Department of Water

May 6, 2009

Michael Perry
California Collaborative Solutions
Post Office Box 706
Big Bear City, CA 92314

Re: Moon Camp Water Feasibility Study – 250 gpd/lot

Dear Mr. Perry,

This letter is in response to your question regarding the Big Bear Lake Department of Water and Power's (DWP's) use of 250 gallons per day (gpd)/lot in the Moon Camp Water Feasibility Study. Currently, the DWP uses 250 gpd/lot for all feasibility studies for new subdivisions and this is based on historical water demand of customers within the DWP's service area.

In our 2006 Master Plan, the engineering firm contracted to produce this plan calculated our daily average water use at 165 gpd (2,720 af/14,748 customers) using 2002 water use data, and added 65 gpd for unaccounted for water and demographic factors to equal 230 gpd/customer. Prior to this work, the DWP had been using 250 gpd/lot as its planning number. The Master Plan analysis confirmed this number was reasonable and we still use it.

The calculations described above were produced with water use data collected prior to the implementation of an extremely aggressive water conservation program. Between 2001 and 2005, the water demand within our service area declined 18%. Most of these conservation measures are still in effect and the water demand within our service area remains well below the peak demand recorded in 2001. Considering we now have 950 (7%) more customers than in 2002, maintaining water demand more than 15% below the 2001 peak is encouraging.

Customer water demand was 2,424 acre feet in 2008 and the number of DWP customers that year was 15,698, which yields an average of 138 gpd/customer. If we add the same figure for unaccounted for water and demographics (65 gpd/customer), as was done in 2006, the current planning number estimate would be 203 gpd/customer. This is 19% lower than the 250gpd/customer planning number used in the Moon Camp Feasibility Study.

While the DWP has not updated the 250 gpd/lot planning number since 2006, we feel this number is the best available estimate for planning purposes at this time. The simple analysis I

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calcolsol@gmail.com

May 14, 2009

Wes Reeder
County Geologist
Land Use Services Department
County of San Bernardino
385 North Arrowhead Avenue, 1st Floor
San Bernardino, CA 92415-0181

Re: Moon Camp Tract Water Supply

Wes,

Enclosed please find the items / responses to your requests regarding the Moon Camp Tract Water Supply:

1. May 6, 2009 letter from the DWP's Water Resource Manager, William La Haye, explaining the basis for the DWP's use of 250 gallons per day (gpd) in their Water Feasibility Studies for new development.

2. Copies of the DWP's Water Usage Restrictions / Water Conservation Regulations including Ordinance No. 2005-348; Conservation Stage 1 Water Use Restrictions; Residential Tiered Water Rates; Spring & Summer Water Conservation Guide; and Fall & Winter Conservation Guide.

3. May 1, 2009 letter from Tom Harder, Groundwater Consulting, addressing your questions:
    - The minimum perennial yield for Sub Area A
    - His opinion of the potential impacts of pumping Well FP2 on Big Bear Lake
    - His opinion of potential impacts associated with utilization of Well FP4 as a supplemental water source

4. Our request to the DWP for their conceptual approval of Water Service Alternative #1 – interconnection of the Moon Camp Tract's pipelines and wells with the DWP's Fawnskin Water system in order to provide water storage and fire flow to the Tract. (Water Service Alternative #2 is the construction of an independent water system on the Tract including reservoir and fire booster station)

5. Figure 2-1, DWP Service Area, and Figure 5-1, DWP Existing Facilities, from the DWP November 2006 Master Plan; Exhibit 2-3, Land Use Designations, from the Moon Camp Draft EIR; and the DWP's September 2, 2008 Figure 1, DWP Service Area and Tributary Subarea Boundaries. These Figures and Exhibit show that the only remaining undeveloped private land within Sub Area A is a 6.8 acre parcel of land to the north of the Moon Camp Tract. This parcel is within the DWP's service area and will be served from the Grout Creek Groundwater Basin through the existing DWP water line in Flicker Road that dead ends into the western boundary of the 6.8 acre parcel.

As we discussed, the Draft EIR will include the statement: "The pumping of Well FP2 within Sub Area A of the North Shore Groundwater Basin to supply the Moon Camp Tract will be limited to 9 acre feet per year until the water purveyor can demonstrate that more than 9 acre feet per year can be withdrawn without adverse impacts to Sub Area A and the private well owners who also pump from Sub Area A."

Please call me if you have any questions.

Sincerely,

Michael Perry

Michael Perry
California Collaborative Solutions

DWP's Water Conservation / Water Usage Restrictions

The average water demand in the San Bernardino Valley (and other areas of California) is much higher than in the Big Bear area as most houses off the mountain have extensive green landscape areas to water. The DWP has been a leader in water conservation by implementing:

- Significantly increasing Tiered Water Rate Structure - $2.06/ccf to $9.77/ccf (copy attached)
- All indoor water fixtures are required to be low flow / low flush (new construction and at change of ownership)
- Water Conservation Landscape Ordinance (copy attached):
    - Limiting turf to 500 square feet for each property and approval by DWP
    - Turf irrigation must include an automatic controller that incorporates evapo-transpiration and rain shutoff features
    - Sprinklers are only allowed for turf. All other landscape plantings must be irrigated with efficient, low water use devices, such as, drip systems or bubblers.
    - All outdoor irrigation systems shall be shut off and winterized between Nov 1 – Apr 1
    - All new developments are required to install low water use landscape elements
    - Landscape plans must be approved by the DWP when proposed landscape exceeds 1,000 square feet
    - Landscape plans must demonstrate their adherence to Xeriscape principles
- Stage 1 Water Use Regulations (copy attached):
    - No washing of sidewalks, walkways, driveways, patios, porches, buildings from a hose
    - Outdoor irrigation limited to every other day
    - Outdoor irrigation before 9 am and after 6 pm only
    - No water used for compaction or dust control
    - No flooding or runoff onto driveways or streets
    - Vehicle washing using a bucket and hose equipped with an automatic shutoff nozzle

As shown in the Landscape Ordinance, outdoor irrigation in Big Bear only occurs for a maximum of 7 months a year. Due to the cold spring / fall climate, only 4 months, June – September, are warm enough for what would be called, "normal outdoor irrigation".

As shown above, water usage in Big Bear is required to be significantly different than what occurs in the San Bernardino Valley and elsewhere in California.

DEPARTMENT OF WATER (DWP)

RESIDENTIAL WATER RATES FOR 2 MONTHS

SERVICE CHARGES: (5/8" Meter)

Operation & Maintenance	$ 8.36
Debt Service	$ 35.60
System Rehabilitation Fee	$ 15.82
Total Minimum Billing Every Two Months:	**$ 59.78**

WATER USAGE CHARGE

1 unit = 1 ccf = 100 cubic feet = 748 gallons

Tier 1	First 24 ccf	$ 2.06 each
Tier 2	Next 16 ccf (25 to 40 ccf)	$ 2.86 each
Tier 3	Next 20 ccf (41 to 60 ccf)	$ 4.27 each
Tier 4	Next 40 ccf (61 to 100 ccf)	$ 7.04 each
Tier 5	All usage over 100 ccf	$ 9.77 each

The service charge and rehabilitation fees are "readiness to serve" charges applicable to all connected services. This amount is charged regardless of any water usage or whether the service is turned on or off. The purpose of the service charge is to keep the water system in a condition that is ready to serve ALL our customers at any given time. Approximately 60% of your service charges go to repay the debt for the purchase of the Water System. The remainder of the service charge (and all the usage fees) are used to fund the Operations and Maintenance Budget. The rehabilitation fee is specifically designated to fund the needed improvements to the Water System.

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www.bbldwp.com

Rev. 7/08

Department of Water

City of Big Bear Lake
41972 Garstin Drive, Big Bear Lake, CA 92315
909-866-5050

CONSERVATION STAGE I: WATER-USE REGULATIONS

All Department of Water (DWP) customers in the Big Bear Valley are under **Stage I Water Shortage Emergency Regulations, with the exception of Lake William, which is under Stage II Water Shortage Emergency Regulations.** Conservation stages are determined by the Board of Commissioners based on many variables, some of which are the current ground water levels, recent ground water level trends, prior year precipitation and water demand, and current and anticipated water demand. Current Stage I regulations include, but are not limited to the following:

- Outdoor irrigation will be permitted every other day based on the customer's address and the current date. **See reverse side for details.**
- All new landscapes and existing landscape modifications greater than 1,000 square feet require a landscaping permit prior to beginning work.
- New turf installations may not exceed 500 square feet in size, and must be permitted prior to installation. **See reverse side for details.**
- Irrigation systems must be shut down from November 1st to April 1st.
- No DWP water may be used for soil compaction or dust control.
- No washing of sidewalks, walkways, driveways, parking areas, patios, porches or verandas, buildings and structures using water from a hose except when needed to protect public health and safety.
- No water shall be used to clean, fill, operate, or maintain levels in decorative fountains unless such water is part of a recycling system.
- All water leaks must be repaired in a timely manner.
- Noncommercial washing of private vehicles, trailers, buses or boats must be conducted through the use of a bucket and a hose equipped with a shut-off nozzle.
- There shall be no use of water from a fire hydrant, except for fire protection purposes.
- There shall be no flooding or run-off in driveways or streets.

FOR A COMPLETE LIST OF THE WATER-USE REGULATIONS, PLEASE CALL THE CONSERVATION DEPARTMENT AT (909) 866-5050 OR VISIT WWW.BBLDWP.COM.

Oudo Water Saving Tips

- **Lay mulch around trees and plants** at least one to two inches deep to retain moisture, slow evaporation, and discourage weed growth.
- **Weeds are water thieves,** robbing your plants of water and nutrients. Try to keep your lawn and garden weed-free.
- **Set a kitchen timer or invest in a sprinkler timer to help prevent over watering.** A lot of water can be wasted in a short period of time if you forget to turn your sprinklers off.
- **If it doesn't grow, don't water it.** Position sprinklers so water doesn't land in the gutters or on any paved areas.
- **Don't water on windy days.** Water will go everywhere except where it is needed.
- **Consider installing drip irrigation systems.** Drip irrigation systems allow water to flow slowly to roots and also reduce water loss due to evaporation.
- **Check for leaks** in pipes, hoses, faucets, and couplings. Leaks can waste a lot of water.

Xeriscape

It's a Smart Choice

Salvia

Xeriscape is an attractive, sustainable landscape that conserves water and is based on sound horticultural practices. Simply stated, Xeriscape is a landscape that is water wise – using water conservatively in the landscape without wasting. Creating sustainable landscapes is one way that homeowners can lessen the impact on the local environment. Xeriscaping encourages the use of a wide variety of durable plants to create a low-maintenance landscape that is well matched to its region. Planting a beautiful Xeriscape landscape can attract hummingbirds, butterflies and beneficial insects, while enhancing the value, comfort and appearance of your property.

Outdoor Wate g Schedule

- Before 9:00 a.m. and after 6:00 p.m.
- Every other day based on your address and the current date. If your address ends in an even number, you can water on the even days of the week, such as the 2nd, 4th, etc.

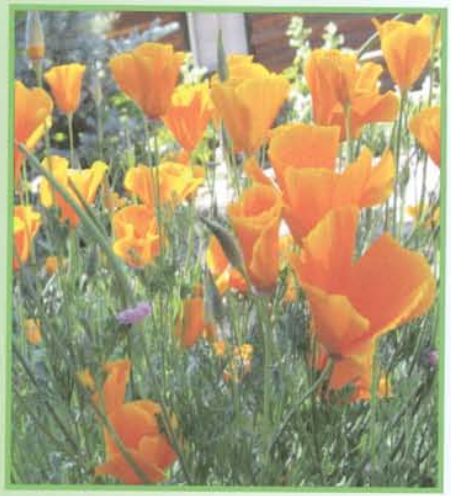
Outdoor Watering Guidelines

Additional outdoor watering restrictions include, but are not limited to:

- New turf installations plus existing turf, may not exceed 500 square feet in size, and must be approved by the DWP prior to installation.
- No washing of sidewalks, walkways, driveways, parking areas, patios, porches or verandas, buildings and structures using water from a hose except when needed to protect public health and safety.
- No water shall be used to clean, fill, operate, or maintain levels in decorative fountains unless such water is part of a recycling system.
- Non-commercial washing of private vehicles, trailers, buses or boats must be conducted through the use of a bucket and a hose equipped with a shut-off nozzle.
- No flooding or run-off in driveways or streets.
- All water leaks must be repaired in a timely manner.

Plant Smart **Water Smart**

Spring & Summer Guide



California Poppy

Department of Water and Power
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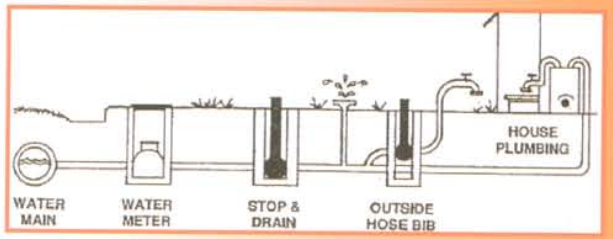
P MBING DIAGRAM



ALTERNATIVE FREEZE PREVENTION

Instead of draining your home's water system, you may heat the home to avoid freezing pipes. However, leaving your thermostat at 45 to 55 degrees does NOT always ensure that the pipes will not freeze. Winter storms may cause power outages, which will cause some heating systems to shut off, resulting in frozen pipes.

IF YOUR PIPES FREEZE

- If you turn on the faucets and nothing comes out, call the DWP. We can send a field employee to your home to help evaluate the situation.
- If you have detected that your pipes are frozen, you may need to call a plumber or wait for the pipes to thaw out. Turning up the home's thermostat might help unfreeze the pipes.
- Open all faucets in the house. When water freezes, it expands by 1/5th its original volume. By relieving pressure, due to the expanding water, you may avoid additional pipe damage.
- Once your pipes have thawed, it is important that you carefully inspect your home for any signs of a leak. The freezing of the pipes could have caused a pinhole leak, hairline break, or large crack.

DWP (909) 866-5050

FALL G/ ENING

Fall is the perfect time for assessing, designing, and improving your landscape. The little effort you make now will help your garden survive the cold winter and thrive in the springtime.

Fall To Do Items

- Adjust your irrigation schedule to reflect your plants' reduced water needs. Turn off irrigation by November 1st.
- Prune any diseased or stressed tree and shrub limbs now, while the healthy parts of the plant are more easily differentiated.
- Cut back flowers that have stopped blooming. Wildflower and perennial seeds can be harvested and sown now or before the first snowfall.
- Eliminate weeds. Each weed you eliminate now will prevent possibly hundreds of weeds from sprouting in the spring.
- Plant your spring bulb garden now.
- Plant trees and shrubs. The soil is still warm from summer, encouraging healthy root growth.
- Mulch to help protect plant roots from fluctuating soil temperatures.

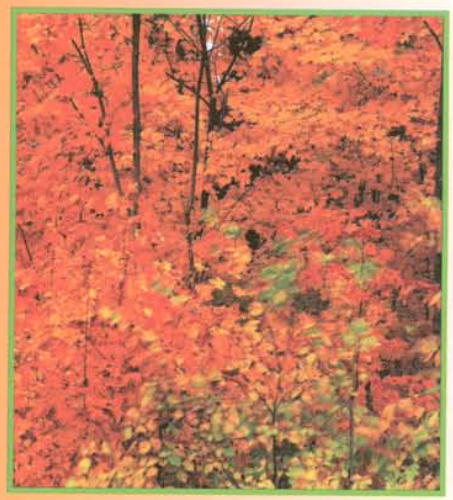
PLANNING FOR SPRING

October and November are the perfect time to start planning for the upcoming spring season. This includes planting drought-tolerant bulbs such as crocus, iris, and tulips.

