3. Environmental Analysis

This section of the EIR examines and describes the potential environmental impacts associated with the construction and operation of the proposed Upper Reach Project. Based on the NOP/IS (January 2007) prepared for the proposed project (See Appendix A.1 and A.2) and comments submitted during the scoping process (See Appendix A.3), the environmental analysis focuses on five issues: Noise, Transportation/Traffic, Air Quality, Recreation, and Geology/Hydrogeology. Section 3 evaluates the impact of the Upper Reach pipeline for each of these issue areas. This introduction describes the format followed in Section 3 for evaluating project impacts.

The environmental impact analysis addresses four key areas. Each of these key areas is described below.

Regulatory Setting. The regulatory setting describes current public policies, regulations, programs, and standards that apply to the proposed project as it relates to the specific issue area in question. Often, these existing policies and regulations serve to reduce or avoid potential environmental impacts.

Environmental Setting. The environmental setting section describes existing conditions in the project area that may be subject to change as a result of the implementation of the proposed project.

Impacts and Mitigation. The impacts and mitigation measures section describes the anticipated environmental impacts that could result from the construction and operation of the proposed project. In determining the significance of impacts, the ability of existing regulations and other public agency requirements to reduce potential impacts is taken into consideration. If an adverse impact is potentially significant despite existing regulations and requirements, mitigation measures are proposed to reduce or avoid the impact, where feasible. Mitigation measures are only required for significant adverse impacts. Once impacts and mitigation measures, as applicable, are presented, the "level of significance after mitigation" is determined.

While the criteria for determining significant impacts are unique to each issue area, the analysis applies a uniform classification of the impacts based on the following definitions:

- A designation of *no impact* is given when no adverse changes in the environment are expected.
- A *less-than-significant impact* would cause no substantial adverse change in the environment.
- A *less-than-significant impact with mitigation* avoids substantial adverse impacts on the environment through mitigation.
- A *significant but unavoidable impact* would cause a substantial adverse impact on the environment, and no feasible mitigation measures would be available to reduce the impact to a less-than-significant level.

Cumulative Impacts. Cumulative impacts are also discussed for each issue area. To determine the potential for cumulative impacts, Section 2.8 of the Project Description identifies projects within 2.5 miles of the proposed Upper Reach alignment and projects that would be constructed within the same time frame as the proposed project. These cumulative projects were used to determine cumulative impacts for each issue area described in this section.

3.1 Noise and Vibration

This section addresses noise and vibration impacts that would result from the proposed project. The analysis presented herein is based on the *RSCI Upper Reach Noise and Vibration Study* prepared by Medlin & Associates, Inc., which is provided in Appendix C of this EIR.

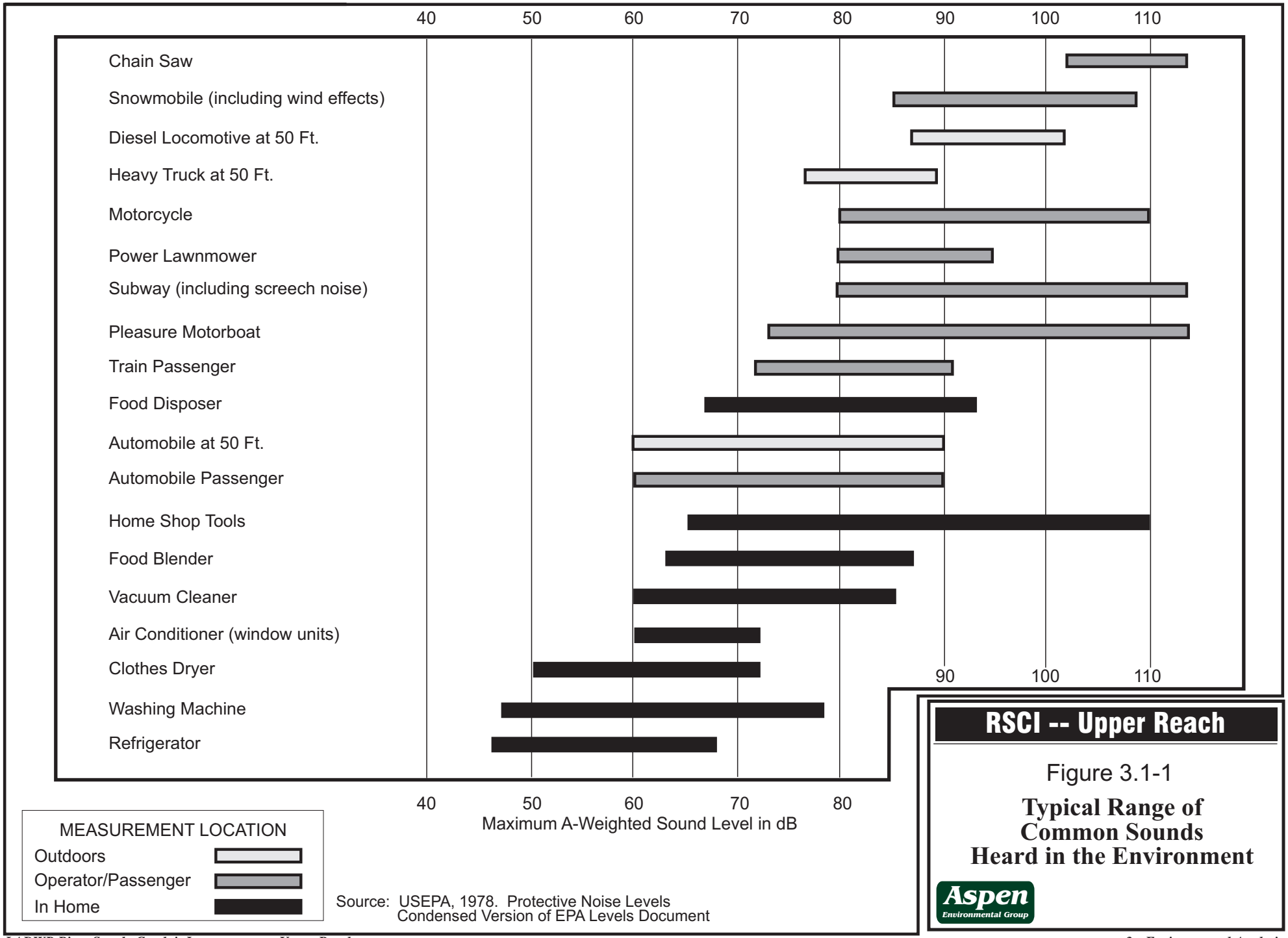
3.1.1 Introduction

To describe environmental noise and to assess impacts on areas sensitive to community noise, a frequency weighting measure that simulates human perception is customarily used. The frequency weighting scale, known as A-weighting, best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise. The A-weighted decibel scale (dBA) is cited in most noise criteria. Decibels are logarithmic units that conveniently compare the wide range of sound intensities to which the human ear is sensitive. Figure 3.1-1 illustrates typical ranges of common sounds heard in the community noise environment.

Due to the logarithmic nature of sound, decibel arithmetic works differently than ordinary arithmetic. Doubling the sound in a measured environment results in only a three decibel addition to the measured values, not a doubling of the number of decibels; a ten-fold increase in sound results in an addition of ten decibels to the measured value. Conveniently, human perception of "loudness" is also approximately logarithmic. A three-decibel change in sound level is just noticeable to most people. A five-decibel change is readily noticeable, whereas a change of ten decibels is usually perceived as a doubling of the "volume."

The community noise environment and the consequences of human activities cause noise levels to be widely variable over time. For simplicity, sound levels are usually best represented by an equivalent level over a given time period (L_{eq}) or by an average level occurring over a 24-hour day-night period (L_{dn}). The L_{eq}, or equivalent sound level, is a single value for any desired duration (usually one hour), which includes all of the time-varying sound energy in the measurement period. It is important to note that, like other averaging methods, L_{eq} does not indicate the range of noise level measurements. Two identical values of L_{eq} may represent two widely different ranges of actual noise measurements. Because of the logarithmic nature of expressing sound level, however, very loud sounds of any significant duration will tend to "swamp" quieter sounds of longer duration, thus biasing measurements in favor of the louder sounds.

