traffic conditions, would result in an increase in traffic volumes. Analysis has concluded that implementation of recommended mitigation measures would reduce impacts to the intersection of Stanfield Cutoff and Big Bear Boulevard to a less than significant level.*

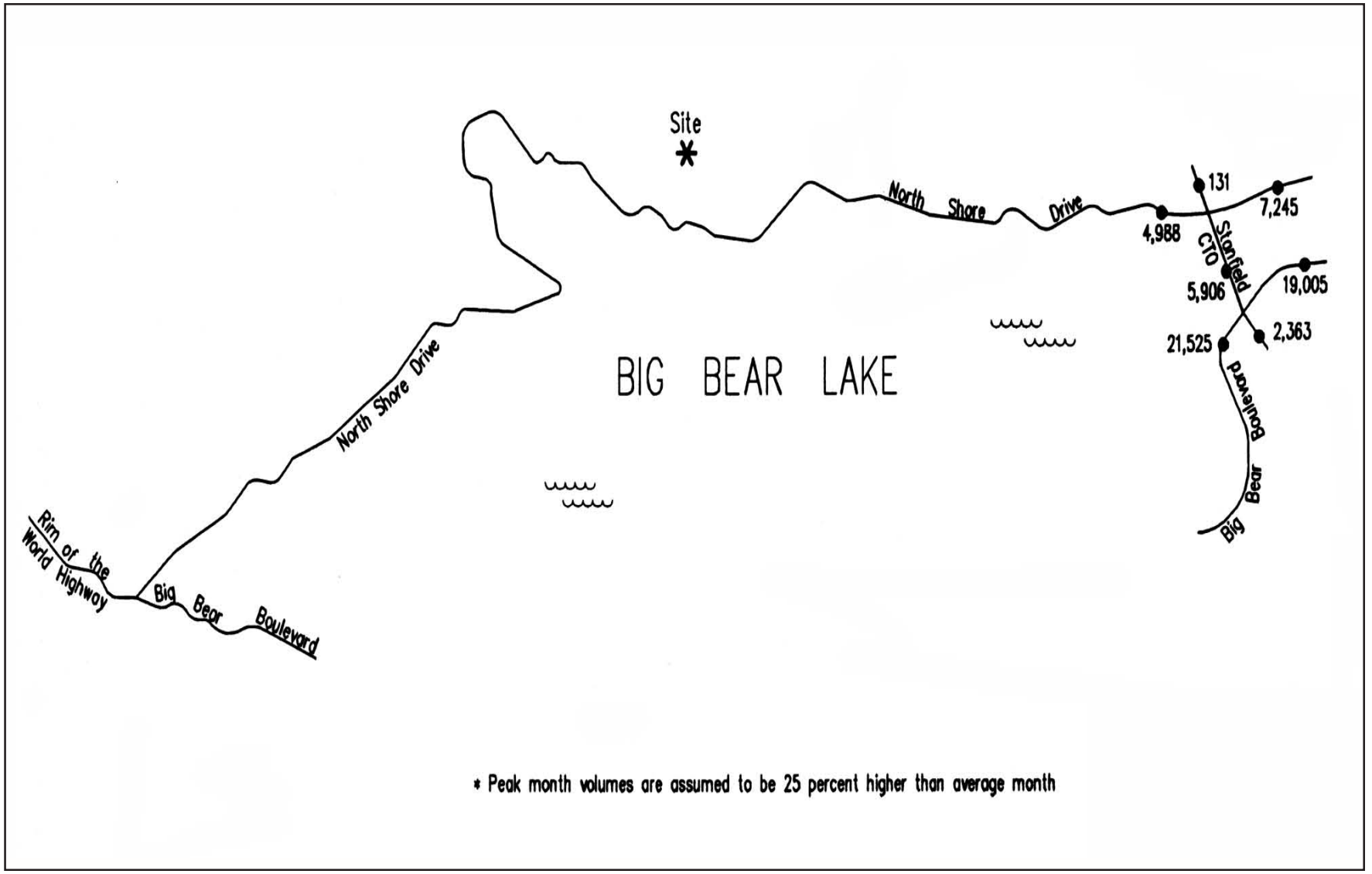
To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. The *Traffic Analysis* report contains analysis on the "existing plus other development traffic conditions" in 2006 (refer to Section 7 of the *Traffic Analysis* report). Exhibit 5.5-8, *Year 2006 Daily Traffic Volumes - Peak Month*, illustrates traffic conditions including other anticipated development with the project. Table 5.5-7, *Daily Leg Volume Calculations*, shows the calculations of intersection leg daily traffic volumes. To account for growth which can be expected in the area, a growth rate of 1 percent per year compounded annually for five years is assumed. The total compounded growth over 5 years is 5 percent. The basis of this growth rate assumption is the County of San Bernardino.

As shown on Exhibit 5.5-8, the daily traffic volumes on State Route 38, east of the project site and west of Stanfield Cutoff, is 4,988. The volumes on Stanfield Cutoff are 5,906, which include traffic distributed from State Route 38 and Big Bear Boulevard. The highest traffic volumes are on Big Bear Boulevard, with volumes of 21,525 west of Stanfield Cutoff and volumes east of Stanfield Cutoff of 19,005.

The Kunzman traffic report contains plots of the cumulative conditions peak hour intersection turning movement volumes and number of intersection through and turning movement lanes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Traffic Signal Warrants - Year 2006

Traffic signals would not be warranted at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. Refer to discussion under "Traffic Signal Warrants" under Impact Statement 5.5-1 for the applicability of Rural Warrants.



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-8

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Year 2006 Daily Traffic Volumes - Peak Month

Table 5.5-7
Daily LEG Volume Calculations

Intersection	Intersection Leg	Project Added Daily Leg Volume	Existing Year 2001		Year 2006		Year 2025	
			Existing Daily Volumes	With Project Volumes	Existing Plus Background Growth Daily Volumes	With Project Volumes	Existing Plus Background Growth Daily Volumes	With Project Volumes
1. Stanfield Cutoff (NS) and	North	0	100	100	105	105	124	124
North Shore Drive (EW)	South	667	4,500	5,167	4,725	5,392	5,580	6,247
	East	0	4,500	4,500	4,725	4,725	5,580	5,580
Average Month	West	667	2,100	2,767	2,205	2,872	2,604	3,271
2. Stanfield Cutoff (NS) and Big	North	667	4,500	5,167	4,725	5,392	5,580	6,247
Bear Boulevard (EW)	South	0	1,800	1,800	1,890	1,890	2,232	2,232
	East	400	13,800	14,200	14,490	14,890	17,112	17,512
Average Month	West	267	16,900	17,167	17,745	18,012	20,956	21,223
1. Stanfield Cutoff (NS) and	North	0	125	125	131	131	155	155
North Shore Drive (EW)	South	667	6,000	6,667	6,300	6,967	7,440	8,107
	East	0	6,000	6,000	6,300	6,300	7,440	7,440
Peak Month	West	667	2,700	3,367	2,835	3,502	3,348	4,015
2. Stanfield Cutoff (NS) and Big	North	667	6,000	6,667	6,300	6,967	7,440	8,107
Bear Boulevard (EW)	South	0	2,200	2,200	2,310	2,310	2,728	2,728
	East	400	17,300	17,700	18,165	18,565	21,452	21,852
Peak Month	West	267	21,100	21,367	22,155	22,422	26,164	26,431

NOTE: Background Growth Rate is assumed to be as follows in percent: 1.000

From Year 2001 to Year 2006 is 5 years. the calculated simple growth factor is : 1.050

From Year 2001 to Year 2025 is 24 years. The calculated simple growth factor is: 1.240

It should be noted that signals should be installed only when warranted and that installation of unwarranted signals can increase accident potential, energy consumption, and air pollutant emissions, while costing governmental jurisdictions approximately $500 per month for maintenance and utilities.

Existing Plus Other Development Level of Service – Year 2006

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 5.5-2 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 5.5-1, it can be seen that all intersections in the vicinity of the site operate at a LOS E or better for existing plus other development peak hour traffic conditions based on delay. However, as previously noted, the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. As stated under the existing plus project impact analysis, the solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection.

Existing Plus Project Plus Other Development Traffic Conditions – Year 2006

Additional development is presently planned in the vicinity of the site. To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. Exhibit 5.9-9, *Year 2006 Plus Project Daily Traffic Volumes – Peak Month*, illustrates traffic conditions including other planned development with the project.

As shown on Exhibit 5.5-9, *Year 2006 Plus Project Daily Traffic Volumes*, on State Route 38, east of the project site and west of Stanfield Cutoff, is 5655. The volumes on Stanfield Cutoff are 6573 which include traffic distributed from State Route 38 and Big Bear Boulevard. The highest traffic volumes are on Big Bear Boulevard with volumes of 21,792 west of Stanfield Cutoff and volumes east of Stanfield Cutoff of west of Stanfield Cutoff and volumes east of Stanfield Cutoff of 19,405.

Cumulative Conditions Level of Service – Year 2006

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 5.5-4 shows how LOS is related to Intersection Delay, and describes LOS.

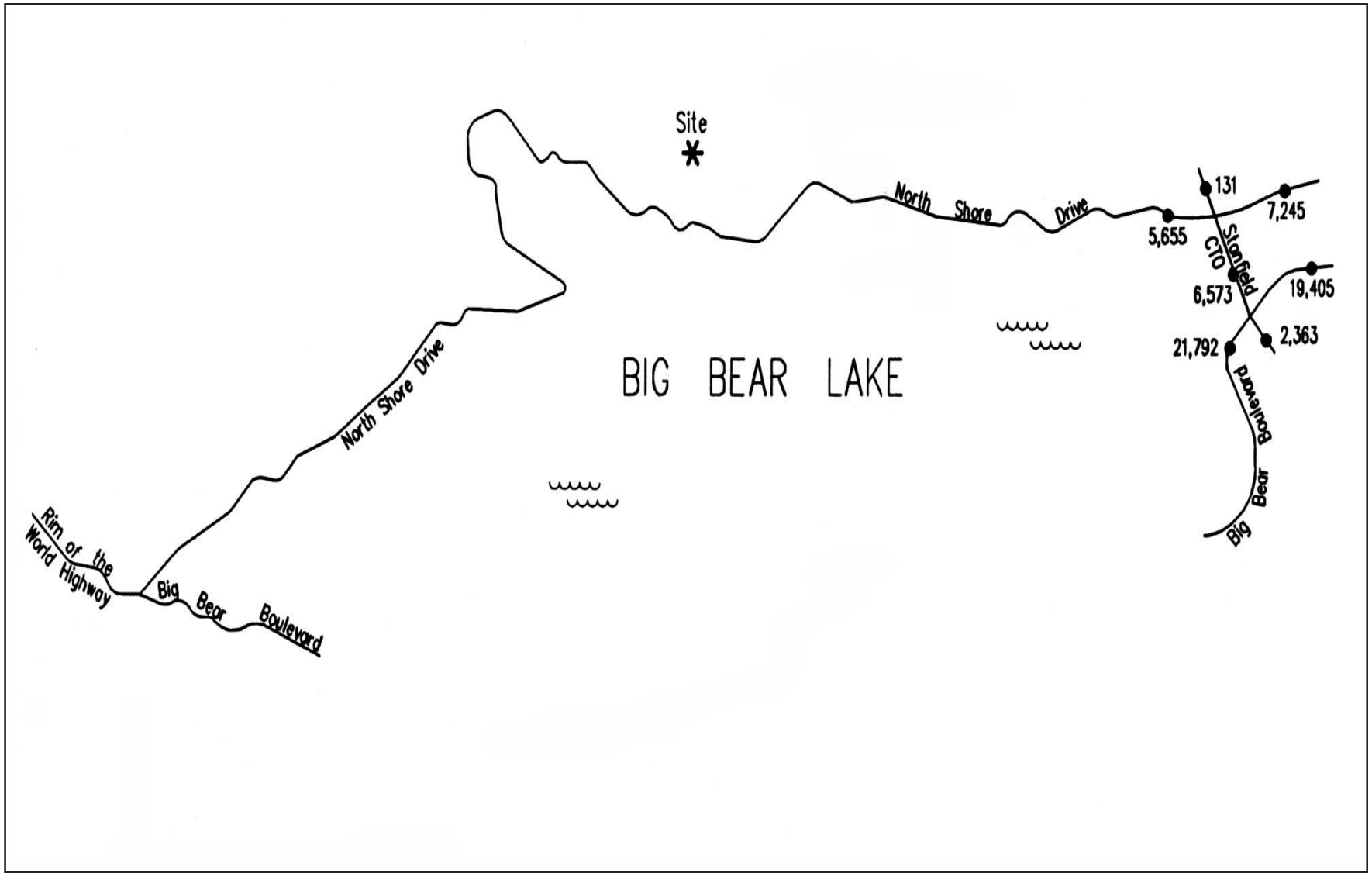
From Table 5.5-1, it can be seen that all intersections in the vicinity of the site operate at LOS F or better for cumulative peak hour traffic conditions based on delay. However, as noted, the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection.

YEAR 2025 TRAFFIC ANALYSIS

5.5-3 *Project implementation, with year 2025 traffic conditions, would result in an increase in traffic volumes. Analysis has concluded that implementation of recommended mitigation measures would reduce impacts to the intersection of Stanfield Cutoff/Big Bear Boulevard and Stanfield Cutoff/North Shore Drive to a less than significant level.*

To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. Exhibit 5.5-10, *Year 2025 Plus Project Daily Traffic Volumes - Peak Month*, illustrates traffic conditions including other anticipated development with the project. Table 5.5-8 shows the calculations of intersection leg daily traffic volumes. To account for growth which can be expected in the area, a growth rate of one percent per year compounded annually for 24 years has been assumed. The total compounded growth over 24 years is 24 percent. The basis of this growth rate assumption can be found in Table 5.5-1. To note, the *Traffic Analysis* report contains analysis on the "existing plus other development traffic conditions" in 2025 (refer to Section 9 of the *Traffic Analysis* report).

As shown on Exhibit 5.5-10, the traffic volume on State Route 38, east of the project site and west of Stanfield Cutoff, is 5,890. The traffic volume on Stanfield Cutoff is 6,975, which includes traffic distributed from State Route 38 and Big Bear Boulevard.



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-9

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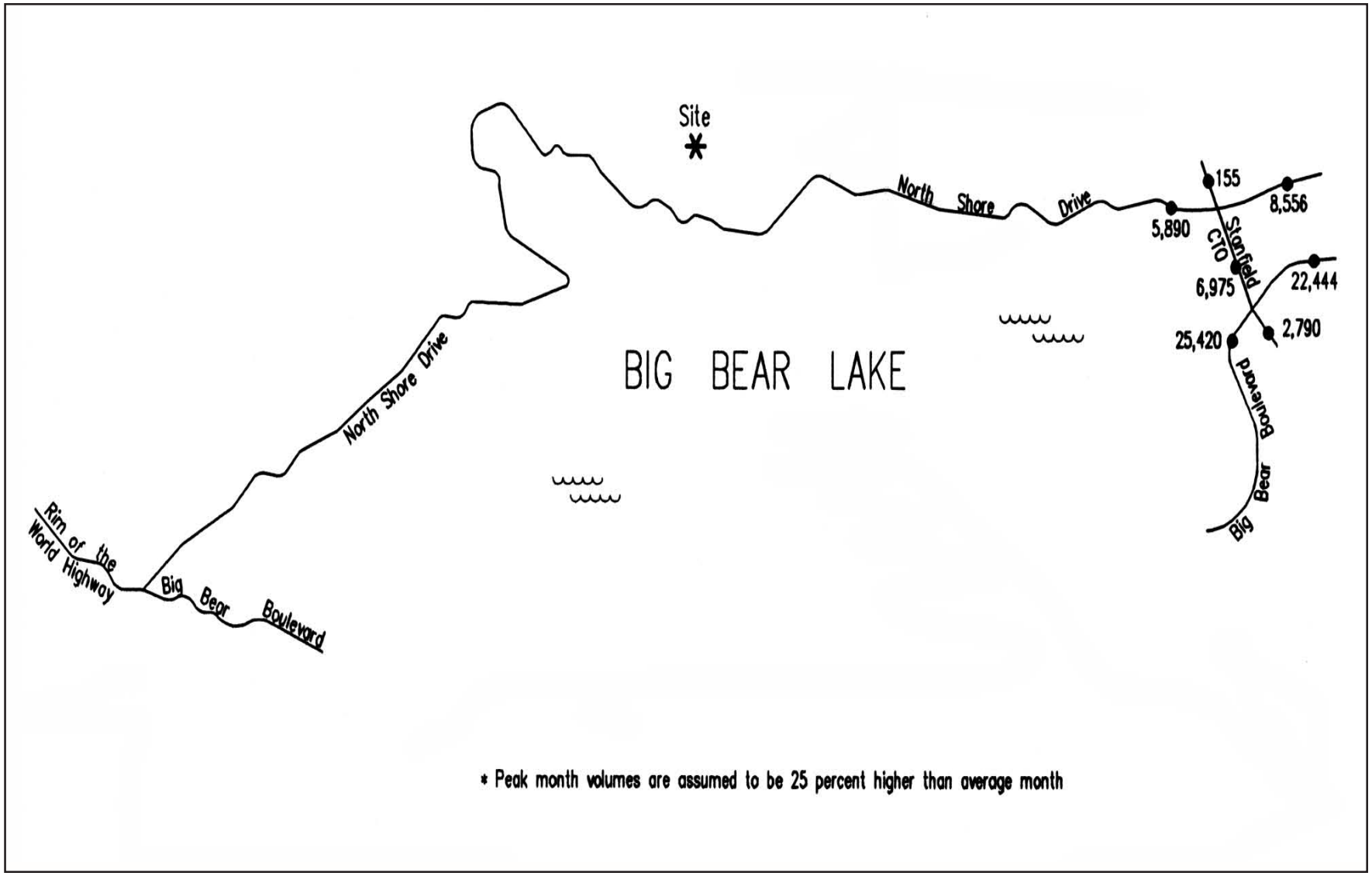
ENVIRONMENTAL IMPACT REPORT

Year 2006 Plus Project Daily Traffic Volumes - Peak Month



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-10

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Year 2025 Daily Traffic Volumes - Peak Month

The highest traffic volumes are contained on Big Bear Boulevard, with a traffic volume of 25,420 west of Stanfield Cutoff, and a traffic volume of 22,444 east of Stanfield Cutoff.

The Kunzman traffic report contains plots of the cumulative conditions peak hour intersection turning movement volumes and number of intersection through and turning movement lanes. Additionally, the same plots show the peak hour leg approach volumes and two-way peak hour leg volumes.

Traffic Signal Warrants - Year 2025

Traffic signals would be required at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. The applicability of Rural Warrants was previously discussed. Refer to discussion under "Traffic Signal Warrants" under Impact Statement 5.5-2 for the applicability of Urban Warrants.