If you are planning a Xeriscape garden, log on to the DWP web site to access extensive plant lists, landscaping guides, and links to water-wise gardening. If you have turf and want to replace it with beautiful Xeriscape or Native plants, hardscape, or other alternatives, please contact the DWP to learn about our turf buy-back program. Start planning your water-wise garden now!

www.bbldwp.com

FALL & WINTER GUIDE



Fall Colors

Department of Water and Power
City of Big Bear Lake
41972 Garstin Drive
Big Bear Lake, CA 92315
909-866-5050

ORDINANCE NO. 2005-348

AN ORDINANCE OF THE CITY OF BIG BEAR LAKE, COUNTY OF SAN BERNARDINO, STATE OF CALIFORNIA, AMENDING CHAPTER 15.66 OF ARTICLE XV OF THE BIG BEAR LAKE MUNICIPAL CODE DEALING WITH THE REGULATION OF LANDSCAPING

WHEREAS, the Department of Water and Power of the City of Big Bear Lake (the "Department") has undertaken to supply existing customers with water including, most importantly, water for human consumption, sanitation, and fire protection; and

WHEREAS, the total water supply available to the Department Service Area is dependent upon local rainfall and snow melt percolation into local ground water sources, which are limited; and

WHEREAS, recent periods of insufficient natural ground water recharge in the Big Bear Valley make it necessary for the Department to implement water conservation measures; and

WHEREAS, water usage and demand by Department customers has substantially increased over the past ten years, especially as a result of landscaping; and

WHEREAS, the estimate of perennial yield of the aquifers, water usage by customers, and anticipated growth of the community indicate that water demand may exceed supply within the next ten years; and

WHEREAS, the City Council of the City of Big Bear Lake ("City") desires to maintain the Department's water resources for human consumption, sanitation, and fire protection and reduce wasteful and inefficient consumption of water; and

WHEREAS, the City Council of the City of Big Bear Lake finds inefficient landscaping practices disproportionately drains the water resources of the Department; and

WHEREAS, the City Council of the City of Big Bear Lake finds that Chapter 15.66 must be amended to adequately address inefficient landscaping practices; and

WHEREAS, pursuant to Article XI, Section 7 of the California Constitution, the City is authorized to make and enforce within its limits all local, police, sanitary, and other ordinances and regulations not in conflict with the general laws of the State.

NOW THEREFORE, THE CITY COUNCIL OF THE CITY OF BIG BEAR LAKE DOES ORDAIN AS FOLLOWS:

SECTION 1. Chapter 15.66 of Article XV of the City of Big Bear Lake Municipal Code is hereby amended in its entirety to read as follows:

Chapter 15.66

LANDSCAPING REGULATIONS

Sections:

Section 15.66.010 Purpose. The purpose of this chapter is to set forth and require all new, retrofitted, or modified landscaping to adhere to landscaping practices guided by the latest low water use technology that emphasizes water-use efficiency to maximize the benefit of existing water supplies for the citizens of, visitors to, and the economic well-being of the Big Bear Valley. These measures will significantly reduce wasteful and inefficient consumption of water, and thus make these water resources available for human consumption, sanitation, and fire protection.

Section 15.66.020 Application; Exception. The provisions of this chapter shall apply to all customers of the Department, including customers who may also take ground water from private wells not owned or operated by the Department. Some or all of the guidelines and prohibitions contained in this chapter may not apply to specific, publicly owned properties such as schools and parks, which will be evaluated on a case-by-case basis.

Section 15.66.030 Goals and Objectives. Due to the increasing demand for water by Department customers for landscaping, and the finite nature of the Big Bear Valley's water resources, the general welfare of the community is best served by using the available water supply efficiently for maximum beneficial uses. Wasteful, inefficient, and unreasonable uses of water must be prevented.

Therefore, the Department hereby declares and establishes the following goals and objectives pertaining to the use of water provided by Department for landscaping.

A. Goals.

1. Efficient use and distribution of water used for landscaping and irrigation.
2. Conservation of limited water resources.
3. Use of appropriate planning to eliminate all wasteful and inefficient uses of water from all landscape plans during the planning stage.
4. Provide reasonable and appropriate size and water-use limitations for all landscape features.

B. Objectives.

1. To conserve the available water supply.
2. To achieve an overall, per capita reduction in water use.
3. To eliminate inefficient irrigation.
4. To reduce the volume of water waste.
5. To ensure an adequate supply of water to meet the reasonable needs of all users of Department water.
6. To increase the use and installation of water-conserving plants, landscapes, mountainscapes, and Xeriscapes.
7. To require all new developments and encourage existing developments to install low water-use landscape elements and erosion control devices.

Section 15.66.040 Definitions. The following words and phrases, whenever used in this chapter, shall be construed as defined in this section, unless otherwise specified within individual sections of this chapter.

"Aquifer" means a permeable geologic unit that can transmit significant quantities of water under ordinary hydraulic gradients.

"Board" means the Department's Board of Commissioners.

"CCF" means 100 cubic feet which equals 748 gallons.

"Customer" (City and County) means all persons, residences, businesses, and entities who receive and/or use water provided by the Department within the City or County.

"Department" means the City of Big Bear Lake Department of Water and Power.

"Drought" means a series of years where precipitation is below average.

"Emitter" means any irrigation nozzle that is used to distribute water to landscape vegetation.

"Environmental sensing device" means any device that uses or recognizes weather or soil moisture to modify irrigation schedules. Typical examples of an environmental sensing device include evapotranspiration irrigation controllers, soil moisture sensors, and rainfall shut-off devices.

"Erosion" means the process of moving soil by any agent of weather, typically the result of rainfall runoff.

"Erosion control" means anything that inhibits erosion.

"Essential water use" means water necessary for human consumption, sanitation, and fire protection. All other use of water, not specifically required to meet these needs, shall be considered nonessential.

"Existing developments" means any development for which certificates of occupancy have been granted.

"Finite" means limited in quantity.

"Fire protection" means water needed to protect humans and their property from an active fire.

"Ground water" means any water derived from springs or wells.

"Hardscape" means a landscape feature that contains no vegetation. Examples of a Hardscape include walkways, decks, graveled areas, and areas covered with mulches.

"His" is a collective term independent of gender and may refer to male or female.

"Human consumption" means water directly consumed by humans and their pets or livestock.

"Inefficient" means using water in a quantity in excess of the amount required, as determined by the Department, to accomplish a given task.

"Inefficient irrigation" means the process of providing more water to landscape plants or elements than is required for healthy, normal growth and appearance.

"Irrigation" means the process of providing supplemental water supplied by the Department to landscape plants and elements.

"Landscape" means the entire parcel less the building footprint, driveways, non-irrigated portions of parking lots, hardscapes, and other non-porous areas.

"Landscape element" means any and all unique features of a landscape.

"Landscaping" means the process of adding or subtracting vegetation or non-vegetative materials or their support structures (e.g. irrigation systems, walkways, retaining walls) to a landscape.

"Maximize the benefit" means to obtain the greatest feasible benefit.

"Mountainscape" means any low water-use landscape that is compatible with the climate of the Big Bear Valley.

"New developments" means developments that are under construction or will be constructed in the near future, and for which certificates of occupancy have not been granted.

"Percolation" means movement of water, by the forces of gravity, through soils and bedrock to a point of greater depth than its previous location.

"Perennial yield" means the maximum quantity of water available on an annual basis for the foreseeable future. This quantity depends on the amount of water economically, legally, and politically available to the organization(s) managing the ground water basin.

"Rain shut-off sensor" means any mechanism that detects precipitation and transmits the information to an irrigation controller.

"Recharge" means the process of adding water to an aquifer.

"Retrofit" means any change to any existing element.

"Sanitation" means cleanliness or the disposal of unhealthful waste.

"Turf" means a surface layer of earth containing grass with its roots.

"Wasteful" means using water in a quantity in excess of the amount needed to accomplish a given task.

"Water conservation plan" means a plan developed for any property that provides recommendations for conserving water based on how the home or business occupying the property used water in the past.

"Water conservation" means practices or activities which result in the use of water efficiently and in quantities considered less than average.

"Water features" means any landscape feature that utilizes standing or moving water as a main component. Standard examples are ponds, streams, and fountains.

"Water loss" means the loss of water caused by evaporation.

"Water resources" means the retrievable and usable supply of water.

"Water usage" means the act of using water provided by the Department's water system.

"Water-use efficiency" means the use of water in a way that minimizes waste (i.e. use beyond which is needed to accomplish a task).

"Winterize" means turning off water service and draining the on-site pipes or plumbing to prevent damage to the system during the winter months due to freezing.

"Xeriscape" means a landscape that requires relatively little water to install and maintain. Qualifying landscapes include those that range from highly vegetated to completely lacking in vegetation.

Section 15.66.050 Water-Use Policies and Requirements.

A. Customers shall be encouraged to use native and water-conserving plants for landscaping.

B. Customers shall be required to minimize the use of turf at all new and retrofitted commercial and residential landscapes.

C. Water conservation, emphasizing water use efficiency, will be required as set forth herein.

D. The Department shall require and promote development of water conservation plans for all customers whose water use exceeds reasonable guidelines developed by the Department.

E. The Department shall require repair of all leaks, once they are detected.

F. All outdoor irrigation systems shall be shut off and winterized between November 1st and April 1st annually.

G. The Department will establish reasonable water use and irrigation standards for all residential and commercial customers in its service area.

Section 15.66.060 Nonessential water use. Nonessential water use means water use in violation of Big Bear Lake Municipal Code section 17.11.040. The list of prohibited acts contained in section 17.11.040 is not exhaustive and may include other actions not listed therein.

Section 15.66.070 Turf installation.

A. Turf installations shall not exceed 500 square feet in size for each property.

B. All new and retrofitted landscapes with turf must be irrigated using a sprinkler system with an automatic irrigation controller, that incorporates evapotranspiration and rain shut-off features and has the capability to accommodate all time and date irrigation restrictions employed by the Department.

C. Prior to installing turf, the soil must be prepared to a minimum depth of six (6) inches by adding topsoil and soil conditioners to enhance the water retention capability of the soil.

D. The design of the turf area must be developed to allow efficient irrigation and prevent overspray and runoff.

E. A master valve must be installed on all new or retrofitted landscapes containing turf.

Section 15.66.080 Water Feature Installation.

A. Water feature installations shall not exceed an aggregate of 500 square feet of total surface area of customer's property.

B. When a water feature moves water, such a water feature must utilize a recirculating pump.

Section 15.66.090 Landscape Plans and Permits.

A. New Installations. Landscape plans must be submitted for review and permitting by a Department representative whenever the proposed landscape exceeds 1,000 square feet or when any turf is proposed to be installed. The landscape plan review and approval process will have no impact in granting a certificate of occupancy.

B. Retrofitting or Altering Existing Landscape. Landscape plans must be submitted for review and permitting by a Department representative whenever the combination of existing landscape and the proposed additional or retrofitted landscape exceeds 1,000 square feet.

C. Plan Review and Permitting. All landscape plans must be submitted to the Department for review and approval at least ten (10) days prior to the start of installation. A landscaping permit will be issued upon approval of the landscape plan.

Section 15.66.100 New Landscape Regulations.

A. Turf installations shall not exceed 500 square feet in size for each property.

B. Landscape plants must be grouped by similar irrigation requirements, and irrigation systems must be set up to irrigate individual water-use zones in accordance with their individual needs.

C. All slope and soil conditions, that may cause excessive runoff, must be identified and clearly resolved during the planning and installation process.

D. Landscape elements must be appropriately maintained to maximize water-use efficiency.

1. All sprinkler, emitter, pipe and pond leaks must be repaired timely, and all irrigation systems must be tested and inspected before regular use each spring.

2. All irrigation systems must be shut off and winterized between November 1st and April 1st annually.

Section 15.66.110 Regulations for Retrofitting Landscapes.

A. On landscapes that do not contain existing turf, new turf must be installed in accordance with section 15.66.070.

B If total turf area of a landscape exceeds 500 square feet, a property owner or customer is prohibited from expanding his turf area. If total turf area of a landscape is less than 500 square feet, a property owner or customer may expand his turf area provided that the total turf area does not exceed 500 square feet.

C. If a landscape contains more than 700 square feet of turf, turf may be rearranged as long as the net area of turf is reduced by at least twenty-five percent (25%).

D. Existing irrigation systems may be used as long as they can be employed to maximize irrigation efficiency on the retrofitted landscape. If existing irrigation systems cannot maximize irrigation efficiency, a new irrigation system must be installed.

E. Landscape plants must be grouped by similar irrigation requirements, and irrigation systems must be set up to irrigate individual water-use zones in accordance with their individual needs.

F. All slope and soil problems that may cause excessive runoff must be identified and clearly resolved during the planning and retrofitting process.

G. Landscape elements must be appropriately maintained to maximize water-use efficiency.

1. All sprinkler, emitter, pipe and pond leaks must be repaired timely, and all irrigation systems must be tested and inspected before regular use each spring.

2. All irrigation systems must be shut off and winterized between November 1st and April 1st annually.

15.66.120 Regulations for Planning and Installation of Irrigation Systems

A. Automatic irrigation control systems, that have the ability to accommodate all time and date irrigation restrictions employed by the Department, are required on all landscapes greater than 1,000 square feet in size.

B. Sprinklers will only be allowed on turf and other groundcovers. All other landscape plantings must be irrigated with efficient, low water-use devices, such as, drip systems or bubblers.

C. Sprinklers shall not be used on planter strips less than ten (10) feet wide, unless it can be demonstrated to the satisfaction of the Department that irrigation equipment will provide efficient irrigation and prevent overspray.

D. All irrigation controllers must be equipped with rain shut-off sensors.

E. A master valve must be installed on all new or retrofitted landscapes containing turf.

15.66.130 Guidelines for Controlling Erosion

A. All landscape plans for new and retrofitted landscapes must identify potential erosion problems.

B. Preventing erosion.

1. All slopes and areas of bare soil must be evaluated for their erosion potential.

2. All areas that are susceptible to erosion must be addressed with an erosion prevention plan as required by the Department.

3. Areas that contain running water from adjoining properties during rain showers or snow melt must be prepared to minimize erosion caused by this type of runoff utilizing dry stream beds, erosion resistant vegetation, or other methods required by the Department.

15.66.140 Instructions for Submitting Landscape Plans. Landscape plans shall be submitted with the permit application required by this chapter and shall contain the following information:

A. If a new or retrofitted landscape exceeds 3,000 square feet, the property owner or customer shall submit the following to the Department:

1. Appropriate addresses and contact information for the property owner and landscape contractor.

2. The proposed landscape design.

3. The existing landscape design, if the landscape is being retrofitted.

4. Identification of low, medium, and high water-use vegetation zones.

5. Plant lists associated with each water-use vegetation zone.

6. The proposed irrigation system design, including the location, type, size and description of landscaping to be installed (including all trees, shrubs, groundcover and turf /grass areas).

7. The existing irrigation system design, if the landscape is being retrofitted, including the location, type, approximate size, and description of landscaping (including all trees, shrubs, groundcover and turf /grass areas).

8. Identification of areas with slope or soil problems that need special irrigation features to effectively irrigate these areas.

9. A detailed description of solutions to irrigation problems identified in section 15.66.150(a)(8).

10. Identification and description of erosion control features.

11. Proposed irrigation schedules for all landscape features.

12. A list of environmental sensing devices associated with irrigation controllers, such as, evapotranspiration controllers, soil moisture sensors, and rainfall shut-off devices.

13. A detailed description of all water features.

14. An estimate of water use per month (in ccfs) for all landscape features, including water loss associated with water features.

15. A maintenance schedule for all landscape features.

16. A north arrow and scale.

17. Clearly legible and identifiable property lines and their dimensions.

18. The date of submittal of the plans and any revision dates.

19. A written narrative highlighting water-conserving features of the proposed landscape and its adherence to Xeriscape principles.

B. If the new or retrofitted landscape is less than 3,000 square feet and greater than 1,000 square feet, the property owner or customer shall submit the following to the Department:

1. Appropriate addresses and contact information for the property owner or customer and landscape contractor.

2. The proposed landscape design including the location, type, approximate size, and description of landscaping (including all trees, shrubs, groundcover and turf /grass areas).

3. If a landscape is being retrofitted, a written summary of the proposed changes and a list of the water-conserving features of the new landscape is required.

4. An estimate of water use per month (in ccfs) for all landscape features, including water loss associated with water features.

5. All landscape plans shall clearly show xeriscape principles are being implemented.

15.66.150 Failure to Comply. The penalties for failure to comply with any provisions of this chapter shall be as follows:

A. First violation. The Department will contact the customer by certified mail explaining the violation, the need for the regulation that was violated, a list of penalties associated with continued violation, and request voluntary compliance.

B. Second violation. The Department will contact the customer by certified mail explaining the violation, the need for the regulation that was violated, inform the customer of his previous violations, provide a list of penalties associated with continued violation, and add a surcharge to the customer's water bill which is twice the customer's charge for water usage for the billing cycle during which the violation occurred. If the customer does not cure the violation within 10 days of the date of the notification letter from the Department, the Department will deem the failure to cure as a new violation.

C. Third violation. The Department will contact the customer by certified mail explaining the violation, the need for the regulation that was violated, inform the customer of his previous violations, provide a list of penalties associated with continued violation, add a surcharge to the customer's water bill which is triple the customer's charge for water usage for the billing cycle during which the violation occurred, and notify the Board. If the customer does not cure the violation within 10 days of the date of the notification letter from the Department, the Department will deem the failure to cure as a new violation.