Because quieter conditions are normally preferred during sleeping hours, various measures have been developed which account for additional annoyance produced by noises occurring at night. The Community Noise Equivalent Level (CNEL) is a 24-hour equivalent noise level. It accounts for the additional annoyance by adding a 5 decibel penalty to noises measured between 7:00 p.m. and 10:00 p.m., and a 10 decibel penalty to noises between 10:00 p.m. and 7:00 a.m. An alternative measure, the Day-Night Level (DNL or L_{dn}), is similar to CNEL. The DNL (or L_{dn}) is also equal to the 24-hour equivalent sound level (in dBA) with a 10 dBA penalty applied to nighttime sounds occurring between 10:00 p.m. and 7:00 a.m. CNEL and DNL are average values only. Because a noise source produces a CNEL or DNL value below a specified threshold does not mean that the



Source: USEPA, 1978. Protective Noise Levels
Condensed Version of EPA Levels Document

RSCI -- Upper Reach

Figure 3.1-1

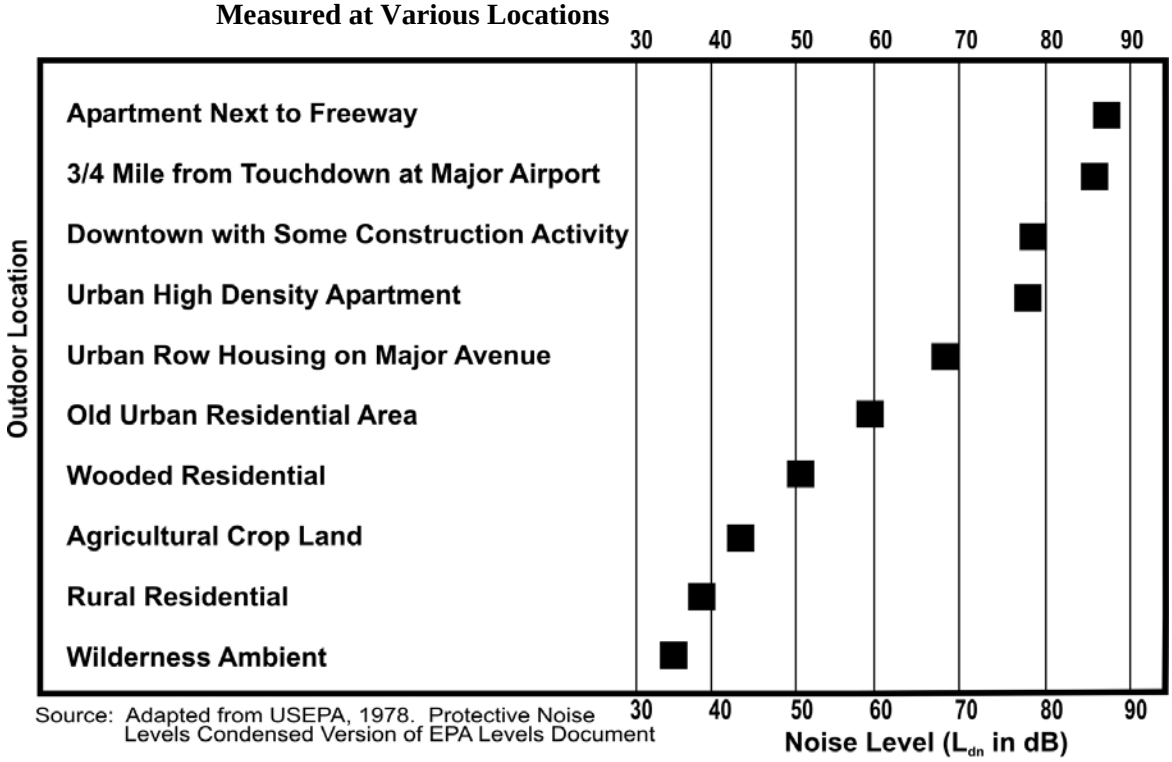
Typical Range of Common Sounds Heard in the Environment

Aspen Environmental Group

noise will be inaudible. Rather, CNEL and DNL thresholds are normally set so that the occurrence of a disturbing noise is not so frequent that it causes substantial annoyance to people or other receptors in the affected area.

Community noise levels are usually closely related to the intensity of nearby human activity. Figure 3.1-2 illustrates the typical noise levels of varying types of land use. Noise levels are generally considered low when ambient levels are below 45 dBA, moderate in the 45 to 60 dBA range, and high above 60 dBA. In wilderness areas, the L_{dn} noise levels can be below 35 dBA. In small towns or wooded and rural residential areas, the L_{dn} is more likely to be around 50 or 60 dBA. Levels around 75 dBA are more common in busy urban areas (e.g., downtown Los Angeles), and levels up to 85 dBA occur near major freeways and airports. Although people often accept the higher levels associated with very noisy urban residential and residential-commercial zones, they nevertheless are considered to be adverse to public health.

Figure 3.1-2: Examples of Outdoor Day-Night (L_{dn}) Average Sound Levels in dB Measured at Various Locations



Source: Adapted from USEPA, 1978. Protective Noise Levels Condensed Version of EPA Levels Document

The surrounding land uses dictate what noise levels would be considered acceptable or unacceptable. Lower levels are expected in rural or suburban areas than what would be expected for commercial or industrial zones. Nighttime ambient levels in urban environments are generally about seven decibels lower than the corresponding daytime levels. In rural areas away from roads and other human activity, the day-to-night difference can be considerably less. Areas with full-time human occupation that are subject to nighttime noise are often considered objectionable because of the likelihood of disrupting sleep. Noise levels above 45 dBA at night can result in the onset of sleep interference effects. At 70 dBA, sleep interference effects become considerable (USEPA, 1974).

3.1.2 Regulatory Setting

Regulating environmental noise is generally the responsibility of local governments. However, the USEPA published guidelines on recommended maximum noise levels to protect public health and welfare (USEPA, 1974), and the State of California maintains recommendations for local jurisdictions in the General Plan Guidelines published by the Governor's Office of Planning and Research (OPR, 2003). The following discussion summarizes federal and State recommendations and local agency requirements for noise and vibration.

Federal and State Standards

Noise

There are no federal noise standards that directly regulate environmental noise. Table 3.1-1 provides a summary of recommended noise levels for protecting public health and welfare with an adequate margin of safety. With regard to noise exposure and workers, the federal Occupational Safety and Health Administration (OSHA) establishes regulations to safeguard the hearing of workers exposed to occupational noise (29 CFR Section 1910.95, Code of Federal Regulations).

Table 3.1-1. Examples of Protective Noise Levels Recommended by USEPA

Effect	Maximum Level	Exterior or Interior Area
Hearing loss	$L_{eq}(24) < 70$ dB	All areas.
Outdoor activity interference and annoyance	$L_{dn} < 55$ dB	Outdoors in residential areas and farms and other outdoor areas where people spend widely varying amounts of time and other places in which quiet is a basis for use.
	$L_{eq}(24) < 55$ dB	Outdoor areas where people spend limited amounts of time, such as schoolyards, playgrounds, etc.
Indoor activity interference and annoyance	$L_{dn} < 45$ dB	Indoor residential areas.
	$L_{eq}(24) < 45$ dB	Other indoor areas with human activities such as schools, etc.

Source: USEPA, 1974.
$L_{eq}(24)$ = Represents the sound energy averaged over a 24-hour period.
L_{dn} = Represents the L_{eq} with a 10 dB nighttime penalty.

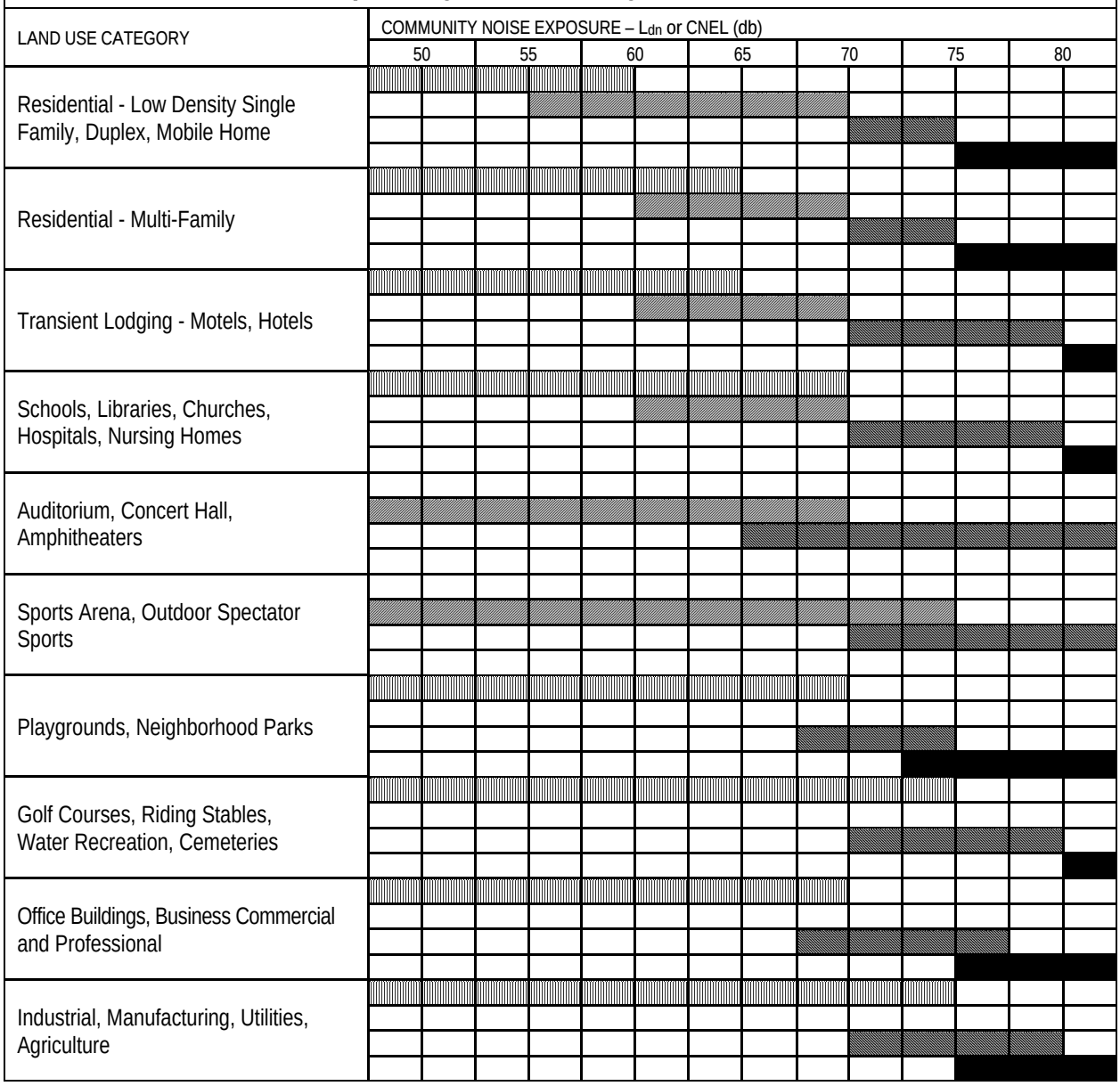
The State of California requires each local government to perform noise surveys and implement a noise element as part of their general plan. Table 3.1-2 shows the State guidelines for evaluating the compatibility of various land uses as a function of noise exposure.