Cumulative Conditions Intersection Delay and Level of Service - Year 2025

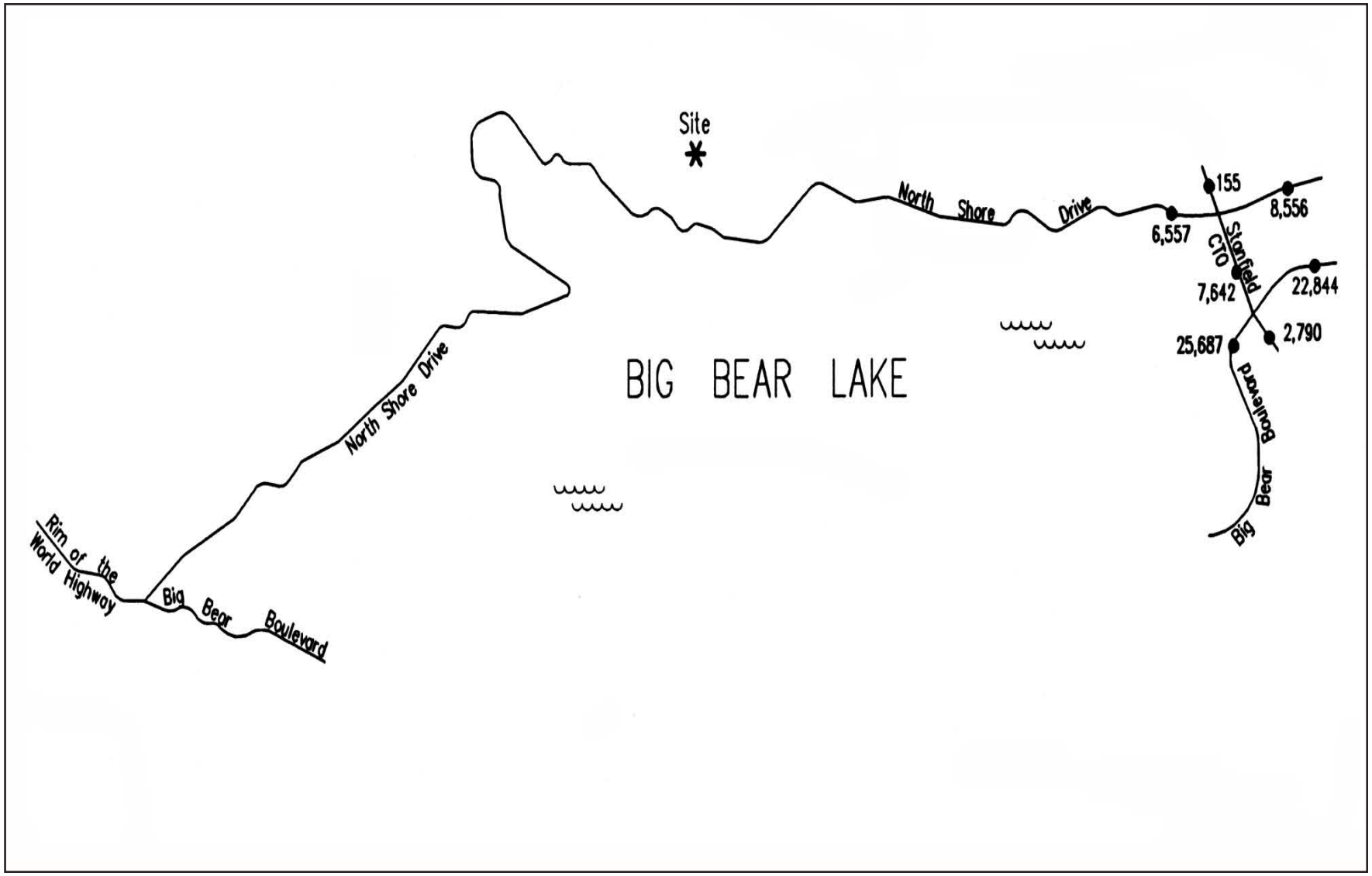
Table 5.5-3 shows the Intersection Delay for cumulative traffic conditions in 2025. Appendix B of the *Traffic Analysis* report contains the Intersection Delay calculations. From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. Table 5.5-4 shows how LOS is related to Intersection Delay, and describes LOS. As shown in Table 5.5-3, the analysis for Year 2025 "Peak Month With Project" traffic conditions evaluates the intersection of Stanfield Cutoff/Big Bear Boulevard under four different scenarios. The four scenarios are as follows:

- AM Peak Hour - Existing Lane Configuration
- PM Peak Hour – Restriped Lane Configuration
- AM Peak Hour – Existing Lane Configuration
- PM Peak Hour – Restriped Lane Configuration

As shown in Table 5.5-2 and 5.5-3, the intersection of Stanfield Cutoff/Big Bear Boulevard would operate at a LOS E or better for existing plus other development peak hour traffic conditions based on delay. However, as previously noted, the intersection of Stanfield Cutoff and Big Bear Boulevard currently operates at an intersection capacity utilization greater than 100 percent in the peak month weekday evening peak hour. The solution is to convert the eastbound right turn lane to an eastbound through lane through the intersection.

Existing Plus Project Plus Other Development Traffic Conditions – Year 2005

Additional development is presently planned in the vicinity of the site. To assess future traffic conditions, project traffic is combined with existing traffic and traffic from other surrounding development. Exhibit 5.5-11, *Year 2025 Plus Project Daily Traffic Volumes – Peak Month*, illustrates traffic conditions including other planned development with the project.



Source: Kunzman Associates, June 25, 2003.

Exhibit 5.5-11

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Year 2025 Plus Project Daily Traffic Volumes - Peak Month

As shown on Exhibit 5.5-11, Year 2025 Plus Project Daily Traffic Volumes on State Route 38, east of the Project site and west of Stanfield Cutoff is 6,557. The volumes on Stanfield Cutoff are 7,642 which include traffic distributed from State Route 38 and Big Bear Boulevard with volumes of 25,687 west of Stanfield Cutoff and volumes east of Stanfield Cutoff of 22,844.

Appendix B contains the Intersection Delay calculations. An explanation of Intersection Delay and how it is calculated is also included in Appendix B.

Cumulative Conditions Levels of Service – 2025

From the Intersection Delay analysis, the intersection Level of Service (LOS) can be determined. LOS is directly related to Intersection Delay. Table 5.5-4 shows how LOS is related to Intersection Delay, and describes LOS.

From Table 5.5-3, it can be seen that the intersection of Stanfield Cutoff and Big Bear Boulevard operates at LOS F, with or without the project, without mitigation measures, whether using the Delay method or the ICU method. To accommodate year 2006 traffic, it is recommended that the eastbound right turn lane be converted to an eastbound through lane through the intersection. This mitigation measure also solves the 2025 traffic conditions.

The project does not have a significant impact on this intersection based on the thresholds of significance described. It therefore is not required to help mitigate this deficiency.

Traffic Signal Warrants – Year 2025

Traffic signals will be warranted with or without the project at the intersection of Stanfield Cutoff and North Shore Drive based on Rural Warrants. The applicability of Rural Warrants was previously discussed.

Pro Rata Share of Off-Site Improvement Costs

Although the project does not significantly impact the intersection of Stanfield Cutoff and North Shore Drive, nor the intersection of Stanfield Cutoff and Big Bear Boulevard per the thresholds discussed, the County of San Bernardino has requested that a pro-rata share of the cost of offsite mitigation measures be calculated.

Specifically, for Stanfield Cutoff and North Shore Drive, the traffic signal is estimated by the County to cost $250,000. The sum of the peak month leg volumes today is 17,400. The sum of the leg volumes in 2025 without the project is 21,576. The project adds 1220 vehicles per day to the intersection leg volumes. The project's pro rata share is calculated as follows: 1220/(21,576+1220-17,400), or 22.61 percent of $250,000. The project's pro-rata share of the off-site improvement cost is $56,523.

Specifically, for Stanfield Cutoff and Big Bear Boulevard, the eastbound right turn lane needs to be converted to an eastbound through lane. This will involve adding pavement on the north side of the west leg of the intersection. It is estimated the

amount of pavement needed is 12 feet wide by 300 feet long, plus a 600 foot 50 to 1 transition from the 12 feet added width back to zero feet added. This will involve 7,200 square feet of pavement at an estimated cost of $10 per square foot, or $72,000. The $10.00 per square foot is equivalent to $1.27 million for one lane mile in each direction. The sum of the peak month leg volumes today is 46,475. The sum of the leg volumes in 2025 without the project is 57,629. The project adds 1220 vehicles per day to the intersection leg volumes. The project's pro rata share is calculated as follows: 1220/(57,629+1220-46,475), or 9.86 percent of $180,000. The project's pro-rata share of the offsite improvement cost is $17,748.

SAFETY HAZARDS AND EMERGENCY ACCESS

5.5-4 *Project implementation may increase hazards to vehicles, pedestrians and bicyclists due to the proposed project. Analysis has concluded that with implementation of the recommended mitigation measures, impacts would be less than significant.*

The project would have access from State Route 38, which is the primary roadway serving the north shore area. The project includes the realignment of this Highway. The realignment would occur in two phases, with construction of the new alignment completed before the existing alignment is demolished in order to eliminate the potential for hampering emergency response activity or evacuation plans. The project would include two interior roads, accessible from State Route 38. Per the analysis contained in the *Traffic Analysis* report, the following conclusions have been made regarding internal circulation and potential safety hazards:

- Site Access. To assure smooth traffic operations for vehicles entering and exiting the site, a 150 foot left turn pocket on is recommended on North Shore Drive at each project access location. The County of San Bernardino has suggested that it should be a continuous left turn pocket across the frontage of the property. Because it is a State Highway, Caltrans would need to decide which they prefer.

  A STOP sign should be installed to control outbound traffic on all site access roadways to North Shore Drive. With more than one driveway, good emergency access is assured because there are two ways of reaching any point within the site. Maintain a high level of service along arterials by restricting parking and controlling roadway access.

  Landscape plantings and signs should be limited to 36 inches in height within 25 feet of project driveways to assure good visibility.

  As is the case for any roadway design, the County should periodically review traffic operations in the vicinity of the project once the project is constructed to assure that the traffic operations are satisfactory.

- Internal Roadway Sizing. To identify future internal circulation needs to the project, future traffic volumes for internal roadways of the project have been determined. The maximum volume is approximately 400 vehicles per day, for which is a two-lane road is satisfactory.

- Internal Circulation. The traffic circulation internal to the proposed project has been reviewed from a traffic engineering viewpoint, and the findings are as follows:

  - Cul-de-sac Lengths: None of the cul-de-sacs have excessive length, which is important for emergency equipment access.

  - Four-Legged Intersections: On arterials, four legged intersections are desirable to reduce turning movements, and expedite traffic movement. On local streets, four legged intersections are undesirable. The proposed project has no four legged intersections on local streets.

  - Distance Between Intersections: It is desirable to place intersections at least two hundred feet apart. All intersections are at least 200 feet apart.

  - Grades: All grades are 10 percent or less, which is satisfactory.

  - Intersection Angle: Intersections at other than 90 degrees are undesirable. All intersecting streets are perpendicular to one another.

  - Visibility: All intersections are designed to afford adequate visibility.

It is concluded that the internal circulation is satisfactory in all aspects.

The *Traffic Analysis* report recommends mitigation measures to assure satisfactory traffic operations and good visibility. Implementation of the recommended mitigation measures would reduce potentially significant impacts to less than significant levels.

MITIGATION MEASURES

This section directly corresponds to the identified Impact Statements in the impacts subsection.

EXISTING CONDITIONS WITH PROJECT TRAFFIC ANALYSIS

5.5-1 For existing traffic conditions, the intersection of Stanfield Cutoff and Big Bear Boulevard currently requires the eastbound right turn lane to be converted to an eastbound through lane, through the intersection. The eastbound right turn lane is restricted to an eastbound through lane, and involves roadway widening. The project's pro rata share of these off-site road improvements is estimated to be $17,748.

YEAR 2006 TRAFFIC ANALYSIS

5.5-2 Refer to Mitigation Measure 5.5-1. No additional mitigation measures are recommended.

YEAR 2025 TRAFFIC ANALYSIS

5.5-3 For future traffic conditions, the intersection of Stanfield Cutoff and North Shore Drive shall require a traffic signal. The project's pro rata share of the signal is $56,523.

SAFETY HAZARDS AND EMERGENCY ACCESS

5.5-4a Parking shall be restricted on State Route 38.

5.5-4b A 150-foot eastbound left turn pocket shall be striped for traffic on North Shore Drive turning left into the project entry locations.

5.5-4c For future traffic conditions, intersection geometrics as recommended in Table 1b of the Kunzman Associates June 2003 *Traffic Analysis* report, shall be implemented.

5.5-4d All streets internal to the project shall be constructed to full ultimate cross-sections. ~~as adjacent development occurs.~~

5.5-4e A STOP sign shall be installed to control outbound traffic on all site access roadways onto North Shore Drive.

5.5-4f The County of San Bernardino shall periodically review traffic operations in the vicinity of the site once the project is constructed in order to assure that the traffic operations are satisfactory.

5.5-4g Landscape plantings and signs shall be limited to 36 inches in height within 25 feet of project driveways to assure good visibility.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

Following implementation of recommended mitigation measures, Traffic and Circulation impacts would be reduced to a less than significant level.

5.6 AIR QUALITY

This Section evaluates air quality impacts associated with short construction and long-term buildout of the Moon Camp Project. Information in this Section is based primarily on the *CEQA Air Quality Handbook*, prepared by the South Coast Air Quality Management District (SCAQMD), April 1993 (as revised through November 1993), Air Quality Data (SCAQMD 1999 through 2003); the *Final Air Quality Management Plan*, prepared by the South Coast Air Quality Management District (August 2003); and the *Fawnskin 92-Dwellings Traffic Analysis*, prepared by Kunzman Associates, September 2003.

EXISTING CONDITIONS

SOUTH COAST AIR BASIN

The South Coast Air Basin (Basin), in which the Community of Fawnskin is located, is characterized as having a "Mediterranean" climate (a semi-arid environment with mild winters, warm summers and moderate rainfall). The Basin is a 6,600-square mile area bounded by the Pacific Ocean to the west and the San Gabriel, San Bernardino, and San Jacinto Mountains to the north and east. The Basin includes all of Orange County and the non-desert portions of Los Angeles, Riverside, and San Bernardino Counties, in addition to the San Gorgonio Pass area in Riverside County. Its terrain and geographical location determine the distinctive climate of the Basin, as the Basin is a coastal plain with connecting broad valleys and low hills.

The general region lies in the semi-permanent high-pressure zone of the eastern Pacific. As a result, the climate is mild, tempered by cool sea breezes. The usually mild climatological pattern is interrupted infrequently by periods of extremely hot weather, winter storms, or Santa Ana winds. The extent and severity of the air pollution problem in the Basin is a function of the area's natural physical characteristics (weather and topography), as well as man-made influences (development patterns and lifestyle). Factors such as wind, sunlight, temperature, humidity, rainfall and topography all affect the accumulation and/or dispersion of pollutants throughout the Basin.

CLIMATE

The climate in the basin is characterized by moderate temperatures and comfortable humidities with precipitation limited to a few storms during the winter season (November through April). The average annual temperature varies little throughout the Basin, averaging 75 degrees Fahrenheit. However, with a less pronounced oceanic influence, the eastern inland portions of the Basin show greater variability in annual minimum and maximum temperatures. All portions of the Basin have had recorded temperatures over 100 degrees in recent years. January is usually the coldest month at all locations while July and August are usually the hottest months of the year. Although the Basin has a semi-arid climate, the air near the surface is moist because of the presence of a shallow marine layer. Except for infrequent periods when dry, continental air is brought into the Basin by off-shore winds, the ocean effect is dominant. Periods with heavy fog are frequent; and low stratus

clouds, occasionally referred to as “high fog” are a characteristic climate feature. Annual average relative humidity is 70 percent at the coast and 57 percent in the eastern part of the Basin. Precipitation is typically 9 to 14 inches annually in the Basin and is rarely in the form of snow or hail due to typically warm weather. The frequency and amount of rainfall is greater in the coastal areas of the Basin.

More specifically, the Community of Fawnskin enjoys an Alpine climate. The community is located in an area that intercepts water-laden clouds which can result in rainfall and/or snow of up to 35 to 45 inches. Precipitation at Big Bear Lake’s National Weather Service station from 1960 to 1995 averaged about 18 inches for each six-month period from October to March. The areas watershed is mountainous with steep upper slopes leading to a mildly sloping valley. The coolest month of the year is January with a mean monthly temperature of 32.4°F. The warmest month is July with a mean monthly temperature of 63.8°F.

SUNLIGHT

The presence and intensity of sunlight are necessary prerequisites for the formation of photochemical smog. Under the influence of the ultraviolet radiation of sunlight, certain original, or “primary” pollutants (mainly reactive hydrocarbons and oxides of nitrogen) react to form “secondary” pollutants (primarily oxidants). Since this process is time dependent, secondary pollutants can be formed many miles downwind from the emission sources. Because of the prevailing daytime winds and time-delayed nature of photochemical smog, oxidant concentrations are highest in the inland areas of Southern California. However, a majority of the smog in the Big Bear Valley is created by the transport of pollutants from Los Angeles, Riverside and San Bernardino Counties as opposed to local sources.

TEMPERATURE INVERSIONS

Under ideal meteorological conditions and irrespective of topography, pollutants emitted into the air would be mixed and dispersed into the upper atmosphere. However, the Southern California region frequently experiences temperature inversions in which pollutants are trapped and accumulate close to the ground. The inversion, a layer of warm, dry air overlaying cool, moist marine air, is a normal condition in the southland. The cool, damp and hazy sea air capped by coastal clouds is heavier than the warm, clear air that acts as a lid through which the marine layer cannot rise. The height of the inversion is important in determining pollutant concentration. When the inversion is approximately 2,500 feet above sea level, the sea breezes carry the pollutants inland to escape over the mountain slopes or through the passes. At a height of 1,200 feet, the terrain prevents the pollutants from entering the upper atmosphere, resulting in a settlement in the foothill communities. Below 1,200 feet, the inversion puts a tight lid on pollutants, concentrating them in a shallow layer over the entire coastal basin. Usually, inversions are lower before sunrise than during the daylight hours. Mixing heights for inversions are lower in the summer and more persistent, being partly responsible for the high levels of ozone observed during summer months in the Basin. Smog in Southern California is generally the result of these temperature inversions combining with coastal day winds and local mountains to contain the pollutants for long periods of time, allowing

them to form secondary pollutants by reacting with sunlight. The Basin has a limited ability to disperse these pollutants due to typically low wind speeds.

The area in which the Community of Fawnskin is located offers approximately 300 days/year of clear skies and sunshine, however, it is still susceptible to air inversions. This traps a layer of stagnant air near the ground where it is further loaded with pollutants. These inversions cause haziness, which is caused by moisture, suspended dust, and a variety of chemical aerosols emitted by trucks, automobiles, furnaces and other sources.

AMBIENT AIR QUALITY STANDARDS

National air quality policies are regulated through the Federal Clean Air Act (FCAA) of 1970 and its 1977 and 1990 amendments. Pursuant to the CAA, the United States Environmental Protection Agency (EPA) has established National Ambient Air Quality Standards (NAAQS) for six air pollutants: carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM_{10}) and lead (Pb). These pollutants are referred to as criteria pollutants because numerical criteria have been established for each pollutant, which define acceptable levels of exposure. The EPA has revised the NAAQS several times since their original implementation and will continue to do so as the health effects of exposure to air pollution are better understood. The federal 1-hour ozone standard will remain in effect until the EPA formally implements the 8-hour standard.

Under the 1977 amendments to the FCAA, states with air quality that did not achieve the NAAQS were required to develop and maintain State Implementation Plans (SIPs). These plans constitute a federally enforceable definition of the states approach (or "plan") and schedule for the attainment of the NAAQS. Air quality management areas were designated as "attainment," "non-attainment" or "unclassified" for individual pollutants depending on whether or not they achieve the applicable NAAQS and CAAQS for each pollutant. In addition, California can designate areas as transitional. It is important to note that because the NAAQS and CAAQS differ in many cases, it is possible for an area to be designated attainment by the EPA (meets NAAQS) and non-attainment by the California Air Resources Board (CARB) (does not meet CAAQS) for the same pollutant.

Areas that were designated as non-attainment in the past, but have since achieved the NAAQS, are further classified as attainment-maintenance. The maintenance classification remains in effect for 20 years from the date that the area is determined by the EPA to meet the NAAQS. There are numerous classifications of the non-attainment designation, depending on the severity of non-attainment. For example, the O_3 non-attainment designation has seven subclasses: transitional, marginal, moderate, serious, severe-15, severe-17, and extreme. Areas that lack monitoring data are designated as unclassified areas. Unclassified areas are treated as attainment areas for regulatory purposes.

Table 5.6-1
Local Air Quality Levels

Pollutant	California Standard	Federal Primary Standard	Year	Maximum[3] Concentration	# of Days State Std. Exceeded	# of Days Federal Std. Exceeded
Carbon Monoxide[2]	9.0 ppm for 8 hour	9.0 ppm for 8 hour	1999 2000 2001 2002 2003	4.1 ppm 4.1 3.3 3.2 4.5	0 0 0 0 0	0 0 0 0 0
Ozone[1] (8 Hours)	NA	0.08 ppm for 8 hours	1999 2000 2001 2002 2003	0.14 ppm 0.15 0.14 0.14 0.14	NA NA NA NA NA	82 64 74 82 71
Ozone[1] (Hourly)	0.09 ppm for 1 hour	0.12 ppm for 1 hour	1999 2000 2001 2002 2003	0.17 ppm 0.18 0.17 0.16 0.16	93 85 18 91 84	30 18 26 22 34
Nitrogen Dioxide[2]	0.25 ppm for 1 hour	NA	1999 2000 2001 2002 2003	0.14 ppm 0.11 0.11 0.11 0.10	0 0 0 0 0	0 0 0 0 0
Particulate Matter (PM_{10})[1, 4, 5]	50 $\mu g/m^3$ for 24 hours	150 $\mu g/m^3$ for 24 hours	1999 2000 2001 2002 2003	47.0 $\mu g/m^3$ 49.0 74.0 52.0 47.0	0 0 2 5 0	0 0 0 0 0
Fine Particulate Matter ($PM_{2.5}$) [2,5]	65 $\mu g/m^3$ for 24 hours	65 $\mu g/m^3$ for 24 hours	1999 2000 2001 2002 2003	121.4 $\mu g/m^3$ 89.8 78.5 82.1 58.4	NA NA NA NA NA	4 2 5 3 0

ppm = parts per million
$\mu g/m^3$ = micrograms per cubic meter
NA = not applicable
PM_{10} = particulate matter 10 microns in diameter or less
$PM_{2.5}$ = particulate matter 2.5 microns in diameter or less
NM = not measured

NOTES:
1. Crestline Station, 24171 Lake Drive, Crestline, California. Located approximately 19 miles west of the project site.
2. San Bernardino Station, 24302 East 4th Street, San Bernardino, California. Located approximately 18 miles southwest of the project site.
3. Maximum concentration is measured over the same period as the California Standard.
4. PM_{10} exceedances are based on state thresholds established prior to amendments adopted on June 20, 2002.
5. PM_{10} and $PM_{2.5}$ exceedances are derived from the number of samples exceeded, not days.