D. Fourth violation. The Department will contact the customer by certified mail explaining the violation, the need for the regulation that was violated, inform the customer of his previous violations, provide a list of penalties associated with continued violation, install a flow restrictor in the customer's water service, add

a surcharge to the customer's bill which is quadruple the customer's charge for water usage for the billing cycle during which the violation occurred, together with all associated expenses dealing with the flow restrictor, and notify the Board. If the customer does not cure the violation within 10 days of the date of the notification letter from the Department, the Department will deem the failure to cure as a new violation.

E. Fifth violation. The Department will contact the violator by certified mail explaining the violation, the need for the regulation that was violated, inform the customer of his previous violations, and, upon approval of the Board, discontinue water service to the customer until the customer delivers a notarized written agreement to abide by all water use regulations established by Department and such other requirements as the Board may determine to be appropriate under the circumstances.

15.66.160 Removal of the Flow Restrictor. The water restrictor will be removed, or water service will be restored, whichever the case may be, upon a hearing as provided in Section 15.66.180 where the customer demonstrates to the satisfaction of the General Manager that the cause of the violation has been corrected and all fees and surcharges have been paid.

15.66.170 Appeal Process. A customer shall have the right to a hearing before the General Manager if the Department receives a written request for such a hearing on or before twenty-one (21) days after the date the notice is mailed to the customer.

The written request for a hearing shall include a statement setting forth reasons why the customer believes that a violation of this chapter has not occurred, along with any documentation that may substantiate the customer's position.

The customer's written request for a hearing shall include payment of the surcharge. Said payment shall be held on deposit with the Department. If, following the hearing, it is determined the surcharge will not be imposed, the Department will refund said deposit.

Upon receipt of a request for a hearing, the General Manager shall contact the customer regarding proposed dates for the hearing. The hearing shall be conducted at the Department's offices. The date of the hearing shall be set at a time that is mutually convenient to both parties, but in any event, shall be held no later than fifteen (15) days from the date of customer's request.

The hearing shall be informal and shall not require adherence to any particular procedure. The General Manager shall render a written decision on or before five (5) days following the date of the hearing.

The customer shall only have a right to appeal alleged violations of the procedures of this chapter by the General Manager or his staff to the Board if the Board receives a written request for such an appeal hearing on or before fifteen (15) days after the date of the General Manager's decision. For all other matters or issues, the decision of the General Manager is a final decision of the Department, and the applicant shall have no right of appeal.

The hearing before the Board shall be held at a regular Board meeting within thirty (30) days of the Department receiving the written request for a hearing. The decision of the Board shall be final.

15.66.180 Permit Fees. No fee shall be charged for the filing of an application or landscape plan under this chapter.

15.66.190 Deposit of Penalty Monies. All monies collected by the Department, pursuant to any of the surcharge provisions of this chapter, shall be deposited in the Water Revenue Fund as reimbursement for the Department's costs and expenses of administering and enforcing this chapter and its general Water Conservation Program.

15.66.200 Severability. If any provision of these Regulations is found to be illegal, unconstitutional, or unenforceable for any reason whatsoever, that provision shall be severed from the remaining provisions, which shall remain in full force and effect.

SECTION 2. This Ordinance shall take effect and shall be published in accordance with applicable law.

PASSED, APPROVED AND ADOPTED this 14th day of March, 2005.

AYES:	Conklin, Dally, Harris, Jahn, Mulvihill
NOES:	None
ABSENT:	None
ABSTAIN:	None

March 14, 2005
Date

Darrell Mulvihill
Darrell Mulvihill, Mayor

ATTEST:

Katherene E. Jefferies
Katherine E. Jefferies
City Clerk

REVIEWED AND APPROVED:

Stephen P. Deitsch
Best Best & Krieger LLP
City Attorney

Thomas Harder

Groundwater Consulting

May 1, 2009

Mr. Michael Perry
California Collaborative Solutions
P.O. Box 706
Big Bear City, California 92314

Re: Letter Addressing County of San Bernardino Comments Regarding Water Supply for the Moon Camp Development

Dear Michael,

As per your request, Thomas Harder Groundwater Consulting (THGC) has prepared this letter addressing comments from the County of San Bernardino (County) regarding water supply for the proposed Moon Camp Development near Fawnskin, California. The primary focus of the County's comments is a report by GEOSCIENCE Support Services, Inc. (GEOSCIENCE)[1] that describes the results of recent pumping tests conducted on the Moon Camp Tract's Well FP-2. However, the County's comments also discuss previous estimates of perennial yield for Tributary Subarea A and supplemental water to be supplied from the Moon Camp Tract's recently constructed Well FP-4.

This letter addresses the following specific issues raised by the County:

1. The range of perennial yield (including the low end or "minimum") that has previously been estimated for Subarea A, which is tributary to Well FP-2.
2. Potential impacts of pumping Well FP-2 on Big Bear Lake.
3. Potential impacts associated with the utilization of Well FP-4 as a supplemental water supply source for the development.

[1] GEOSCIENCE, 2008. Results of Rehabilitation and Aquifer Testing, Moon Camp Well FP-2. Prepared for California Collaborative Solutions; Dated August 7, 2008.

Thomas Harder
Groundwater Consulting
601 E. Yorba Linda Blvd., Suite 3A
Placentia, California 92870
(714) 792-3875

Perennial Yield Estimates

The majority of the proposed Moon Camp development is located within Tributary Subarea A of the North Shore Hydrologic Subunit within the Big Bear Lake Watershed. This subarea is the most westerly of the North Shore subareas and is adjacent to the Grout Creek Hydrologic Subunit (see Figure 1).

The perennial yield (i.e. groundwater available for municipal supply) for Subarea A has been estimated in the context of a range of possible natural recharge estimates for the area. GEOSCIENCE, 2003[2] estimated the natural recharge to range from 14 to 44 acre-ft/yr with a midpoint of 29 acre-ft/yr. They reported that the midpoint of the range (i.e. 29 acre-ft/yr) is considered a good estimate of the perennial yield for the subarea, based on available data.

Although recent testing has shown that the pumping capacity of Well FP-2 can easily meet and exceed the demands of the Moon Camp development, the well will be operated within the low end of the natural recharge estimate (14 acre-ft/yr) minus the estimated pumping of the existing homeowners in Subarea A (5 acre-ft/yr). This leaves 9 acre-ft/yr to be pumped from Well FP-2 for the Moon Camp Development. The low end of the range of natural recharge estimates for Subarea A (14 acre-ft/yr) is a conservative estimate of the perennial yield (i.e. available groundwater supply) for the subarea. This amount of recharge is only 2.5 percent of the long-term average annual precipitation for the subarea, which is approximately 28 in/yr based on the San Bernardino County Flood Control District isohyetal map for the area (see GEOSCIENCE, 2003; Figure 4). This amount of recharge is also below the range of accepted recharge estimates for other groundwater basins in southern California, which is generally 3 to 7 percent of precipitation (GEOSCIENCE, 2003). In some areas of southern California, groundwater recharge as a percent of precipitation has been reported to be greater than 10 percent (as an example, see Manghi, et al., 2009)[3]. Thus, until additional data can be collected to refine the perennial yield estimate of Subarea A, producing up to 14 acre-ft/yr of groundwater from this subarea for existing pumpers and the proposed Moon Camp development is a very conservative approach to developing the groundwater resources of the area.

[2] GEOSCIENCE, 2003. Focused Geohydrologic Evaluation of Maximum Perennial Yield for the North Shore and Grout Creek Hydrologic Subunits. Prepared for the City of Big Bear Lake Department of Water and Power. Dated December 2, 2003.

[3] Manghi, F., Mortazavi, B., Crother, C., and Hamdi, M., 2009. Estimating Regional Groundwater Recharge Using a Hydrological Budget Method. Springer Science and Business Media.

The data that has been collected since 2003, including the data from the FP-2 pumping test, is not adequate to refine the perennial yield estimate. One of the best ways to refine the current perennial yield estimate is to monitor groundwater pumping and groundwater level response within Subarea A over a long-term period. Long-term would be defined on the order of decades and would include monitoring and production over multiple "wet" and "dry" hydrologic cycles. Pumping Well FP-2 and other private wells in Subarea A at rates up to 14 acre-ft/yr is a prudent approach for developing the groundwater resources of the area and, in the context of a groundwater monitoring program, verifying the available perennial yield.

Potential Impacts of Pumping Well FP-2 on Big Bear Lake

The potential impact of pumping Well FP-2 on the surface water in Big Bear Lake would be minimal. Well FP-2 produces groundwater from an aquifer system that is deeper than the bottom of Big Bear Lake and is separated from the lake bottom by multiple silt and clay layers. The top of perforations for Well FP-2 occur approximately 60 ft below ground surface (bgs) at an elevation of approximately 6,686 ft above mean sea level (amsl). The high surface water elevation in the lake is 6,743 ft amsl and the average depth of the lake is 30 ft.[4] Thus, the elevation of the bottom of Big Bear Lake is approximately 27 ft above the top of perforations for Well FP-2. The geologic log for Well FP-2 shows multiple silt and clay layers between the land surface and top of perforations (see Attachment A). If the silt and clay layers extend beneath the lake, they would provide some hydraulic separation between the lake water and aquifer system. While it is possible that some vertical leakage could occur from the lake into the aquifer system of FP-2, the majority of groundwater produced by FP-2 would be from the aquifer underlying Subarea A.

Potential Impacts Associated with Pumping Well FP-4

Well FP-4 has recently been constructed in the northwestern corner of the proposed Moon Camp development to provide a supplemental source of water supply. This well is located within Subarea D of the Grout Creek Hydrologic Subunit, a separate drainage catchment from Tributary Subarea A of the North Shore Hydrologic Subunit (see Figure 1). A pumping test conducted upon completion of Well FP-4 indicates it is capable of producing up to 3.5 gallons per minute

[4] Big Bear Municipal Water District Website.

on a sustained basis. At this rate and assuming continuous operation, the well would produce approximately 5.6 acre-ft/yr.

GEOSCIENCE, 2003 reports the groundwater recharge for Subarea D to be between 32 and 99 acre-ft/yr with a midpoint of 66 acre-ft/yr. At present, the only groundwater production in this subarea is from private wells. There are eleven private wells shown on Figure 4 of GEOSCIENCE, 2003. Assuming an average per-household water demand of 250 gallons per day, annual groundwater production from private wells in Subarea D is estimated to be approximately 3 acre-ft/yr. Based on this, the additional 5.6 acre-ft/yr of pumping anticipated from Well FP-4 will not result in combined pumping in excess of the low end of recharge estimates (32 acre-ft/yr) for the Subarea and is not a significant impact to the long-term water supply of Subarea D.

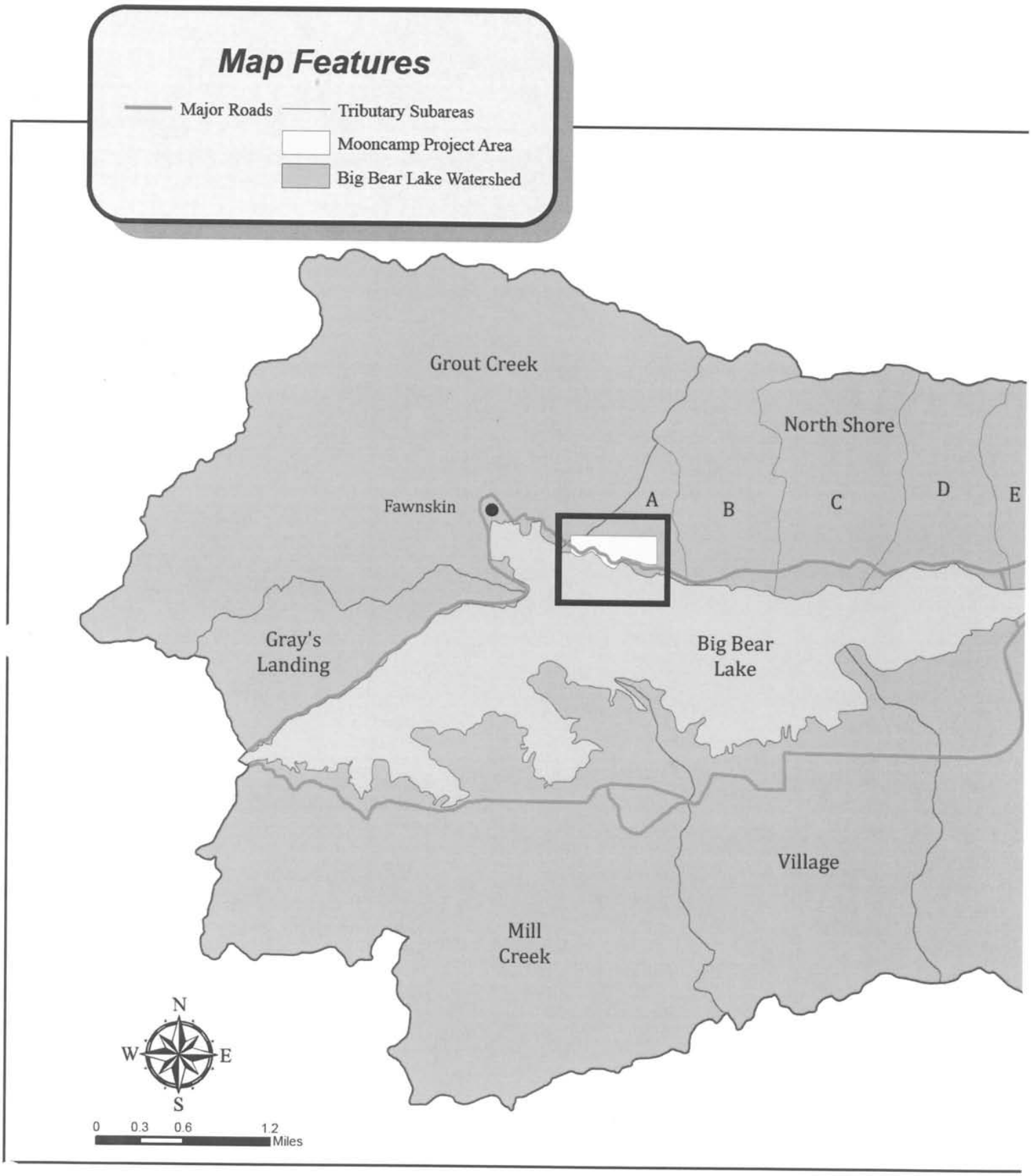
The only other potential impact of pumping Well FP-4 is interference with existing private wells. Pumping test data for Well FP-4 shows that pumping this well at a sustained rate of 3.5 gpm results in approximately 2 ft of drawdown in the nearest private well, which is approximately 250 ft from FP-4. The limited available data for the private well suggests that this well has available saturated thickness to accommodate the additional 2 ft of drawdown and pumping interference from Well FP-4 should not significantly impact the operation of the well.

I appreciate the opportunity to assist in responding to the County's comments regarding the Moon Camp Development. If you have any questions, please call.