Ground Vibration and Groundborne Noise

The Federal Transit Administration (FTA) has set forth a number of criteria to determine whether groundborne vibration is likely to cause annoyance or interfere with activities within a building. These criteria are provided in tables 8-1 and 8-2 of the FTA document *Transit Noise and Vibration Impact Assessment* (May 2006), and are reproduced here (see Tables 3.1-3 and 3.1-4, below). Though these criteria were developed specifically to assess vibration impacts from trains, they should also serve well for construction activities, which involve the use of muck trains during tunneling operations. It should be noted, however, that the while the FTA criteria presented herein carry no statutory authority for this project they provide a reasonable baseline to determine significant impacts.

Table 3.1-2. Land Use Compatibility for Community Noise Environment

Table C.10-4. Land Use Compatibility for Community Noise Environment



	Normally Acceptable. Specified land use is satisfactory, based upon the assumption that any buildings involved are of normal conventional construction, without any special noise insulation requirements.
	Conditionally Acceptable. New construction or development should be undertaken only after a detailed analysis of the noise reduction requirements is made and needed noise insulation features are included in the design. Conventional construction, but with closed windows and fresh air supply systems or air conditioning will normally suffice.
	Normally Unacceptable. New construction or development should generally be discouraged. If new construction or development does proceed, a detailed analysis of the noise reduction requirements must be made and needed noise insulation features included in the design.
	Clearly Unacceptable. New construction or development should generally not be undertaken.

Source: State of California General Plan Guidelines, Office of Planning and Research, October 2003.

Table 3.1-3 below provides criteria for three general categories of building use, with Category 1 having the most stringent criteria. Briefly, Category 1 refers to buildings with vibration-sensitive operations, such as medical or manufacturing equipment whose function may be affected by even imperceptible vibrations. Category 2 refers to buildings where sleep-disturbance may occur, such as residences, hotels, and hospitals. Category 3 refers to buildings such as schools and churches where vibration may interfere with activities but not operation of sensitive equipment.

Table 3.1-3. Groundborne Vibration Criteria – General Assessment (Vdb re 1 μ-inch/sec) [a]

Land Use Category	Frequent Events	Occasional Events	Infrequent Events
Category 1: buildings where vibration would interfere with interior operations	65 VdB	65 VdB	65 VdB
Category 2: residences and buildings where people normally sleep	72 VdB	75 VdB	80 VdB
Category 3: institutional land uses with primarily daytime use	75 VdB	78 VdB	83 VdB

Source: FTA, 2006

Note (a) Levels in the table are stated as decibels referenced to one micro-inch per second, also called "velocity-decibels." They are computed using the root-mean-square (rms) of the ground velocity (not acceleration), and represent the logarithmic sum across the spectrum without any weighting.

Within a category, criteria may vary depending upon the frequency of occurrence of a vibration-inducing event.[1] Infrequent events are considered those which occur less than 30 times per day, occasional events are those which occur between 30 and 70 times per day, while frequent events occur more than 70 times per day. Construction activity is considered to fall within frequent events, and therefore has the most stringent criteria within each category.

Levels provided in Table 3.1-3 are broad-scope criteria for general use in many different types of land-use. Certain buildings, however, have specific functions which do not adequately fit into any of the three categories. Specifically, these include concert halls, television and recording studios, auditoria, and theaters. As a result, levels in Table 3.1-4 below were developed to address these "special-use" buildings.

Table 3.1-4. Groundborne Vibration Criteria – Special-Use Buildings (Vdb re 1 μ-inch/sec)

Land Use Category	Frequent Events	Occasional or Infrequent Events
Concert Halls	65 VdB	65 VdB
TV Studios	65 VdB	65 VdB
Recording Studios	65 VdB	65 VdB
Auditoriums	72 VdB	80 VdB
Theaters	72 VdB	80 VdB

Source: FTA, 2006

Vibration criteria set forth above were all developed with regard to annoyance, not structural damage. Vibration levels well above these are typically required to cause even minor cosmetic damage to a building, and separate criteria are employed to determine potential structural impact.

Local Noise Ordinances and Policies

The proposed project alignment would be located within both the City of Los Angeles and the City of Burbank and would therefore be subject to the noise policies and standards of both of these cities.

[1] The premise is that infrequent events are less likely to disturb than frequent events of the same level.

Los Angeles Municipal Code. The Los Angeles Municipal Code §41.40 indicates that no construction or repair work shall be performed between the hours of 9:00 p.m. and 7:00 a.m. of the following day because such activities would generate loud noises and disturb persons occupying sleeping quarters in any adjacent dwelling, hotel, apartment, or other place of residence. It further prohibits, during these hours, the operation, repair or servicing of construction equipment and the delivery of construction materials to the job-site in residential zones. These restrictions do not apply in any manufacturing or industrial zoned areas, or if written permission is obtained from the Board of Police Commissioners. In addition, §41.40 restricts construction activities occurring within 500 feet of a residential property (including maintenance and materials delivery) to the hours of 8:00 a.m. and 6:00 p.m. on Saturdays and national holidays, and prohibits activities entirely on Sundays. Again, the Board of Police Commissioners has the authority to grant a waiver to these restrictions.

The Los Angeles Municipal Code §112.05 specifies the maximum noise level for powered equipment or powered hand tools. It states that any powered equipment or powered hand tool that produces a maximum noise level exceeding 75 dBA at a distance of 50 feet from construction or industrial machinery between the hours of 7:00 a.m. and 10:00 p.m. in any residential zone of the City or within 500 feet thereof shall be prohibited. However, the above noise limitation shall not apply where compliance is technically infeasible. Technically infeasible means that the above noise limitation cannot be complied with despite the use of mufflers, shields, sound barriers, and/or any other noise reduction device or techniques during the operation of equipment.

Burbank Municipal Code. ~~Chapter 21, Article 2~~ Title 9 (~~Environmental Protection – Noise Control~~ Building Regulations – Environmental Protection) of the Burbank Municipal Code regulates the emission of noise within the City. Per Burbank Municipal Code §~~21-209~~ 9.3.209, it is unlawful for any person performing a construction activity that requires a building permit in any zone other than R-1, R-1-H, and R-1-E, within a radius of 500 feet measured from the nearest property line of any residentially zoned property, to operate construction equipment or perform any outside construction on buildings, structures or projects other than during the following hours (sites 500 feet or less from a residential zone):

Monday – Friday	7:00 a.m. to 7:00 p.m.
Saturday	8:00 a.m. to 5:00 p.m.
Sunday and Holidays	None

The section further requires that a sign(s) be posted on the construction site stating the times and days during which construction is permitted. The Community Development Department, the Planning Board, or the City Council may grant exceptions to the above restrictions.

3.1.3 Environmental Setting

Existing Land Uses

With the exception of that portion south of the Los Angeles River, the project will pass entirely through existing urban and suburban developments, with varying levels of residential and commercial use as shown in Appendix C, Figure 3. In broad terms, the Phase UR1 area (including the optional Phase UR1a route), which comprises the tunneling portion from the NHPS to the intersection of Lankershim Boulevard and Victory Boulevard, is mixed residential and commercial. Areas off of Lankershim Boulevard are primarily single and multi-family residences (see Appendix C, Figure 4). Along Lankershim Boulevard, land uses are primarily dense urban commercial (see

Appendix C, Figure 5), with a few sensitive uses such as the Kiddie Academy interspersed (see Appendix C, Figure 6). The Phase UR2 area (including the optional Phase UR2a route), which would include open-trenching, jacking, and tunneling extends from the intersection of Lankershim Boulevard and Victory Boulevard to the intersection of Burbank Boulevard and Biloxi Avenue near the Burbank border. This phase is primarily high-density urban commercial with sensitive land uses interspersed (see Appendix C, Figures 10-14). The Phase UR3 area, which would include the tunneling under the City of Burbank and a short segment of trenching on the south side of the Los Angeles River, is primarily residential along Whitnall Highway from Burbank Boulevard south to Olive Avenue (see Appendix C, Figures 15-16), but also includes parks and schools (see Appendix C, Figures 18-20). Land uses along the project alignment below Olive Avenue include commercial uses, such as the NBC and Disney studios, and Providence Saint Joseph Medical Center (see Appendix C, Figure 21). Cemeteries constitute the only sensitive land use south of the Los Angeles River until the project terminates at the Headworks Spreading Grounds (see Appendix C, Figures 17, 22, and 23). Each of these phases is discussed in detail in Appendix C, Section 5.1.