Source: *ADAM Air Quality data Statistics*, California Air Resources Board, http://www.arb.ca.gov/adam/welcome.html

Despite implementing many strict controls, the SCAB still fails to meet the Federal air quality standards for three of the criteria pollutants: O_3, CO and PM_{10}. For State standards, the SCAB is designated as non-attainment for O_3 and PM_{10}.[1] Atmospheric concentrations of the other criteria pollutants do not exceed State or Federal standards.

[1] California Air Resources Board, *Proposed Amendments to the Area Designation Criteria and Area designations for State Ambient Air Quality Standards*, December 5, 2003.

ATTAINMENT STATUS

LOCAL AMBIENT AIR QUALITY

The SCAQMD operates several air quality monitoring stations within the Basin. The following air quality information briefly describes the various types of pollutants that are found within the South Coast Air Basin. Additionally, Table 5.6-2, *Air Pollution Sources, Effects and Standards,* provides information on the primary health related effects of the criteria pollutants.

Carbon Monoxide (CO)

CO is an odorless, colorless toxic gas that is formed by the incomplete combustion of fuels. Motor vehicles are by far the largest source of CO in the Basin. At high concentrations, CO can reduce the oxygen-carrying capacity of the blood and cause headaches, dizziness, unconsciousness, and even death. CO also aggravates cardiovascular disease. For CO, the subject portion of the Basin is designated as an attainment area for State standards, however, as a non-attainment area for Federal standards.

Ozone (O_3)

Ground-level ozone, often referred to as smog, is not emitted directly, but is formed in the atmosphere through complex chemical reactions between NO_X and reactive organic gases (ROG) in the presence of sunlight. The principal sources of NO_X and ROG, often termed ozone precursors, are combustion processes (including motor vehicle engines) and evaporation of solvents, paints and fuels. Motor vehicles are the single largest source of O_3 precursor emissions in the SCAQMD. Exposure to O_3 can cause eye irritation, aggravate respiratory diseases and damage lung tissue, as well as damage vegetation and reduce visibility. The entire Basin is designated as a non-attainment area for State and Federal O_3 standards.

Oxides of Nitrogen (NO_X or Nitrogen Dioxide (NO_2))

NO_2, often used interchangeably with NO_X, is a reddish-brown gas that can cause breathing difficulties at high levels. Peak readings of NO_2 occur in areas that have a high concentration of combustion sources (e.g., motor vehicle engines, power plants, refineries, and other industrial operations) in the vicinity. The entire Basin is designated as an attainment area for State and Federal NO_2 standards.

Oxides of Sulfur (SO_X or Sulfur Dioxide (SO_2))

Sulfur Dioxide (SO_2) is a colorless, irritating gas with a “rotten egg” smell formed primarily by the combustion of sulfur-containing fossil fuels. Lead is a metal that is a natural constituent of air, water and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Sulfur dioxide is often used interchangeably with sulfur oxides (SO_X) and lead (Pb). Sulfur dioxide levels in all areas of the Basin do not exceed Federal or State standards. The Basin is designated as attainment for both State and Federal SO_2 standards. Since

ambient concentrations of lead have decreased in the Basin, the SCAQMD no longer monitors the presence of lead in ambient air.

Table 5.6-2
Air Pollution Sources, Effects and Standards

Air Pollutant	State Standard	Federal Primary Standard	Sources	Primary Effects
Ozone (O_3)	0.09 ppm, 1-hour average	0.08 ppm, 8-hour average	Atmospheric reaction of organic gases with nitrogen oxides in sunlight	Aggravation of respiratory and cardiovascular diseases, irritation of eyes, impairment of cardiopulmonary function, plant leaf injury
Carbon Monoxide (CO)	9.0 ppm, 8-hour average 20 ppm, 1-hour average	9.5 ppm, 8-hour average 35 ppm, 1-hour average	Incomplete combustion of fuels and other carbon-containing substances such as motor vehicle exhaust, natural events, such as decomposition of organic matter	Reduced tolerance for exercise, impairment of mental function, impairment of fetal development, death at high levels of exposure, aggravation of some heart diseases (angina)
Nitrogen Dioxide (NO_2)	0.25 ppm, 1-hour average	0.0534 ppm, annual avg.	Motor vehicle exhaust, high-temperature stationary combustion, atmospheric reactions	Aggravation of respiratory illness, reduced visibility, reduced plant growth, formation of acid rain
Sulfur Dioxide (SO_2)	0.25 ppm, 1-hr. avg. 0.04 ppm, 24-hr. avg. with ozone > = 0.10 ppm, 1 hr. avg. or TSP > = 100 $\mu g/m^3$, 24-hr. avg.	0.03 ppm, annual arithmetic mean 0.14 ppm, 24-hour average	Combustion of sulfur-containing fossil fuels, smelting of sulfur-bearing metal ores, industrial processes	Aggravation of respiratory diseases (asthma, emphysema), reduced lung function, irritation of eyes, reduced visibility, plant injury, deterioration of metals, textiles, leather finishes, coatings, etc.
Fine Particulate Matter (PM10)	20 $\mu g/m^3$, annual geometric mean > 50 $\mu g/m^3$, 24-hr. avg.	PM_{10}: 50 $\mu g/m^3$, annual arithmetic mean 150 $\mu g/m^3$, 24-hr. avg.	Stationary combustion of solid fuels, construction activities, industrial processes, industrial chemical reactions	Reduced lung function, aggravation of the effects of gaseous pollutants, aggravation of respiratory and cardio-respiratory diseases, increased coughing and chest discomfort, soiling, reduced visibility
	$PM_{2.5}$: 12 $\mu g/m^3$, annual geometric mean 65 $\mu g/m^3$, 24-hr. avg.	$PM_{2.5}$: 15 $\mu g/m^3$, annual geometric mean 65 $\mu g/m^3$, 24-hr. avg.		
Lead	1.5 $\mu g/m^3$, 30-day average	1.5 $\mu g/m^3$, calendar quarter	Contaminated soil	Increased body burden, impairment of blood formation and nerve conduction
Visibility Reducing Particles	Reduces visual range to less than 10 miles at relative humidity less than 70%, 8-hour avg (9am - 5pm).			Visibility impairment on days when relative humidity is less than 70 percent

Source: *CEQA Air Quality Handbook*, South Coast Air Quality Management District, 1993, and updated with current Federal ozone and $PM_{2.5}$ standards.

Particulate Matter (PM_{10})

PM_{10} refers to suspended particulate matter which is smaller than 10 microns or ten one-millionths of a meter. PM_{10} arises from sources such as road dust, diesel soot, combustion products, construction operations and dust storms. PM_{10} scatters light and significantly reduces visibility. In addition, these particulates penetrate into lungs and can potentially damage the respiratory tract. On June 19, 2003 the CARB adopted amendments to the statewide 24-hour particulate matter standards based upon requirements set forth in the Children's Environmental Health Protection Act (Senate Bill 25). The Federal 24-hour standard of 150 $\mu g/m^3$ was retained.

Fine Particulate Matter ($PM_{2.5}$)

Due to recent increased concerns over health impacts related to fine particulate matter (particulate matter 2.5 microns in diameter or less), both State and Federal $PM_{2.5}$ standards have been created. Particulate matter impacts primarily affect infants, children, the elderly and those with pre-existing cardiopulmonary disease. In 1997, the EPA announced new $PM_{2.5}$ standards. Industry groups challenged the new standard in court and the implementation of the standard was blocked. However, upon appeal by the EPA, the U.S. Supreme Court reversed this decision and upheld the EPA's new standards. The Federal Standard is 65 $\mu g/m^3$ over an average of 24 hours.

On June 20, 2002, CARB adopted amendments for statewide annual ambient particulate matter air quality standards. These standards were revised/established due to increasing concerns by

CARB that previous standards were inadequate, as almost everyone in California is exposed to levels at or above the current State standards during some parts of the year, and the statewide potential for significant health impacts associated with particulate matter exposure was determined to be large and wide-ranging.[2] Based upon a desire to set clean air goals throughout the State, the CARB created a new annual average standard for $PM_{2.5}$ at 12 $\mu g/m^3$. Currently, the CARB has issued a staff report, which recommends that the South Coast Air Basin be designated as non-attainment for State and Federal $PM_{2.5}$ standards[3].

Volatile Organic Compounds (VOCs or Reactive Organic Gasses (ROG))

Hydrocarbon compounds are any compounds containing various combinations of hydrogen and carbon atoms that exist in the ambient air. VOCs contribute to the formation of smog and/or may themselves be toxic. VOCs often have an odor and some examples include gasoline, alcohol and the solvents used in paints. There are no specific State or Federal VOC thresholds as they are regulated by individual air districts as O_3 precursors.

[2] California Environmental Protection Agency, Air Resources Board, *Staff Report: Public Hearing to Consider Amendments to the Ambient Air Quality Standards for Particulate Matter and Sulfates,* May 3, 2002.

[3] Ibid, page 4.8-3.

Visibility

Visibility can be defined as the distance that atmospheric conditions permit a person to see at any given time. Technically, visibility is defined as the farthest distance an observer can distinguish a large black object against the horizon. Reduced visibility causes aesthetic impairment of surroundings and also interferes with aircraft operations. Visibility may be impaired by natural or man-made sources, including natural aerosols such as precipitation, fog, soil particles, volcanic emissions, vegetation, sea spray and organic decomposition products; and man-made sources such as sulfates and nitrates. The greatest contribution to visibility reduction in the Basin is from light scattering by "fine particle" aerosols with the size range of 0.1 to 2 microns (a micron is one-millionth of a meter). Based on review of available technical data provided by CARB, visibility was not measured at SCAQMD Monitoring Stations between 1999 and 2003.

Total Suspended Particulates (TSP)

Total Suspended Particulates (TSP) is the name given to the solid matter suspended in the atmosphere. Approximately 9.5 percent of TSP is generated by stationary sources. This complicated mixture of natural and man-made materials includes soils particles, biological materials, sulfates, nitrates, organic (or carbon-containing compounds) and lead. A high volume sampler is used to determine TSP concentration by passing a measured column of air through a glass fiber filter. The filter then is weighed to determine the concentration of TSP, after which it is analyzed for lead, sulfate, and nitrate by an SCAQMD laboratory. TSP tends to be at higher concentrations in the day and has an unclear seasonal pattern. High dust levels result from strong winds and loose, arid soil. Larger dust particles pose a less serious health threat than small particles produced by fossil fuel combustion. TSP monitoring was discontinued in 1991.

Lead (Pb)

In the Basin, atmospheric lead is generated almost entirely by the combustion of leaded gasoline and contributes less than one percent of the material collected as TSP in 1982. Atmospheric lead concentrations have been reduced substantially in recent years due to the lowering of average lead content in gasoline. Exceedances of the State air quality standard for lead (monthly average concentration of 1.50 ug/m^3) now are confined to the densely populated portions of San Bernardino County where vehicle traffic is greatest.

REGULATORY FRAMEWORK

FEDERAL CLEAN AIR ACT

The FCAA (1977 amendments) 42 USC 7401 *et. seq.*) state that the federal government is prohibited from engaging in, supporting, providing financial assistance for, licensing, permitting or approving any activity that does not conform to an applicable SIP. Federal actions relating to transportation plans, programs and projects developed, funded, or approved under 23 USC of the Federal Transit Act

(40 USC 1601 *et. seq*.) are covered under separate regulations for transportation conformity.

In the 1990 FCAA amendments (FCAAA), the EPA included provisions requiring federal agencies to ensure that actions undertaken in non-attainment or attainment-maintenance areas are consistent with applicable SIPs. The process of determining whether or not a Federal action is consistent with an applicable SIP is called conformity.

The EPA General Conformity Rule applies only to federal actions that result in emissions of "non-attainment or maintenance pollutants", or their precursors, in federally designated non-attainment or maintenance areas. The EPA General Conformity Rule establishes a process to demonstrate that federal actions would be consistent with applicable SIPs and would not cause or contribute to new violations of the NAAQS, increase the frequency or severity of existing violations of the NAAQS, or delay the timely attainment of the NAAQS. The emissions thresholds that trigger requirements of the conformity rule for federal actions emitting nonattainment or maintenance pollutants, or their precursors, are called *de minimus* levels. The general conformity *de minimus* thresholds are defined in 40 CFR 93.153(b). The federal General Conformity Rule does not apply to federal actions in areas designated as non-attainment of only the CAAQS.

CALIFORNIA CLEAN AIR ACT

CARB administers the air quality policy in California. The CAAQS were established in 1969 pursuant to the Mulford-Carrell Act. These standards, included with the NAAQS in Table 4.8-1, are generally more stringent and apply to more pollutants than the NAAQS. In addition to the criteria pollutants, CAAQS have been established for visibility reducing particulates, hydrogen sulfide, and sulfates. The CCAA, which was approved in 1988, requires that each local air district prepare and maintain an air quality management plan (AQMP) to achieve compliance with CAAQS. These AQMP's also serve as the basis for preparation of the SIP for the State of California.

CARB establishes policy and statewide standards and administers the State's mobile source emissions control program. In addition CARB oversees air quality programs established by State statute, such as Assembly Bill (AB) 2588, the Air Toxics "Hot Spots" Information and Assessment Act of 1987.

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

The SCAQMD is one out of 35 air quality management districts that have prepared Air Quality Management Plans (AQMPs) to accomplish the five percent annual reduction goal. The most recent AQMP was adopted in 2003. To accomplish its task, the AQMP relies on a multi-level partnership of governmental agencies at the federal, state, regional and local level.

The 2003 AQMP relies on a multi-level partnership of governmental agencies at the federal, state, regional and local level. These agencies (EPA, CARB, local governments, Southern California Association of Governments (SCAG) and the

SCAQMD are the primary agencies that implement the AQMP programs. The 2003 AQMP proposes policies and measures to achieve federal and state standards for improved air quality in the SCAB and those portions of the Salton Sea Air Basin (formerly named the Southeast Desert Air Basin) that are under SCAQMD jurisdiction.

The 2003 AQMP also addresses several state and federal planning requirements and incorporates significant new scientific data, primarily in the form of updated emissions inventories, ambient measurements, new meteorological episodes and new air quality modeling tools. The 2003 AQMP is consistent with and builds upon the approaches taken in the 1997 AQMP and the 1999 Amendments to the Ozone State Implementation Plan (SIP) for the SCAB for the attainment of the federal ozone air quality standard. However, the 2003 AQMP points to the urgent need for additional emission reductions (beyond those incorporated in the 1997/99 Plan) to offset increased emission estimates from mobile sources and meet all federal criteria pollutant standards within the time frames allowed under the Federal Clean Air Act (FCAA).

SCAG is responsible under the FCAA for determining conformity of projects, plans and programs with the SCAQMD AQMP. As indicated in the *AQMD Air Quality Analysis Guidance Handbook*, there are two main indicators of consistency:

- Whether the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP; and

- Whether the project would exceed the AQMP's assumptions for 2020 or increments based on the year of project build-out and phase.

TOXIC AIR CONTAMINANTS (TACS)

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern in Southern California. There are hundreds of different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases of hazardous materials during upset conditions. Health effects of TACs include cancer, birth defects, neurological damage, and death.

California regulates toxic air contaminants through its air toxics program, mandated in Chapter 3.5 (Toxic Air Contaminants) of the Health and Safety Code (H&SC Section 39660 et. seq.) and Part 6 (Air Toxics "Hot Spots" Information and Assessment) (H&SC Section 44300 et. seq.).

The CARB, working in conjunction with the Office of Environmental Health Hazard Assessment (OEHHA), identifies toxic air contaminants. Air toxic control measures may then be adopted to reduce ambient concentrations of the identified toxic air

contaminant below a specific threshold based on its effects on health, or to the lowest concentration achievable through use of best available control technology for toxics (T-BACT). The program is administered by the CARB. Air quality control agencies, including the SCAQMD, must incorporate air toxic control measures into their regulatory programs or adopt equally stringent control measures as rules within six months of adoption by the CARB.

The Air Toxics "Hot Spots" Information and Assessment Act, codified in the Health and Safety Code, required operators of specified facilities in the District to submit to the SCAQMD comprehensive emissions inventory plans and reports by specified dates (H&SC Section 39660 et. seq. and Section 44300 et. seq.). The SCAQMD reviews the reports and then places the facilities into high, intermediate, and low priority categories, based on the potency, toxicity, quantity, and volume of hazardous emissions, and on the proximity of potential sensitive receptors to the facility. Facilities designated as high priority (Category A) must prepare a health risk assessment. Those found to pose a significant risk are required to notify the surrounding population. The emissions inventory data are to be updated every two years.

Diesel exhaust is a growing concern in the Basin area and throughout California. The CARB in 1998 identified diesel engine particulate matter as a TAC. The exhaust from diesel engines includes hundreds of different gaseous and particulate components, many of which are toxic. Many of these toxic compounds adhere to the particles, and because diesel particles are very small, they penetrate deeply into the lungs. Diesel engine particulate matter has been identified as a human carcinogen. Mobile sources (including trucks, buses, automobiles, trains, ships and farm equipment) are by far the largest source of diesel emissions. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections.

Prior to the listing of diesel exhaust as a TAC, California had already adopted various regulations that would reduce diesel emissions. These regulations include new standards for diesel fuel, emission standards for new diesel trucks, buses, autos, and utility equipment, and inspection and maintenance requirements for health duty vehicles. Following the listing of diesel engine particulate matter as a TAC, the CARB is currently evaluating what additional regulatory action is needed to reduce public exposure. The CARB does not plan on banning diesel fuel or engines. The CARB may consider additional requirements for diesel fuel and engines, however, as well as other measures to reduce public exposure.

SENSITIVE RECEPTORS

Certain land uses are particularly sensitive to air emissions, including schools, hospitals, rest homes, long-term medical and mental care facilities and parks and recreation areas.

Existing sensitive receptors within the vicinity of the project site include residential uses to the east along Highway 38, to the west along Oriole Lane and to the north along Flicker Road. Other sensitive receptors include the following:

Schools
- North Shore Elementary School (765 N. Stanfield Cutoff)
- Big Bear Middle School (41275 Big Bear Boulevard)

Library
- Big Bear Lake Branch Library (41930 Garstin Drive)

Hospitals
- Big Bear Valley Community Hospital (41870 Garstin Road)

EMISSIONS ESTIMATION PROCEDURE

Emissions are estimated using the Urban Emissions (URBEMIS) 2002 Model developed and tested by CARB and approved for use by the SCAQMD. The URBEMIS2002 model is an emissions estimation tool for land use and development projects. The model has been modified and enhanced to estimate construction and area source emissions for various air districts in California. Specific emission factors for each air basin, including the Basin, have been incorporated into the model that account for compliance with air basin specific requirements. Various default parameters specific to each region have been verified and approved by local regulatory agencies and are also included into the model. Additionally, the model includes the ability to selectively identify and account for various mitigation measures.

The SCAQMD, along with other air pollution agencies in California, is actively involved in maintaining and updating the model. The URBEMIS2002 model includes the following updates compared to URBEMIS2001: on-road mobile source emission factors from CARB's EMFAC2002 model have been incorporated into the URBEMIS model to calculate on-road source emissions for both construction and operation; emission factors for off-road mobile sources derived from CARB's off-road model have been incorporated into URBEMIS to estimate emissions from off-road construction equipment; the construction module has been substantially revised to correct problems identified in URBEMIS2001 and provide flexibility by allowing the user to allocate construction emissions by construction phase.