Sincerely,

Thomas Harder

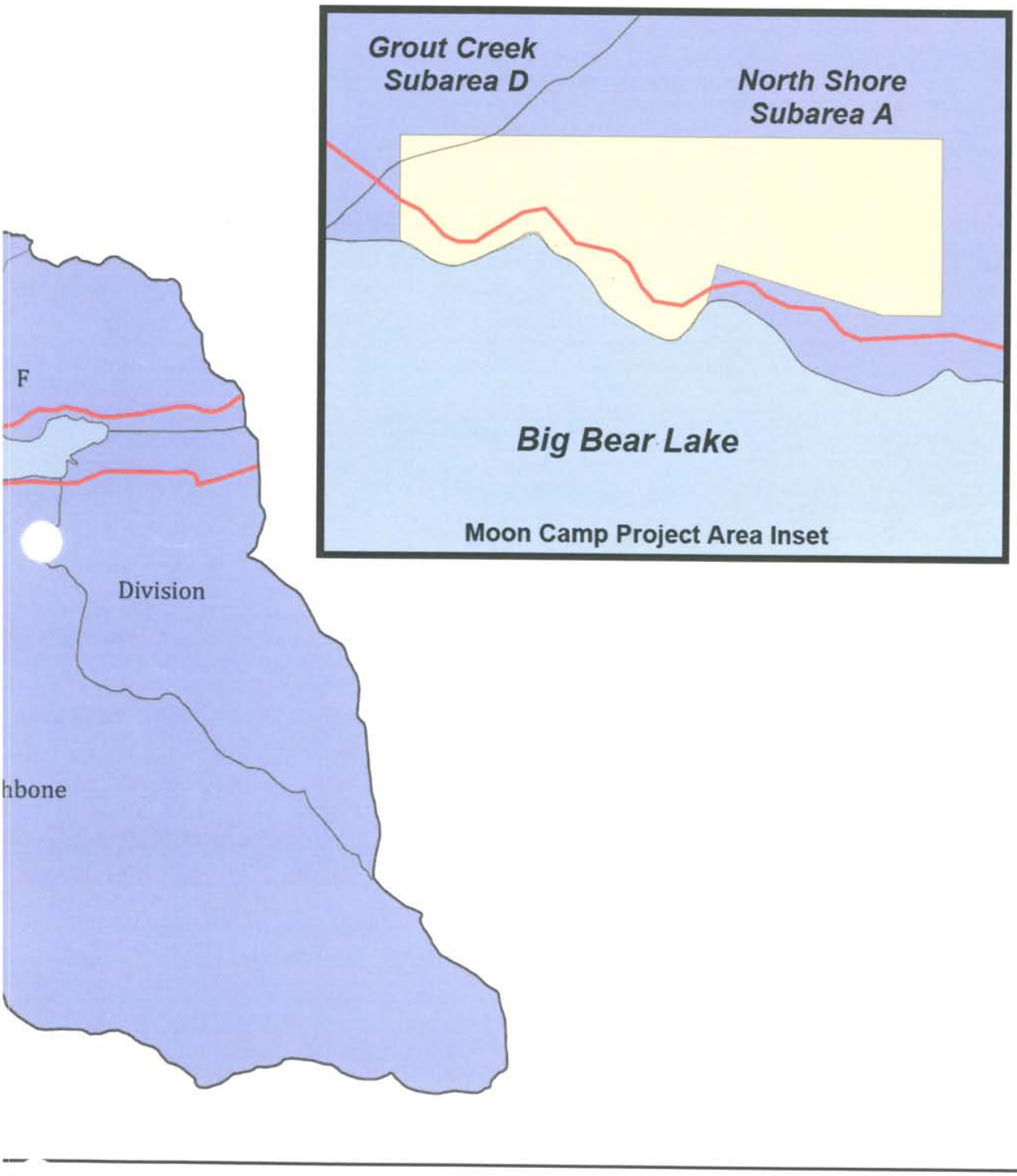
Thomas Harder, P.G., C.HG.
Hydrogeologist



NAD 83 UTM Zone 11
Central Meridian: -117

Thomas Harder
Ground Water Consulting

1-May-09



Moon Camp Project Location and Hydrologic Features

Figure 1

Attachment A

Well FP-2 Borehole Log

LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log		Description of Materials
		SOIL	Brown sandy silt with some gravel, roots
		GRAVEL & SAND	Multicolored, very fine to coarse sand and granule to cobble size gravel
10		SAND	Reddish brown, fine to coarse sand with some clay and fine gravel
20			Clayier
30		SILT	Brown clayey silt with some fine sand
		SAND	Multicolored silty sand with occasional fine to coarse gravel
		CLAY	Brown sandy clay with some silt and medium to coarse sand
40		SAND	Brown clayey sand with some gravel
		CLAY	Brown, medium to coarse sandy clay
50		SAND	Multicolored with a few fine gravels, medium to coarse loose sand
		CLAY	Brown sandy clay with considerable silt
60		SAND	Brown clayey sand with a few fine gravels, medium to coarse sand
		CLAY & SAND	Brown clay with local thin medium to coarse sand layers
70			Siltier

LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log		Description of Materials
			Clayier
90			
		SAND	Brown clayey sand with some silt, occasional fine gravel, fine to coarse sand
100			
			Clays decrease
			Clay
110			
			Gravel lens
120			
		CLAY	Brown silty clay with some sand
130		SAND	Brown clayey sand with some fine gravel, very fine to medium sand
140		CLAY & SAND	Brown clay and sand interbedded, occasional fine gravel, very fine to coarse sand
			Siltier
150			

LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log		Description of Materials
		SAND	Brown clayey, very fine to fine sand with some silt and local fine gravel lens
170			
		CLAY	Reddish brown sandy clay with local sand lenses with occasional fine gravels
180			
190			
200			
210			
		SAND	Brown clayey very fine to medium sand, with some silts
220			
230			
		CLAY	Reddish brown sandy clay with occasional fine gravel and very fine to medium sand
240			

LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log		Description of Materials
			Interbedded thin sand layers
250			
		SAND	Brown, clayey, fine to coarse sand with some fine gravel
260			
			Clayier
270			
		CLAY	Reddish brown sandy clay with local thin beds of fine sand
280			
290			
300			
310		SAND	Brown clayey medium to coarse sand with a few fine gravels

LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log		Description of Materials
			Clayier
330			
			White clays
340			
		CLAY	Reddish brown sandy clay with some silts and very fine to medium sand
350			
		SAND	Multicolored clayey very fine to coarse sand
360			
			Gravelly
370		CLAY	Reddish brown, medium to coarse sandy clay
380			
390			

LITHLOGIC LOG

Well No. FP-2

Depth	Graphic Log	Description of Materials
410		

California
Collaborative
Solutions

909 586-5819
P.O. Box 706
Big Bear City, CA 92314
calcolsol@gmail.com

April 24, 2009

Joel Dickson
General Manager
Big Bear Lake DWP
P.O. Box 1929
Big Bear Lake, CA 92315

Re: Moon Camp Tract

Joel,

I am working to complete our Draft EIR for the Moon Camp Project. We anticipate having it ready for the 45 day Public Review Period in late May, early June.

As a part of the Draft EIR, we are showing 2 alternatives for the Water System (see attached Summary).

I am requesting the DWP's approval of Alternative #1 which includes connecting to the Fawnskin Water System as detailed in the DWP's Feasibility Study.

Please call me if you have any questions or need any additional information.

Thank you for your consideration.

Sincerely,

Michael Perry
California Collaborative Solutions

Moon Camp Water Service

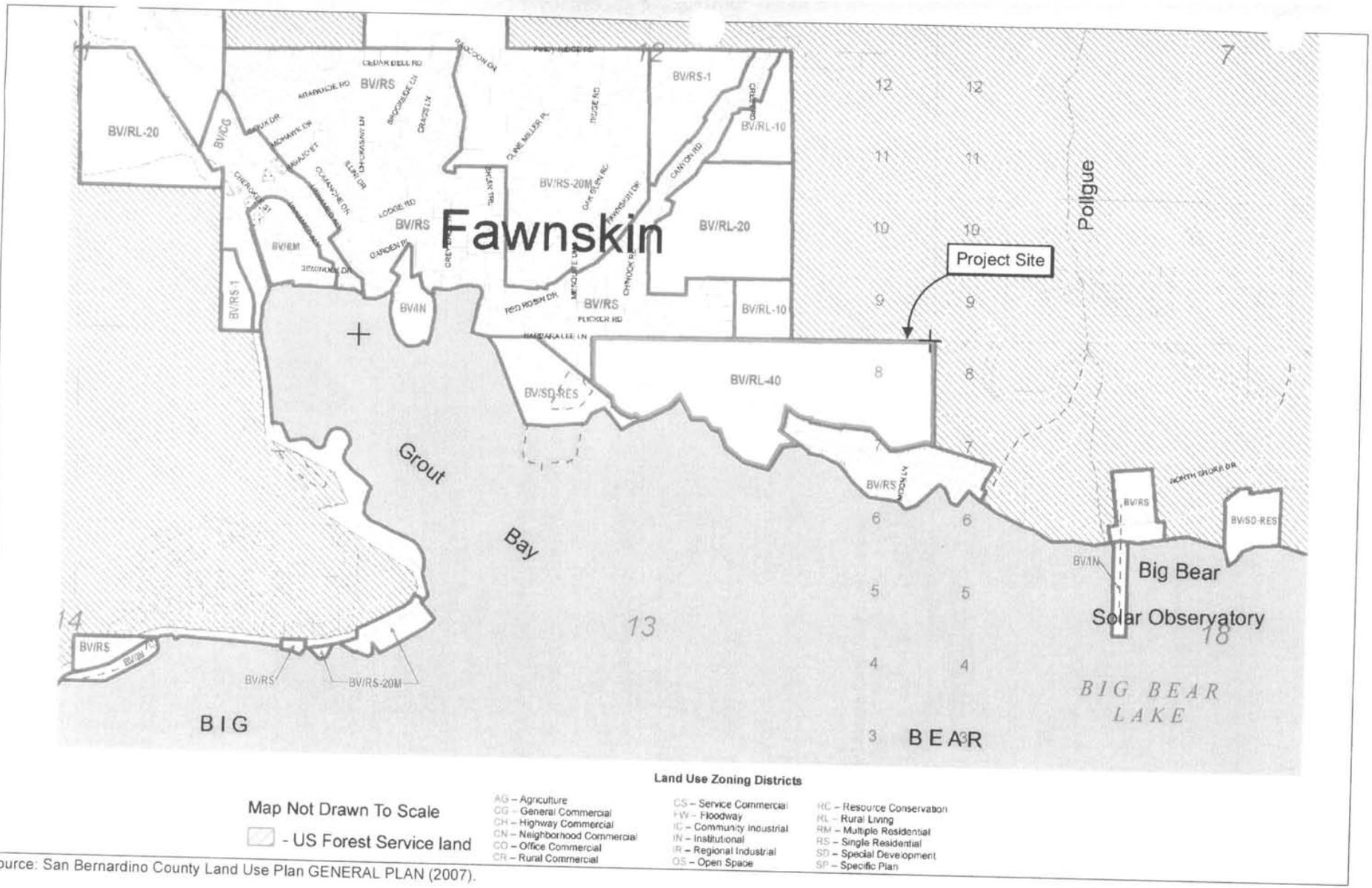
Water Supply:

- 50 each, ½ - 3 acre lots, individual lot sales, custom built homes (previously 92 lots)
- 50 lots require 14 acre-feet per year (Alda Feasibility Study/La Haye-DWP)
- Well FP2 provides 9 acre-feet from the North Shore Sub Area "A" Basin (Geoscience/Harder)
- Well FP4 provides 5 acre-feet from Grout Creek Basin (Geoscience/Harich/Harder)

Water Facilities:

- **Draft EIR Alternative #1** --- Interconnect Moon Camp Tract pipelines / wells with the existing DWP Fawnskin Water Facilities per Alda Feasibility Study. Moon Camp Tract facilities (onsite) owned and operated by CSA 53C (per LAFCo). Offsite facilities (Fawnskin Water System) owned and operated by DWP.
    - Racoon Reservoir provides domestic and fire flow storage (per Alda Feasibility Study)
    - Moon Camp refurbishes Clinemiller Booster (per Alda Feasibility Study)
    - Moon Camp provides 35 KW emergency generator (per Alda Feasibility Study)
    - Moon Camp replaces 2,800 feet of Phase 1, 12" DWP pipeline (per Alda Feasibility Study)
    - Moon Camp constructs 700 feet of 12" DWP pipeline (per Alda Feasibility Study)
    - Moon Camp Wells pump thru 12" line into DWP system – controlled by DWP telemetry
    - CSA 53C sells excess water from Wells FP2 and FP4 to DWP
    - In an emergency, if Wells FP2 and FP4 are unable to supply the needs of the Moon Camp Tract, DWP will sell water to CSA 53C
    - Reimbursement Agreement for Phase 1 replaced pipeline

- **Draft EIR Alternative #2** --- All water facilities are constructed onsite: 3 wells, reservoir, fire booster, pipelines. Owned and operated by CSA 53C (per LAFCo)



Source: San Bernardino County Land Use Plan GENERAL PLAN (2007).

NORTH

Michael Brandman Associates

00520089 • 10/2007 | 2-3_land_use_designations.mxd

Exhibit 2-3
Land Use Designations

SAN BERNARDINO COUNTY
MOON CAMP 50-LOT RESIDENTIAL SUBDIVISION

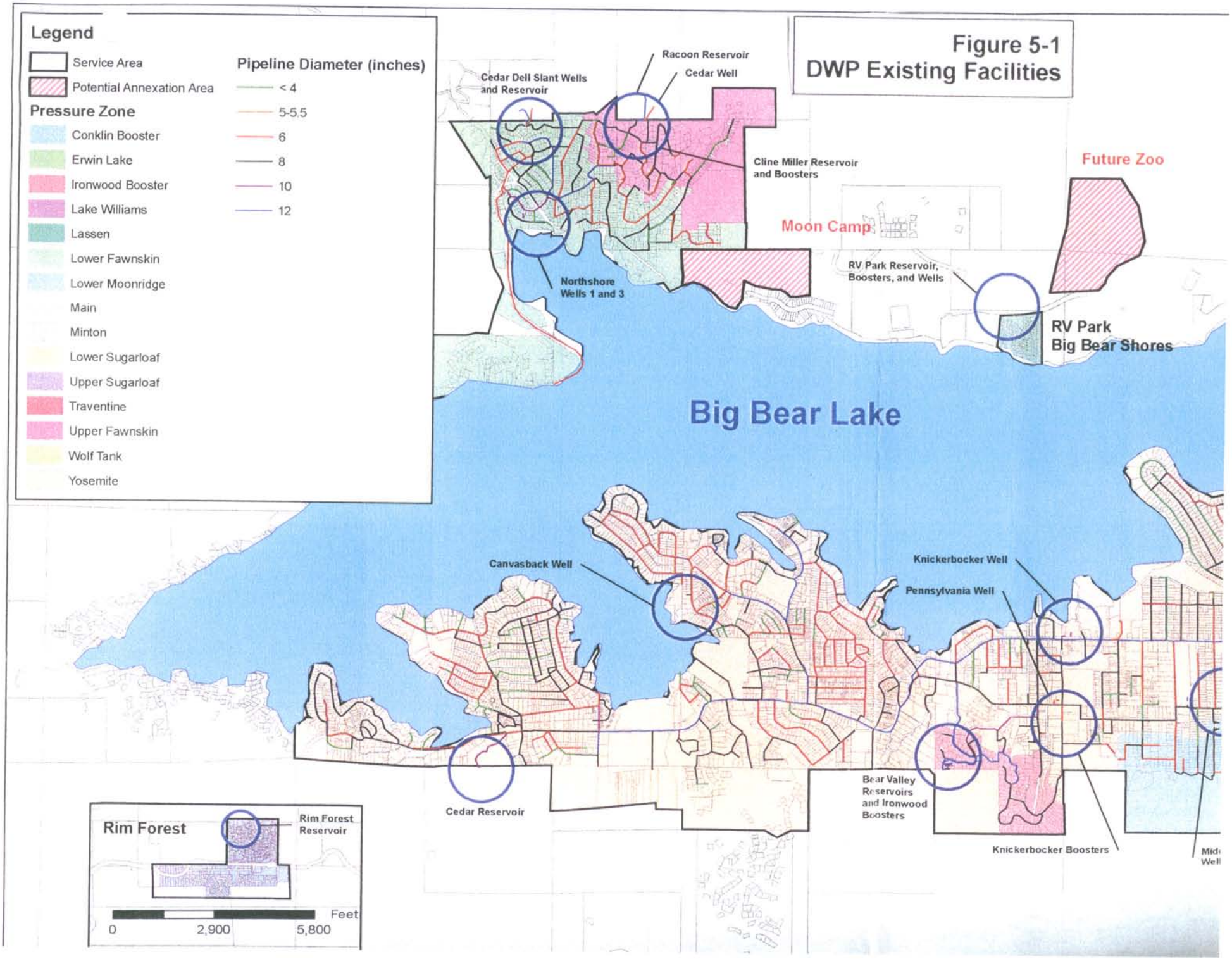


Figure 5-1
DWP Existing Facilities
Legend
Service Area
Potential Annexation Area
Pressure Zone
Conklin Booster
Erwin Lake
Ironwood Booster
Lake Williams
Lassen
Lower Fawnskin
Lower Moonridge
Main
Minton
Lower Sugarloaf
Upper Sugarloaf
Traventine
Upper Fawnskin
Wolf Tank
Yosemite
Pipeline Diameter (inches)
< 4
5-5.5
6
8
10
12
Racoon Reservoir
Cedar Well
Cedar Dell Slant Wells and Reservoir
Cline Miller Reservoir and Boosters
Future Zoo
Moon Camp
RV Park Reservoir, Boosters, and Wells
Northshore Wells 1 and 3
RV Park
Big Bear Shores
Big Bear Lake
Canvasback Well
Knickerbocker Well
Pennsylvania Well
Cedar Reservoir
Bear Valley Reservoirs and Ironwood Boosters
Knickerbocker Boosters
Rim Forest
Rim Forest Reservoir
Feet
0
2,900
5,800

