

HYDROLOGY / HYDRAULIC REPORT



Project Site:
CANYON OAKS
San Dimas, CA

Prepared for:
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26152 Oroville Place
Laguna Hills, CA 92653

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Date Prepared: May 2008
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JN: 349.04.01



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Prepared for:

Canyon Oaks, in the City of San Dimas
In the
County of Los Angeles, CA

NJD Limited
26152 Oroville Place
Laguna Hills, CA 92653

By:

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1.0 INTRODUCTION

The proposed Canyon Oaks project site is a 318.48-acre parcel located in the City of San Dimas, CA. The project site is bounded by open space within the City of Glendora on the west, the Angeles National Forest to the north, open space within the City of San Dimas to the east and residential lots north of Maverick Drive and Dalepark Drive to the south.

Drainage is to the San Gabriel Watershed. The San Gabriel River Watershed is located in the eastern portion of Los Angeles County. It is bound by the San Gabriel Mountains to the north, most of San Bernardino/Orange County to the east, the division of the Los Angeles River from the San Gabriel River to the west, and the Pacific Ocean to the south. The watershed is composed of approximately 640 square miles of land spanning over 37 cities with 26% of its total area developed.

The watershed drains into the San Gabriel River from the San Gabriel Mountains flowing 58 miles south until its confluence with the Pacific Ocean. Major tributaries to the San Gabriel River include Walnut Creek, San Jose Creek, Coyote Creek, and numerous storm drains entering from the 19 cities that the San Gabriel River passes through. Channel flows pass through different sections in the San Gabriel River, diverting from the riverbed into four different spreading grounds, held behind several rubber dams for controlled flow and ground water recharge, and controlled through 10 miles of concrete channel bottom from below Whittier Narrows Dam to past Coyote Creek.

The southerly portion of the site will drain to two catch basins within the City of San Dimas located on Cataract Avenue. The catch basins drain to the City of Glendora through a storm drain system to the golf course west of the City Line. The combined capacity of the two catch basins is 93 cfs. The northerly portion of the site will drain overland toward the City of Glendora.

Under existing conditions, the project site is undeveloped open space for the most part. There are equestrian uses on site. Adjacent land uses include open space to the east and west, the Angeles National Forest to the north and single family residential to the south.

Current land use is as single family very low estate with a density of 0 to 0.2 per acre. Zoning is SP-25 or specific plan.

Soil type is type 080 per County of Los Angeles soil type maps.

Prior to construction, 1% of the site is impervious, being mostly undeveloped. There are no on-site drainage facilities. The northern portion of the site drains to the west into the City of Glendora. The southeasterly portion of the site drains southerly into a drainage easement for the City of San Dimas where the runoff flows southerly until it is picked up in catch basins on San Dimas Avenue near its intersection with Prairie Drive. The remainder of the site flows southwesterly down Shuler Canyon until it flows into the end of Cataract Street and is picked up by two catch basins and transported onto the Glendora Golf Course in the City of Glendora.

The proposed project includes two parts, the southerly part know as Tract 62872, an entitled tract for 8 single family homes, and the northerly part that consists of 50 single family home sites on a minimum of 1-acre lots and appurtenant roads, utilities, and debris basins. There are some existing equestrian facilities that will be demolished.

The existing drainage patterns will be maintained. Debris basins will be constructed above any home sites exposed to run on from off-site areas upstream. Bio-filtration basins or bio-cells will be provided for first flush treatment from the proposed home-sites. These basins are dependent on the approval of

a qualified soils engineer/geologist. The topography of the site precludes the use of swales, being much too steep for any effective treatment. Infiltration basins would not be feasible due to the topography and the proximity of fill slopes. The proposed bio-filtration basins would be lined and have a drainage system beneath filtration media to take the filtered stormwater to the existing natural drainage system.

The proposed project will disturb approximately 80 acres of the 318 acre site. The 80 acres will become 21% (LA County Hydrology – single family homes-estate) impervious instead of the 1% impervious of the undeveloped site.