IMPACTS

SIGNIFICANCE CRITERIA

In accordance with CEQA, the effects of a project are evaluated to determine if they will result in a significant impact on the environment. An Environmental Impact Report (EIR) is required to focus on these effects and offer mitigation measures to reduce or avoid any significant impacts that are identified. The criteria, or standards, used to determine the significance of impacts may vary depending on the nature of the project. Air quality impacts resulting from the implementation of the proposed project could be considered significant if they cause any of the following to occur:

- Conflict with or obstruct implementation of the applicable air quality plan (refer to Impact Statement 5.6-3);

- Violate any air quality standard or contribute substantially to an existing or projected air quality violation (refer to Impact Statements 5.6-1 and 5.6-2);

- Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors) (refer to Impact Statement 5.6-4);

- Exposes sensitive receptors to substantial pollutant concentrations (refer to Impact Statement 5.6-2); and/or

- Create objectionable odors affecting a substantial number of people (refer to Section 10.0, *Effects Found Not To Be Significant*).

The SCAQMD *CEQA Air Quality Handbook* establishes thresholds for pollutant emissions generated both during and following construction. Buildout of the proposed project would be required to implement control measures during construction activities in order to reduce the amount of emissions to below the significance thresholds, when possible. SCAQMD construction and operation thresholds are indicated in Table 5.6-3, *SCAQMD Thresholds of Significant Contribution to Regional Air Pollution*. As previously stated, the Basin is designated non-attainment for State standards for O_3 and PM_{10} and for CO under Federal standards. Any increase in these pollutants would create a significant and unavoidable air quality impact.[4]

Table 5.6-3
SCAQMD Thresholds of Significant Contribution to Regional Air Pollution

Pollutant	Threshold of Significant Effect	
	Construction Emissions	Operational Emissions
Reactive Organic Gases (ROG)	75 lbs/day	55 lbs/day
Oxides of Nitrogen (NOx)	100 lbs/day	55 lbs/day
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Particulate Matter (PM10)	150 lbs/day	150 lbs/day
Source: *CEQA Air Quality Handbook*, South Coast Air Quality Management District, 1997.		

SHORT-TERM AIR QUALITY IMPACTS

5.6-1 *Significant short-term air quality impacts would occur during site preparation and project construction. These impacts are considered significant before and after mitigation for ROG and NO_X emissions from construction equipment exhaust. Impacts would be less than significant*

[4] The SCAQMD is in the process of revising the *CEQA Air Quality Handbook*. Three chapters have been revised to date including Chapters 2 - Improving Air Quality, 3 – Basin Air Quality Information, and 4 – Early Consultation and Sensitive Receptor Siting Criteria.

for other pollutants. (Mitigation in this instance refers to applicable County Development Code Sections and SCAQMD Rules.)

Short-term air quality impacts would occur during grading and construction operations associated with implementation of the proposed project. The short-term air quality analysis considers cumulative construction emissions combined with the proposed project. The temporary impacts include:

- Particulate (fugitive dust) emissions from clearing and grading activities on-site;
- Exhaust emissions and potential odors from the construction equipment used on-site as well as the vehicles used to transport materials to and from the site;
- Off-site air pollutant emissions at the power plant serving the site, while temporary power lines are needed to operate construction equipment and provide lighting; and
- Exhaust emissions from the motor vehicles of the construction crew.

The above described power plant and vehicle emissions are generated during construction activities. Project-related power plant and motor vehicle emissions are further analyzed in the long-term impacts portion of this Section. Potential odors generated during construction operations are temporary in nature and are not considered to be an impact (refer to Section 10.0, *Effects Found Not To Be Significant*).

It should be noted that emissions produced during grading and construction activities are "short-term" in nature as they endure only for the duration of construction.

Fugitive Dust Emissions

Construction activities are a source of fugitive dust (PM_{10}) emissions that may have a substantial, temporary impact on local air quality. In addition, fugitive dust may be a nuisance to those living and working in the project vicinity. Fugitive dust emissions are associated with land clearing, ground excavation, cut and fill operations, and truck travel on unpaved roadways. Dust emissions also vary substantially from day to day, depending on the level of activity, the specific operations, and weather conditions.

Fugitive dust from grading and construction is expected to be short-term and would cease following project completion. Additionally, most of this material is inert silicates, rather than the complex organic particulates released from combustion sources, which are more harmful to health. Dust (larger than 10 microns) generated by such activities usually becomes more of a local nuisance than a serious health problem. Of particular health concern is the amount of PM_{10} (particulate matter smaller than 10 microns) generated as a part of fugitive dust emissions. As previously discussed, PM_{10} poses a serious health hazard; alone or in combination with other pollutants. The URBEMIS2002 computer model (adapted from the

URBEMIS7G model by the SCAQMD) calculates PM_{10} fugitive dust as part of the site grading emissions (refer to Table 5.6-4, below). Even with implementation of standard construction practices regarding dust control techniques (i.e., daily watering), limitations on construction hours, and adherence to SCAQMD Rule 403 (requires watering for inactive and perimeter areas, track out requirements, etc.), impacts from PM_{10} fugitive dust would be less than significant.

Table 5.6-4
Construction Emissions

Emissions Source	Pollutant (pounds/day)[1]			
	ROG	NO_X	CO	PM_{10}
Unmitigated Emissions[2]	400.3	162.5	192.6	52.1
SCAQMD Threshold	75	100	550	150
Is Threshold Exceeded Before Mitigation?	***Yes***	***Yes***	***No***	***No***
Mitigated Emissions[4]	400.3	162.5	192.6	20.4
Is Threshold Exceeded After Mitigation?	***Yes***	***Yes***	***No***	***No***

ROG = reactive organic gases NO_X = nitrogen oxides CO = carbon monoxide PM_{10} = fine particulate matter

NOTES:
[1] Emissions calculated using the URBEMIS2002 Computer Model as recommended by the SCAQMD and project specific construction data provided by the project applicant.
[2] Calculations include emissions from numerous sources including: site grading, construction worker trips, stationary equipment, diesel and gas mobile equipment, and asphalt off-gassing using a maximum amount of grading per day of 2.5 acres and 260 working days per year. For future lot development, air quality modeling assumes a conservative scenaric that roadway surfaces will be graded, and that rough grading will occur for the proposed pad foundations. Results are based on the maximum amount of site grading, construction and asphalt activity that would occur in one day. Due to the uncertainty of future pad foundations and the relatively small amounts of pollutants generated, fine grading has not been included in this analysis.
[3] Refer to Appendix 15.4, *Air Quality Data*, for assumptions used in this analysis, including quantified emissions reduction by mitigation measures. Emissions would exceed the SCAQMD quarterly construction emissions for NOx and ROG.
[4] The reduction/credits for construction emission mitigations are based on mitigations included in the URBEMIS2002 computer model and as typically required by the SCAQMD. The mitigations include the following: proper maintenance of mobile and other construction equipment and speed limitation on unpaved roads to 15 miles per hour.

Construction Equipment and Worker Vehicle Exhaust
(Significant after mitigation for NO_X emissions)

Exhaust emissions from construction activities include emissions associated with the transport of equipment, worker trips, emissions produced on-site as the equipment is used, and emissions from trucks to/from the site. Emitted pollutants would include CO, ROG, NO_X, and PM_{10}.

Table 5.6-4, *Construction Emissions*, presents exhaust emission factors for typical diesel-powered heavy equipment. Refer to Appendix 15.4, *Air Quality Data*, for a listing of mobile and stationary construction equipment included in these calculations. Computer model results are also included in Appendix 15.4. The maximum area estimated to be disturbed per day would total 2.5 acres. The modeling input assumes that a maximum amount of grading took place five days per week throughout the year (260 days). These assumptions are based upon a worst case scenario, based upon the rugged site conditions.

As indicated in Table 5.6-4, emissions associated with construction equipment within the project area are anticipated to exceed SCAQMD construction thresholds for NO_X and ROG. Feasible mitigation measures are not available to reduce the significance of short-term construction NO_X and ROG emissions to less than significant levels.

As such, short-term air emissions for this pollutant would be considered significant and unavoidable.

LONG-TERM OPERATIONAL IMPACTS

5.6-2 *The project would result in an overall increase in the local and regional pollutant load due to direct impacts from vehicle emissions and indirect impacts from electricity and natural gas consumption. Combined mobile and area source emissions would exceed SCAQMD thresholds for ROG, CO and PM_{10}. These exceedances are considered significant and cannot be mitigated to a less than significant level.*

The calculations for the following analysis are based upon the Traffic Study (refer to Section 5.5, *Traffic and Circulation*). Buildout of Moon Camp would occur incrementally over time beginning with the realignment/construction of North Shore Drive. The County of San Bernardino on a project-by-project basis would evaluate the exact details of each individual lot construction. However, for the purposes of this air quality emissions analysis, it was assumed that all of the residential lots would be built in one phase.

Long-term air quality impacts would consist of mobile source emissions generated from project-related traffic and from stationary source emissions generated directly from the natural gas consumed and indirectly from the power plant providing electricity to the project site. Emissions associated with each of these sources are discussed and calculated below.

Mobile Source Emissions Only: Regional Impacts

Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions. Depending upon the pollutant being discussed, the potential air quality impact may be of either regional or local concern. For example, ROG, NO_X, SO_X, and PM_{10} are all pollutants of regional concern. (NO_X and ROG react with sunlight to form O_3 or photochemical smog, and SO_X and PM_{10} are readily transported by wind currents). However, CO tends to be a localized pollutant, dispersing rapidly at the source. Long-term impacts to regional air quality levels are analyzed below.

As previously discussed, the Basin is a non-attainment area for Federal and State air quality standards for O_3 and PM_{10} and for CO (Federal standard only). Nitrogen oxides and ROG are regulated O_3 precursors. (A precursor is defined as a directly emitted air contaminant that, when released into the atmosphere, forms or causes to be formed or contributes to the formation of a secondary air contaminant for which an ambient air quality standard has been adopted). Project-generated vehicle emissions have been estimated using the URBEMIS2002 computer model (published by the SCAQMD and based on the URBEMIS7G model). This model predicts ROG, CO, NO_X, and PM_{10} emissions from motor vehicle traffic associated with new or modified land uses (refer to Appendix 15.4, *Air Quality Data*, for model input values used for this project with the model output). Project trip generation rates were based on the Project Traffic Study (refer to Section 5.5, *Traffic and Circulation*,

and Appendix 15.3, *Traffic Data*). Table 5.6-5, *Long-Term Project Emissions*, presents anticipated regional mobile emissions.

Area Source Emissions

The proposed project would generate electrical demand and heating demands resulting in natural gas and wood burning combustion. Electrical demand would result in electrical generation emissions from local power plants. As shown in Table 5.6-5, *Long-Term Project Emissions*, stationary source emissions generated directly from the natural gas consumed and wood burning, and indirectly from the power plant providing electricity to the project site would exceed SCAQMD thresholds with operation (ROG, CO and PM_{10}).

Residential Wood Burning Fireplaces

All burning creates harmful by-products of combustion, resulting in air pollution. Materials on the low end of the energy scale such as wood and charcoal create the most pollution. Sources on the high end of the energy scale or ladder, such as natural gas and propane burn very cleanly resulting in very little air pollution. The basic constituents of wood smoke pollutants are:[5]

- Particulates.[6] PM_{10}, $PM_{2.5}$, and Nanoparticulate particulates are tiny particles suspended in the air that are too small to be filtered out, and thus become embedded deep within the lungs. The most injurious are particles classified as PM_{10}, 10 microns in diameter or less. Wood smoke PM_{10} contains creosote, soot, and ash. Most smoke particles average less than one micron (one millionth of a meter), allowing them to remain airborne for 3 weeks. The particles are efficient vehicles for transporting toxic gases, bacteria and viruses deep into the lungs where they pass into the blood stream. Inhalation of PM_{10} causes coughing, irritation and permanent scarring and damage to the lungs resulting in decreased lung function and increases in respiratory illness. These effects become significant at averages less than 40 micrograms per cubic meter. Smoke from just one fireplace burning has been found to cause particulate levels to exceed 200 ug/m^3 in the outdoor air surrounding the neighboring property.

- Carcinogens. Polycyclic Aromatic Hydrocarbons (PAH): Residential wood burning is the source of 50 percent of airborne Polynuclear Organic Material (POM) in the U.S. POMs contain a group of compounds known as PAHs which include many Class A carcinogens. The U.S. EPA estimates the cancer risk from wood smoke is twelve times greater than that from equal amounts of tobacco smoke. Wood burning also creates dioxins (refer to Footnote 5).

[5] A Summary of the Emissions Characterization and Noncancer Respiratory Effects of Wood Smoke, 1993 EPA Report, EPA-453/R-93-036.

[6] Particulate pollution in the past decade has been measured as PM_{10}, that is particulate matter 10 microns in diameter or less, which is talcum powder size. Recently the focus has shifted to smaller diameter particles, $PM_{2.5}$, which denotes all particles 2.5 microns and smaller (bacteria sized). These small sizes are thought to be more injurious because they are deeply respirable, becoming lodged in the farthest recesses of the lungs. Smoke from wood combustion is almost entirely in this range.

- Dioxin. Carbon Monoxide: An odorless gas resulting from all burning but produced in large amounts when burning takes place with reduced oxygen, such as in wood stoves. Even small amounts in the air reduce the body's ability to transport oxygen, constrict muscles and blood vessels, stress the heart, and result in feeling cold, fatigued and nauseated. High CO levels are found indoors where wood is burned.

- Respiratory Irritants and Toxins. There are over 100 different chemicals and compound groups in emissions from burning wood. In addition to those noted above there are chemicals known to be toxic such as formaldehyde, propionaldehyde, acetaldehyde, isobutyraldehyde, phenol, cresols. Nitrogen dioxide released from burning wood impairs the respiratory system and reduces its ability to fight infection. This combines with the organic compounds to form ozone which makes breathing difficult. High levels of Volatile Organic Compounds are found in the emissions of lawn equipment, charcoal grills and many personal care and cleaning products.

The project proposes 92 single-family residential lots, which are assumed for the purposes of this analysis to have wood burning fireplaces. The URBEMIS2002 computer model generates worst-case particulate quantities based upon 8 hours of use per day during the winter months. Additionally, URBEMIS2002 predicts wood burning quantities for Carbon Monoxide (CO) and Reactive Organic Gases (ROG). However, these pollutants can be reduced through the installation of an Environmental Protection Agency (EPA) certified fireplace. If properly operated, the cleaner EPA certified fireplaces built after 1992 can decrease the level of polluting emissions by up to 85 percent and create the same amount of heat during the winter using 30 percent less wood. Additionally, the installation of a ceramic coating on the honeycomb inside a catalytic combustor has been proven to help the gases and particles in smoke burn faster and at lower temperatures. Alternatively, the installation of a natural gas burning fireplace with ceramic logs eliminates particulate emissions.

Recreational Boating Activities

Lot “C” is a gated entrance to the project, including a proposed boat dock, consisting of 100 boat slips, which would be available for use by residents of the tract and accessible by Lot “C”. The types of vessels, which would be docked at the boat slips, would be comprised of outboard and personal watercraft. These boat engines, which have typically used simple two-stroke technology, contribute about 12 percent of hydrocarbon (HC) emissions from mobile sources. Emission standards for outboard and personal watercraft engines call for manufacturers to meet increasingly stringent HC levels over a nine-year phase-in period starting in 1998. By 2006 all manufacturers will produce engines with 75 percent lower HC emissions. The gradually decreasing emission standard allows manufacturers to determine the best approach for achieving the targeted reductions over time by allowing them to phase in the types of control technologies in the most sensible way, while minimizing the cost impact to the consumer.[7] With the Environmental Protection Agency’s new regulation over outboard and personal watercraft (EPA420-F-96-012), marine

[7] United States Environmental Protection Agency, *Reducing Air Pollution from Nonroad Engines*, Office of Transportation and Air Quality, November 2000.

engines will be over 75 percent cleaner in 2006, as compared to marine engine technology in 1998. Since the reduction of HC emissions depends on sales of these newer technology engines, the EPA expects to achieve this reduction in HC emissions from marine engines by the year 2025. EPA expects a 50 percent reduction to occur by the year 2020.[8]

Total Project Operational Emissions: Area and Mobile Sources
(Significant for ROG, CO and PM_{10} emissions)

As shown in Table 5.6-5, the mobile source and area emissions associated with the proposed project would generate pollutant emissions in excess of SCAQMD thresholds. Thus, implementation of the proposed project would create a significant and unavoidable individual project impact from ROG, CO and PM_{10} emissions. The ROG emissions are primarily from the combustion of wood in the fireplaces. As the proposed project would exceed established ROG, CO and PM_{10} thresholds, the project would create a significant and unavoidable impact to regional levels of these pollutants.

Table 5.6-5
Long-Term Project Emissions[1]

Project	Pollutant (Pounds/Day)			
	ROG	NO_X	CO	PM_{10}
(unmitigated)				
• Area Source Emissions[2]	1,035.1	14.5	1,137.3	155.8
• Vehicle Emissions	10.1	17.4	127.8	14.3
Total Unmitigated Emissions	1,045.2	31.9	1,265.1	170.1
SCAQMD Threshold	55	55	550	150
Is Threshold Exceeded? (Significant Impact?)	**Yes**	**No**	**Yes**	**Yes**

ROG = reactive organic gases NO_X = nitrogen oxides CO = carbon monoxide PM_{10} = fine particulate matter

NOTES:
1 – Based on URBEMIS2002 modeling results, worst-case seasonal emissions for area and mobile emissions, and trip rate data provided in the project Traffic Study.
2 – Operational scenario assumes 25 percent utilization of outdoor wood burning stoves and 100% utilization of fireplaces.

Localized CO Emissions

The SCAQMD recommends performing a carbon monoxide hotspots analysis when a project increases the intersection capacity utilization (ICU) by 0.02 (2 percent) for any intersection with a Level of Service (LOS) rating of D or worse. Carbon monoxide is the pollutant of major concern along roadways since the most notable source of carbon monoxide is vehicles. For this reason carbon monoxide concentrations are usually indicative of the local air quality generated by the roadway network, and are used as an indicator of its impacts upon local air quality. CO is an odorless, colorless toxic gas that is formed by the incomplete combustion of fuels

[8] *National Management Measures Guidance to Control Nonpoint Source Pollution from Marinas and Recreational Boating*, United States Environmental Protection Agency, November 2001.

that at high concentrations can lead to a localized plumes commonly referred to as "Carbon Monoxide Hotspots". A screening level analysis was performed per SCAQMD protocol for Year 2006 and Year 2025 peak month conditions for the following intersections:

- Stanfield Cutoff/Big Bear Boulevard
- Stanfield Cutoff/North Shore Drive

In order to simulate a worst-case conservative scenario, the intersections were screened in existing configuration without improvements. The carbon monoxide screening utilized the intersection analysis as contained within the Project traffic report. Based upon the Traffic Report, the project would generate 880 daily trips, 69 of which would occur during the morning peak hour and 93 of which would occur during the evening peak hour. As illustrated in Table 5.6-6 – *Carbon Monoxide Screening Analysis*, the maximum intersection delay increase due to the Project is 1.5 percent at Stanfield Cutoff and Big Bear Boulevard. Therefore, there would be a less than significant impact in regards to Carbon Monoxide Hotspots.

Table 5.6-6
Carbon Monoxide Screening Analysis

Intersection	Scenario					
	Year 2006 No Project ICU (LOS)	Year 2006 With Project ICU (LOS)	Intersection Delay Increase	Year 2025 No Project ICU (LOS)	Year 2025 With Project ICU (LOS)	Intersection Delay Increase
Stanfield Cutoff/Big Bear Blvd.						
AM Peak Hour	0.861 (D)	0.876 (D-)	0.015 (1.5%)	0.827 (D+)	0.839 (D)	0.012 (1.2%)
PM Peak Hour	1.097 (F-)	1.102 (F-)	0.005 (0.5%)	1.250 (F-)	1.255 (D+)	0.005 (0.5%)
Stanfield Cutoff/North Shore Dr.						
AM Peak Hour	- (B)	- (B)	-	- (A+)	- (A+)	-
PM Peak Hour	- (B)	- (B)	-	- (A+)	- (A+)	-

ICU = Intersection Capacity Utilization LOS = Level of Service
Notes:
1 – ICU and LOS derived from the Project Traffic Report Dated September 2003.
2 – Values reflect existing unimproved roadway conditions for peak month traffic data.