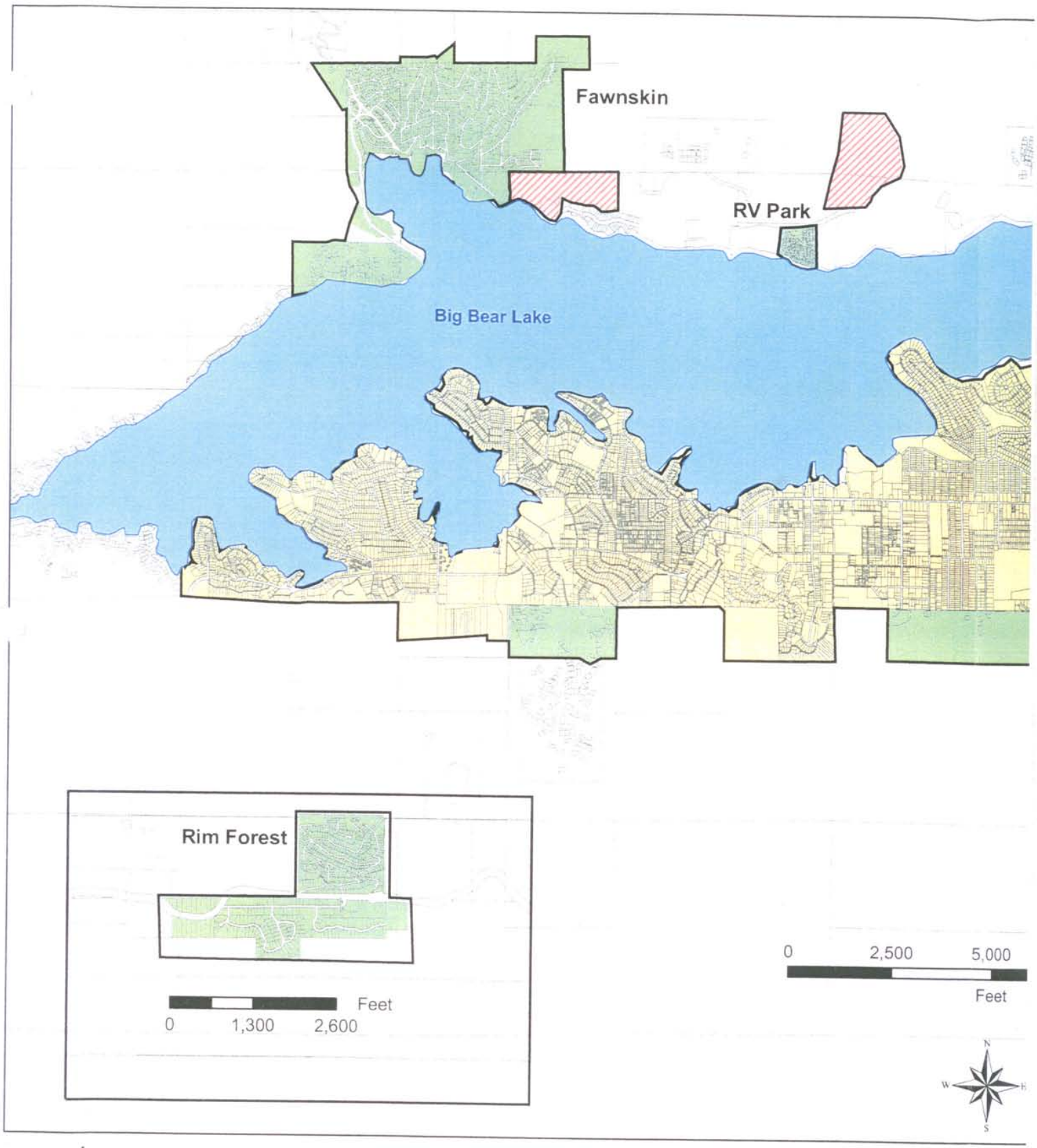
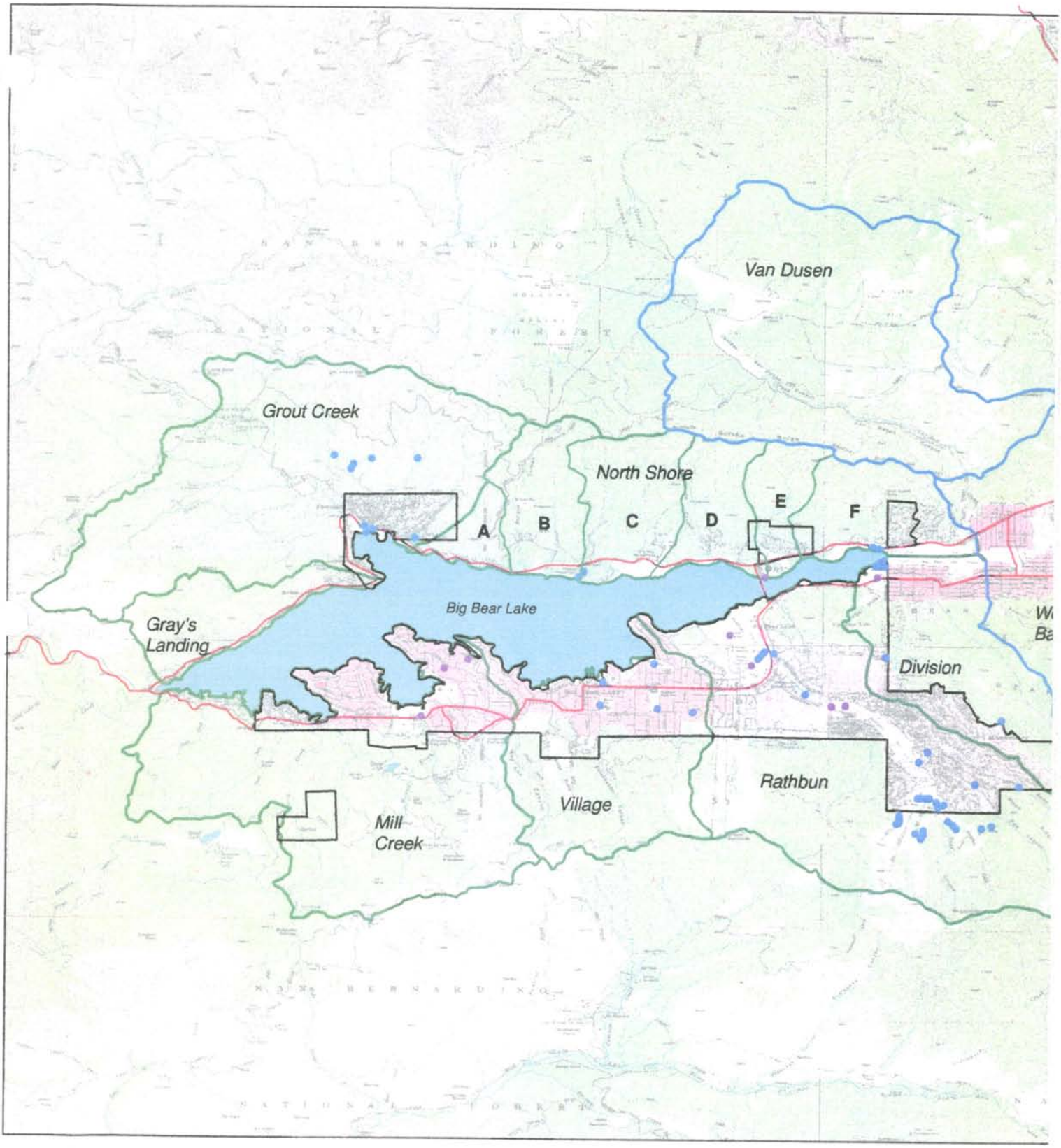


Figure 2-1
DWP Service Area



Sep-08

Figure 1

Big Bear DWP Service Area

Tributary Subarea

A

City of Big Bear Lake
Department of Water and Power

Appendix D:
Noise Data

D.1 - Noise Modeling Data (DKS, No Date)

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-BigBearEOStanfield Year 2030 Weekday

Location: Big Bear Blvd East of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	1864	183	63.7	59.1	54.6	50.1	45.6	41.0	36.5	32.0
Med Trucks	19	2	54.1	49.5	45.0	40.5	36.0	31.4	26.9	22.4
Hvy Trucks	19	2	57.4	52.8	48.3	43.8	39.3	34.8	30.3	25.7
TOTAL	1902	186	65.0	60.4	55.9	51.4	46.8	42.3	37.8	33.3
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	2981	292	65.8	61.1	56.6	52.1	47.6	43.1	38.6	34.1
Med Trucks	30	3	56.2	51.5	47.0	42.5	38.0	33.5	29.0	24.5
Hvy Trucks	30	3	59.5	54.9	50.4	45.8	41.3	36.8	32.3	27.8
TOTAL	3042	298	67.1	62.4	57.9	53.4	48.9	44.4	39.9	35.3
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	2989	293	65.8	61.2	56.6	52.1	47.6	43.1	38.6	34.1
Med Trucks	31	3	56.2	51.6	47.0	42.5	38.0	33.5	29.0	24.5
Hvy Trucks	31	3	59.5	54.9	50.4	45.8	41.3	36.8	32.3	27.8
TOTAL	3050	299	67.1	62.4	57.9	53.4	48.9	44.4	39.9	35.4
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	1125	110	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Med Trucks	11	1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
Hvy Trucks	11	1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
TOTAL	1148	112	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
CHANGE FROM FUTURE NO PROJECT										
Autos	8	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	8	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-BigBearEOStanfieldSunday Year 2030 Sunday

Location: Big Bear Blvd East of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	1809	177	63.6	59.0	54.5	49.9	45.4	40.9	36.4	31.9
Med Trucks	18	2	54.0	49.4	44.9	40.3	35.8	31.3	26.8	22.3
Hvy Trucks	18	2	57.3	52.7	48.2	43.7	39.2	34.6	30.1	25.6
TOTAL	1846	181	64.9	60.3	55.7	51.2	46.7	42.2	37.7	33.2
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	2691	264	65.3	60.7	56.2	51.7	47.2	42.6	38.1	33.6
Med Trucks	27	3	55.7	51.1	46.6	42.1	37.6	33.0	28.5	24.0
Hvy Trucks	27	3	59.0	54.4	49.9	45.4	40.9	36.4	31.8	27.3
TOTAL	2746	269	66.6	62.0	57.5	53.0	48.4	43.9	39.4	34.9
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	2694	264	65.3	60.7	56.2	51.7	47.2	42.6	38.1	33.6
Med Trucks	27	3	55.7	51.1	46.6	42.1	37.6	33.0	28.5	24.0
Hvy Trucks	27	3	59.0	54.4	49.9	45.4	40.9	36.4	31.9	27.3
TOTAL	2749	269	66.6	62.0	57.5	53.0	48.4	43.9	39.4	34.9
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	885	87	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Med Trucks	9	1	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Hvy Trucks	9	1	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TOTAL	903	88	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
CHANGE FROM FUTURE NO PROJECT										
Autos	3	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	3	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-BigBearWOStanfield Year 2030 Weekday

Location: Big Bear Blvd West of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Traffic Volume Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	2521	247	65.0	60.4	55.9	51.4	46.9	42.4	37.8	33.3
Med Trucks	26	3	55.4	50.8	46.3	41.8	37.3	32.8	28.2	23.7
Hvy Trucks	26	3	58.8	54.1	49.6	45.1	40.6	36.1	31.6	27.0
TOTAL	2572	252	66.3	61.7	57.2	52.7	48.2	43.6	39.1	34.6
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	4191	410	67.2	62.6	58.1	53.6	49.1	44.6	40.0	35.5
Med Trucks	43	4	57.6	53.0	48.5	44.0	39.5	35.0	30.5	25.9
Hvy Trucks	43	4	61.0	56.3	51.8	47.3	42.8	38.3	33.8	29.3
TOTAL	4277	419	68.5	63.9	59.4	54.9	50.4	45.9	41.3	36.8
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	4807	471	67.8	63.2	58.7	54.2	49.7	45.2	40.6	36.1
Med Trucks	49	5	58.2	53.6	49.1	44.6	40.1	35.6	31.0	26.5
Hvy Trucks	49	5	61.6	56.9	52.4	47.9	43.4	38.9	34.4	29.8
TOTAL	4905	480	69.1	64.5	60.0	55.5	51.0	46.4	41.9	37.4
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	2286	224	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Med Trucks	23	2	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Hvy Trucks	23	2	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
TOTAL	2333	228	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
CHANGE FROM FUTURE NO PROJECT										
Autos	615	60	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Med Trucks	6	1	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Hvy Trucks	6	1	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
TOTAL	628	61	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-BigBearWOStanfieldSunday Year 2030 Sunday

Location: Big Bear Blvd West of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	2329	228	64.7	60.1	55.6	51.0	46.5	42.0	37.5	33.0
Med Trucks	24	2	55.1	50.5	46.0	41.4	36.9	32.4	27.9	23.4
Hvy Trucks	24	2	58.4	53.8	49.3	44.8	40.3	35.7	31.2	26.7
TOTAL	2377	233	66.0	61.4	56.8	52.3	47.8	43.3	38.8	34.3
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	3408	334	66.3	61.7	57.2	52.7	48.2	43.7	39.1	34.6
Med Trucks	35	3	56.8	52.1	47.6	43.1	38.6	34.1	29.6	25.0
Hvy Trucks	35	3	60.1	55.4	50.9	46.4	41.9	37.4	32.9	28.4
TOTAL	3478	341	67.6	63.0	58.5	54.0	49.5	45.0	40.4	35.9
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	3426	335	66.4	61.7	57.2	52.7	48.2	43.7	39.2	34.7
Med Trucks	35	3	56.8	52.2	47.6	43.1	38.6	34.1	29.6	25.1
Hvy Trucks	35	3	60.1	55.5	51.0	46.4	41.9	37.4	32.9	28.4
TOTAL	3496	342	67.7	63.0	58.5	54.0	49.5	45.0	40.5	35.9
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	1097	107	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Med Trucks	11	1	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Hvy Trucks	11	1	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TOTAL	1119	110	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
CHANGE FROM FUTURE NO PROJECT										
Autos	18	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	18	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-NorthShoreEOStanfield Year 2030 Weekday

Location: North Shore Drive East of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	643	63	59.1	54.5	50.0	45.5	40.9	36.4	31.9	27.4
Med Trucks	7	1	49.5	44.9	40.4	35.9	31.3	26.8	22.3	17.8
Hvy Trucks	7	1	52.8	48.2	43.7	39.2	34.7	30.1	25.6	21.1
TOTAL	656	64	60.4	55.8	51.3	46.7	42.2	37.7	33.2	28.7
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	1410	138	62.5	57.9	53.4	48.9	44.3	39.8	35.3	30.8
Med Trucks	14	1	52.9	48.3	43.8	39.3	34.8	30.2	25.7	21.2
Hvy Trucks	14	1	56.2	51.6	47.1	42.6	38.1	33.6	29.0	24.5
TOTAL	1439	141	63.8	59.2	54.7	50.2	45.6	41.1	36.6	32.1
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	1418	139	62.5	57.9	53.4	48.9	44.4	39.9	35.3	30.8
Med Trucks	14	1	52.9	48.3	43.8	39.3	34.8	30.3	25.7	21.2
Hvy Trucks	14	1	56.3	51.6	47.1	42.6	38.1	33.6	29.1	24.5
TOTAL	1447	142	63.8	59.2	54.7	50.2	45.7	41.1	36.6	32.1
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	775	76	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Med Trucks	8	1	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
Hvy Trucks	8	1	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
TOTAL	791	77	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
CHANGE FROM FUTURE NO PROJECT										
Autos	8	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	8	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-NorthShoreEOStanfieldSunday Year 2030 Sunday

Location: North Shore Drive East of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	601	59	58.8	54.2	49.7	45.2	40.6	36.1	31.6	27.1
Med Trucks	6	1	49.2	44.6	40.1	35.6	31.0	26.5	22.0	17.5
Hvy Trucks	6	1	52.5	47.9	43.4	38.9	34.4	29.8	25.3	20.8
TOTAL	613	60	60.1	55.5	51.0	46.4	41.9	37.4	32.9	28.4
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	1138	111	61.6	57.0	52.4	47.9	43.4	38.9	34.4	29.9
Med Trucks	12	1	52.0	47.4	42.9	38.3	33.8	29.3	24.8	20.3
Hvy Trucks	12	1	55.3	50.7	46.2	41.7	37.1	32.6	28.1	23.6
TOTAL	1161	114	62.9	58.2	53.7	49.2	44.7	40.2	35.7	31.2
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	1143	112	61.6	57.0	52.5	47.9	43.4	38.9	34.4	29.9
Med Trucks	12	1	52.0	47.4	42.9	38.4	33.8	29.3	24.8	20.3
Hvy Trucks	12	1	55.3	50.7	46.2	41.7	37.2	32.6	28.1	23.6
TOTAL	1166	114	62.9	58.3	53.8	49.2	44.7	40.2	35.7	31.2
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	542	53	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Med Trucks	6	1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Hvy Trucks	6	1	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
TOTAL	553	54	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
CHANGE FROM FUTURE NO PROJECT										
Autos	5	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	5	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-NorthShoreWOStanfield Year 2030 Weekday