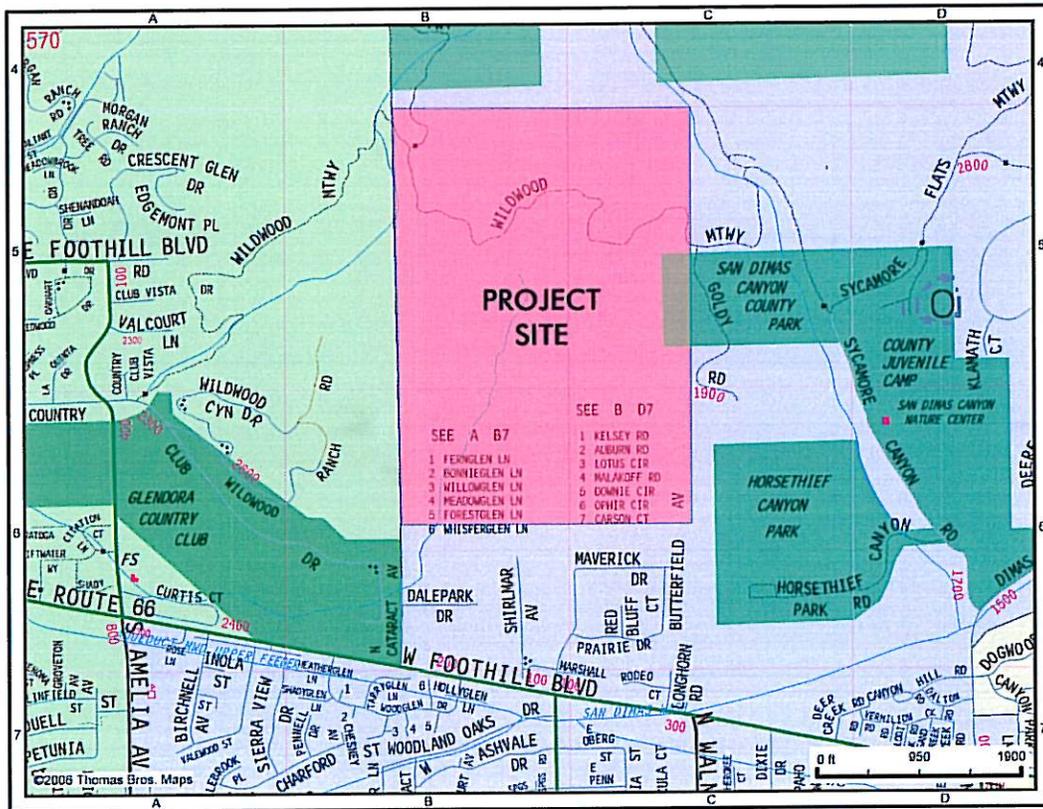


Figure 1 Vicinity Map

2.0 ENVIRONMENTAL SETTING

2.1 HYDROLOGY

2.1.1 EXISTING ON-SITE HYDROLOGY CONDITIONS

The purpose of the existing conditions evaluation is to establish a baseline for comparing the post-development Project conditions with the pre-development conditions. The conditions analyzed include land use, hydrology, and floodplain mapping.