CONSISTENCY WITH AIR QUALITY MANAGEMENT PLAN

5.6-3 *The project would not conflict with the Air Quality Management Plan (AQMP). Analysis has concluded that the proposed project is consistent with the AQMP criteria.*

As noted under the Significance Criteria discussion, a potentially significant impact to air quality would occur if the project would conflict with or obstruct the implementation of the applicable air quality plan. Although the project would represent an incremental negative impact to air quality in the Basin, of primary concern is that project-related impacts have been properly anticipated in the regional

air quality planning process and reduced whenever feasible. Therefore, it is necessary to assess the project's consistency with the AQMP.

According to the SCAQMD *CEQA Air Quality Handbook*, the purpose of the consistency finding is to determine if a project is inconsistent with the assumptions and objectives of the regional air quality plans, and thus if it would interfere with the region's ability to comply with federal and State air quality standards. If the project is inconsistent, local governments need to consider project modifications or inclusion of mitigation to eliminate the inconsistency. It is important to note that even if a project is found consistent it could still have a significant impact on air quality under CEQA. Consistency with the AQMP means that a project is consistent with the goals, objectives, and assumptions in the respective plan to achieve the federal and State air quality standards.

As indicated in SCAQMD's *CEQA Air Quality Handbook*, there are two main indicators of consistency:

- Whether the project would not result in an increase in the frequency or severity of existing air quality violations or cause or contribute to new violations, or delay timely attainment of air quality standards or the interim emission reductions specified in the AQMP; and

- Whether the project would exceed the AQMP's assumptions for 2010 or increments based on the year of project build-out and phase.

Since the project would only create an additional 880 trips, the AQMP's assumptions would not be exceeded. Additionally, the Applicant will pay its fair share contribution to implement necessary improvements to improve the level of service. Therefore, the project would be considered consistent with the AQMP in this regard.

The project would result in an increase in the severity of existing air quality violations. The Basin is presently in non-attainment for O_3 and PM_{10} air quality standards (both State and Federal standards) and CO (Federal standards). As indicated in Table 5.6-5, the mobile source and area emissions associated with the proposed project would generate pollutant emissions in excess of SCAQMD thresholds. This increase in the severity of the existing violations would make the proposed development inconsistent with one of the two indicators of consistency. Project implementation would result in a significant unavoidable impact with respect to consistency with the AQMP.

CUMULATIVE

5.6-4 *Cumulative impacts to regional air quality resulting from development of the proposed Project would be less than significant.*

The annual short-term and long-term emissions associated with the proposed Project and cumulative projects indicated in Section 4.0, *Basis for Cumulative Analysis*, would be dependent on the internal phasing. Adherence to SCAQMD rules and regulations would help to alleviate potential impacts related to cumulative conditions. However, the build-out, sale and occupancy of the proposed residences would be

controlled by market demand. The primary post-construction air quality impacts from the development of the Project would result from operational emissions from area and mobile sources. A comparison of the projected emissions for the Basin in the 2003 AQMP and the emission estimates from development of the Project help determine the extent of the air quality impacts that the Project would have on the environment and surrounding air quality. Projected Basin emission estimates have been determined based on the 2003 AQMP estimates for years 2000, 2006 and 2010. Projected emissions for each pollutant were extrapolated from the 2003 AQMP based on the trend of each pollutant from 2000 to 2010. Table 5.6-7, *Projected Emission Estimates for Basin from the 2003 AQMP Compared to Project Emissions*, lists the percent comparison of the Project estimates with the projected Basin estimates. From the emissions presented, it is evident that emissions from the Project are less than 0.01 percent of the total projected Basin emissions. Therefore buildout of Moon Camp would have a less than significant impact on the overall air quality within the Basin.

Table 5.6-7
Projected Emission Estimates for Basin
from the 2003 AQMP Compared to Project Emissions

Pollutant	Year 2020 Emissions Estimates (lbs/day)		
	Projected AQMP Emissions	Moon Camp	Percent Change
ROG	1,182,000	1,045.2	0.088
NO_X	839,000	31.9	0.004
CO	3,490,000	1,265.1	0.036
PM_{10}	992,000	170.1	0.017

NOTE: Year 2020 AQMP emissions are linearly extrapolated based on 2000 to 2010 emission trends in the 2003 AQMP.

MITIGATION MEASURES

The following mitigation measures directly correspond to the identified impact statements provided in the impacts Subsection for the proposed project:

SHORT-TERM AIR QUALITY IMPACTS

5.6-1 In accordance with the County Development Code and SCAQMD Rules, the Project Applicant shall incorporate the following measures during the construction phase of the Project to the satisfaction of the SCAQMD and County of San Bernardino. Compliance with this measure is subject to periodic field inspections by the SCAQMD and County of San Bernardino.

Grading:

Apply non-toxic soil stabilizers according to manufacturer's specifications to all inactive construction areas (previously graded for ten days or more);

- Replace ground cover in disturbed areas as quickly as possible;
- Enclose, cover, water two times daily or apply non-toxic soil binders in accordance to manufacturer's specifications to exposed piles (i.e., gravel, sand, dirt) with 5% or greater silt content;
- Suspend all excavating and grading operations when wind speeds (as instantaneous gusts) exceed 25 mph; and
- All trucks hauling dirt, sand, soil, or other loose materials shall be covered and shall maintain at least two feet of freeboard (i.e., minimum vertical distance between top of the load and the top of the trailer).

Paved Roads:

- Sweep streets at the end of the day if visible soil material is carried onto adjacent public paved roads.

LONG-TERM OPERATIONAL IMPACTS

5.6-2 To the extent feasible, the project shall incorporate the installation of EPA-certified wood burning stoves or fireplaces. If this is not feasible, then the installation of a ceramic coating on the honeycomb inside a catalytic combustor shall be investigated as a feasible alternative. Alternatively, the use of natural gas fireplaces may be used as a feasible alternative.

CONSISTENCY WITH AIR QUALITY MANAGEMENT PLAN

5.6-3 No mitigation measures are recommended.

CUMULATIVE

5.6-4 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

The following air quality impacts would remain significant and unavoidable following mitigation:

- ROG and NO_X from construction activities;
- Project Operations: Exceedance of State and/or Federal emission levels (ROG, CO and PM_{10}) from project operations; and

- Project implementation would result in a significant unavoidable impact with respect to consistency with the AQMP.

If the County of San Bernardino approves the project, the County shall be required to cite their findings in accordance with Section 15091 of CEQA and prepare a Statement of Overriding Considerations in accordance with Section 15093 of CEQA.

5.7 NOISE

The purpose of this Section is to analyze Project-related noise source impacts on-site and to surrounding land uses. Mitigation measures are also recommended to minimize the noise impacts of the Project. This Section evaluates short-term construction related impacts as well as long-term buildout conditions. Information in this Section was obtained from the County of San Bernardino General Plan and Development Code and traffic information contained in the *Traffic Analysis* report (refer to Section 5.5, *Traffic and Circulation*, and Appendix 15.3, *Traffic Data*). Noise impacts to biological resources are addressed in Section 5.8, *Biological Resources*. Refer to Appendix 15.5, *Noise Data*, for additional information.

EXISTING CONDITIONS

DEFINITIONS

Sound is technically described in terms of the loudness (amplitude) of the sound and frequency (pitch) of the sound. The standard unit of measurement of the loudness of sound is the decibel (dB). Since the human ear is not equally sensitive to sound at all frequencies, a special frequency-dependent rating scale has been devised to relate noise to human sensitivity. The A-weighted decibel scale (dBA) performs this compensation by discriminating against frequencies in a manner approximating the sensitivity of the human ear.

Decibels are based on the logarithmic scale. The logarithmic scale compresses the wide range in sound pressure levels to a more usable range of numbers in a manner similar to the Richter scale used to measure earthquakes. In general, a 1 dBA change in the sound pressure levels of a given sound is detectable only under laboratory conditions. A 3 dBA change in sound pressure level is considered a “just detectable” difference in most situations. A 5 dBA change is readily noticeable and a 10 dBA change is considered a doubling (or halving) of the subjective loudness. It should be noted that, generally speaking, a 3 dBA increase or decrease in the average traffic noise level is realized by a doubling or halving of the traffic volume; or by about a 7 mile per hour (mph) increase or decrease in speed.

In terms of human response to noise, a sound 10 dBA higher than another is judged to be twice as loud; 20 dBA higher four times as loud; and so forth. Everyday sounds normally range from 30 dBA (very quiet) to 100 dBA (very loud). Examples of various sound levels in different environments are shown in Table 5.7-1, *Sound Levels and Human Response.* There are three general methods used to measure sound over a period of time: the Community Noise Equivalent Level (CNEL), the equivalent energy level (Leq), and the Day/Night Average Sound Level (Ldn), as defined below.

Table 5.7-1
Sound Levels and Human Response

Noise Source	dBA Noise Level	Response
	150	
Carrier Jet Operation	**140**	Harmfully Loud
	130	Pain Threshold
Jet Takeoff *(200 ft.)* Discotheque	**120**	
Unmuffled Motorcycle Auto Horn *(3 ft.)* Rock'n Roll Band Riveting Machine	**110**	Maximum Vocal Effort Physical Discomfort
Loud Power Mower Jet Takeoff *(2000 ft.)* Garbage Truck	**100**	Very Annoying Hearing Damage (Steady 8-Hour Exposure)
Heavy Truck *(50 ft.)* Pneumatic Drill *(50 ft.)*	**90**	
Alarm Clock Freight Train *(50 ft.)* Vacuum Cleaner *(10 ft.)*	**80**	Annoying
Freeway Traffic *(50 ft.)*	**70**	Telephone Use Difficult
Dishwashers Air Conditioning Unit *(20 ft.)*	**60**	Intrusive
Light Auto Traffic *(100 ft.)*	**50**	Quiet
Living Room Bedroom	**40**	
Library Soft Whisper *(15 ft.)*	**30**	Very Quiet
Broadcasting Studio	**20**	Just Audible
	10	Threshold of Hearing

Source: Outdoor Noise in the Metropolitan Environment, Melville C. Branch and R. Dale Beland, 1970 (p. 2).

CNEL. The predominant community noise rating scale used in California for land use compatibility assessment is the Community Noise Equivalent Level (CNEL). The CNEL reading represents the average of 24 hourly readings of equivalent levels, known as Leq's, based on an A-weighted decibel with upward adjustments added to account for increased noise sensitivity in the evening and night periods. These adjustments are +5 dBA for the evening (7 p.m. to 10 p.m.), and +10 dBA for the night (10 p.m. to 7 a.m.). CNEL may be indicated by "dBA CNEL" or just "CNEL."

Leq. The Leq is the sound level containing the same total energy over a given sample time period. The Leq can be thought of as the steady (average) sound level which, in a stated period of time, would contain the same acoustic energy as the time-varying sound level during the same period. Leq is typically computed over 1, 8 and 24-hour sample periods.

Ldn. Another commonly used method is the day/night average level or Ldn. The Ldn is a measure of the 24-hour average noise level at a given location. It was adopted by the United States Environmental Protection Agency (EPA) for developing criteria for the evaluation of community noise exposure. It is based on a measure of the average noise level over a given time period called the Leq. The Ldn is calculated by averaging the Leqs for each hour of the day at a given location after penalizing the "sleeping hours" (defined as 10 p.m. to 7 a.m.), by a 10 dBA to account for the increased sensitivity of people to noises that occur at night. The maximum noise level recorded during a noise event is typically expressed as Lmax. The sound level exceeded over a specified time frame can be expressed as Ln (i.e., L90, L50, L10, etc.). L50 equals the level exceeded 50 percent of the time.

HUMAN RESPONSES TO SOUND

Human response to sound is highly individualized. Annoyance is the most common issue regarding community noise. The percentage of people claiming to be annoyed by noise will generally increase with the environmental sound level. However, many factors will also influence people's response to noise. Thee factors can include the character of the noise, the variability of the sound level, the presence of tones or impulses, and the time of day of the occurrence. Additionally, non-acoustical factors, such as the person's opinion of the noise source, the ability to adapt to the noise, the attitude towards the source and those associated with it, and the predictability of the noise, will all influence people's response. As such, response to noise varies widely from one person to another and with any particular noise, individual responses will range from "highly annoyed" to "not annoyed".

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

This section describes the laws, ordinances, regulations and standards that are applicable to mixed land use developments and the proposed Project. Regulatory requirements related to environmental noise are typically promulgated at the local level. However, federal and state agencies provide standards and guidelines to the local jurisdictions.

STATE OF CALIFORNIA GUIDELINES

California Environmental Quality Act. CEQA was enacted in 1970 and requires that all known environmental effects of a project be analyzed, including environmental noise impacts. Under CEQA, a project has a potentially significant impact if the project exposes people to noise levels in excess of standards established in the local general plan or noise ordinance. Additionally, under CEQA, a project has a potentially significant impact if the project creates a substantial increase in the ambient noise levels in the project vicinity above levels existing without the project. If a project has a potentially significant impact, mitigation measures must be considered. If mitigation measures to reduce the impact to less than significant are not feasible due to economic, social, environmental, legal, or other conditions, the most feasible mitigation measures must be considered.

California Government Code. California Government Code Section 65302 (f) mandates that the legislative body of each county and city adopt a noise element as part of their comprehensive general plan. The local noise element must recognize the land use compatibility guidelines established by the State Department of Health Services as shown in Table 5.7-2, *Land Use Compatibility for Community Noise Environments.* The guidelines rank noise land use compatibility in terms of "normally acceptable", "conditionally acceptable" and "clearly unacceptable" noise levels for various land use types. Single-family homes are "normally acceptable" in exterior noise environments up to 60 CNEL and "conditionally acceptable" up to 70 CNEL. Multiple-family residential uses are "normally acceptable" up to 65 CNEL and "conditionally acceptable" up to 70 CNEL. Schools, libraries and churches are "normally acceptable" up to 70 CNEL, as are office buildings and business, commercial and professional uses.

COUNTY OF SAN BERNARDINO NOISE STANDARDS

According to the San Bernardino County General Plan, areas within San Bernardino County will be designated as "noise impacted" if exposed to existing or projected future exterior noise levels from mobile or stationary sources exceeding the standards listed in the Tables 5.7-3, *Interior/Exterior Noise Level Standards – Mobile Noise Sources*, and Table 5-7-4, *Hourly Noise Level Performance Standards – Locally Regulated Sources*.[1]

LOCATION OF SENSITIVE RECEPTORS

Certain land uses are particularly sensitive to noise, including schools, hospitals, rest homes, long-term medical and mental care facilities and parks and recreation areas. Residential areas are also considered noise sensitive, especially during the nighttime hours.

Existing sensitive receptors within the vicinity of the project site include residential uses to the east along Highway 38, to the west along Oriole Lane and to the north along Flicker Road. Other sensitive receptors include the following:

[1] Source: San Bernardino County General Plan, Section II Planning Issues, Man-Made Hazards – Noise, page II-B1-7.

Schools
- North Shore Elementary School (765 N. Stanfield Cutoff)
- Big Bear Middle School (41275 Big Bear Boulevard)

Library
- Big Bear Lake Branch Library (41930 Garstin Drive)

Hospitals

- Big Bear Valley Community Hospital (41870 Garstin Road)

Table 5.7-2
Land Use Compatibility for Community Noise Environments

Land Use Category	Community Noise Exposure			
	Ldn or CNEL, dBA			
	Normally Acceptable	Conditionally Acceptable	Normally Unacceptable	Clearly Unacceptable
Residential - Low Density, Single-Family, Duplex, Mobile Homes	50 - 60	55 - 70	70-75	75-85
Residential - Multiple Family	50 - 65	60 - 70	70 - 75	70 - 85
Transient Lodging - Motel, Hotels	50 - 65	60 - 70	70 - 80	80 - 85
Schools, Libraries, Churches, Hospitals, Nursing Homes	50 – 70	60 - 70	70 - 80	80 - 85
Auditoriums, Concert Halls, Amphitheaters	NA	50 - 70	NA	65 - 85
Sports Arenas, Outdoor Spectator Sports	NA	50 - 75	NA	70 - 85
Playgrounds, Neighborhood Parks	50 – 70	NA	67.5 - 75	72.5 - 85
Golf Courses, Riding Stables, Water Recreation, Cemeteries	50 – 70	NA	70 - 80	80 - 85
Office Buildings, Business Commercial and Professional	50 – 70	67.5 - 77.5	75 - 85	NA
Industrial, Manufacturing, Utilities, Agriculture	50 – 75	70 - 80	75 - 85	NA

Source: General Plan Guidelines, Office of Planning and Research, California, November 1998, page 187.

Notes:
NORMALLY ACCEPTABLE - Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
CONDITIONALLY ACCEPTABLE - New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
NORMALLY UNACCEPTABLE - New Construction or development should be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
CLEARLY UNACCEPTABLE - New construction or development should generally not be undertaken.
NA: Not Applicable

Table 5.7-3
Interior/Exterior Noise Level Standards – Mobile Noise Sources

Land Use		Ldn (or CNEL), dB	
Categories	**Uses**	**Interior***	**Exterior****
Residential	Single and multi-family, duplex, mobile homes	45	60***
Commercial	Hotel, motel, transient lodging Commercial retail, bank, restaurant Office building, research and development, professional offices Amphitheater, concert hall, auditorium, movie theater	45 50 45 45	60*** N/A 65 N/A
Institution/Public	Hospital, nursing home, school classroom, church library	45	65
Open Space	Park	N/A	65

* Indoor Environment excluding: bathrooms, kitchen, toilets, closets and corridors

** Outdoor environment limited to:
Private yard of single family dwellings
Multi-family private patios or balconies
Mobile home parks
Hospital/office building patios
Park scenic areas
School playgrounds
Hotel and motel recreation areas

*** An exterior noise level up to 65 dB (or CNEL) will be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of the best available noise reduction technology, and interior noise exposure does not exceed 45 dB (or CNEL) with windows and doors closed. Requiring that windows and doors remain closed to achieve an acceptable interior noise level will necessitate the use of air conditioning or mechanical ventilation.

Source: San Bernardino County General Plan, Section II – Planning Issues, Man-Made Hazards – Noise, Figure II-8. pg II-B1-6.

Table 5.7-4
Hourly Noise Level Performance Standards – Locally-Regulated Sources*

Land Use Category	7:00 a.m.– 10:00 PM		10:00 p.m. – 7:00 AM	
	Leq	**Lmax**	**Leq**	**Lmax**
Residential or other noise-sensitive receivers	55 dBA	75 dBA	45 dBA	65 dBA

* Noise sources which are stationary and not pre-empted from local noise control. Pre-empted sources include vehicles operated on public roadways, railroad line operations and aircraft in flight.

Source: San Bernardino County General Plan, Section II – Planning Issues, Man-Made Hazards – Noise, Figure II-9. pg II-B1-7.

Churches [2]

- Seventh Day Adventist (340 E. North Shore Drive)
- St. Joseph's Catholic Church of Big Bear (42242 North Shore Drive)
- Church of Jesus Christ of Latter-Day Saints (400 E. North Shore Drive)
- St. Columba's Episcopal Church (42324 North Shore Drive)
- Shepherd in the Pines Lutheran Church (42450 North Shore Drive)
- Center for Creative Living (816 W. Big Bear Boulevard)
- First Baptist Church of Big Bear Valley (41960 Big Bear Boulevard)
- Church of Christ (41035 Big Bear Boulevard)
- Bear Valley Community Church (40946 Big Bear Boulevard)
- Assembly of God (41965 Garstin Road)
- Big Bear Believer's Chapel (42180 Moonridge Road)
- First Church of Christ Scientist (547 Cottage Lane)
- Big Bear Foursquare Church (101 E. Mojave)
- Big Bear Christian Center (800 Greenspot)
- Jehovah's Witnesses (255 Catalina Street)
- United Methodist Church) (1001 Holden Avenue)
- Calvary Chapel of Big Bear (713 Stocker Road)
- Presbyterian Church (575 Prairie Lane)

Parks and Recreational Areas

- Grout Bay Park (located at southwestern corner of Grout Bay);
- Grout Bay Recreation Area (located west of Grout Bay);
- Dana Point Park (located at northern side of Grout Bay);
- Serrano Campgrounds (located southwest of the intersection of Holcomb Valley Road and Highway 38);
- Meadows Edge Park (Located to the east of Bluebird Lane and adjacent to the northern side of Big Bear Lake);
- San Bernardino National Forest Lands (refer to Section 5.8, *Biological Resources*); and
- Big Bear Lake (also refer to Section 5.8, *Biological Resources*).