Location: North Shore Drive West of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	291	28	55.7	51.0	46.5	42.0	37.5	33.0	28.5	23.9
Med Trucks	3	0	46.1	41.4	36.9	32.4	27.9	23.4	18.9	14.4
Hvy Trucks	3	0	49.4	44.8	40.2	35.7	31.2	26.7	22.2	17.7
TOTAL	297	29	56.9	52.3	47.8	43.3	38.8	34.3	29.8	25.2
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	1649	161	63.2	58.6	54.1	49.5	45.0	40.5	36.0	31.5
Med Trucks	17	2	53.6	49.0	44.5	39.9	35.4	30.9	26.4	21.9
Hvy Trucks	17	2	56.9	52.3	47.8	43.3	38.8	34.2	29.7	25.2
TOTAL	1683	165	64.5	59.9	55.3	50.8	46.3	41.8	37.3	32.8
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	1685	165	63.3	58.7	54.1	49.6	45.1	40.6	36.1	31.6
Med Trucks	17	2	53.7	49.1	44.6	40.0	35.5	31.0	26.5	22.0
Hvy Trucks	17	2	57.0	52.4	47.9	43.4	38.8	34.3	29.8	25.3
TOTAL	1719	168	64.6	60.0	55.4	50.9	46.4	41.9	37.4	32.9
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	1394	136	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Med Trucks	14	1	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
Hvy Trucks	14	1	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
TOTAL	1422	139	7.6	7.6	7.6	7.6	7.6	7.6	7.6	7.6
CHANGE FROM FUTURE NO PROJECT										
Autos	35	3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Med Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hvy Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	36	4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-NorthShoreWOStanfieldSunday Year 2030 Sunday

Location: North Shore Drive West of Stanfield Cutoff

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	460	45	57.6	53.0	48.5	44.0	39.5	35.0	30.4	25.9
Med Trucks	5	0	48.0	43.4	38.9	34.4	29.9	25.4	20.9	16.3
Hvy Trucks	5	0	51.4	46.7	42.2	37.7	33.2	28.7	24.2	19.7
TOTAL	469	46	58.9	54.3	49.8	45.3	40.8	36.3	31.7	27.2
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	1191	117	61.8	57.2	52.6	48.1	43.6	39.1	34.6	30.1
Med Trucks	12	1	52.2	47.6	43.0	38.5	34.0	29.5	25.0	20.5
Hvy Trucks	12	1	55.5	50.9	46.4	41.9	37.3	32.8	28.3	23.8
TOTAL	1215	119	63.1	58.4	53.9	49.4	44.9	40.4	35.9	31.4
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	1216	119	61.9	57.3	52.7	48.2	43.7	39.2	34.7	30.2
Med Trucks	12	1	52.3	47.7	43.1	38.6	34.1	29.6	25.1	20.6
Hvy Trucks	12	1	55.6	51.0	46.5	41.9	37.4	32.9	28.4	23.9
TOTAL	1241	122	63.2	58.5	54.0	49.5	45.0	40.5	36.0	31.4
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	757	74	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Med Trucks	8	1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
Hvy Trucks	8	1	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
TOTAL	772	76	4.2	4.2	4.2	4.2	4.2	4.2	4.2	4.2
CHANGE FROM FUTURE NO PROJECT										
Autos	25	2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Med Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hvy Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	26	3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT

FILE: NOISE-StanfieldBTWNorthShoreBigBear Year 2030 Weekday

Location: Stanfield Cutoff Between North Shore Dr and Big Bear Blvd

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	1350	132	62.3	57.7	53.2	48.7	44.2	39.6	35.1	30.6
Med Trucks	14	1	52.7	48.1	43.6	39.1	34.6	30.0	25.5	21.0
Hvy Trucks	14	1	56.0	51.4	46.9	42.4	37.9	33.4	28.9	24.3
TOTAL	1378	135	63.6	59.0	54.5	50.0	45.4	40.9	36.4	31.9
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	3067	300	65.9	61.3	56.8	52.2	47.7	43.2	38.7	34.2
Med Trucks	31	3	56.3	51.7	47.2	42.6	38.1	33.6	29.1	24.6
Hvy Trucks	31	3	59.6	55.0	50.5	46.0	41.4	36.9	32.4	27.9
TOTAL	3130	306	67.2	62.6	58.0	53.5	49.0	44.5	40.0	35.5
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	3123	306	66.0	61.3	56.8	52.3	47.8	43.3	38.8	34.3
Med Trucks	32	3	56.4	51.8	47.2	42.7	38.2	33.7	29.2	24.7
Hvy Trucks	32	3	59.7	55.1	50.6	46.0	41.5	37.0	32.5	28.0
TOTAL	3187	312	67.3	62.6	58.1	53.6	49.1	44.6	40.1	35.5
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	1773	174	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Med Trucks	18	2	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Hvy Trucks	18	2	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
TOTAL	1809	177	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
CHANGE FROM FUTURE NO PROJECT										
Autos	56	5	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Med Trucks	1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hvy Trucks	1	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	57	6	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-StnfildBTWNorShorBgBrSun Year 2030 Sunday

Location: Stanfield Cutoff Between North Shore Dr and Big Bear Blvd

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	1367	134	62.4	57.8	53.2	48.7	44.2	39.7	35.2	30.7
Med Trucks	14	1	52.8	48.2	43.6	39.1	34.6	30.1	25.6	21.1
Hvy Trucks	14	1	56.1	51.5	47.0	42.5	37.9	33.4	28.9	24.4
TOTAL	1395	137	63.7	59.0	54.5	50.0	45.5	41.0	36.5	32.0
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	2143	210	64.3	59.7	55.2	50.7	46.2	41.6	37.1	32.6
Med Trucks	22	2	54.7	50.1	45.6	41.1	36.6	32.1	27.5	23.0
Hvy Trucks	22	2	58.1	53.4	48.9	44.4	39.9	35.4	30.9	26.3
TOTAL	2187	214	65.6	61.0	56.5	52.0	47.5	42.9	38.4	33.9
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	2184	214	64.4	59.8	55.3	50.8	46.2	41.7	37.2	32.7
Med Trucks	22	2	54.8	50.2	45.7	41.2	36.7	32.1	27.6	23.1
Hvy Trucks	22	2	58.1	53.5	49.0	44.5	40.0	35.5	30.9	26.4
TOTAL	2229	218	65.7	61.1	56.6	52.1	47.5	43.0	38.5	34.0
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	817	80	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Med Trucks	8	1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Hvy Trucks	8	1	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
TOTAL	834	82	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
CHANGE FROM FUTURE NO PROJECT										
Autos	41	4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Med Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hvy Trucks	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL	42	4	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-StanfieldNONorthShore Year 2030 Weekday

Location: Stanfield Cutoff North of North Shore Drive

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	30	3	45.8	41.2	36.7	32.2	27.7	23.2	18.6	14.1
Med Trucks	0	0	36.3	31.6	27.1	22.6	18.1	13.6	9.1	4.5
Hvy Trucks	0	0	39.6	34.9	30.4	25.9	21.4	16.9	12.4	7.9
TOTAL	31	3	47.1	42.5	38.0	33.5	29.0	24.5	19.9	15.4
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	58	6	48.6	44.0	39.5	35.0	30.5	26.0	21.4	16.9
Med Trucks	1	0	39.0	34.4	29.9	25.4	20.9	16.4	11.8	7.3
Hvy Trucks	1	0	42.4	37.7	33.2	28.7	24.2	19.7	15.2	10.7
TOTAL	59	6	49.9	45.3	40.8	36.3	31.8	27.2	22.7	18.2
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	58	6	48.6	44.0	39.5	35.0	30.5	26.0	21.4	16.9
Med Trucks	1	0	39.0	34.4	29.9	25.4	20.9	16.4	11.8	7.3
Hvy Trucks	1	0	42.4	37.7	33.2	28.7	24.2	19.7	15.2	10.7
TOTAL	59	6	49.9	45.3	40.8	36.3	31.8	27.2	22.7	18.2
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	27	3	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Med Trucks	0	0	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Hvy Trucks	0	0	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
TOTAL	28	3	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
CHANGE FROM FUTURE NO PROJECT										
Autos	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-StanfieldNONorthShoreSunday Year 2030 Sunday

Location: Stanfield Cutoff North of North Shore Drive

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	39	4	47.0	42.3	37.8	33.3	28.8	24.3	19.8	15.2
Med Trucks	0	0	37.4	32.7	28.2	23.7	19.2	14.7	10.2	5.6
Hvy Trucks	0	0	40.7	36.1	31.5	27.0	22.5	18.0	13.5	9.0
TOTAL	40	4	48.2	43.6	39.1	34.6	30.1	25.6	21.0	16.5
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	58	6	48.6	44.0	39.5	35.0	30.5	26.0	21.4	16.9
Med Trucks	1	0	39.0	34.4	29.9	25.4	20.9	16.4	11.8	7.3
Hvy Trucks	1	0	42.4	37.7	33.2	28.7	24.2	19.7	15.2	10.7
TOTAL	59	6	49.9	45.3	40.8	36.3	31.8	27.2	22.7	18.2
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	58	6	48.6	44.0	39.5	35.0	30.5	26.0	21.4	16.9
Med Trucks	1	0	39.0	34.4	29.9	25.4	20.9	16.4	11.8	7.3
Hvy Trucks	1	0	42.4	37.7	33.2	28.7	24.2	19.7	15.2	10.7
TOTAL	59	6	49.9	45.3	40.8	36.3	31.8	27.2	22.7	18.2
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	19	2	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Med Trucks	0	0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
Hvy Trucks	0	0	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
TOTAL	19	2	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
CHANGE FROM FUTURE NO PROJECT										
Autos	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-StanfieldSOBigBear Year 2030 Weekday

Location: Stanfield Cutoff South of Big Bear Blvd

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	298	29	55.8	51.1	46.6	42.1	37.6	33.1	28.6	24.0
Med Trucks	3	0	46.2	41.5	37.0	32.5	28.0	23.5	19.0	14.5
Hvy Trucks	3	0	49.5	44.9	40.3	35.8	31.3	26.8	22.3	17.8
TOTAL	304	30	57.0	52.4	47.9	43.4	38.9	34.4	29.9	25.3
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	400	39	57.0	52.4	47.9	43.4	38.9	34.4	29.8	25.3
Med Trucks	4	0	47.4	42.8	38.3	33.8	29.3	24.8	20.2	15.7
Hvy Trucks	4	0	50.8	46.1	41.6	37.1	32.6	28.1	23.6	19.1
TOTAL	408	40	58.3	53.7	49.2	44.7	40.2	35.6	31.1	26.6
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	400	39	57.0	52.4	47.9	43.4	38.9	34.4	29.8	25.3
Med Trucks	4	0	47.4	42.8	38.3	33.8	29.3	24.8	20.2	15.7
Hvy Trucks	4	0	50.8	46.1	41.6	37.1	32.6	28.1	23.6	19.1
TOTAL	408	40	58.3	53.7	49.2	44.7	40.2	35.6	31.1	26.6
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	102	10	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Med Trucks	1	0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
Hvy Trucks	1	0	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
TOTAL	104	10	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
CHANGE FROM FUTURE NO PROJECT										
Autos	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

Table 1
TRAFFIC NOISE IMPACT
FILE: NOISE-StanfieldSOBigBearSunday Year 2030 Sunday

Location: Stanfield Cutoff South of Big Bear Blvd

Vehicle Type	Traffic Volume 24-hr volume	Equiv 1-hr	Noise Reference Level (15 meters	Noise Level (dB Ldn) Centerline Distance (feet) 100	200	400	800	1600	3200	6400
				(meters) 30	61	122	244	488	975	1951
EXISTING (2007)										
Autos	331	32	56.2	51.6	47.1	42.6	38.1	33.5	29.0	24.5
Med Trucks	3	0	46.6	42.0	37.5	33.0	28.5	23.9	19.4	14.9
Hvy Trucks	3	0	49.9	45.3	40.8	36.3	31.8	27.3	22.7	18.2
TOTAL	338	33	57.5	52.9	48.4	43.9	39.3	34.8	30.3	25.8
Attenuation from existing walls:										
FUTURE NO PROJECT (2030)										
Autos	388	38	56.9	52.3	47.8	43.3	38.7	34.2	29.7	25.2
Med Trucks	4	0	47.3	42.7	38.2	33.7	29.1	24.6	20.1	15.6
Hvy Trucks	4	0	50.6	46.0	41.5	37.0	32.5	28.0	23.4	18.9
TOTAL	396	39	58.2	53.6	49.1	44.5	40.0	35.5	31.0	26.5
Attenuation from existing walls:										
FUTURE WITH PROJECT (2030)										
Autos	388	38	56.9	52.3	47.8	43.3	38.7	34.2	29.7	25.2
Med Trucks	4	0	47.3	42.7	38.2	33.7	29.1	24.6	20.1	15.6
Hvy Trucks	4	0	50.6	46.0	41.5	37.0	32.5	28.0	23.4	18.9
TOTAL	396	39	58.2	53.6	49.1	44.5	40.0	35.5	31.0	26.5
Attenuation from existing walls:										
CHANGE FROM EXISTING										
Autos	57	6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Med Trucks	1	0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Hvy Trucks	1	0	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
TOTAL	58	6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
CHANGE FROM FUTURE NO PROJECT										
Autos	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Med Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hvy Trucks	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Average speed: 104.6 km/hr= 65.0 mi/hr

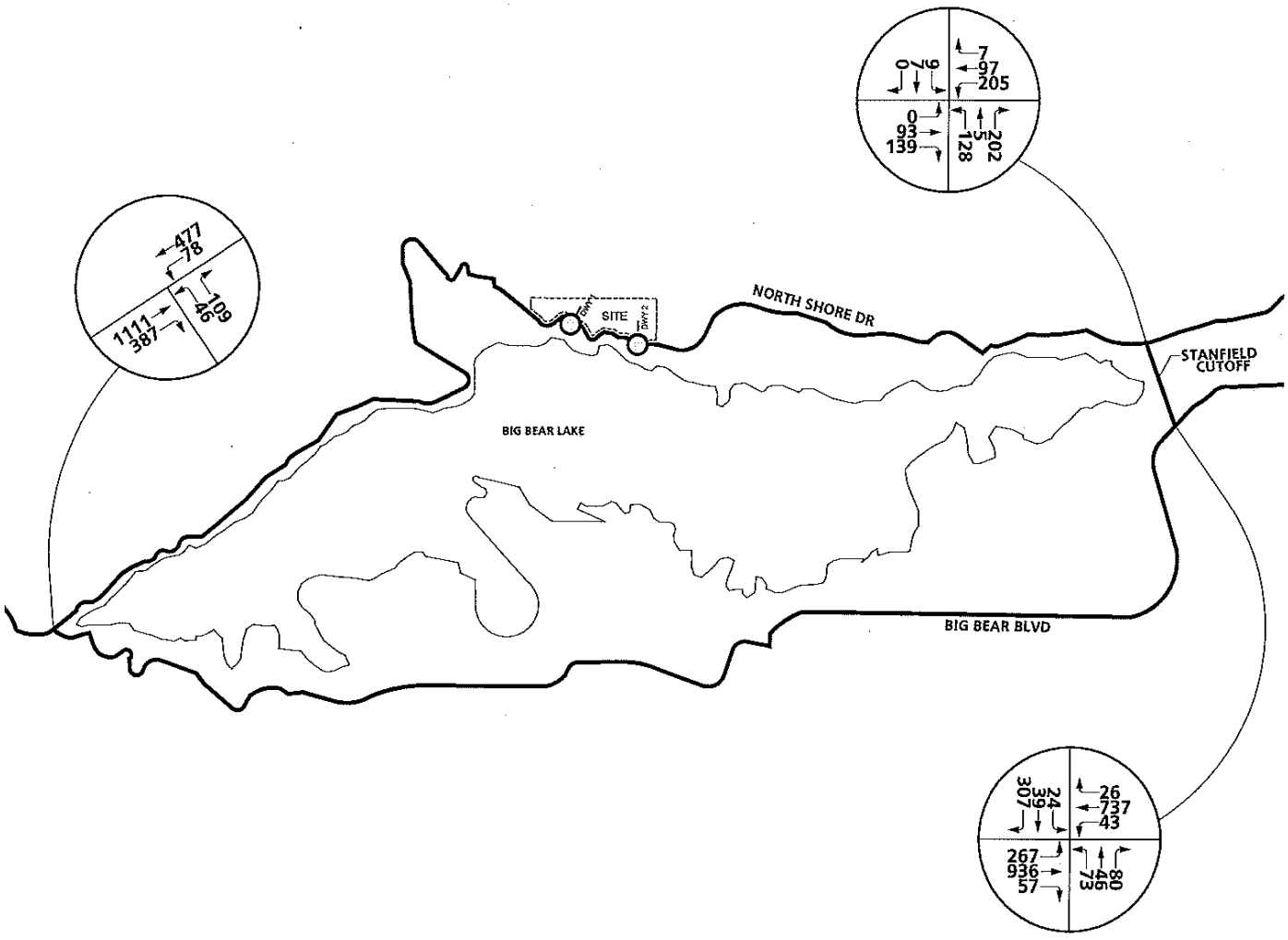
Time of day:		Fleet Mi	
70.0%	Day	98.0%	Autos
15.0%	Evening	1.0%	Medium Trucks
15.0%	Night	1.0%	Heavy Trucks
100.0%		100.0%	