Existing Ambient Noise Levels

A wide range of noise sources occur in the project area, mainly due to the wide range of land uses that are traversed by the alignment. The primary noise source in the project area is traffic noise from the major streets serving the project area. Secondary noise may result from commercial and institutional activities (e.g., truck deliveries), airport noise associated with Bob Hope Airport (formerly known as Burbank-Glendale-Pasadena Airport), and residential noise sources (e.g., passenger vehicles and landscape maintenance operations).

Noise measurements were recorded at 14 locations along the proposed pipeline route, as shown on Appendix C, Figure 24. The noise levels listed in Table 3.1-5 provide a representative sample of ambient noise conditions along the proposed route. Noise conditions are described in terms of: Equivalent Sound Level (L_{eq}), the average level of sound determined over a specific period of time. As described in Table 3.1-5, existing average ambient noise levels in the vicinity of the proposed pipeline route ranged between 56.3 dBA and 70.5 dBA.

Table 3.1-5. Ambient Noise Levels Representative of the Project Area

Location		Start Time	Duration (minutes)	L_{eq}	Notes/Noise Sources
#	Description				
a	Morella Ave. across from NHPS	12:15 p.m.	15	60.2	Residential - Aircraft noise and varying degrees of traffic noise from Lankershim Boulevard
b	Morella Ave. and Hart St.	12:33 p.m.	15	62.4	Residential - Aircraft noise and varying degrees of traffic noise from Lankershim Boulevard
c	Heart St. and Lankershim Blvd.	12:52 p.m.	15	66.4	Residential - Aircraft noise and varying degrees of traffic noise from Lankershim Boulevard
d	Kittridge St. and Lankershim Blvd. – Kiddie Academy	1:21 p.m.	15	66.7	Commercial – Street traffic and low-level construction activities nearby
e	Lankershim Blvd. and Oxnard St. - school	1:50 p.m.	19	62.0	Commercial – Street traffic and some aircraft noise
f	Satsuma Ave. and Burbank Blvd.	2:11 p.m.	31	70.5	Commercial – Street traffic and some aircraft noise. Measurement would be closer to 68 dBA if the effects of an ambulance siren are removed.

Location		Start Time	Duration (minutes)	L_{eq}	Notes/Noise Sources
#	Description				
g	Clyborn Ave. and Burbank Blvd.	11:23 a.m.	11	61.6	Residential/Commercial – Minimal street traffic but frequent high-level noise peaks due to passing aircraft
h	Chandler Blvd. and Whitnall Highway – grassy area	11:00 a.m.	15	68.8	Residential/Park - Street traffic and frequent high-level noise peaks due to passing aircraft
i	Magnolia Blvd. and Kenwood St.	9:56 a.m.	15	56.3	Residential/Commercial - Minimal street traffic but frequent high-level noise peaks due to passing aircraft
j	Whitnall Highway and Verdugo Ave. – grassy area	10:30 a.m.	16	58.2	Residential/Park - Minimal street traffic but frequent high-level noise peaks due to passing aircraft
k	Alameda Ave. and Bob Hope Dr. – studios and medical	11:06 a.m.	15	67.0	Commercial – Street traffic (Alameda Ave. and Ventura Freeway)
l	Johnny Carson Park	10:45 a.m.	15	67.2	Park – Street traffic (Riverside Dr. and Ventura Freeway)
m	Bob Hope Dr. and Riverside Dr.	10:23 a.m.	16	59.4	Residential - Street traffic (Riverside Dr. and Ventura Freeway)
n	Headworks and Forest Lawn Dr.	12:44 p.m.	15	70.2	Open Space/Cemetery – Street traffic (Forest Lawn Dr. and Ventura Freeway)

Source: ~~Appendix C~~ Medlin & Associates, Inc., RSCI Upper Reach Noise and Vibration Study, October 2007, Section 5.2 and Table 4.

Notes: 1) All measurements are in dBA; Measurements recorded on March 30 and April 1, 2007 using a Larson Davis 824 Type 1 sound level meter and spectral analyzer, fitted with windscreen and calibration-checked before and after measurements.

2) L_{eq} = Equivalent Sound Level, a measurement that accounts for the moment-to-moment fluctuations due to all sound sources during the measurement period, combined.

Sensitive Receptors

Noise sensitive receptors are facilities or areas (e.g., residential areas, hospitals, schools, sound studios, places of worship, theaters, parks, cemeteries, etc.) where excessive noise may convey annoyance or loss of business. A land use survey along the proposed pipeline route was conducted to identify sensitive receptors in the general vicinity of the proposed project. Residential receptors, churches, medical clinics, and schools are dispersed along Phase UR1 (and Phase UR1a) as shown in Appendix C, Figures 8 and 9. Schools, churches, medical clinics, and studios are dispersed along Phase UR2 (and Phase UR2a) as shown in Appendix C, Figures 12 through 14. Residential receptors, churches, medial clinics, schools, studios and parks (including a cemetery) are dispersed along Phase UR3 as shown in Appendix C, Figures 18 through 23. For a complete listing of all land uses along the proposed pipeline route, refer to the Appendix C, Section 5.1.

3.1.4 Impacts and Mitigation Measures

Criteria for Determining Significance

Significance of noise impacts depends on whether the proposed project would increase noise levels above the existing ambient levels by introducing new sources of noise. For this analysis, the proposed project would be considered significant if the project would result in:

- Criterion N-1: Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
- Criterion N-2: A substantial temporary or periodic increase in ambient noise levels in the project vicinity above noise levels existing without the project.
- Criterion N-3: Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels.

- Criterion N-4: Would result in noise levels in the project area, which would be cumulatively considerable.

As discussed in the Initial Study (see Appendix A.2), the proposed project would result in a less-than-significant impact related to permanent increases in ambient noise levels (Section 3.11(c)) and would not expose people residing or working in the project area to excessive noise levels associated with municipal or private airport noise (Section 3.11 (e) and (f)). Therefore these issues are not discussed further in this EIR.

Project Impacts

To support the significance determination for the noise criteria discussed below, an airborne-noise impact is defined as any of the following when occurring at any noise-sensitive receiver (Appendix C, Section 6.2.2):

- Any activity which violates statutory limits in the Los Angeles or Burbank Municipal Codes. This specifically refers to permitted hours of construction, as stated in Section 3.1.2, above.
- An hourly-average noise level greater than 75 dBA. This is intended to provide a substantial margin in avoiding any hazardous noise condition.
- An hourly-average noise level which is 10 dB above the existing ambient level. This is based on the fact that the human ear interprets a 10 dB increase as a doubling of the "volume" of sound. Whereas the ear interprets a 5 dB increase as a significant increase in noise, such a stringent limit would be inappropriate for construction noise, which is of limited duration.

Exposure of persons to or generation of noise levels in excess of standards (Criterion N-1)

Construction. Construction activity would generally occur between 7:00 a.m. and 6:00 p.m. Monday through Friday and 8:00 a.m. to 5:00 p.m. on Saturday. In addition, construction activities may continue into the swing shift generally occurring between 3:00 p.m. and 11:00 p.m. No construction activities will occur in public right-of-ways during the graveyard shift (11:00 p.m. to 7:00 a.m.), although maintenance and dewatering activities may occur 24 hours a day. On-site noise during construction would result from the operation of heavy machinery along the trenching route and at jacking pits and tunnel shaft locations. It would consist primarily of engine exhaust noise, with conjunctive other noises produced by these machines such as track squeal, hydraulic pump whine, and banging of dump truck bays. Ancillary on-site equipment, including portable generators, air-compressors, and concrete-mixers, may also contribute substantial noise to the surrounding environment. In addition, certain activities, such as pavement cracking and sawing, may produce intense noise levels for short durations.

Airborne noise from construction equipment would occur at all points along the project route, except along the tunnel alignments. The primary areas of concern would be around the tunnel shafts and jacking pits. While airborne noise levels around the trenched areas would be substantially above ambient noise levels, the relatively high rate of trench progression (approximately 80 feet per day) would limit the duration to which any one receiver along the trench route would be exposed. Construction activities around tunnel shafts and jacking pits, however, would continue for considerably longer durations, thus creating greater impacts on nearby receptors.

Specific details regarding construction activities are provided in Section 2, Project Description. Essentially, open-trenching would require equipment to open and close the trench, haul dirt, install the pipe, and deliver materials and waste to and from the site. Approximately 500 feet of trench could be open at one time, with a work area extending up to 1,400 feet. Tunnel shafts and jacking pits would require sufficient equipment to excavate the shafts/pits, haul dirt, deliver materials and waste to and from the various sites, and handle them within the shaft or pit. Activities around tunnel shafts and jacking pits would be essentially stationary, and would

continue for as long as necessary to complete the task at hand. Table 2-4 shows the expected types and quantities of machines required for the above two operations.

In order to estimate airborne noise levels around the Upper Reach project, the Federal Highway Administration (FHWA) noise data were applied to the list of project equipment in Table 2-4 and adjusted for the usage factor and quantity of each type of machine (where an exact match was not found, a similar machine was substituted). Table 3.1-6 below shows the adjusted noise levels for equipment to be used on the open-trench portion of the project. The "Lmax" column shows the highest typical noise output for each machine when it is fully engaged in an operation. This level is adjusted down by the usage factor to estimate levels in the "Leq" column, which represent the hourly-average noise level each machine would produce when measured at 50 feet. Table 3.1-7 shows similar data for equipment to be used around tunnel shafts and jacking pits.