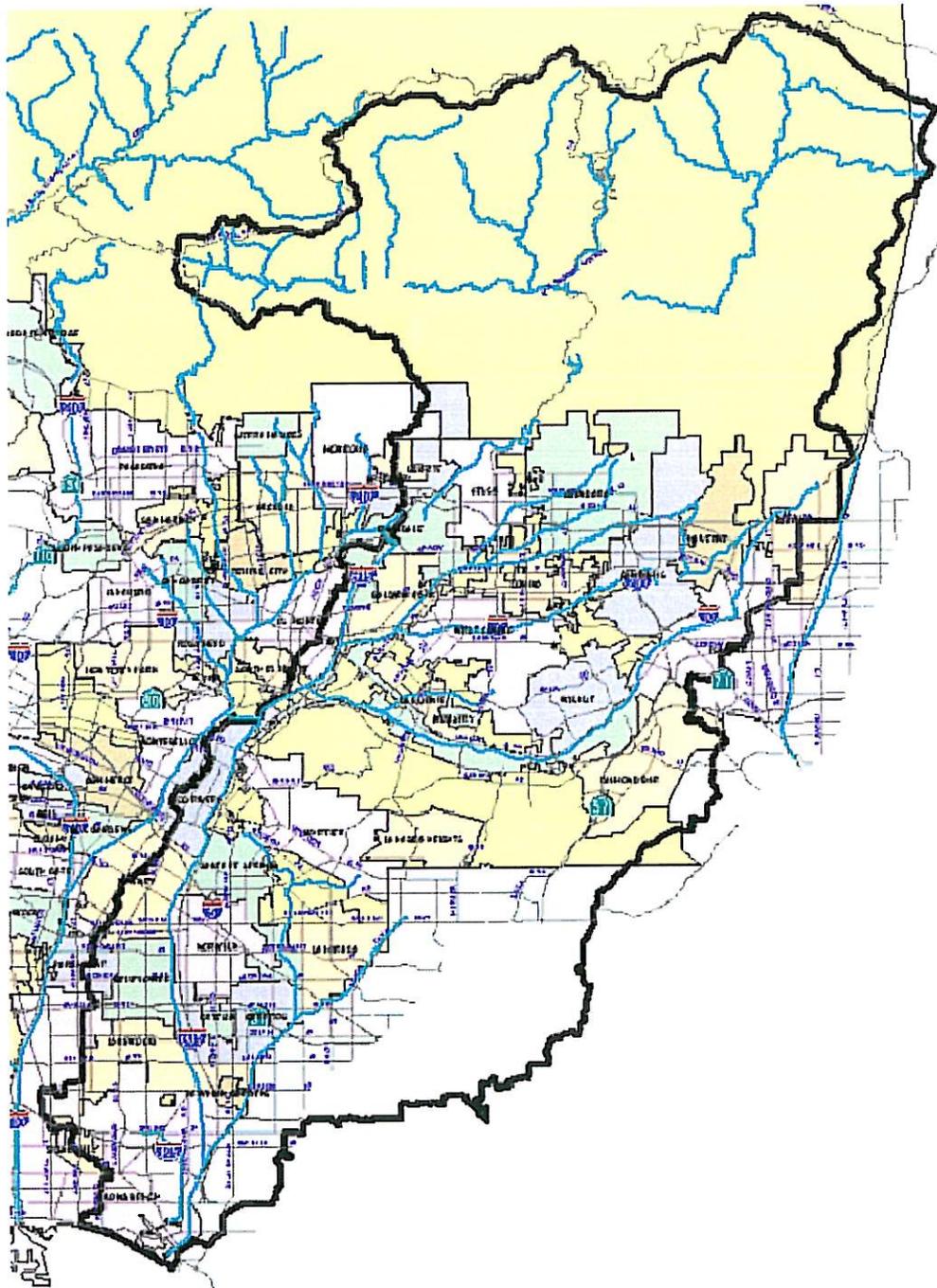
Drainage is to the San Gabriel Watershed. The San Gabriel River Watershed is located in the eastern portion of Los Angeles County. It is bound by the San Gabriel Mountains to the north, most of San Bernardino/Orange County to the east, the division of the Los Angeles River from the San Gabriel River to the west, and the Pacific Ocean to the south. The watershed is composed of approximately 640 square miles of land spanning over 37 cities with 26% of its total area developed.

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There are several streams on site which carry the names of the canyons in which they flow. The south-westerly portion of the site drains through Shuler Canyon to two catch basins within the City of San Dimas located on Cataract Avenue. The catch basins drain to the City of Glendora through a storm drain system to the golf course west of the City Line. The combined capacity of the two catch basins is 93 cfs. The northerly portion of the site drains overland toward the City of Glendora open-space through Wildwood Canyon. The southeasterly portion of the site drains southerly through Shay Canyon into a drainage easement in favor of the City of San Dimas where the runoff flows southerly until it is captured by catch basins on San Dimas Avenue near its intersection with Prairie Drive thus entering the San Dimas MS4 system.

Prior to construction, 1% of the site is impervious, being mostly undeveloped. There are no on-site drainage facilities. Post construction, there will be open-space that maintains the 1% impervious and estate-type home sties that will be 21% impervious.

Figure 2 San Gabriel River Watershed Map



The Canyon Oaks site is currently undeveloped consisting of rolling hills with fairly steep slopes covered with native grasses and deep canyons having chaparral in the canyon bottoms.