Notes: Based on methods of Federal Highway Administration "Highway Traffic Noise Model", FHWA-RD-77-108, December, 1978.
Traffic data obtained from DKS Associates

D.2 - Exhibit 3-D, Existing Sunday Mid-Day Peak Hour Intersection Volumes (Urban Crossroads, No Date)

EXHIBIT 3-D

EXISTING SUNDAY MID-DAY PEAK HOUR INTERSECTION VOLUMES



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URBAN CROSSROADS

Appendix E:
Traffic Impact Analysis

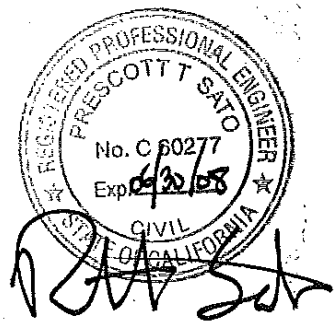
E.1 - Traffic Study
(Urban Crossroads, April 2007)

URBAN
CROSSROADS

5411 Avenida Encinas, Suite 100
Carlsbad, CA 92008

Prepared by:

Scott Sato, P.E.
Raul Armenta
James Santos



Prepared for:

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San Bernardino, CA 92408

MOON CAMP
TRAFFIC IMPACT ANALYSIS
COUNTY OF SAN BERNARDINO, CALIFORNIA

April 24, 2007

JN:04409-02
SS :RA :JCS

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APPENDICES

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MOON CAMP
TRAFFIC IMPACT ANALYSIS
COUNTY OF SAN BERNARDINO, CALIFORNIA

1.0 INTRODUCTION

This report summarizes the traffic impact analysis conducted to assess the potential impacts of the proposed Moon Camp residential development on the roadway system in the study area. The proposed development is generally located along North Shore Drive in the County of San Bernardino. The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and three lots for open space and common area on approximately 62.43 acres. The general location of the project site is presented on Exhibit 1-A.

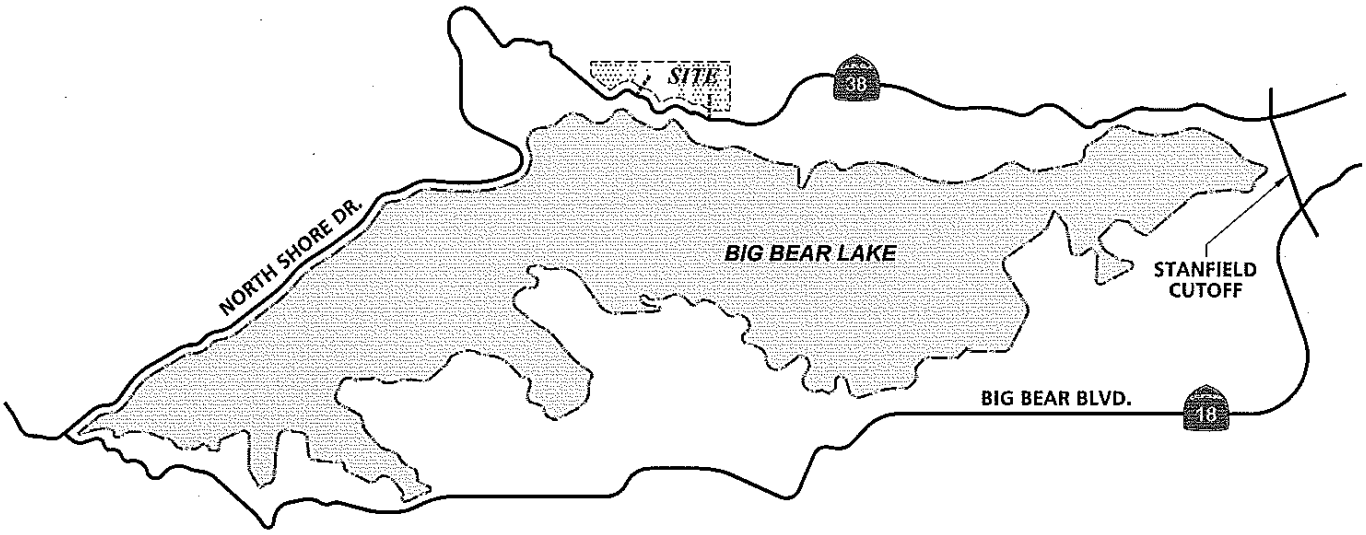
In conformance with the requirements of the San Bernardino County Congestion Management Program (CMP), the proposed project does not require a CMP traffic study. The CMP requires no analysis for projects generating less than 250 peak hour trips. The project generates approximately 51 and 51 trips during the AM and PM peak hours, respectively; which is less than the required threshold for a CMP traffic study. However, per discussion with County staff, the traffic study should follow CMP guidelines and a long-range traffic analysis is required.

The introduction to this report presents an overview of the project and provides a brief description of the study area. The analysis methodologies used to evaluate the impacts of the project are described and the definitions of roadway system deficiencies and significant project impacts are presented in the context of the County of San Bernardino and CEQA requirements.

Subsequent sections of the report will describe the project in detail and provide a complete description of existing and projected traffic conditions within the study area.

EXHIBIT 1-A

LOCATION MAP



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1.1 Project Overview

The proposed Moon Camp residential development is generally located north of North Shore Drive south of Flicker Road and east of Canyon Road in San Bernardino County. The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and three open space lots and common area. Exhibit 1-B illustrates the site plan.

There are two (2) primary full access points to the project site located off North Shore Drive.

Additional detailed discussion of the roadway network features of the project and its traffic generation characteristics will be provided in subsequent sections of this report.

1.2 Study Area

The overall study area evaluated in this study is presented on Exhibit 1-A. Based on discussion with County transportation staff, the study area includes the following existing study intersections:

Stanfield Cutoff (NS) at:

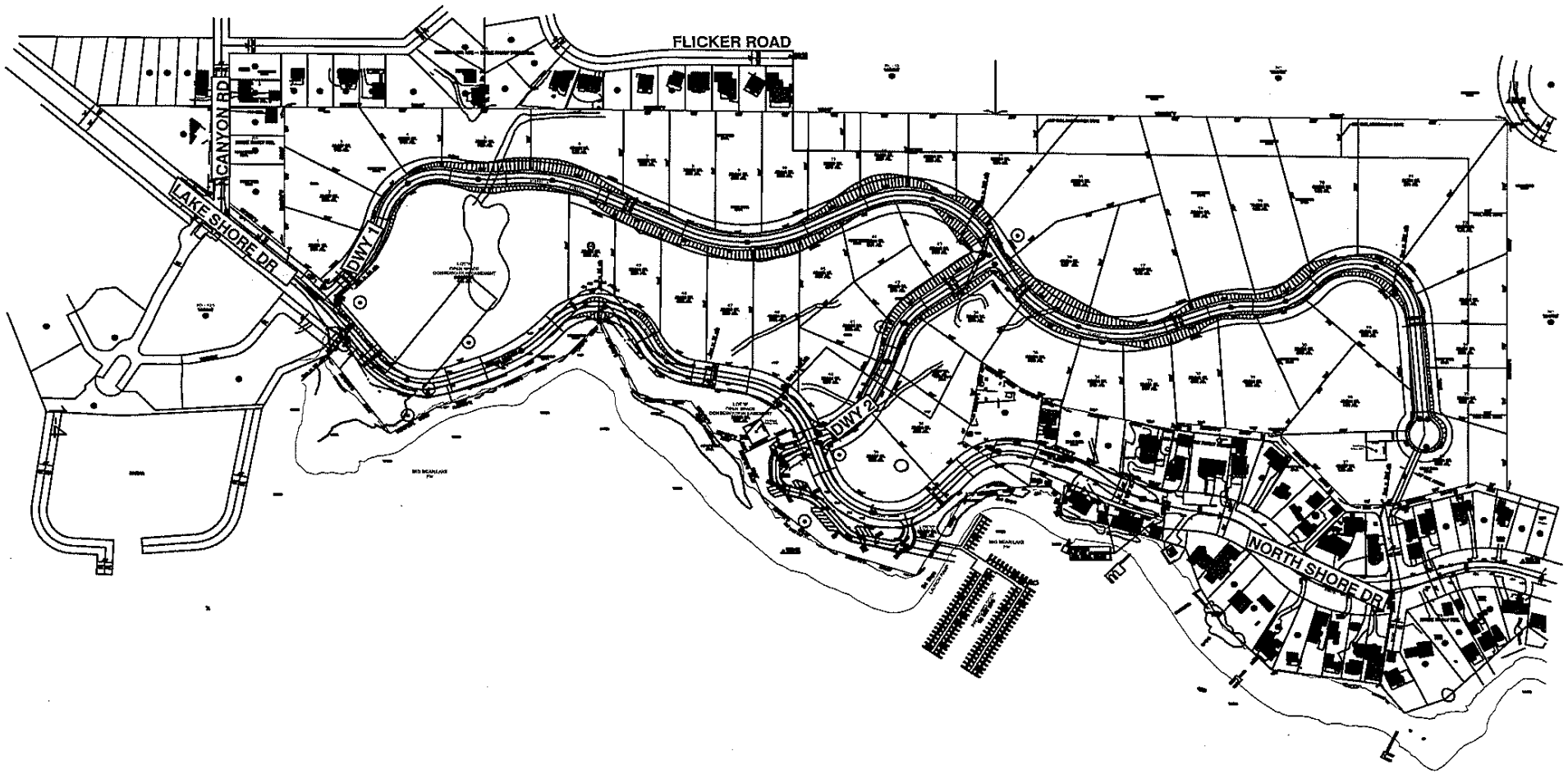
- North Shore Drive (SR-38) (EW)
- Big Bear Boulevard (SR-18) (EW)

North Shore Drive (SR-38) (NS) at:

- Big Bear Boulevard (SR-18) (EW)

EXHIBIT 1-B

SITE PLAN



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1.3 Analysis Methodologies

This section of the report presents the methodologies used to perform the traffic analyses summarized in this report. The methodologies described are consistent with the San Bernardino County Congestion Management Program. The following analysis years are considered in this report:

- Existing Condition – 2007
- Interim Year – 2010
- Long Range – 2030

The overall methodologies used to develop future traffic volume forecasts, and the explicit traffic operations analysis methodologies are summarized herein. The primary section of interest to the non-technically oriented reviewer is Section 1.4.2 (Definition of Significant Impact).

1.3.1 Overall Analysis Methodology

As described previously, traffic conditions are evaluated in this report for existing conditions, 2010 Interim Year Without Project conditions, 2010 Interim Year With Project conditions, and Long Range General Plan Buildout (2030) conditions.

Actual traffic count data was obtained from manual intersection counts (conducted in March 2007, see Appendix "A") to quantify existing traffic conditions. Per discussion with County staff, the peak season of the study area occurs during the summer months, thus a 16% growth is applied to manual intersection counts to represent existing peak hour intersection volumes.

Project traffic volumes for all future conditions were estimated using the manual approach. Trip generation has been estimated based on data collected by the Institute of Transportation Engineers (ITE). The project trip distribution was derived from a select zone run of the San Bernardino Mountain Model.

Interim Year conditions have been estimated based on areawide growth (other projects that are approved, pending, or under construction) and the addition of the project related peak hour volumes. An area-wide growth of 2% per year is applied to adjusted existing volumes (with 16% growth).

The Interim Year 2010 without project traffic volumes are estimated based on the 2007 existing traffic volumes (with 16% adjustment) plus the 2007 to 2010 background growth volumes (2%) plus the known cumulative development volumes.

Project traffic volumes for all future conditions were estimated using the manual approach described in the CMP guidelines. The trip generation calculation is based on the most recent Institute of Transportation Engineers Trip Generation Rates, 7th Edition. The project trip distribution was developed from a select zone run of the San Bernardino Mountain Model and was reviewed by the County of San Bernardino staff. The project only traffic forecasts have been generated by applying the trip generation, distribution and traffic assignment calculations.

Long Range General Plan Buildout (2030) conditions have been estimated based on the San Bernardino Mountain Model and the addition of both the project related peak hour volumes and the known cumulative development peak hour volumes per discussions with County staff.

1.3.2 Traffic Operations Analysis

The current technical guide to the evaluation of traffic operations is the 2000 Highway Capacity Manual (HCM) (Transportation Research Board Special Report 209). The HCM defines level of service as a qualitative measure which describes operational conditions within a traffic stream, generally in terms of such factors as speed and travel time, freedom to maneuver, traffic interruptions, comfort and convenience, and safety. The criteria used to evaluate LOS (Level of Service) conditions vary based on the type of roadway and whether the traffic flow is considered interrupted or uninterrupted. The definitions of level of service for uninterrupted flow (flow unrestrained by the existence of traffic control devices) are:

- LOS "A" represents free flow. Individual users are virtually unaffected by the presence of others in the traffic stream.

- LOS "B" is in the range of stable flow, but the presence of other users in the traffic stream begins to be noticeable. Freedom to select desired speeds is relatively unaffected, but there is a slight decline in the freedom to maneuver.

- LOS "C" is in the range of stable flow, but marks the beginning of the range of flow in which the operation of individual users becomes significantly affected by interactions with others in the traffic stream.

- LOS "D" represents high-density but stable flow. Speed and freedom to maneuver are severely restricted, and the driver experiences a generally poor level of comfort and convenience.

- LOS "E" represents operating conditions at or near the capacity level. All speeds are reduced to a low, but relatively uniform value. Small increases in flow will cause breakdowns in traffic movement.

- LOS "F" is used to define forced or breakdown flow. This condition exists wherever the amount of traffic approaching a point exceeds the amount which can traverse the point. Queues form behind such locations.

Uninterrupted flow is generally found only on limited access (freeway) facilities in urban areas. The definitions of level of service for interrupted traffic flow (flow restrained by the existence of traffic signals and other traffic control devices) differ slightly depending on the type of traffic control.

The level of service is typically dependent on the quality of traffic flow at the intersections along a roadway. The HCM methodology expresses the level of service at an intersection in terms of delay time for the various intersection approaches. The HCM uses different procedures depending on the type of intersection control. The levels of service determined in this study are calculated using the HCM methodology.

For signalized intersections, average total delay per vehicle for the overall intersection is used to determine level of service. Levels of service at signalized study intersections have been evaluated using an HCM intersection analysis program.

The study area intersections which are stop sign controlled with stop-control on the minor street only have been analyzed using the two-way stop

controlled unsignalized intersection analysis methodology of the HCM. For these intersections, the calculation of level of service is dependent on the occurrence of gaps occurring in the traffic flow of the main street. Using data collected describing the intersection configuration and traffic volumes at these locations to calculate average intersection delay; the level of service has been calculated. The level of service criteria for this type of intersection analysis is based on total delay per vehicle for the worst minor street movement(s).

The levels of service are defined in terms of average delay for the intersection analysis methodology as follows:

LEVEL OF SERVICE	AVERAGE TOTAL DELAY PER VEHICLE (SECONDS)	
	SIGNALIZED	UNSIGNALIZED
A	0 to 10.00	0 to 10.00
B	10.1 to 20.00	10.01 to 15.00
C	20.1 to 35.00	15.01 to 25.00
D	35.1 to 55.00	25.01 to 35.00
E	55.1 to 80.00	35.01 to 50.00
F	Over 80.0 or V/C ≥ 1.00	50.01 and up

Per the CMP guidelines, signalized intersections are considered deficient (LOS "F") if the overall intersection critical volume to capacity (V/C) ratio equals or exceeds 1.0, even if the level of service defined by the delay value is below the defined LOS standard. The V/C ratio is defined as the critical volumes divided by the intersection capacity. A V/C ratio greater than 1.0 implies an infinite queue.