Table 3.1-6. Open-Trench Equipment Noise Emissions

Project Equipment	Quantity	Modeled Equivalent	Usage Factor	Lmax @ 50 ft.	Leq @ 50 ft.	Quantity Adjusted
Backhoe	1	Backhoe	40 %	78 dBA	74 dBA	74 dBA
Compactor	1	Compactor	20 %	83 dBA	76 dBA	76 dBA
Crane	1	Crane	16 %	81 dBA	73 dBA	73 dBA
Dump Truck	6	Dump Truck	40 %	76 dBA	72 dBA	80 dBA
Excavator	1	Excavator	40 %	81 dBA	77 dBA	77 dBA
Fork Lift	1	Front-end Loader	40 %	79 dBA	75 dBA	75 dBA
Pickup Truck	5	Pickup Truck	40 %	75 dBA	71 dBA	78 dBA
Pitman	1	Man Left	20 %	75 dBA	68 dBA	68 dBA
Service Truck	1	Dump Truck	40 %	76 dBA	72 dBA	72 dBA
Water Truck	1	Dump Truck	40 %	76 dBA	72 dBA	72 dBA
Welding Truck	1	Generator	50 %	81 dBA	78 dBA	78 dBA
Wheel Loader	1	Front-end Loader	40 %	79 dBA	75 dBA	75 dBA
SUM	---	---	---	90 dBA	85 dBA	87 dBA

Source: ~~Appendix C~~ Medlin & Associates, Inc., RSCI Upper Reach Noise and Vibration Study, October 2007, Table 6.

Table 3.1-7. Tunnel-Shaft and Jacking-Pit Equipment Noise Emissions

Project Equipment	Quantity	Modeled Equivalent	Usage Factor	Lmax @ 50 ft.	Leq @ 50 ft.	Quantity Adjusted
Crane	1	Crane	16 %	81 dBA	73 dBA	73 dBA
Dump Truck	1	Dump Truck	40 %	76 dBA	72 dBA	72 dBA
Excavator	1	Excavator	40 %	81 dBA	77 dBA	77 dBA
Pickup Truck	2	Pickup Truck	40 %	75 dBA	71 dBA	74 dBA
SUM	---	---	---	85 dBA	80 dBA	80 dBA

Source: ~~Appendix C~~ Medlin & Associates, Inc., RSCI Upper Reach Noise and Vibration Study, October 2007, Table 7.

Detailed impacts on nearby receptors are discussed in Appendix C, Section 6.3.2. Noise-contour figures are also provided (Appendix C, Figures 27 through 50). A rough estimate of the noise level near an operation can be obtained by accounting for the quantity of each type of equipment and then summing all of their noise emissions together. This value is shown in the lower right corner of Tables 3.1-6 and 3.1-7 above. For open-trench operations, the estimated hourly-average (L_{eq}) noise level is approximately 87 dBA at 50 feet, whereas for tunnel shafts and jacking pits it is 80 dBA. These are rough estimates only, which assume that all of the equipment is clustered together (not valid for trenching operations).

Other potential sources of airborne noise would also exist during construction. Prior to trench excavation, existing pavement would be removed using either a concrete saw or pavement breaker, both of which produce

high noise levels (greater than 90 dBA at 50 feet). Their use in any one location, however, would be relatively brief. In addition, dewatering pumps may be used near the Los Angles River and other locations as necessary. These pumps would likely run at night, and therefore must be shielded or otherwise configured to avoid noise impacts on any nearby sensitive receptors or land uses (see Mitigation Measure N-5).

Trucks hauling materials, dirt, and waste would also produce airborne noise along the delivery routes chosen by the contractors. Trucking noise would only contribute to existing traffic noise, and is therefore considered separately from airborne construction-equipment noise discussed above.

Appendix C, Figure 26 shows the average noise emissions produced by heavy trucks as measured at a distance of 25 feet from the centerline of travel (the approximate distance of a building from the lanes). They show the hourly-average noise level that would be measured as a function of the number of truck-trips per hour. As shown in the graph, 30 truck-trips per hour would result in average noise levels of around 65 dBA, which is comparable to the existing ambient noise levels along Lankershim Boulevard and Burbank Boulevard. Unless project requirements dictate trucking activity at a rate substantially higher than one trip every two minutes, no impact from trucking noise is anticipated. Of course, whether or not trucking activities would cause a significant impact on any particular delivery route, however, depends upon the intended number of truck-trips per hour as well the volume of traffic already using that route (or more specifically the ambient traffic noise level). Delivery routes would be specified by the project contractors, and have not yet been determined. It has been assumed that trucks servicing the project would use the major thoroughfares, such as Lankershim Boulevard and Burbank Boulevard, through the commercial districts, and would avoid residential side streets. This assumption, while reasonable, may not be feasible in all areas along the proposed route.

Within the City of Burbank, ~~no trucking~~ truck and equipment noise would occur ~~is anticipated in connection with the proposed project~~, near the location of proposed ventilation shafts at: (1) the tower parcel on the south end of Whtinall Highway Park North or tower parcel on Pass Avenue south of Chandler; (2) tower parcel on Screenland north of Clark; (3) Tower parcel within utility corridor adjacent to Jacaranda Avenue cul-de-sac; (4) near tower within parking north east of Fairway Street and Olive Avenue; and (5) at Johnny Carson Park. ~~as all construction would be carried out underground, with the exception of the area around Johnny Carson Park and the Los Angeles River where construction staging would occur as described below.~~ As noted in the Project Description, the temporary ventilation shafts would be constructed in approximately eight weeks. When the project reaches the shaft, another three weeks of construction would be needed to either close the shaft or make it into a permanent ventilation structure. Even though construction would be temporary, this construction noise has the potential to adversely impact residences and businesses along the route. A noise and vibration control plan, as required by Mitigation Measure N-11, would identify how noise mitigation measures would be implemented to reduce noise during construction, and would document where and when monitoring would be conducted. In addition, measures that require best available exhaust mufflers, notification, equipment lubrication, and noise barriers would also further reduce the potential for significant noise impacts from construction of the ventilation shafts. Therefore, with the implementation of Mitigation Measures N-1 through N-11, noise associated with the construction of the ventilation shafts would be less than significant.

Noise impacts would occur around Johnny Carson Park (north of Riverside Drive) and the Headworks Spreading Ground where LADWP proposes the construction staging. ~~While t~~The contractor(s) would be responsible for scouting and securing suitable local lots for other staging areas ~~as none have been specifically identified for the proposed project, possible staging areas include the Headworks Spreading Grounds, Johnny Carson Park north~~

~~of Riverside Drive,~~ such as open right-of way within the Whitnall Highway, or local LADWP facilities, such as the North Hollywood Pump Station. These ~~potential~~ staging areas are located near residences, which would be considered noise-sensitive receptors, and therefore would be subjected to additional noise during construction. For example, a portion of Johnny Carson Park between the freeway and Riverside Drive would be set aside for staging construction equipment. Assuming the staging area is removed a sufficient distance from these residences; they would be subject primarily to truck traffic accessing the staging area via Bob Hope Drive. As indicated in Appendix C, Figure 3, it is unlikely that sufficient truck traffic would exist to drive noise levels substantially above the existing ambient level of approximately 60 dBA.

The possibility exists that the use of dewatering pumps may be required, especially around the Los Angeles River, as discussed in Section 3.5.3, Environmental Setting – Hydrogeology. These pumps would run continuously and at night, and would therefore create potential noise impacts on nearby sensitive receptors or land uses.

Within and immediately adjacent to residential zones, unmitigated construction noise levels would likely violate Section 112.05 of the Los Angeles Municipal Code, resulting in periodic exposure to noise levels at or above 75 dBA, which would result in potentially significant impacts. Construction activities during the swing shift (3:00 p.m. to 11:00 p.m.), as well as maintenance and dewatering activities which may occur up to 24 hours a day, would also violate Section 41.40 of the Los Angeles Municipal Code and Section ~~21-209~~ 9.3.209 of the Burbank Municipal Code, potentially resulting in significant impacts to residences in the area. Implementation of the following mitigation measures would reduce potentially significant short-term construction noise impacts to a less-than-significant level; however, due to the hours of construction, the proposed project would not comply with the local noise ordinances of both the cities of Los Angeles and Burbank resulting in significant and unavoidable impacts.

N-1 LADWP or its construction contractor shall provide advance notice, between two and four weeks prior to construction, by mail to all residents or property owners and businesses including the television and recording studios within 300 feet of the pipeline alignment. The announcement shall state specifically where and when construction will occur in the area. If construction delays of more than two weeks occur, an additional notice shall be made, either in person or by mail. Notices shall provide tips on reducing noise intrusion, for example, by closing windows facing the planned construction. The LADWP shall also publish a notice of impending construction in local newspapers, stating when and where construction will occur, and place signs at construction sites with construction contact information.

The notices shall provide a contact person and hotline where residents or business owners can call on a 24-hour basis with questions or comments during the construction period. LADWP or its construction contractor shall promptly respond to all inquiries regarding construction noise and vibration. On-site measurements may be needed to determine if noise or vibration levels are significantly above expected levels. Notices and construction signs will include a website address, which will be updated quarterly and where interested parties can obtain construction and project-related information.