The site generally drains from east to west and northeast to southwest at a slope of 7 to 26%. Being undeveloped, there are no major drainage improvements on-site. Sheet flow and stream flow are the means of storm water runoff conveyance for the project area (see Figure 3). Sheet and stream flow are also the means of conveyance for the upstream and downstream areas within the local vicinity. Storm water runoff ultimately discharges into the San Dimas Wash and then to reach 4 of the San Gabriel River in the Lower San Gabriel Valley between Santa Fe Dam and Whittier Narrows Dam.

The Canyon Oaks project site can be divided into 3 sub-drainage areas to further describe the existing drainage conditions. Refer to Appendix C for locations of the sub-drainage areas. Hydrologic calculations to evaluate surface water runoff associated with the 50-year high confidence storm frequency were performed for the drainage areas both on- and off-site. The calculations were performed using Tc Calculator and MORA to perform Rational Method Hydraulic calculations. The watershed boundaries were delineated using US Geological Survey (USGS) topographic maps. Results of the existing condition hydrologic analysis are summarized in Table 1 below. Detailed calculations are provided in Appendix A.

EXISTING HYDROLOGY CONDITIONS: CANYON OAKS OFF-SITE WATERS ACCEPTED		
Sub-Area ID ¹	Off-site Drainage Area	50-Year Peak Flow Rate (Q ₅₀ , cfs)
1-OS	38.95	99.80
2-OS	12.36	31.64
3-OS	36.04	92.26
4-OS	3.09	7.91
5-OS	2.87	7.35
6-OS	3.03	7.75
7-OS	30.76	78.75
Total	127.10	325.46 cfs
1 Refer to Appendix C for locations of sub-drainage areas cfs cubic feet per second OS-offsite.		

Table 1 Summary of existing hydrology conditions for Canyon Oaks off-site.

Under existing conditions, there are eight points of entry into the site for off-site waters. The off-site drainage area comprises 126.55 acres and generates 265.83 cfs which must be accepted and conveyed through the site. This corresponds generally to a 2.1:1 ratio between the peak flow rate and the drainage area.

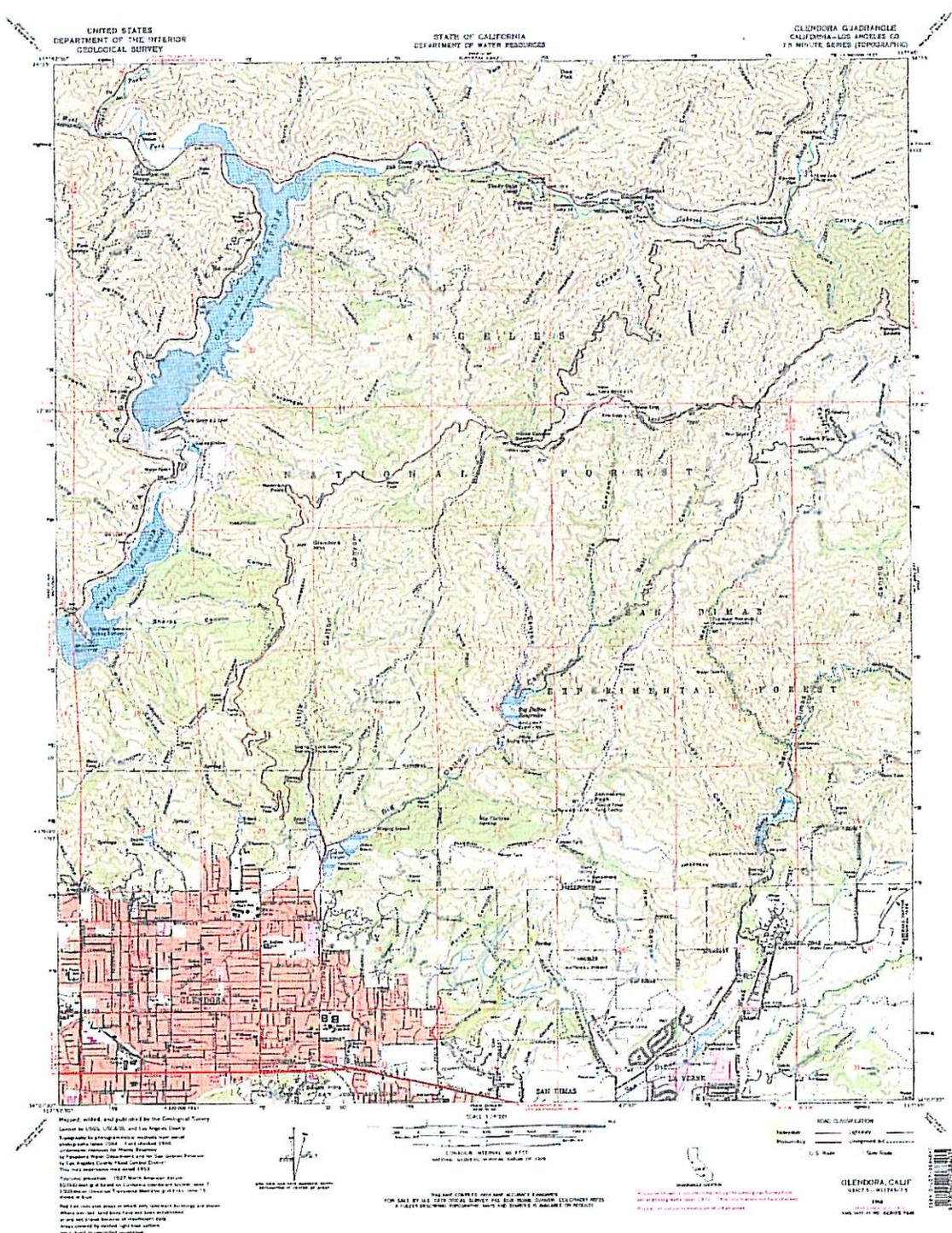
EXISTING HYDROLOGY CONDITIONS: CANYON OAKS EXITING THE SITE		
Area ID ¹	Drainage Area	50-Year Peak Flow Rate (Q ₅₀ , cfs)
A	142.44 acres	283 cfs
B	68.49 acres	148 cfs
C	190.03 acres	400 cfs
Total	400.96 acres	831 cfs
¹ Refer to Appendix C for locations of sub-drainage areas cfs cubic feet per second		