EXISTING NOISE ENVIRONMENTS

COMPUTER MODELING

The existing and future roadway noise levels within the vicinity of the proposed Project were projected using the Federal Highway Administration's Highway Noise Prediction Model (FHWA RD-77-108) together with several roadway and site parameters. These parameters determine the projected impact of vehicular traffic noise and include the roadway cross-section (e.g., number of lanes), the roadway width, the average daily traffic (ADT), the vehicle travel speed, the percentages of auto and truck traffic, the roadway grade, the angle-of-view, the site conditions ("hard" or "soft"), and the percent of total ADT which flows each hour throughout a 24-hour period. The model does not account for ambient noise levels (i.e., noise from adjacent land uses) or topographical differences between the roadway and

[2] Source: Big Bear Chamber of Commerce website. July 2002. http://www.bigbearchamber.com/church.htm

adjacent land uses. Noise projections are based on modeled vehicular traffic as derived from the Project Traffic Study.

A 35 to 45 mile per hour (mph) average vehicle speed was assumed for existing conditions (varies depending on roadway) based on empirical observations and posted maximum speeds along the adjacent roadways. ADT estimates were obtained from the Project traffic report (refer to Appendix 15.3, *Traffic Data*).

EXISTING NOISE LEVELS

Table 5.7-5, *Existing Traffic Noise Levels*, indicates the location of the 60, 65, and 70 CNEL noise contours associated with vehicular traffic along local roadways as modeled with the aforementioned FHWA computer model. Traffic noise along three major roadways was modeled to estimate existing noise levels from mobile traffic. These roadways include North Shore Drive, Stanfield Cutoff, and Big Bear Boulevard, as described in Table 5.7-5.

Table 5.7-5
Existing Traffic Noise Levels
(Based on Peak Month Traffic Volumes)

Roadway Segment	Average Daily Traffic	dBA @ 100 Feet from Roadway Centerline[1]	Distance from Roadway Centerline to: (Feet)		
			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour
North Shore Drive:					
West of Stanfield Cutoff	4,750	57.17	15	19	69
East of Stanfield Cutoff	6,900	58.79	19	41	88
Stanfield Cutoff:					
North of North Shore Dr.	125	32.22	0	1	2
North Shore Dr. to Big Bear Blvd.	5,625	57.90	17	36	77
South of Big Bear Blvd.	2,250	49.15	4	9	20
Big Bear Boulevard:					
West of Stanfield Cutoff	20,500	62.87	39	85	183
East of Stanfield Cutoff	18,100	62.32	36	78	168

Traffic data obtained from the *Traffic Analysis* report (refer to Appendix 15.3, *Traffic Data*).
Note:
[1] = 100 feet is the assumed distance to the midpoint of a receptor rear yard.

EXISTING WATERCRAFT NOISE LEVELS

Watercraft, including boats, jet skis, etc., constitute a periodic noise around the perimeter of Big Bear Lake. According to the Big Bear Municipal Water District, during the 1999 boating season, the average daily use of boats on the Lake was approximately 199 (refer to Section 5.2, *Recreation*).

Per the requirements of the Big Bear Municipal Water District, lake activities and boating operations must comply with the following general regulations:

- Speed Limit. 35 MPH maximum; 10 MPH from sunset to 7:00 AM; 5 MPH between buoys indicating same and the shoreline; 3 MPH in Papoose Bay, Canvasback Cove and Mallard Lagoon.

- Mufflers. No boat shall operate with excessive noise, per the requirements of Harbor and Navigation Code 654.

- Launching. Boats requiring trailers may be launched only from designated launch ramps. All other boats may be carried and launched at designated recreational or public access points around the Lake after obtaining a permit.

- Mooring. Mooring or tying to navigational markers is prohibited. Overnight mooring or beaching of boats along the shoreline is prohibited.

- Water-skiing. Hours of water-skiing are between 7:00 a.m. and sunset.

Harbor and Navigational Code 654 states that:

"Muffler requirements: The exhaust of every internal combustion engine used on any motorboat shall be effectively muffled at all times to prevent any excessive or unusual noise and as may be necessary to comply with the provisions of Section 654.05.

The provisions of this section shall not apply to motorboats competing under a local public entity or United States Coast Guard permit in a regatta, in a boat race, while on trial runs, or while on official trials for speed records during the time and in the designated area authorized by the permit. In addition, this section shall not apply to motorboats preparing for a race or regatta if authorized by a permit issued by the local entity having jurisdiction over the area where the preparations will occur."

Harbor and Navigational Code 654.05 states that:

"Motorboat noise: No person shall operate any motorboat in or upon the inland waters of this state in such a manner as to exceed the following noise levels:

(a) For engines manufactured before January 1, 1976, a noise level of 86 dBA measured at a distance of 50 feet from the motorboat.

(b) For engines manufactured on or after January 1, 1976, and before January 1, 1978, a noise level of 84 dBA measured at a distance of 50 feet from the motorboat.

(c) For engines manufactured on or after January 1, 1978, a noise level of 82 dBA measured at a distance of 50 feet from the motorboat.

(d) *Testing procedures employed to determine such noise levels shall be in accordance with the exterior noise level measurement procedure for pleasure motorboats recommended by the society of Automotive*

Engineers in its recommended practice designated SAEJ34. The department may, by regulation, amend such testing procedures when deemed necessary to adjust to advances in technology.

The provisions of this section shall not apply to motorboats competing under a local public entity or United States Coast Guard permit in a regatta, in a boat race, while on trial runs, or while on official trials for speed records during the time and in the designated area authorized by the permit. In addition, addition, this section shall not apply to motorboats preparing for a race or regatta if authorized by a permit issued by the local entity having jurisdiction over the area where the preparations will occur."

IMPACTS

SIGNIFICANCE CRITERIA

Appendix G, Initial Study Checklist, of the CEQA Guidelines contains analysis guidelines related to the assessment of noise impacts. These guidelines have been utilized as thresholds of significance for this analysis. As stated in Appendix G, a project may create a significant environmental impact if one or more of the following occurs:

- Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies (refer to Impact Statements 5.7-1 to 5.7-5);
- Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels (refer to Impact Statements 5.7-1);
- A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project (refer to Impact Statements 5.7-2, 5.7-3, and 5.7-4);
- A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project (refer to Impact Statements 5.7-1, 5.7-3, and 5.7-4);
- For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels (refer to Section 10.0, *Effects Found Not To Be Significant*); and
- For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels (refer to Section 10.0, *Effects Found Not To Be Significant*).

Based on these standards, the effects of the proposed project have been categorized as either a "less than significant impact" or a "potentially significant impact." Mitigation measures are recommended for potentially significant impacts. If

a potentially significant impact cannot be reduced to a less than significant level through the application of mitigation, it is categorized as a significant and unavoidable impact. The standards used to evaluate the significance of impacts are often qualitative rather than quantitative because appropriate quantitative standards are either not available for many types of impacts or are not applicable for some types of projects.

SIGNIFICANCE OF CHANGES IN AMBIENT NOISE LEVELS

A project is considered to have a significant noise impact where it causes an adopted noise standard to be exceeded for the project site or for adjacent sensitive receptors. In addition to being concerned about the absolute noise level that might occur when a new source is introduced into an area, it is also important to consider the existing noise environment. If the existing noise environment is quiet and the new noise source greatly increases the noise exposure, even though a criterion level might not be exceeded, an impact may occur. Lacking adopted standards for evaluating such impacts, general considerations for community noise environments are that a change of over 5 dBA is readily noticeable and, therefore, is considered a significant impact (refer to Table 5.7-6, *Significance of Changes in Cumulative Noise Exposure*).[3] Changes from 3 to 5 dBA may be noticed by some individuals and are, therefore considered an adverse environmental impact, since under these conditions sporadic complaints may occur. Changes in community noise levels of less than 3 dBA are normally not noticeable and are therefore considered less than significant.[4] Adverse impacts would result if increases in noise levels are audible (increases equal to, or greater than 3 dBA), although the noise level may not exceed the significant impact criteria specified above.

Table 5.7-6
Significance of Changes in Cumulative Noise Exposure

Ambient Noise Level Without Project (Ldn or CNEL)	Significant Impact Assumed to Occur if the Project Increases Ambient Noise Levels by:
< 60 dBA	+ 5.0 dBA or more
60-65 dBA	+3.0 dBA or more
> 65 dBA	+1.0 dBA or more
Sources: FICON, FHWA, and Caltrans as applied by Brown-Buntin Associates, Inc., 1997.	

Potential impacts are grouped below according to topic. The numbered mitigation measures at the end of this Section directly correspond with the numbered impact statements.

[3] *Assessment of Noise with Respect to Community Response*, ISDR 1996, International Standardization, Switzerland.

[4] *Fundamentals and Abatement of Highway Traffic Noise*, Bolt, Beranek and Newman, 1973.

SHORT-TERM CONSTRUCTION NOISE AND VIBRATION IMPACTS

5.7-1 *Grading and construction within the Project area would result in temporary noise and/or vibration impacts to nearby noise sensitive receptors. Analysis has concluded that construction noise and vibration impacts would be less than significant following compliance with the County requirements.*

Construction activities are generally of relatively short duration, lasting from a few days to a period of months. Groundborne vibration, groundborne noise, and other types of construction related noise impacts would typically occur during the initial site preparation, which can create the highest levels of groundborne vibration and noise. Generally, site preparation has the shortest duration of all construction phases. Activities that occur during this phase include earthmoving, removal of existing roadways and compacting of soils. High groundborne noise levels, ground vibration and other miscellaneous noise levels can be created during this phase due to the operation of heavy-duty trucks, backhoes, and front-end loaders.

Noise levels typically range from 73 to 96 dBA at 50 feet from individual pieces of equipment.[5] The figures indicated in Table 5.7-7, *Typical Construction Equipment Noise Levels*, below, represents the "worst-case" day in which all equipment used during a given phase is operating. Because all equipment would not be operating on most days during construction, actual noise levels would, on many days, be lower than presented in Table 5.7-7.

Table 5.7-7
Typical Construction Equipment Noise Levels

Type of Equipment	Maximum Level, dB (50 feet; thence)
Scrapers	88
Bulldozers	87
Heavy Trucks	88
Backhoe	85
Pneumatic Tools	85

In addition to construction noise from the project site, the construction periods would also cause traffic noise along access routes to the site due to movement of equipment and workers on the site. The primary heavy equipment construction tools/vehicles are expected to be moved on to the site once during the initial grading/ construction period and would have a less than significant short-term effect on noise levels. Daily transportation of construction workers is not expected to cause a significant effect since this traffic would not be a substantial percentage of current daily volumes in the area, and would not be anticipated to increase traffic noise levels by more than 1 dBA.

As stated in Table 5.7-3, the maximum permitted noise exposure to residential uses from mobile noise sources is 60 dB (Ldn or CNEL). However, an exterior noise level

[5] United States EPA, 1971.

up to 65 dB (or CNEL) would be allowed provided exterior noise levels have been substantially mitigated through a reasonable application of best available noise reduction technology and interior noise exposure does not exceed 45 dB (or CNEL) with windows and doors closed. According to Table 5.7-4, the maximum permitted noise exposure to residential uses from "locally-regulated sources" is 55 dBA Leq or 75 dBA Lmax from 7:00 a.m. to 10:00 p.m., and 45 dBA Leq or 65 dBA Lmax from 10:00 p.m. to 7:00 a.m. Locally regulated sources are stationary and not pre-empted from local noise control. Pre-empted sources include vehicles operated on public roadways, railroad line operations and aircraft in flight.

Project construction activities would temporarily increase local noise and vibration levels in the project study area and may temporarily exceed County standards. However, the County of San Bernardino Development Code exempts construction activities from adhering to County noise/vibration standards as long as construction is limited to the hours of 7:00 a.m. to 7:00 p.m. Monday to Saturday and prohibited on Sundays or Federal Holidays.

With adherence to the County Development Code and the noise-related policies in the County General Plan, and due to the relatively short period of construction, noise and vibration impacts are anticipated to be less than significant. Implementation of the recommended mitigation measure would ensure that impacts remain at or below less than significant levels.

LONG-TERM NOISE IMPACTS

5.7-2 *Implementation of the Moon Camp Project would generate additional vehicular travel on the surrounding roadway network, thereby resulting in noise level increases. Analysis has concluded that long-term noise impacts would be less than significant for all analyzed roadway segments in Year 2006 and Year 2025 traffic scenarios. No mitigation measures are recommended.*

Project implementation would result in additional traffic on adjacent roadways, thereby increasing vehicular generated noise in the vicinity of existing and proposed residential uses. As discussed in Section 5.3, *Traffic and Circulation*, traffic conditions were analyzed utilizing existing, Year 2006 and Year 2025 traffic volumes. For purposes of analyzing noise impacts associated with project-related traffic volumes, this section compares the following scenarios: 1) Existing Plus Other Development Traffic Conditions (Year 2006) versus Existing Plus Project Plus Other Development Traffic Conditions (Year 2006) and; 2) Existing Plus Other Development Traffic Conditions (Year 2025) versus Existing Plus Project Plus Other Development Traffic Conditions (Year 2025). Thus, in accordance with the project traffic study, with and without the proposed project scenarios were modeled for Year 2006 and Year 2025 traffic conditions.

According to the *Traffic Analysis* report, twenty-five percent (25%) of the project traffic distribution would be distributed to the west of the project site. The following roadways segments to the west of the project site would receive traffic from the Project site:

- North Shore Drive: North of Big Bear Boulevard and Dam (Existing ADT = 2,300)
- Rim of the World Highway: West of North Shore Drive (Existing ADT = 7,100)
- Big Bear Boulevard: East of North Shore Drive (Existing ADT = 7,300)

Assuming a worst-case scenario of 220 trips (25 percent of 880 trips) along North Shore Drive, north of Big Bear Boulevard and Dam, under existing conditions, the vehicular noise level along this roadway segment would increase by 0.42 dBA. Thus, noise impacts along this roadway segment would be less than significant based on the significance criteria as stated within Table 5.7-6.

Therefore, since the roadway segments along Rim of the World Highway (west of North Shore Drive) and Big Bear Boulevard (East of North Shore Drive), would receive fifteen percent (15%) and ten percent (10%) of the project traffic, respectively, coupled with the fact that traffic volumes are greater on these segments than on North Shore Drive, noise level increases along these segments as a result of project generated traffic would be less than 0.42 dBA. Thus, according to the significance criteria as stated within Table 5.7-6, noise impacts along these roadway segments would be les than significant under existing and future traffic scenarios.

YEAR 2006 TRAFFIC CONDITIONS

Noise levels within the vicinity of the proposed project area were modeled for with and without project scenarios for 2006 traffic conditions to determine the location and extent of future vehicular generated noise conditions. Table 5.7-8, *Exterior Noise Exposure Adjacent to Nearby Roadways, 2006*, indicates the noise increase and/or decrease for the analyzed roadways within the County of San Bernardino and City of Big Bear Lake. According to Table 5.7-8, under the "2006 Without Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 32 to 63 dBA. The highest noise levels would occur on Big Bear Boulevard, west of Stanfield Cutoff. The lowest noise levels would occur along Stanfield Cutoff (north of North Shore Drive).

As stated in Table 5.7-8, under the "2006 With Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 32 to 63 dBA. Similar to the "2006 Without Project" scenario, the highest and lowest noise levels would occur along Big Bear Boulevard (west of Stanfield Cutoff) and Stanfield Cutoff (north of North Shore Drive), respectively.

Table 5.7-8 also compares noise levels under the "2006 Without Project" scenario with the "2006 With Project" scenario. Based on the information cited in Table 5.7-8, all roadway segments comparatively analyzed would experience a noise increase of less than 1 dBA at 100 feet from the roadway centerline. Thus, noise impacts along all the roadway segments would be less than significant based on the significance criteria as stated within Table 5.7-6, *Significance of Changes in Cumulative Noise Exposure*.

Table 5.7-8
Exterior Noise Exposure Adjacent to Nearby Roadways, 2006
(Based on Peak Month Traffic Volumes)

Roadway Segment	2006 Without Project					2006 With Project					Difference in dBA @100 Feet from Roadway
	Average Daily Traffic	dBA @ 100 Feet from Roadway Centerline[1]	Distance from Roadway Centerline to: (Feet)			Average Daily Traffic	dBA @ 100 feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
North Shore Drive:											
West of Stanfield Cutoff	4,988	57.38	15	33	71	5,655	57.92	17	20	77	0.54
East of Stanfield Cutoff	7,245	59.00	20	42	91	7,245	59.00	20	42	91	0.00
Stanfield Cutoff:											
North of N. Shore Dr	131	32.42	0	1	2	131	32.42	0	1	2	0.00
N. Shore Dr. to Big Bear Blvd	5,906	58.11	17	37	80	6,573	58.58	18	40	86	0.47
South of Big Bear Blvd	2,363	49.36	4	10	21	2,363	49.36	4	10	21	0.00
Big Bear Boulevard:											
West of Stanfield Cutoff	21,525	63.08	41	88	188	21,792	63.13	41	88	190	0.05
East of Stanfield Cutoff	19,005	62.54	37	81	173	19,405	62.63	38	82	176	0.09

Traffic data obtained from the *Traffic Analysis* report (refer to Appendix 15.3, *Traffic Data*).
Note:
[1] = 100 feet is the assumed distance to the midpoint of a receptor rear yard.
- Noise level models computed for 2006 scenarios utilized existing 2002 roadway cross-section data.

In summary, based on the significance criteria established in Table 5.7-6, the proposed Moon Camp Project would not create significant vehicular related noise impacts along the analyzed roadway segments based on 2006 traffic conditions.

YEAR 2025 TRAFFIC CONDITIONS

Noise levels within the vicinity of the proposed project area were modeled for with and without project scenarios for 2025 traffic conditions to determine the location and extent of future vehicular generated noise conditions. Table 5.7-9, *Exterior Noise Exposure Adjacent to Nearby Roadways, 2025*, indicates the noise increase and/or decrease for the analyzed roadways within the County of San Bernardino and City of Big Bear Lake. According to Table 5.7-9, under the "2025 Without Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 33 to 64 dBA. The highest noise levels would occur on Big Bear Boulevard, west of Stanfield Cutoff. The lowest noise levels would occur along Stanfield Cutoff (north of North Shore Drive).

As stated in Table 5.7-9, under the "2025 With Project" scenario, noise levels at a distance of 100 feet from centerline would range from approximately 33 to 64 dBA. Similar to the "2025 Without Project" scenario, the highest and lowest noise levels

would occur along Big Bear Boulevard (west of Stanfield Cutoff) and Stanfield Cutoff (north of North Shore Drive), respectively.

Table 5.7-9
Exterior Noise Exposure Adjacent to Nearby Roadways, 2025
(Based on Peak Month Traffic Volumes)

Roadway Segment	2025 Without Project					2025 With Project					Difference in dBA @100 Feet from Roadway
	Average Daily Traffic	dBA @ 100 Feet from Roadway Centerline[1]	Distance from Roadway Centerline to: (Feet)			Average Daily Traffic	dBA @ 100 feet from Roadway Centerline	Distance from Roadway Centerline to: (Feet)			
			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour			70 CNEL Noise Contour	65 CNEL Noise Contour	60 CNEL Noise Contour	
North Shore Drive:											
West of Stanfield Cutoff	5,890	58.10	17	37	79	6,557	58.57	18	40	85	0.47
East of Stanfield Cutoff	8,556	59.72	22	47	102	8,556	59.72	22	47	102	0.00
Stanfield Cutoff:											
North of N. Shore Dr	155	33.16	0	1	2	155	33.16	0	1	2	0.00
N. Shore Dr. to Big Bear Blvd	6,975	58.83	19	41	89	7,642	59.23	20	44	94	0.40
South of Big Bear Blvd	2,790	50.09	5	11	23	2,790	50.09	5	11	23	0.00
Big Bear Boulevard:											
West of Stanfield Cutoff	25,420	63.80	45	98	211	25,687	63.85	46	98	212	0.05
East of Stanfield Cutoff	22,444	63.26	42	90	194	22,844	63.34	42	91	196	0.08

Traffic data obtained from the *Traffic Analysis* report (refer to Appendix 15.3, *Traffic Data*).
Note:
[1] = 100 feet is the assumed distance to the midpoint of a receptor rear yard.
- Noise level models computed for 2006 scenarios utilized existing 2002 roadway cross-section data.

Table 5.7-9 also compares noise levels under the "2025 Without Project" scenario with the "2025 With Project" scenario. Based on the information cited in Table 5.7-9, all roadway segments comparatively analyzed would experience a noise increase of less than 1 dBA at 100 feet from the roadway centerline. Thus, noise impacts along all the roadway segments would be less than significant based on the significance criteria as stated within Table 5.7-6, *Significance of Changes in Cumulative Noise Exposure*.

In summary, based on the significance criteria established in Table 5.7-6, the proposed Moon Camp Project would not create significant vehicular related noise impacts along the analyzed roadway segments based on 2025 traffic conditions.