N-2 All machinery to be used on-site shall be equipped with the best available exhaust mufflers and any applicable "hush kits." Any powered equipment or powered hand tools which exceeds the legal criteria (No machinery shall be allowed on-site which emits noise levels in excess of 75 dBA when

measured at a distance of 50 feet from the machine) shall be prohibited from use on-site, unless technically infeasible ~~do~~ due to the nature of the machine or its operation. LADWP or its contractor shall substitute quieter machinery, wherever feasible.

N-3 All machinery shall be maintained in good working order and lubricated as necessary to minimize unnecessary squeals, groans, and other noise. All cabinets, panels, covers, shrouds, and similar components shall be securely fastened to ensure that they do not create excessive noise due to vibration.

N-4 LADWP or its construction contractor shall turn off all unnecessary machinery. Delivery and hauling trucks shall not sit with their engines idling for periods exceeding 5 minutes. The contractor shall post signs advising drivers to turn off idling engines.

N-5 LADWP or its construction contractor shall erect temporary noise-barriers to shield nearby residences and other sensitive receptors or land uses from direct exposure to airborne construction noise. These barriers shall be erected to reduce construction noise levels to 70 dBA or below and to maintain one-hour average noise levels below 75 dBA at any sensitive receptor or land use. The *RSCI Upper Reach Noise and Vibration Study* (Appendix C) includes recommendations for achieving these noise levels. For example, barriers shall consist of commercially-available noise-control curtains, in-situ fabricated sound walls, or equivalent barrier with a sound-transmission class rating of STC-28 or higher. All barriers shall be constructed to contain no unnecessary holes or gaps. Where access through the barrier is required, overlapping sections shall be constructed to prevent noise escaping through the opening. The most appropriate barrier shall be determined specific to each situation.

N-6 The use of noise producing signals, including horns, whistles, alarms, and bells shall be for safety warning purposes only.

N-7 LADWP or its construction contractor shall perform noisy work off-site and away from any residential areas wherever feasible. Such off-site activities may include rock-crushing, materials pre-fabrication, and equipment maintenance.

N-8 All trucking shall be constrained to major roadways (e.g., Lankershim Boulevard, Burbank Boulevard), to the extent feasible, to limit use of residential side streets. The contractor shall establish designated truck routes to serve each project area. All subcontractors shall also be required to adhere to the designated truck routes.

N-9 LADWP or its construction contractor shall restrict deliveries to those hours permitted by the City of Los Angeles and City of Burbank. Staging areas in the vicinity of sensitive receptors and land uses receivers shall be locked after hours, and shall have signs prominently displaying operating hours.

N-10 LADWP or its construction contractor shall instruct all personnel, including subcontractor personnel, of the necessity for, and methods of, controlling noise and vibration impacts on sensitive receptors and land uses. Instruction ~~should~~ shall occur before the start of construction. ~~enters any noise-sensitive areas~~. LADWP shall provide instruction on the necessity for controlling noise and vibration impacts to contractor at project kick-off meeting and advise the contractor to provide updates at monthly construction meetings. Contractor shall be responsible for instruction to on-site personnel.

N-11 LADWP or its construction contractor shall monitor noise and vibration under the guidance of an independent qualified acoustical consultant along the project alignment to ensure the measures described in N-1 through N-10 are effectively reducing noise levels. Monitoring shall be conducted quarterly and documented. Monitoring shall include additional spot-checks of the noise and vibration levels near sensitive receptors/land uses including the television and recording studios and any additional measurements to resolve issues reported as part of the 24-hour hotline required as part of Mitigation Measure N-1. LADWP, under the guidance of the acoustical consultant, shall have the authority to cease any construction activity which significantly exceeds noise thresholds or is causing substantial disturbance to sensitive receptors or land use (as determined by the number of concerns received at a specific location) until additional noise or vibration-reducing measures are implemented. The qualified acoustical consultant will prepare a construction noise and vibration plan that documents monitoring events, monitoring thresholds, and incorporates other noise and vibration mitigation measures identified in the EIR.

Operation. Once operational, the proposed project would not result in significant noise levels. Therefore, noise impacts from operations of the proposed project would be less than significant and no mitigation measures would be required.

Substantial Temporary or Periodic Increases in Ambient Noise Levels (Criterion N-2)

Construction. In addition to potential conflicts with applicable ordinances and standards, unmitigated noise levels associated with construction of the proposed project have the potential to cause substantial temporary increases in ambient noise levels in the project vicinity above existing noise levels without the project. As described in Table 3.1-5, average ambient noise levels were found to vary between average L_{eq} values of approximately 56 and 71 dBA. Assuming average unmitigated construction noise levels range from 80 to 87 dBA (per Tables 3.1-6 and 3.1-7), temporary increases in ambient noise levels could be as low as 0 dBA and as high as 31 dBA. The actual magnitude of construction noise impacts would depend on the type of construction activity, the noise level generated by various pieces of construction equipment, the duration of the activity, the distance between the activity and the sensitive noise receptors, and whether local barriers and topography provide shielding effects.

Implementation of Mitigation Measures N-1 through N-11, above, would reduce potentially significant construction noise impacts to levels that would be less than significant.

Operation. As discussed above for Criterion N-1, operations of the proposed project would not result in significant noise levels. Therefore, noise impacts from operations would be less than significant and no mitigation measures would be required.

Generation of Excessive Groundborne Vibration or Groundborne Noise (Criterion N-3)

As discussed in the *RSCI Upper Reach Noise and Vibration Study* prepared by Medlin & Associates, Inc., which is provided in Appendix C of this EIR, ground vibration and groundborne noise are anticipated only along the tunneled portions of the project alignment, resulting from operation of the tunnel-boring machine (TBM) and movement of muck trains within the tunnel. A ground vibration or groundborne noise impact is defined as the following (Appendix C, Section 6.1.3, Table 8, and Section 6.2.3):

- A residence or similar sensitive receptor experiencing TBM operations resulting in vibration levels in excess of 80 VdB (velocity decibels) or muck train operations resulting in vibration levels in excess 72 VdB (Appendix

C, Table 8). This is based on application of FTA criteria summarized in Tables 3.1-3 and 3.1-4, above, classifying TBM operation as "infrequent" and muck train operation as "frequent."

  - TBM operation would not create a significant impact due to vibration at residences or similar sensitive receptors.
  - Muck train operations would create a significant impact due to vibration at residences or similar sensitive receptors if located within about 100 feet of the tunnel alignment.

- A television or recording studio or other facility that employs vibration-sensitive equipment. experiencing TBM and muck train operations resulting in vibration levels in excess of 65 VdB or muck train operations resulting in vibration levels in excess 65 VdB (Appendix C, Table 8). This is based on application of FTA criteria summarized in Tables 3.1-3 and 3.1-4, above, classifying TBM operation as "infrequent" and muck train operation as "frequent."
  - TBM operations would create a significant impact due to vibration at television or recording studio or other facility that employs vibration-sensitive equipment located within about 110 feet of the tunnel alignment.
  - Muck train operations would create a significant impact due to vibration at television or recording studio or other facility that employs vibration-sensitive equipment located within about 170 feet of the tunnel alignment;
- A residence or similar sensitive receptor experiencing groundborne noise levels exceed 45 dBA. This level is consistent with the interior-noise requirement of the California Building Code (Title 24) and other codes and general-plan requirements in California. Structures other than residences are not considered impacted by groundborne noise.
  - TBM operation would not create a significant impact due to groundborne noise at residences or similar sensitive receptors.
  - Muck train operations would create a significant impact due to groundborne noise at residences or similar sensitive receptors if located within about 150 feet of the tunnel alignment.

Combining the above criteria with the results of the regression analyses, significant impacts are assumed to exist for any of the following conditions:

- Muck train operations would create a significant impact due to vibration at television or recording studios or other facilities, which employs vibration-sensitive equipment located within 170 feet of the tunnel alignment.
- Muck train operations would create a significant impact due to groundborne noise at residences or similar sensitive receptors if located within about 150 feet of the tunnel alignment.

Construction. Ground vibration is felt, rather than heard, and may produce other effects such as interference with operation of sensitive equipment. In extreme cases, it may produce cosmetic or even structural damage of buildings; however, such levels of vibration are not anticipated on this project. Groundborne noise is a secondary effect of ground vibration, and results from vibration of interior walls, dishes, picture frames, etc. It is confined to those areas where ground vibration is present, and is usually only of concern in quiet environments (i.e. groundborne noise would not likely be noticeable near a tunnel shaft, as it would be dominated by airborne noise from machinery operating around the shaft).

Ground vibration impacts are substantially more difficult to predict than airborne noise impacts, as propagation characteristics vary widely with soil conditions. Furthermore, only limited data are available regarding ground-vibration levels produced by TBMs and muck trains, thus limiting the ability to predict their impacts. Therefore, an estimation of impacts for the proposed project was made using data from two previous projects in the City of Los Angeles.

Ground vibration and associated groundborne noise may occur along the tunneled portions of the proposed project, and would result from operations of the TBM and movement of muck trains within the tunnel. Because

of the continuous operation of muck trains along the length of the alignments, tunneling operations would produce long-duration impacts, even after the TBM has passed a given location. Please refer to Appendix C for additional information regarding operations associated with tunneling.