Table 2 Summary of existing hydrology peak flows for Canyon Oaks exiting the site.

Currently, there are three points of exit from the site. The complete drainage area comprised of the site and upstream tributary area is 400.96 acres and generates 831 cfs. This corresponds generally to a 2.1:1 ratio between the peak flow rate leaving the site and the total tributary drainage area. As previously mentioned, there are no existing drainage facilities upstream or within the project boundaries, and storm water runoff is conveyed via sheet and stream flow through the project site.

Figure 3 Existing Drainage Vicinity Topography

USGS Glendora Quadrangle



2.1.2 WATERSHED HYDROLOGY CONDITIONS

There are no proposed drainage facilities within the site boundaries. The development site is within the City of San Dimas, which has no proposed drainage facilities within the drainage area.

Shuler Canyon stream flows (Area A) are currently being intercepted at two catch basins near the intersection of Cataract Avenue and West Dalepark Drive in the City of San Dimas. The catch basins are located off-site about 0.2 miles south of the southwesterly site boundary. Flows enter the catch basins, which are owned and maintained by the City of San Dimas. The flow then crosses the city boundary with the City of Glendora via a 30" RCP which discharges into the Glendora Golf Course.

Area B stream flows (in Shay Canyon) to the south where it enters a City of San Dimas drainage easement and sheet flows southerly through the easement to a catch basin in San Dimas Avenue south of the intersection with Prairie Avenue in the City of San Dimas. The entry to San Dimas Avenue is sheet flow over the existing curb face approximately 0.26 miles south of the site property line.

Stream flow from Area C, which is tributary to Wildwood Canyon, flows generally southwesterly and crosses into the City of Glendora at the westerly property line. The property to the west, in the City of Glendora, is also owned by NDJ Limited and that property will accept the drainage onto their site without attenuation.

2.1.3 FLOODPLAIN MAPPING

The National Flood Insurance Act (1968) established the National Flood Insurance Program, which is based on the minimal requirements for flood plain management and is designed to minimize flood damage within Special Flood Hazard Areas. The Federal Emergency Management Agency (FEMA) is the agency, which administrates the National Flood Insurance Program. Special Flood Hazard Areas (SFHA) are defined as areas that have a 1% chance of flooding within a given year. This is also referred to as the 100-year flood. Flood Insurance Rate Maps (FIRMs) were developed to identify areas of flood hazards within a community.