STATIONARY NOISE

5.7-3 *Implementation of the Moon Camp project would result in on-site noise associated with residential and parking lot activities and boat loading/unloading activities at the marina. Analysis has concluded that stationary source impacts would be reduced to less than significant levels*

with adherence to the County of San Bernardino General Plan policies relating to noise level standards and recommended mitigation measures.

Project implementation would result in stationary noise source impacts on-site.[6] These sources would include the typical residential noise sources and marina activities, including the adjacent parking lot. The potential impact from these sources were analyzed in terms of their proximity to the nearest off-site sensitive receptors.

Residential Areas

Development of the residential lots adjacent to residences located to the north (along Flicker Road), west (along Oriole Lane) and east (along North Shore Drive) would create new stationary noise typical of any residential development. Noise that is typical of residential areas includes such things as children playing, pet noise, amplified music, car repair, pool and spa equipment, woodworking and home repair. Noise typically associated with residential land uses does not produce noise levels greater than 60dBA. Noise from residential stationary sources would primarily occur during the "daytime" hours of 7:00 a.m. to 10:00 p.m. Furthermore, the residence would be required to comply with the noise standards set forth in the County General Plan. It is stated in the County's General Plan that exterior noise levels in residential property shall not exceed the basic noise standard of 55 dBA between the hours of 7:00 a.m. and 10:00 p.m. and shall not exceed 45 dBA between the hours of 10:00 p.m. and 7:00 a.m. (refer to Table 5.7-4). Thus, noise impacts from the residential uses are anticipated to be less than significant in this regard.

Marina Facilities

The project proposes to construct a marina on Big Bear Lake and an associated parking lot at the southwest corner of the site. Surface parking lots generate instantaneous maximum sound levels from tire squeals, trash pick-up, delivery trucks, lot sweeping, door slamming, back-up alarms, and engine start-ups (refer to Table 5.7-10, *Maximum Noise Levels Generated by Parking Lots*). Noise would primarily remain on-site and would be temporary (during peak-events). Parking lot noise can also be considered a "stationary" noise source and may occur after 10 p.m. Typical noise levels generated by parking areas are an estimated 70 dBA at 50 feet during peak events (this is an "instantaneous" or peak noise level). Parking lot noise would also be partially masked by background noise from adjacent roads and typical community noise sources. Since the nearest existing residential areas are located some 500 feet from the proposed marina parking lot, noise levels would not exceed 55 dBA during the daytime or 45 dBA at nighttime. Therefore, typical parking lot noise generated at the project site would be below both the daytime and nighttime noise standards at the nearest existing residential uses. Thus, impacts are considered to be less than significant in this regard.

[6] Stationary noise levels diminish at the rate of 6 dBA per doubling of distance, in comparison to mobile noise sources that diminish at the rate of 4.5 dBA per doubling.

Table 5.7-10
Maximum Noise Levels Generated by Parking Lots

Event	Maximum Noise Level (dBA AT 50 FEET)
Door Slam	60 to 70
Engine Start-Up	60 to 70
Car Pass-by	55 to 70
Source: Mestre Greve Associates.	

WATERCRAFT NOISE

5.7-4 *Implementation of the Moon Camp project would result in increased watercraft activities on Big Bear Lake. Analysis has concluded that watercraft noise impacts would be reduced to less than significant levels with adherence to Rules and Regulations established by the Big Bear Municipal Water District for Big Bear Lake.*

The Moon Camp Project proposes to construct approximately 100 boat docks (dependent upon demand) on the southwest corner of the project site, located on the north shore of Big Bear Lake. As stated in Section 5.2, *Recreation*, the 100 dock slips, if multiplied by the weekend use factor of 9 percent, would add approximately 9 boats per day to the daily average number of boats using the lake.

All boating activities would be responsible for complying with rules and regulations established by the Big Bear Municipal Water District. Boating operation requirements that include speed limits, mooring and launching restrictions, and muffler requirements would serve to reduce noise impacts generated by watercraft activities. As previously stated, the proposed project would add approximately 9 boats to the average daily use of the Lake. Not only is this considered a nominal increase in daily boating numbers, adherence to the Water District's rules and regulations, including Harbor and Navigational Code 654 (refer to page 5.7-11), would reduce noise impacts from watercrafts to a less than significant level. It is noted that during peak holiday and summer periods, the daily use of watercraft would significantly increase. However, compliance with the Water District's rules and regulations would reduce impacts to less than significant levels.

CUMULATIVE

5.7-5 *Implementation of the Moon Camp Project, combined with cumulative projects, would increase the ambient noise levels in the site vicinity. Impact analysis and mitigation of impacts are determined on a project-by-project basis.*

Implementation of the proposed project, combined with development of cumulative projects, would increase ambient noise levels in the site vicinity. This increase would be due to both vehicular traffic noise along local roadways and stationary noise

sources associated with development. The evaluation of noise impacts is typically determined on a project-by-project basis in order to focus mitigation on a particular noise source. As such, future development proposals within the County would require separate discretionary approval and CEQA assessment which would address potential noise impacts and identify appropriate attenuation measures where appropriate. As previously stated above, the proposed project, as well as cumulative development projects, would be individually required to reduce noise impacts to below County noise standards and demonstrate adherence to Development Code and General Plan requirements.

MITIGATION MEASURES

This section directly corresponds to the identified Impact Statements in the impacts subsection.

SHORT-TERM CONSTRUCTION NOISE AND VIBRATION IMPACTS

5.7-1a Construction activities shall be limited to the hours of 7:00 a.m. ~~and~~ to 7:00 p.m. Monday to Saturday and prohibited on Sundays and Federal Holidays.

5.7-1b All construction equipment, fixed or mobile, shall be equipped with properly operating and maintained mufflers, to the satisfaction of the County Engineer.

5.7-1c Stationary construction equipment shall be placed such that emitted noise is directed away from sensitive noise receptors, to the satisfaction of the County Engineer.

5.7-1d Stockpiling and staging areas shall be located as far as practical from noise sensitive receptors during construction activities, to the satisfaction of the County Engineer.

LONG-TERM NOISE IMPACTS

5.7-2 No mitigation measures are recommended.

STATIONARY NOISE

5.7-3 No mitigation measures are recommended.

WATERCRAFT

5.7-4 No mitigation measures are recommended.

CUMULATIVE

5.7-5 No mitigation measures are recommended.

LEVEL OF SIGNIFICANCE AFTER MITIGATION

No unavoidable significant impacts related to noise have been identified following implementation of recommended mitigation measures and compliance with applicable requirements set forth by the County of San Bernardino and the Big Bear Municipal Water District.

5.8 BIOLOGICAL RESOURCES

The purpose of this Section is to identify existing biological resources on-site and in the vicinity, analyze potential Project-related impacts to these resources (including sensitive species) and recommend mitigation measures to reduce the significance of impacts that are identified. This Section describes the biological character of the site in terms of plants, wildlife, and wildlife habitats and analyzes the biological significance of the site in view of federal, state and local laws and policies. Information in this Section is based on the *Biological Resources Assessment* and Focused Surveys conducted by BonTerra Consulting (July 2003). The Biological Technical Report was prepared in accordance with accepted scientific and technical standards that are consistent with the requirements of the U.S. Fish and Wildlife Service (USFWS) and the California Department of Fish and Game (CDFG). This Section is also based on the Delineation of Jurisdictional Waters conducted by RBF Consulting (March 2002). Information is included in Appendix 15.6, *Biological Resources Information*.

EXISTING CONDITIONS

SURVEY METHODOLOGIES

This section describes the methodologies used to conduct the biological field surveys for the proposed Project. The results of these survey efforts are discussed in the *Existing Biological Resources* Section.

VEGETATION MAPPING AND GENERAL PLANT SURVEYS

A general reconnaissance field survey was conducted in December, 2001 to evaluate the potential of the Project site to support special status plants and animals and determine the need for further focused biological surveys. Additional field survey were conducted in May and June, 2002 to identify the vegetation types and plant species present on the Project site. All plant species observed were recorded in field notes. Plant species were identified in the field or collected for later identification. Plants were identified using taxonomic keys in Hickman, Munz, and Abrams. Taxonomy follows Hickman for scientific and common names. Plant community classifications follow Holland.

GENERAL WILDLIFE SURVEYS

Wildlife species observed during the general reconnaissance field survey were recorded in field notes. The Project site was also evaluated for its potential to support special status wildlife species that are known or are expected to occur in the region. Additionally, all wildlife species observed during focused surveys were recorded in field notes. Active searches for reptiles and amphibians included lifting, overturning, and carefully replacing rocks and logs. Birds were identified by visual and auditory recognition. Mammals were identified by visual recognition and by identifying diagnostic sign, including scat, footprints, scratch-outs, burrows, and trails. Taxonomy and nomenclature for wildlife generally follow American

Ornithologist's Union (AOU) for birds and Laudenslayer et al. for all other terrestrial vertebrates.

FOCUSED SURVEYS

Special Status Plant Species. Special status plant surveys were conducted in the spring and summer of 2002. All areas of the Project site containing native habitats potentially suitable for special status species were sampled using meandering transects. For a detailed discussion of survey methods refer to Appendix 15.6, *Biological Resources Information*.

Rubber Boa. Focused surveys for the rubber boa (*Charina bottae*) were conducted in the spring and summer of 2002. The survey effort consisted of three-drift fence and pitfall trapping periods, and five visual encounter surveys. For a detailed discussion of survey methods refer to Appendix 15.6, *Biological Resources Information*.

Southwestern Willow Flycatcher. Five focused surveys for the southwestern willow flycatcher (*Empidonax trailii*) were conducted during the spring and summer of 2002 per the guidelines of the U.S. Fish and Wildlife Service (USFWS). For a detailed discussion of survey methods refer to Appendix 15.6, *Biological Resources Information*.

California Spotted Owl. Focused surveys for the California spotted owl (*Strix occidentalis*) were conducted from April through June 2002. Six nighttime surveys and one roost location survey were performed on the Project site. Adjacent areas in the vicinity of the Project site were also surveyed to determine if off-site individuals or pairs were foraging on the Project site. For a detailed discussion of survey methods refer to Appendix 15.6, *Biological Resources Information*.

Bald Eagle. Focused surveys for the bald eagle (*Haliaeetus leucocephalus*) were conducted in February 2002. Four surveys were conducted to identify which trees on the Project site were used most frequently by the bald eagle for perching and/or roosting. In addition, a records search was conducted to characterize historic bald eagle wintering activity and tree use on the Project site and in the vicinity of Big Bear Lake. For a detailed discussion of survey methods refer to Appendix 15.6, *Biological Resources Information*.

Tree Surveys. A Forester Report was prepared in July 2001 to provide information on timber stand composition, condition, site quality, soil classification and characteristics, and impact of construction and development on the Project site. The report also provides guidelines for the protection of trees and prevention of insect infestation during the construction process. A complete copy of the report is included in Appendix 15.6, *Biological Resources Information*.

EXISTING BIOLOGICAL RESOURCES

This section describes the biological resources that either occur or potentially occur within the Project site or in the immediate vicinity. Vegetation types, wildlife populations and movement patterns, special status vegetation types, and special

status plant and wildlife species either known or potentially occurring are discussed below.

VEGETATION TYPES

Four vegetation types occur within the Project site. Exhibit 5.8-1, *Biological Resources*, illustrates their distribution and Table 5.8-1, *Existing Vegetation Types on the Project Site*, summarizes the extent of vegetation types present within the Project site. Each of the vegetation types observed during field surveys are described below.

Table 5.8-1
Existing Vegetation Types on the Project Site

Vegetation Type	Acreage
Jeffrey Pine Forest	54.91
Pebble Plain	0.69
Lake Shoreline	4.14
Developed	2.82
Total	**62.56**

Jeffrey Pine Forest. Jeffrey pine forest occurs on 54.91 acres of the eastern half of the Project site. This area is dominated by Jeffrey pine (*Pinus jeffreyi*) with white fir (*Abies concolor*), incense cedar (*Calocedrus decurrens*), western juniper (*Juniperus occidentalis*), singleleaf pinyon pine (*Pinus monophylla*), and black oak (*Quercus kellogii*) occurring at lower densities. The understory is sparse, consisting of scattered chaparral shrubs including greenleaf manzanita (*Arctostaphylos patula*), mountain whitethorn (*Ceanothus cordulatus*), Greg's ceanothus (*Ceanothus greggii*), deer brush (*Ceanothus integerrimus*), California mountain mahogany (*Cercocarpus betuloides*), and curl-leaf mountain mahogany (*Cercocarpus ledifolius*). Herbaceous cover is generally low, consisting of grasses and forbs in scattered patches. Jeffrey pine forest occurs at elevations ranging from 3,200 to 7,800 feet above msl in southern California.

Portions of the Jeffrey pine forest on the Project site provide suitable habitat for listed Threatened and Endangered plant species. In particular, approximately 17.38 acres containing few trees and fairly open canopy where Wright's matting buckwheat (*Eriogonum wrightii* ssp. *subscaposum*) occurs are suitable habitat for the federally-listed Threatened ash-gray Indian paintbrush, CNPS 1B listed Parish's rock-cress (*Arabis parishii*), and CNPS 1B listed silver-haired ivesia. For this reason, open Jeffrey pine forest is shown as a separate vegetation type on Exhibit 5.8-1. Additionally, areas within the Jeffrey pine forest where herbaceous cover is dominated by Wright's matting buckwheat are identified on Exhibit 5.8-1.

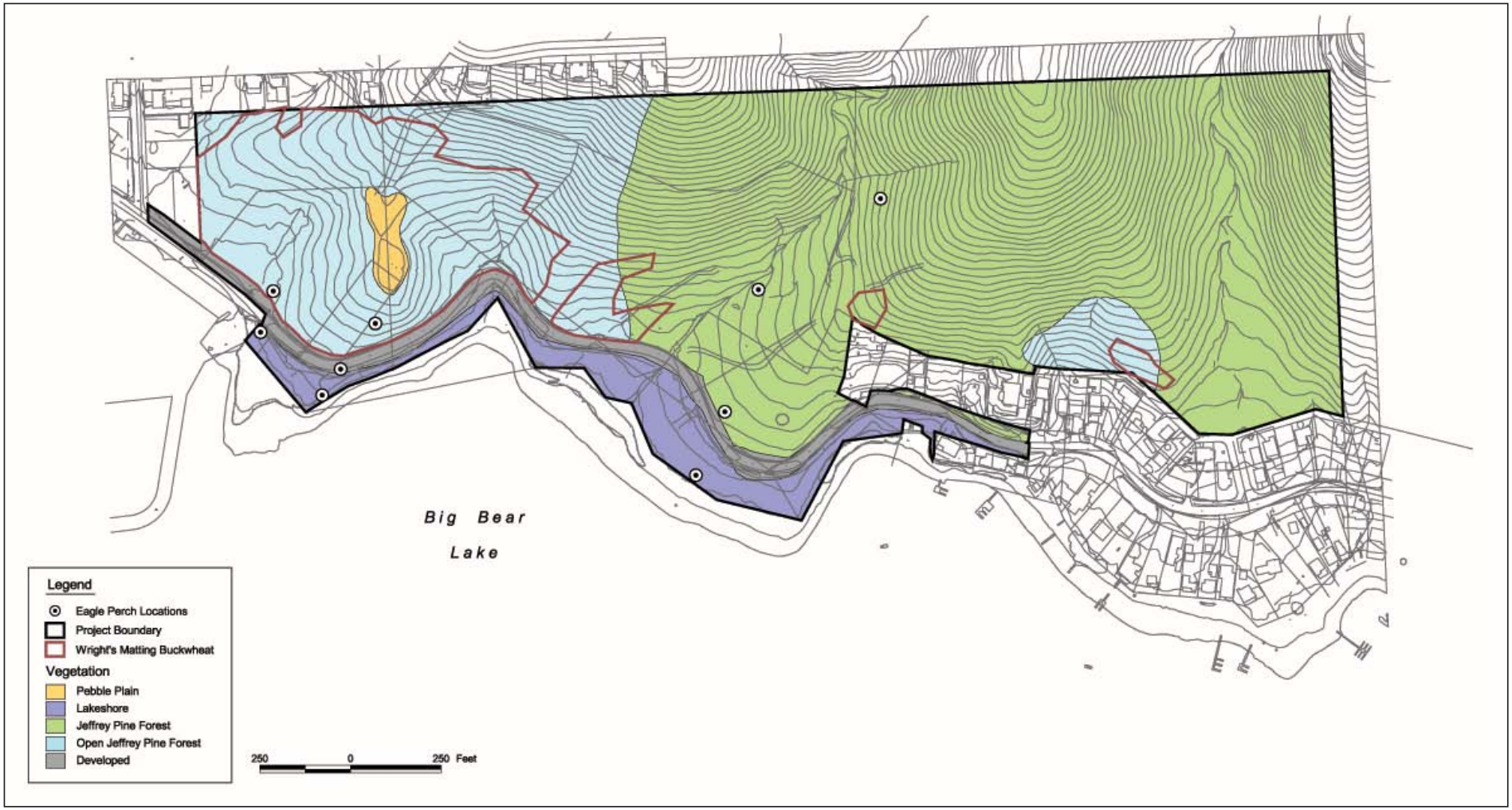
Within the Jeffrey pine forest onsite, tree resources consist of unevenly aged, pine stands composed of approximately 85 percent Jeffrey pine, eight percent western juniper, six percent singleleaf pinyon pine, and less than 1 percent of scattered white fir and black oak. Site quality has been rated medium Class 4 according to the criteria in the Forester's Handbook. The medium Class 4 rating describes the site as having 40 to 59 percent tree cover (medium cover) with small trees of conifer crown diameter 12 to 24 feet, and trunk diameter at breast height (dbh) of 11 to 24 inches. A total of 2,772 trees six inches in diameter or larger was calculated from aerial photographs. These trees grow on soils classified as 2/3 Morical-Hecker in the southern portion and 1/3 Pacifico-Wapi in the northern portion. Morical-Hecker soils are very deep with an effective rooting depth of 40 inches, and have high moisture retention capability, moderate erosion hazard, and a good timber productivity rating. Pacifico-Wapi soils are shallow, with a 10-20 inch effective root depth, low moisture holding capacity, high erosion hazard, and a poor capacity for tree seedling survival and growth without supplemental irrigation.

The overall condition of trees on the property is classified as fair. Scattered groups of large Jeffrey pine and juniper are host to moderate amounts of dwarf mistletoe (*Phorodendron* sp.) and several saplings and small pole pines under these trees have become heavily infested. Although a large number of dead trees were observed on the site, only one tree was observed to have been recently killed by bark beetles. Given the current drought situation and beetle population, there is a high potential for additional tree mortality from insect attack.

Pebble Plain. Pebble plain occurs on 0.69 acre of the Project site north of State Route 38. It appears as a distinct open patch within open Jeffrey pine forest in the western portion of the Project site. The substrate in this area consists of clay soil mixed with quartzite pebbles and gravel that are continually pushed to the surface through frost action. This substrate supports a high floristic diversity consisting of small cushion-forming plants, tiny annuals, grasses, and succulents that are well spaced, low growing, and sun tolerant. Several rare and special status plants are associated with pebble plain habitat, including federally-listed Threatened and Endangered species.

Portions of the pebble plain habitat on the Project site have been subjected to disturbance by off-road vehicles. The Pebble Plain Habitat Management Guide and Action Plan was developed by the San Bernardino National Forest to provide management direction for long-term conservation of pebble plains and the rare plants associated with them. Closure of unauthorized vehicle routes through pebble plain habitat, signage, increased patrol, habitat acquisition, removal of non-native grasses, and public education are actions being taken to protect and enhance the habitat.

Lake Shoreline. Approximately 4.14 acres of the southern boundary of the Project site is formed by the shore of Big Bear Lake. Plant species along the shore itself consisted primarily of herbaceous native and non-native species of periodically saturated soils, including willowherb (*Epilobium* sp.), wire-grass (*Juncus mexicanus*), cursed buttercup (*Ranunculus sceleratus*), and several cinquefoil species (*Potentilla* spp.). Several seedling cottonwood trees (*Populus balsamifera* spp. *trichocarpa*)



Source: BonTerra Consulting, July 2003.

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also occur in this vegetation type. Small patches of meadow transitioning into upland grassland occur along the lakeshore south of State Route 38. The extent of the meadows could not be determined or mapped in 2002 due to dry conditions. The lake was well below its maximum level in 2001 to 2002 due to acute drought conditions. Vegetation is patchy above the high-water level where small areas of Jeffrey pine forest are interspersed among open meadows and grasslands and scattered patches of arroyo willow (*Salix lasiolepis*) and red willow (*Salix laviegata*).