As discussed in Appendix C, Section 6.1.3, a regression curve based on actual data was calculated for TBM operations to determine the ground vibration impacts of the proposed project. Based on this curve, TBM vibrations would never exceed the 80 VdB threshold for residences, and would not exceed the 65 VdB threshold for TV and recording studios beyond a distance of 110 feet from the tunnel alignment. Likewise, the 83 VdB threshold for institutional uses primarily used during the daytime would also never be breached. No significant groundborne noise from TBMs is anticipated, due to their low rotational speeds; any resulting groundborne noise would be of frequencies below human audibility. While these results do not guarantee that complaints won't be received regarding TBM ground-vibration, since levels as low as 65 VdB are perceptible to humans, the above results do indicate that no significant impact to residences would occur.

In contrast to TBMs, muck trains would continue to operate along the entire tunnel alignment even after the TBM has passed, meaning that their impact must be classified as "frequent," with a correspondingly lower impact threshold. Muck trains are also likely to produce higher-frequency ground vibrations than TBMs, and therefore produce potentially audible levels of groundborne noise in addition to ground-vibration. Based on an analysis of two previous projects in Los Angeles, ground vibration levels due to muck trains may exceed the 72 VdB threshold for frequent events at residential receptors at distances up to 100 feet from the tunnel alignment, while levels exceeding the 65 VdB for TV and recording studios may occur up to 170 feet from the alignment. As such, impacts from muck trains would be significant. It is not anticipated that muck-train vibrations would exceed the 75 VdB threshold for institutional uses primarily used during the daytime, therefore no impact is expected to these sensitive receptors.

As described above, an appropriate threshold for groundborne noise impacts inside a residence is 45 dBA (1 hour average). Groundborne noise inside a typical residence is estimated by A-weighting the ground-vibration levels. As the highest frequency of muck-train vibration would be on the order of 60 Hertz, groundborne noise levels would be approximately 20-25 dB less than the corresponding ground vibration level. Muck-train vibration on the two previous projects fell to a level of about 66 VdB at a distance of 150 from the tunnel alignment, corresponding to a groundborne vibration level of 41-46 dBA inside a typical residence. Therefore, residences lying at a distance of up to 150 feet from the tunnel alignment would be impacted by muck-train operations, resulting in a significant impact.

Combining the above results, it becomes clear that muck-train operations are likely to create the furthest-reaching impacts during tunnel construction, with the outer limits being 150 feet from the tunnel alignment for residences (as a result of groundborne noise), and 170 feet for television and recordings studios or any other facility which employs vibration-sensitive equipment. The 150-foot and 170-foot impact zones associated with the proposed project are shown in Appendix C, Figures 51 and 52 (City of Los Angeles) and Figures 53 through 56 (City of Burbank). Television and recording studios located within the impact zones include Fred Wolf Films (Figure 53, #31), and the very northeast edge of NBC Studios (Figure 56, #42). The only medical facility located within the impact zones is the Burbank Emergency Medical Group (Figure 56, #46).

No structural or cosmetic damage is anticipated from any TBM or muck train operations associated with the proposed project. Appendix C, Figure 25 shows the recommended vibration limits (due to blasting) published by

the former U.S. Bureau of Mines (USBM, 1980). In all cases, the recommended limits are far above levels anticipated from either TBM or muck-train operations on this project. The only exceptions to this conclusion might be any fragile or historic buildings lying close to the tunnel alignments. Such buildings may contain weakened old plaster or other construction, which may be sensitive to vibration.

Implementation of Mitigation Measures N-1, N-3, N-10, and N-11, above, would provide advance notice to nearby property owners, maintain equipment in good working order, instruct personnel on the necessity and procedures for controlling noise and vibration impacts on sensitive receptors, and provide for periodic noise and vibration monitoring throughout construction, thereby reducing significant nuisances from vibration. In addition to these measures, implementation of the following mitigation measures would further reduce significant vibration impacts:

N-12 LADWP or its construction contractor shall take all reasonable measures necessary to maintain ground-vibration levels below a peak-particle velocity of 0.02 inches per second (72 VdB) at any sensitive receptor or land use as verified during periodic monitoring by a qualified acoustical consultant required as part of Mitigation Measure N-11. Such measures may include any of the following:

- Adjust the speed of the TBM cutting wheel (it is possible that the rotational speed of the cutting wheel may coincide with natural frequencies of nearby structures, thus amplifying the induced vibration; increasing or decreasing the wheel speed would likely reduce this impact).
- Use alternate TBM cutting surfaces (different cutting surfaces, if available, may induce varying levels of vibration into the soil, particularly with regard to soil composition and condition).
- Minimize the undulations and roughness of muck-train tracks (a muck car which rolls smoothly over its tracks will induce less vibration into the surrounding soils).
- Minimize the number of junctions in the muck-train tracks (previous experience indicates that muck-train vibration impacts are greatest near junctions in the tracks, where disjoints are likely to occur in the rails).
- Minimize gaps between adjoining rails.
- Mount muck-train tracks on resilient pads or springs.
- Maintain roundness of muck-train wheels.
- Lessen the load of the muck-trains (lightly-loaded cars will induce less vibration into surrounding soils than heavily-laden cars).

N-13 No less than 60 days prior to construction, LADWP or its construction contractor shall identify historic and fragile buildings within 200 feet of the tunneling portions of the alignment. Buildings shall be identified in the field and, as necessary, a building inspector or architectural historian may be needed to support the identification of these buildings. If buildings are identified that are in poor condition and therefore may be adversely affected by ground vibration, or buildings are considered historical based on local, state, or federal designations, then additional information shall be documented on those buildings through an exterior evaluation of the condition of the buildings and photo documentation. The purpose of this focused survey is to document the current condition of older buildings along the tunneling portion of the alignment, if any, prior to the start of construction and to assess whether there is any change in the conditions of the buildings during or after construction. If there is reason to believe that a structure may be potentially damaged during project construction, then LADWP in conjunction with its construction contractor will determine if there are measures that can be taken to reduce vibration impacts to the building or structure.

Operation. No ground vibration or groundborne noise would result from the operations of the proposed project.

3.1.5 Level of Significance After Mitigation

Implementation of Mitigation Measures N-1 through N-11 would reduce potentially significant construction noise impacts to levels that would be less than significant (Criterion N-2); however, due to the hours of construction, the proposed project would not comply with the local noise ordinances of both the cities of Los Angeles and Burbank (Criterion N-1) resulting in significant and unavoidable impacts. LADWP would follow the City of Los Angeles and the City of Burbank procedures to obtain a project-specific exemption from the permitted hours of construction. However, even with this exemption or permit, the project would result in significant and unavoidable noise impacts to sensitive receptors along the project route because construction activities would occur during the swing shift (3:00 p.m. to 11:00 p.m.), and maintenance and dewatering activities may occur up to 24 hours a day.

Ground vibration and groundborne noise impacts (Criterion N-3) would be reduced through implementation of Mitigation Measures N-1, N-3, and N-10 through N-13; however it is unlikely that impacts would be reduced to below the recommended thresholds due to the nature of ground vibration. As such, ground vibration and groundborne noise impacts would be significant and unavoidable.

3.1.6 Cumulative Impacts

Noise levels that are cumulatively considerable (Criterion N-4)

Because the proposed project would result in less than significant impacts related to permanent increases in ambient noise levels, the focus of this cumulative impact discussion is based on short-term construction impacts. Construction of the proposed project is expected to occur from November 2008 to October 2012. Other construction projects that will be within approximately 2.5 miles of the proposed project corridor include various land development (e.g., mixed uses, office buildings, residential, etc.), transportation infrastructure (e.g., freeway widening, on-ramp construction, etc.), utility infrastructure (e.g., wastewater facilities [Integrated Resources Plan], Lower Reach RSC Project, etc.), and other redevelopment projects (see Section 2.8, Cumulative Projects). In localized areas where project construction may occur simultaneously, noise generated from the projects would have a cumulative impact on sensitive receptors. Construction of the cumulative projects could further increase the short-term potentially significant noise and vibration impacts associated with the construction of the proposed project. Mitigation measures identified for the proposed project (see Criterion N-1, N-2, and N-3) would reduce the proposed project impacts to the extent feasible; however, ground vibration and groundborne noise impacts would remain significant. However, these impacts are localized in nature and would not combine with any of the cumulative projects identified in Section 2.8. Therefore, cumulative noise impacts would be less than significant.

3.2 Transportation and Traffic

3.2.1 Introduction

This section presents the findings of the traffic study for the proposed project prepared by KOA Corporation dated December 21, 2007. The traffic study is included in its entirety in Appendix D of this ~~Draft~~Final EIR. In addition, this section uses information from the site reconnaissance to supplement and address issues such as pedestrian safety and parking.

3.2.2 Regulatory Setting

California Department of Transportation

The California Vehicle Code (code) establishes height, weight, length, and width restrictions for vehicles and their loads. Vehicles or loads that exceed these limitations are considered oversize and require a special permit to operate on the State highway system. The code authorizes the California Department of Transportation (Caltrans) to issue special permits for the movement of these oversize vehicles along specified routes on the State highway system. The code authorizes county and city governments, such as Los Angeles, to issue special permits for movement of oversize vehicles through their jurisdictions.

City of Los Angeles

The City of Los Angeles Department of Transportation (LADOT) is responsible for transportation issues within the City of Los Angeles boundaries. LADOT reviews the transportation/traffic studies prepared for projects of all types for which the City is the lead agency, in addition to other public agency projects (County, State, or federal) located within, or that may affect, the City. LADOT's internal procedures are described in their Traffic Study Policies and Procedures Manual.