The LOS analysis for signalized intersections has been performed using optimized signal timing. This analysis has included an assumed lost time of two seconds per phase in accordance with San Bernardino CMP recommended default values. Signal timing optimization has considered pedestrian safety and signal coordination requirements. Appropriate time for pedestrian crossing have also been considered in the signalized intersection analysis. The following formula has been used to calculate the pedestrian minimum times for all HCM runs:

[(Curb to Curb distance) / (4 feet/second)] + 5 seconds

The resulting minimum green times are shown in the appendices for each analyzed scenario. Saturation flow rates of 1,800 vehicles per hour of green (vphg) for through and right-turn lanes and 1,700 vphg for single left-turn lanes, 1,600 vphg per lane for dual left-turn lanes, and 1,500 vphg per lane for triple left-turn lanes have been assumed for all capacity analysis under 2007 Existing and 2010 Interim Year conditions. Under 2030 Horizon Year conditions, saturation flow rates of 1,900 vphg for through and right-turn lanes and 1,800 vphg for single left-turn lanes, 1,700 vphg per lane for dual left-turn lanes, and 1,600 vphg per lane for triple left-turn lanes have been assumed. These are the default values recommended by the CMP guidelines.

The 2030 peak hour factor has been adjusted upwards to 0.95. This is specifically allowed by the San Bernardino CMP guidelines to account for the effects of congestion on peak spreading. Peak spreading refers to the tendency of traffic to spread more evenly across time as congestion increases.

1.4 Definition of Deficiency and Significant Impact

The following definitions of deficiencies and significant impacts have been developed in accordance with the County of San Bernardino requirements.

1.4.1 Definition of Deficiency

County of San Bernardino guidelines indicate that peak hour intersection operations of LOS "C" or better are considered acceptable. Therefore, any intersection operating at LOS "D" or worse is considered deficient. Per CMP direction, state controlled facilities (state highways, freeway ramp intersection, etc.) are subject to local jurisdiction (California Department of Transportation) traffic operations requirements, with no greater than 45 seconds average stopped delay per vehicle allowed during peak hour operations (middle of LOS "D")

The identification of a CMP deficiency requires further analysis in satisfaction of CMP and County requirements, including:

- Evaluation of the mitigation measures required to restore traffic operations to an acceptable level of service with respect to CMP and local jurisdiction LOS standards.
- Calculation of the project share of new traffic on the impacted CMP facility during peak hours of traffic.
- Estimation of the cost required to implement the improvements required to restore traffic operations to an acceptable level of service as described above.

This study incorporates each of these aspects for all locations where a CMP deficiency is identified.

1.4.2 Definition of Significant Impact

The identification of significant impacts is a requirement of CEQA, and is not directly addressed in the CMP document. The County of San Bernardino General Plan and Circulation Element have been adopted in accordance with CEQA requirements, and any roadway improvements within the County of San Bernardino which are consistent with these documents are not considered a significant impact, so long as the project contributes its "fair share" funding for improvements.

A traffic impact is considered significant and immitigable if the project both: i) contributes measurable traffic to and ii) substantially and adversely changes the level of service at any off-site location projected to experience deficient operations under foreseeable cumulative conditions, where feasible improvements consistent with the County of San Bernardino General Plan cannot be constructed.

2.0 PROJECT DESCRIPTION

This section describes the project land uses and traffic characteristics for each of the future conditions analyzed.

2.1 Project Description

The proposed Moon Camp residential development is located along North Shore Drive in the County of San Bernardino. The Moon Camp residential project is proposed to include 50 new single-family detached dwelling units and one existing single-family detached dwelling unit. Exhibit 1-B (previously presented) illustrates the site plan.

There are two (2) primary full access points to the project site located off North Shore Drive.

2.2 Project Traffic

The traffic related to the project has been calculated in accordance with the following accepted procedural steps:

- Trip Generation
- Trip Distribution
- Traffic Assignment

These steps are described in detail below.

2.2.1 Project Trip Generation

The trip generation calculation is based on the most recent Institute of Transportation Engineers Trip Generation Rates, 7th Edition. Table 2-1 indicates the proposed trip generation rates. As indicated in Table 2-2, the

TABLE 2-1

TRIP GENERATION RATES[1]

LAND USE	ITE CODE	QUANTITY	UNITS[2]	FRIDAY PM PEAK HOUR			SUNDAY MID-DAY PEAK HOUR			DAILY
				IN	OUT	TOTAL	IN	OUT	TOTAL	
PROJECT										
Single Family Residential	210	50	DU	0.64	0.37	1.01	0.64	0.37	1.01	9.57
CUMULATIVE PROJECTS										
Hotel	310	Varies	ROOMS	0.31	0.28	0.59	0.31	0.28	0.59	8.17
Townhomes/Condominium	230	78	DU	0.35	0.17	0.52	0.35	0.17	0.52	5.86
Fast Food Restaurant With Drive-Thru	934	2.5	TSF	18.01	16.63	34.64	18.01	16.63	34.64	496.12
Shopping Center	820	10	TSF	6.57	7.12	13.70	6.57	7.12	13.70	152.03
Shopping Center	820	22.517	TSF	4.99	5.40	10.39	4.99	5.40	10.39	114.43
Automobile Care Center	942	4.375	TSF	1.69	1.69	3.38	1.69	1.69	3.38	20.00
Mini-Warehouse	151	3	AC	1.99	1.84	3.83	1.99	1.84	3.83	38.87
Office	710	6.3	TSF	0.17	0.83	1.00	0.17	0.83	1.00	11.01
Church	560	20	TSF	0.34	0.32	0.66	0.34	0.32	0.66	9.11

[1] Source: ITE (Institute of Transportation Engineers) Trip Generation Manual, 7th Edition, 2003.

[2] DU = Dwelling Units

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TABLE 2-2

PROJECT TRIP GENERATION SUMMARY

LAND USE	QUANTITY	UNITS[1]	FRIDAY PM PEAK HOUR			SUNDAY MID-DAY PEAK HOUR			DAILY
			IN	OUT	TOTAL	IN	OUT	TOTAL	
Single Family Residential	50	DU	32	19	51	32	19	51	479

[1] DU = Dwelling Units

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proposed Moon Camp residential development is projected to generate 479 trip-ends per day with 51 vehicles per hour during the weekday AM peak hour and 51 vehicles per hour during the weekday PM peak hour. It is our understanding that the weekday PM peak hour generates more trips than the Sunday Midday peak hour. Based on discussions with County of San Bernardino staff, weekday PM peak hour trip generation has been used in both Friday PM peak hour analysis and Sunday Mid-day peak hour analysis to represent a conservative worst case condition.

2.2.2 Project Trip Distribution and Assignment

The project trip distribution and assignment process represents the directional orientation of traffic to and from the project site. Trip distribution is heavily influenced by the geographical location of the site, the location of surrounding uses, and the proximity to the regional freeway system.

Project trip distribution has been derived from a select zone run of the San Bernardino Mountain Model. The trip distribution pattern for both Friday PM peak and Sunday Mid-day peak is based on the Friday PM distribution per discussions with County staff. Exhibit 2-A illustrates the project trip distribution.

2.2.3 Project Only Traffic Volume Forecasts

The project only traffic forecasts have been generated by applying the trip generation, distribution and traffic assignment calculations. The project ADT volumes are presented on Exhibit 2-B. The project only Friday PM peak hour and Sunday Mid-day peak hour intersection volumes are depicted on Exhibit 2-C.

EXHIBIT 2-A

PROJECT TRIP DISTRIBUTION

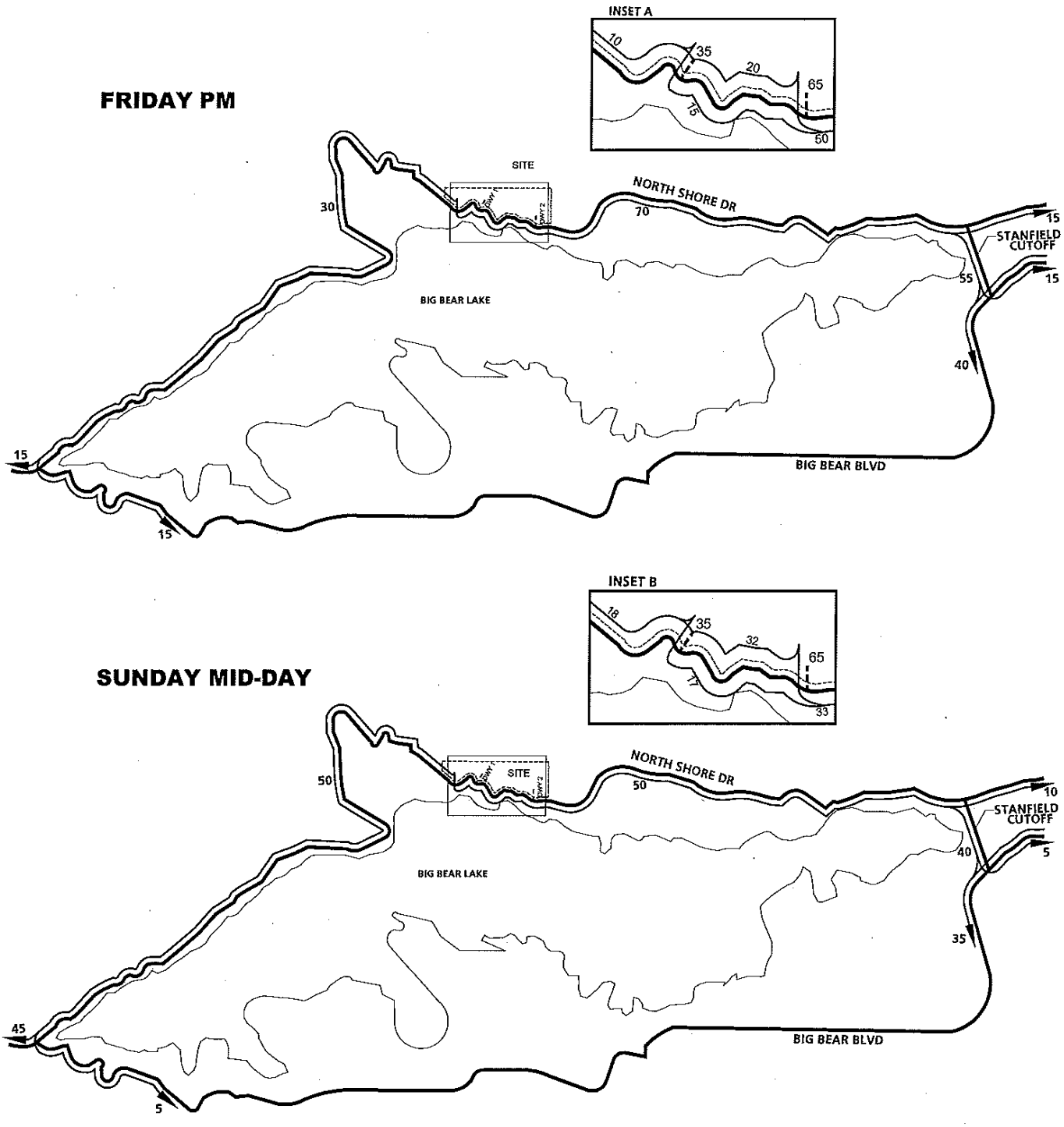
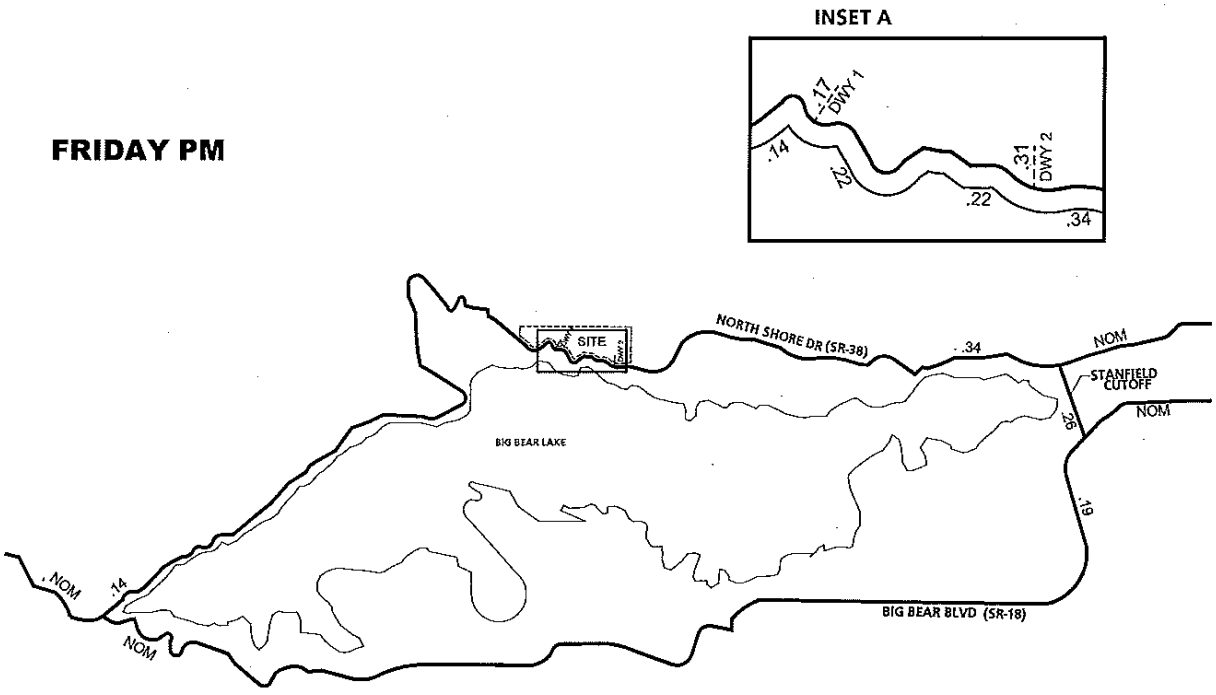


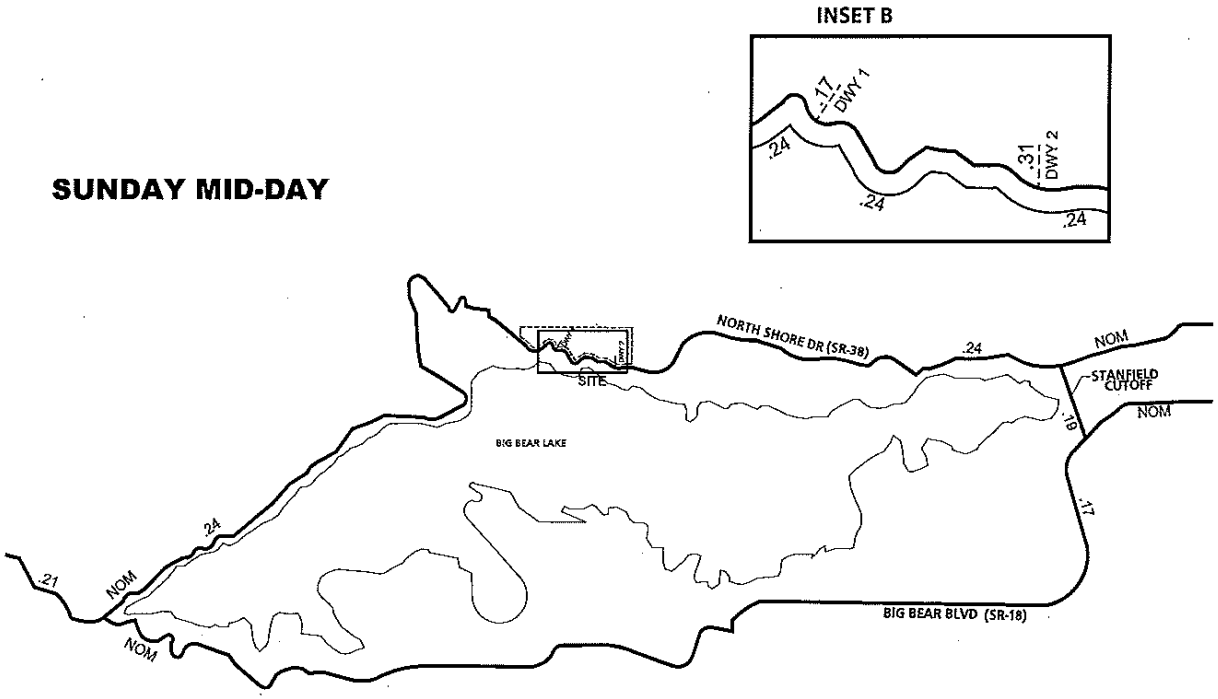
EXHIBIT 2-B

PROJECT AVERAGE DAILY TRAFFIC

FRIDAY PM



SUNDAY MID-DAY



LEGEND:

10.0 = VEHICLES PER DAY (1000'S)
NOM = NOMINAL, LESS THAN 50 VEHICLES PER DAY

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