Developed. Developed areas occur on 2.82 acres along the shoreline of the site. Plants found in this vegetation type consist of native and non-native ornamental species which offer very little habitat value for native wildlife species. Paved areas such as State Route 38 and existing turnouts are included in this vegetation type.

Jurisdictional Waters. A Delineation of Jurisdictional Waters was prepared in order to delineate U.S. Army Corps of Engineers' and California Department of Fish and Game's (CDFG) jurisdictional authority for unnamed drainages located within the Project site.

Prior to visiting the site, RBF conducted a review of USGS topographic maps (Quadrangle *Fawnskin, California*, dated 1996) and aerial photographs to identify areas that *may* fall under an agency's jurisdiction. Corps jurisdictional wetlands are delineated using the methods outlined in the Corps of Engineers *Wetland Delineation Manual* (1987) based on hydrologic and edaphic features of the site, and on the vegetation composition of the site. Non-wetland waters of the U.S. are delineated based on the limits of the ordinary high water mark (OHWM) as determined by erosion, the deposition of vegetation or debris, and changes in the vegetation. Generally, California Department of Fish and Game (CDFG) takes jurisdiction to the bank of the stream/channels or to the limit of the adjacent riparian vegetation, whichever is greater. Analysis of the Project site consists of field surveys and verification of current conditions conducted in March 2002.

Vegetation within the drainages of the Project site consisted of upland habitat, dominated by Jeffery pines. Soils within the drainage were documented to be silty-sand (large grain). Soil samples taken on-site were generally dry and lacked characteristics of hydric soils (i.e., odor, streaking, mottling). ~~No flow within the on site drainages was observed during the March 15, 2002 field visit. However, evidence of an OHWM was observed within the drainages, primarily indicated by sediment deposits.~~ No flow within the on-site drainages was observed during the March 15, 2002 field visit. However, evidence of an OHWM was observed within the drainages, primarily indicated by sediment deposits. It should also be noted that Big Bear Lake adjoins the project site to the south. Based on discussions with the Big Bear Municipal Water District, the current water level of Big Bear Lake (as of June 28, 2004) is 6,727.8-feet above mean sea level (msl). The high water mark is reported to be 6,743.2 feet above msl.

There are three key agencies that regulate activities within inland streams, wetlands and riparian areas in California. The U.S. Army Corps of Engineers (Corps) Regulatory Program regulates activities pursuant to Section 404 of the Federal Clean Water Act, and Section 10 of the Rivers and Harbors Act. The California Department of Fish and Game (CDFG) regulates activities under the Fish and Game Code

Section 1600-1616, and the Regional Water Quality Control Board (RWQCB) under Section 401 of the Federal Clean Water Act and the California Porter-Cologne Act.

Waters of the U.S. (Wetland) Determination. The Corps and the EPA jointly define wetlands as: *Those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas* (33 CFR Section 328.3(b)).

In order to be considered a wetland, an area must exhibit all three of the wetland parameters (i.e., vegetation, soil, and hydrology) per the evaluation criteria in the Wetland Delineation Manual. Based on the results of the field investigations, it was determined that all three parameters were not present within the drainages (hydric soils nor riparian vegetation were present). As a result, RBF identified no Corps wetlands on the Project site.

Waters of the U.S. (Non-Wetland) Determination. The unnamed drainages within the Project site exhibited evidence of flow (i.e., sediment/silt deposition) sufficient to document the OHWM (i.e., channel bed and bank lines), thus meeting the criteria for jurisdictional waters. Refer to Exhibit 5.8-2, *Jurisdictional Map*, for an illustration of jurisdictional boundaries.

Based on the results of the field observations and data collection, 0.15-acre of Corps jurisdictional "waters of the U.S." were identified within the Project site. ~~The drainages are ephemeral.~~ In addition to on-site ephemeral drainages, the Corps considers Big Bear Lake jurisdictional. The Corps' jurisdictional limits are delineated at the high water line, which is reported to be at 6,743.2-foot elevation (and below).

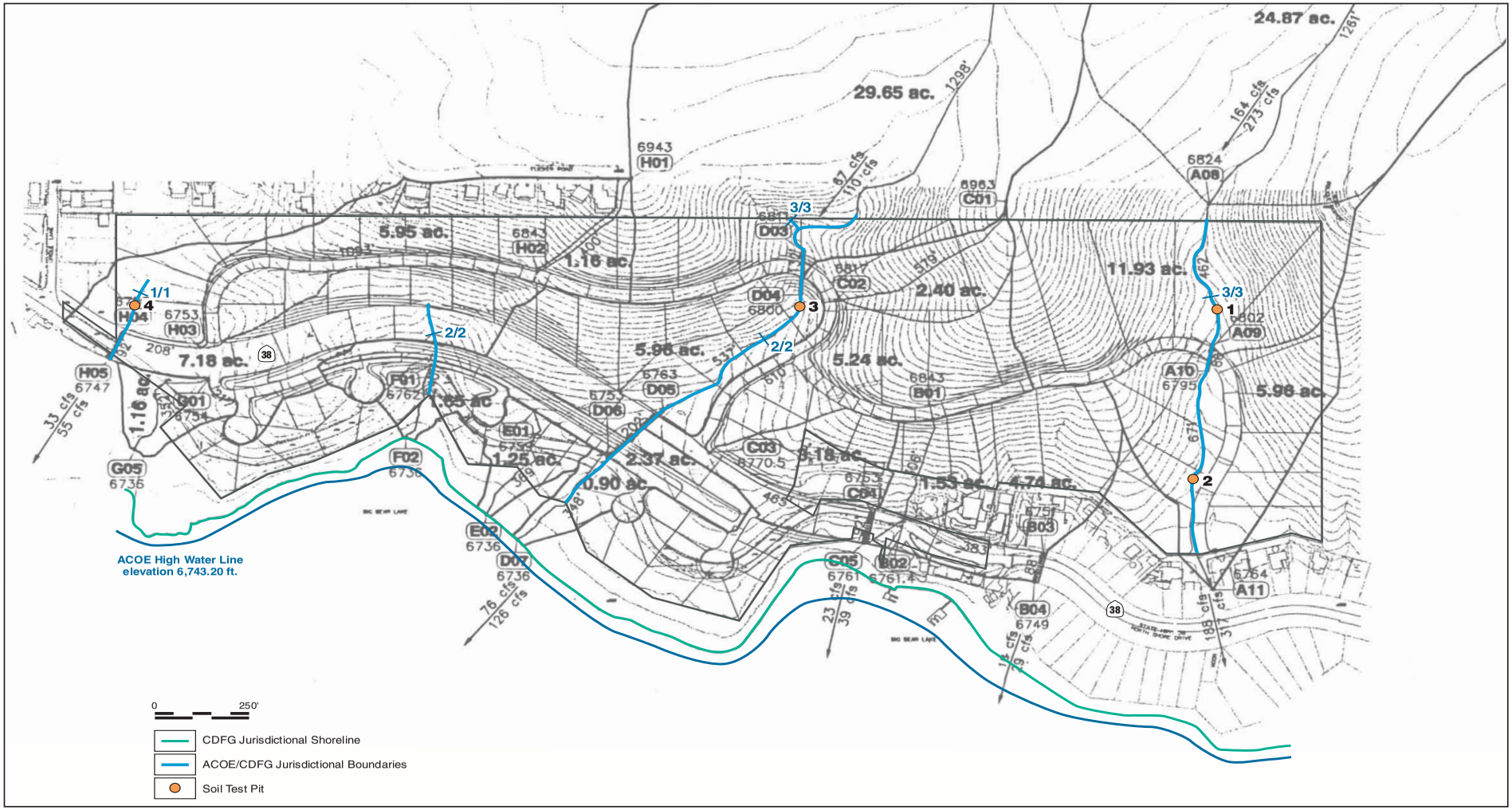
California Department of Fish and Game (1602) Jurisdiction. Based on the results of the field observations and data collection, 0.15-acre of CDFG jurisdictional streambed~~waters~~ was~~were~~ identified within the Project site. As with the Corps, Big Bear Lake would be considered jurisdictional by the CDFG, including the approximate 4.14-acre lake shoreline.

WILDLIFE INVENTORY

WILDLIFE

Amphibians

Amphibians require moisture for at least a portion of their life cycle and many require standing or flowing water for reproduction. Although more typical in mesic conditions, there are a number of amphibians species that occur or potentially occur even in the more xeric habitats. Terrestrial species may or may not require standing water for reproduction. These species are able to survive in dry areas by remaining beneath the soil in burrows, under logs or leaf litter, and emerging only when temperatures are low and humidity is high. Many of these species' habitats are associated with water, and they emerge to breed once the rainy season begins. Soil moisture conditions can remain high throughout the year within some habitat types, depending on factors such as amount of vegetation cover, elevation, and slope aspect.



Source: Delineation of Jurisdictional Waters, Moon Camp TT #16136, prepared by RBF, July 2004.

RBF CONSULTING
PLANNING ■ DESIGN ■ CONSTRUCTION
12/05 JN 10-101901

MOON CAMP TT #16136
ENVIRONMENTAL IMPACT REPORT

Jurisdictional Map

Exhibit 5.8-2

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No amphibians were detected during the field surveys; however, leaf litter and rotting logs on the Project site provide potential habitat for the Pacific slender salamander (*Batrachoseps pacificus*). The western toad (*Bufo boreas*) would also be expected to occur on the Project site.

Reptiles

Reptilian diversity and abundance typically vary with vegetation type and character. Many species prefer only one or two vegetation types; however, most will forage in a variety of habitats. Most species occurring in open areas use rodent burrows for cover, and protection from predators and extreme weather conditions. Those species discussed below, which were not observed during surveys, are expected to occur based on the presence of suitable habitat (substrate and vegetation) within the Project site.

Reptile species observed during the surveys include the western fence lizard (*Scleroporus occidentalis*), sagebrush lizard (*Sceloperus graciosus*), western skink (*Eumeces skiltonianus*), southern alligator lizard (*Elgaria multicarinatus*), and southern Pacific rattlesnake (*Crotalus viridis helleri*). Common reptile species expected to occur on the Project site include the side-blotched lizard (*Uta stansburiana*) and gopher snake (*Pituophis melanoleucus*).

Birds

Montane conifer forests in the San Bernardino Mountains can experience severe winter conditions during the winter months. Nonetheless, several resident bird species are expected to occur on the Project site, using the habitats throughout the year. Other species are present only during certain seasons. For example, the Anna's hummingbird (*Calypte anna*), which was observed on the Project site, is expected to occur during the breeding season (i.e., spring and summer) and will then migrate south for the winter.

Common resident bird species observed on the Project site during surveys include the following:

- wild turkey (*Meleagris gallopavo*)
- band-tailed pigeon (*Columba fasciata*), great-horned owl (*Bubo virginianus*)
- acorn woodpecker (*Melanerpes formicivorus*)
- red-breasted sapsucker (*Sphyrapicus ruber*)
- hairy woodpecker (*Picoides villosus*)
- Nuttall's woodpecker (*Picoides nuttallii*)
- northern flicker (*Colaptes auratus*)
- black phoebe (*Sayornis nigricans*)
- Stellar's jay (*Cyanocitta stelleri*)
- common raven (*Corvus corax*)
- mountain chickadee (*Poecile gambeli*)
- bushtit (*Psaltriparus minimus*)
- red-breasted nuthatch (*Sitta canadensis*)
- white-breasted nuthatch (*Sitta carolinensis*)
- house wren (*Troglodytes aedon*)

- western bluebird (*Sialia mexicana*)
- northern mockingbird (*Mimus polyglottos*)
- European starling (*Sturnus vulgaris*)
- spotted towhee (*Pipilo maculatus*)
- dark-eyed junco (*Junco hyemalis*)
- Brewer's blackbird (*Euphagus cyanocephalus*)
- brown-headed cowbird (*Molothrus ater*)
- house finch (*Carpodacus mexicanus*)
- red crossbill (*Loxia curvirostra*)

Other resident species expected to occur on the Project site include the following:

- pied-billed grebe (*Podilymbus podiceps*)
- great blue heron (*Ardea herodias*)
- mallard (*Anas platarynchos*)
- gadwall (*anas strepera*)
- ruddy duck (*Oxyura jamaicensis*)
- red shouldered hawk (*Buteo lineatus*)
- red-tailed hawk (*Buteo jamaicensis*)
- American kestrel (*Falco sparverius*)
- American coot (*Fulica americana*)
- killdeer (*Charadrius vociferus*)
- rock dove (*Columbia livia*)
- mourning dove (*Zenaida macroura*)
- pygmy nuthatch (*Sitta pygmaea*)
- brown creeper (*Certhia americana*)
- Bewick's wren (*Thryomanes bewickii*)
- American robin (*Turdus migratorius*)
- pine siskin (*Carduelis pinus*)

Montane conifer habitats in the San Bernardino Mountains typically experience mild, warm summer months. Given the mild climate and abundance of nesting habitat, several bird species are expected to occur on the Project site during the breeding season. Common breeding bird species observed on the Project site during surveys include Ana's hummingbird and western wood-peewee (*Contopus sordidulus*). Other common breeding species expected to occur on the Project site include the spotted sandpiper (*Actitis macularia*), violet green swallow (*Tachycineta thalassina*), and yellow-rumped warbler (*Dendroica coronata*).

Mammals

The ornate shrew (*Sorex ornatus*), brush mouse (*Peromyscus boylii*), western grey squirrel (*Sciurus griseus*), California ground squirrel (*Spermophilus beecheyi*), dusky-footed woodrat (*Neotoma fuscipes*), California vole (*Microtus californicus*), and coyote (*Canis latrans*) were observed on the Project site during the surveys. Other mammals expected to occur on the Project site include the following:

- dusky shrew (*Sorex monticolus*)
- broad-footed mole (*Scapanus latimanus*)
- Merriam's chipmunk (*Tamias merriami*)

- lodgepole chipmunk (*Tamias speciosus*)
- golden-mantled ground squirrel (*Spermophilus lateralis*)
- deer mouse (*Peromyscus maniculatus*)
- western harvest mouse (*Reithrodontomys megalotis*)
- Botta's pocket gopher (*Thomomys bottae*)
- house mouse (*Mus musculus*)

Easily detectable mammals that are expected to occur on the site include the following:

- Virginia opossum (*Didelphis virginiana*)
- porcupine (*Erethizon dorsatum*)
- long-tailed weasel (*Mustela frenata*)
- striped skunk (*Mephitis mephitis*)
- raccoon (*Procyon lotor*)
- mule deer (*Odocoileus hemionus*)
- bobcat (*Felis rufus*)

Larger mammals that may occur on the Project site include the gray fox (*Urocyon cinereoargenteus*), black bear (*Ursus americanus*), badger (*Taxidea taxus*), and mountain lion (*Felis concolor*).

Bats occur throughout most of southern California and may use any portion of the Project site as foraging habitat. Most of the bats that could potentially occur onsite are inactive during the winter and either hibernate or migrate, depending on the species. The California myotis (*Myotis californicus*) and big brown bat (*Eptesicus fuscus*) may occur on the Project site. Gaps in peeling bark and hollow snags or limbs provide potential roosting and maternal colony opportunities for these and other bat species.

WILDLIFE MOVEMENT

Wildlife movement activities usually fall into one of three movement categories: (1) dispersal (e.g., juvenile animals from natal areas, individuals extending range distributions); (2) seasonal migration; and (3) movements related to home range activities (e.g., foraging for food or water, defending territories, searching for mates, accessing breeding areas, or securing cover). A number of terms have been used in various wildlife movement studies, such as "travel route", "wildlife corridor", and "wildlife crossing" to refer to areas in which wildlife move from one area to another.

To clarify the meaning of these terms and to facilitate the discussion on wildlife movement in this analysis, these terms are briefly defined as follows:

- *Travel Route* – a landscape feature such as a ridgeline, drainage, canyon, or riparian strip within a larger natural habitat area that is used frequently by animals to facilitate movement and provide access to necessary resources (e.g., water, food, cover, den sites).

- *Wildlife Corridor* – a piece of habitat, usually linear in nature, that connects two or more habitat patches that would otherwise be fragmented or isolated from one another.

- *Wildlife Crossing* – a small, narrow area, relatively short in length and generally constricted in nature, that allows wildlife to pass under or through an obstacle or barrier that otherwise hinders or prevents movement.

As defined above, the Project site does not contain wildlife crossings or corridors. Nonetheless, the Project site could be used as a travel route connecting forest habitat to the north with Big Bear Lake. However, direct connection to open space areas north and east of the Project site are obstructed by State Route 38. The importance of this travel route may be diminished by the vehicle traffic hazard associated with crossing State Route 38 as well as the availability of similar habitat immediately adjacent to the east of the Project site.

SPECIAL STATUS BIOLOGICAL RESOURCES

The following discussion addresses special status biological resources observed, reported, or having the potential to occur on the Project site. These resources include plant and wildlife species that have been afforded special status and/or recognition by federal and state resource agencies, as well as the California Native Plant Society (CNPS). In general, the principal reason an individual taxon (i.e., species, subspecies, or variety) is given such recognition is the documented or perceived decline or limitations of its population size, geographic range, and/or distribution resulting in most cases from habitat loss. Table 5.8-2, *Special Status Plant Species*, and Table 5.8-3, *Special Status Wildlife Species*, provide a summary of special status plant and wildlife species known to occur in the Project region including information on the status, potential for occurrence, and definitions for the various status designations. In addition, special status biological resources include vegetation types and habitats that are either unique, of relatively limited distribution in the region, or of particularly high wildlife value. Federal, state, and local government conservation programs have defined these resources. Sources used to determine the special status of biological resources are as follows:

- Plants – *Electronic Inventory of Rare and Endangered Vascular Plants of California.* (California Native Plant Society [CNPS] [2000]). California Natural Diversity Database (CNDDB) *List of Special Plants* (CDFG [1998]). Various Federal Register notices from the USFWS regarding listing status of plant species.

- Wildlife – California Wildlife Habitat Relationships Database System (CDFG 1991); CNDDB (CDFG 2000), Various Federal Register notices from the USFWS regarding listing status of wildlife species.

- Habitats – CNDDB (CDFG 2000).

Table 5.8-2
Special Status Plant Species Potentially Occurring Within the Project Region

Species	Status[1]			Likelihood for Occurrence
	USFWS	CDFG	CNPS	
Abronia nana ssp. *covillei* Coville's dwarf abronia	—	—	4	Low; marginally suitable habitat
Allium parishii Parish's onion	—	—	4	Low; above known elevation range
Antennaria marginata White-margined everlasting	—	—	2	None; outside of known geographic range (only local occurrences in Barton Flats area)
Arabis breweri var. *pecuniaria* San Bernardino rock-cress	—	—	1B	None; far below known elevation range
Arabis dispar Pinyon rock-cress	—	—	2	None; outside known geographic range (only occurs on desert-facing slopes)
Arabis parishii Parish's rock-cress	—	—	1B	Observed
Arabis shockleyi Shockley's rock-cress	—	—	2	None; outside known geographic range (only local occurrences on desert-facing slopes)
Arenaria lanuginosa ssp. *saxosa* Rock sandwort	—	—	2	Moderate; marginally suitable habitat
Arenaria ursina Big Bear Valley sandwort	FT	—	1B	High; suitable habitat
Astragalus albens Cushenbury milk-vetch	FE	—	1B	None; no suitable habitat (carbonate soils)
Astragalus bicristatus Crested milk-vetch	—	—	4	High; suitable habitat
Astragalus lentiginosus var. *sierrae* Big Bear Valley milk-vetch	—	—	1B	High; suitable habitat
Astragalus leucolobus Big Bear Valley woollypod	—	—	1B	Observed
Atriplex parishii Parish's smallscale	—	—	1B	None; no suitable habitat (alkali sink)
Berberis fremontii Fremont's barberry	—	—	3	None; no suitable habitat (presumed extinct in Cushionbury area)
Botrychium crenulatum Scalloped moonwort	—	—	2	None; no suitable habitat (marshes, bogs)
Calochortus palmeri var. *palmeri* Palmer's mariposa lily	—	—	1B	Moderate; marginally suitable habitat
Calochortus plummerae Plummer's mariposa lily	—	—	1B	None; above known elevation range
Castilleja cinerea Ash-gray Indian paintbrush	FT	—	1B	Observed
Castilleja lasiorhyncha San Bernardino Mountain owl's clover	—	—	1B	High; suitable habitat
Dryopteris filix-mas Male fern	—	—	2	Low; local rarity; outside known range