According to the Flood Insurance Rate Map (FIRM) catalog, there ia a FIRM produced by FEMA for the project site:

MAP Number: 0601540001C

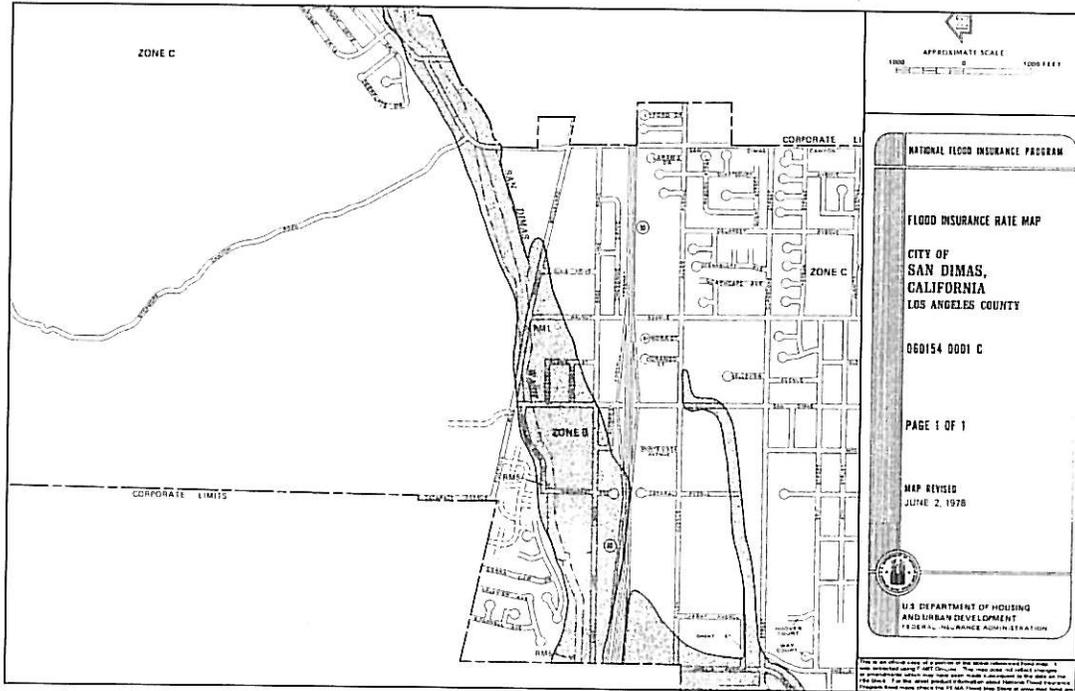
MAP Revised: June 2, 1978

Figure 4 shows the flood zones designated for the Canyon Oaks project site. The complete site is located within Zone C (white), which is an area of minimal flooding (100-year). This area may also be subject to flooding from severe storm activity or local drainage problems.

As shown in Figure 4, there are no floodways recognized by FEMA within the vicinity of the project site.

Figure 5 FIRM Panels

FIRMettes
0601540001C



3.0 CONCLUSION

The existing hydrology has been calculated for the site. The calculations will be used to show that the proposed project will not increase the flow to the existing downstream facilities.

4.0 REFERENCES

County of Los Angeles. 1991 Hydrology / Sedimentation Manual.

County of Los Angeles. Hydrologic Method, Addendum to the 1991 Hydrology / Sedimentation Manual. June 2002.

5.0 TECHNICAL APPENDICES

- Appendix A Rational Method Hydrology Study: Existing Condition
- Appendix B Rational Method Hydrology Study: Proposed Condition
- Appendix C Existing Hydrology Map (map pocket)
- Appendix D Proposed Hydrology Map (map pocket)
- Appendix E Debris calculations
- Appendix F Detention Basin calculations
- Appendix G Preliminary Drainage Study and Hydraulic Calculations for Tract No. 62872, August 10, 2006
- Appendix H Bud Wheeler Drainage Study (Includes Capacity of Existing Catch Basins), January 24, 2001