City of Burbank

The City of Burbank Planning and Transportation Division is responsible for reviewing all development projects for transportation issues within the City boundaries. Before any project may be considered for approval by the City of Burbank, the potential environmental impacts of the project must be considered as required by the CEQA.

3.2.3 Environmental Setting

Existing Street System

Overview

Section 2.0 (Project Description) Figure 2-1 illustrates the proposed Upper Reach pipeline alignment. Table 2-1 of the Project Description (Section 2) describes the three construction phases identified to facilitate design and constructability of the proposed project.

The proposed Upper Reach pipeline would be located in City of Los Angeles and City of Burbank streets, utility corridors, and parks. The portion of the pipeline in the City of Burbank would be approximately 11,900 feet

long, and the remaining approximately 19,400 feet would be in the City of Los Angeles. The majority of the proposed pipeline would be located within city streets surrounded by urban development including both residential and commercial zones, as well as the existing Whitnall Highway utility (transmission) corridor.

Street Descriptions

The following information describes the roadways that would contain the proposed Upper Reach pipeline:

- Morella Avenue - North Hollywood Pump Station north to Hart Street (Phase UR1 and UR1a): Morella Avenue is a two-lane roadway with street parking available on both sides.
- Hart Street - between Morella Street and Lankershim Boulevard (Phase UR1): Hart Street is a two-lane roadway with street parking available on both sides.
- Archwood Street - between Morella Street and Lankershim Boulevard (Phase UR1a): Archwood Street is a two-lane roadway with street parking available on both sides.
- Lankershim Boulevard - Hart Street to Victory Boulevard (Phase UR1) and Archwood Street to Victory Boulevard (Phase UR1a): This area of Lankershim Boulevard is a four-lane roadway with street parking available on both sides.
- Lankershim Boulevard - Victory Boulevard to Burbank Boulevard (Phase UR2 and Phase UR 2a): This segment of Lankershim Boulevard is a four-lane roadway with street parking available on both sides but is approximately 10 feet wider than the segment north of Victory Boulevard.
- Burbank Boulevard – Lankershim Boulevard to Whitnall Highway (Phase UR2) – Burbank Boulevard is a two-lane roadway varying between 50-60 feet in width along this segment. Parking is permitted along both sides of the roadway.
- Forest Lawn Drive – Tunnel connection to Headworks (Phase UR3) – This segment of Forest Lawn Drive is a four-lane roadway with no parking allowed on either side.

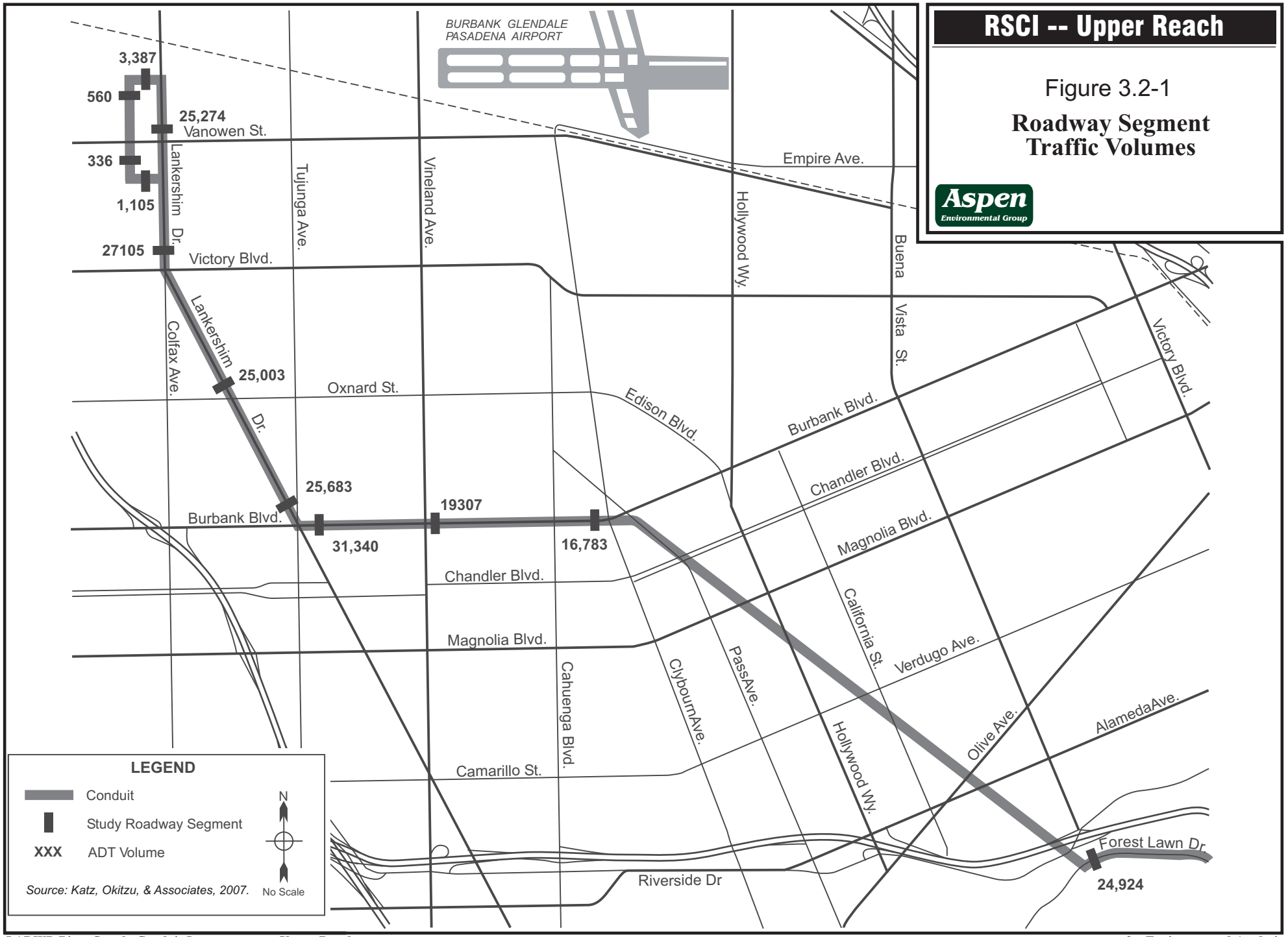
Average Daily Traffic (ADT) volumes were collected at multiple points for public roadways that would be part of the proposed project route. Volumes were collected on segments with similar cross-sectional widths and fronting land uses – additional counts were taken where such characteristics changed along the route. Volumes were collected on March 28, 2007, over a 24-hour period (midnight to midnight), by automatic volume counting equipment. Figure 3.2-1 provides the ADT volumes for the project route.

Freeways and Highways

One freeway State Route 134 (Ventura Freeway) would be tunneled under by Phase UR3. The Ventura Freeway is an east-west oriented freeway located immediately north of the project site (Forest Lawn Drive). In the project vicinity, the Ventura Freeway provides six mixed mode travel lanes. A full interchange is provided at Forest Lawn Drive north of the project route.

Public Transit

The City of Los Angeles Metropolitan Transit Authority (MTA or Metro) and City of Burbank bus transit both serve the project area. Current bus route information indicates that several lines provide service within walking distance (less than two miles) of the project route that could be used by persons traveling to and from destinations along the proposed Upper Reach pipeline route. The following identifies MTA and City of Burbank bus lines located along the proposed Upper Reach pipeline route (note that no bus routes are located along proposed project segment UR3).


RSCI -- Upper Reach
Figure 3.2-1
Roadway Segment Traffic Volumes
Aspen Environmental Group
BURBANK GLENDALE PASADENA AIRPORT
3,387
560
25,274
Vanowen St.
336
1,105
27105
Victory Blvd.
Lankershim Dr.
Tujunga Ave.
Vineland Ave.
Hollywood Wy.
Buena Vista St.
Empire Ave.
Colfax Ave.
Lankershim Dr.
25,003
Oxnard St.
Edison Blvd.
Burbank Blvd.
Chandler Blvd.
Magnolia Blvd.
Victory Blvd.
25,683
19307
Burbank Blvd.
31,340
16,783
Chandler Blvd.
Magnolia Blvd.
California St.
Verdugo Ave.
Olive Ave.
AlamedaAve.
Cahuenga Blvd.
ClybournAve.
PassAve.
Hollywood Wy.
Camarillo St.
Forest Lawn Dr.
Riverside Dr
24,924
LEGEND
Conduit
Study Roadway Segment
XXX ADT Volume
N
Source: Katz, Okitzu, & Associates, 2007.
No Scale

Lankershim Boulevard (Phases UR1, UR1a, UR2, and UR2a). The following MTA bus lines have published routes that operate on Lankershim Boulevard, or have routes that cross Lankershim Boulevard.

- **Metro Line 154** operates as an east-west regional bus route that provides service between Burbank, North Hollywood, Van Nuys, Encino, and Tarzana. Within the study area, the line travels along Oxnard Street. This service provides an approximate frequency of one hour during the peak periods.
- **Metro Line 164** operates as an east-west regional bus route that provides service between West Hills, Woodland Hills, Reseda, Lake Balboa, Van Nuys, North Hollywood, and Burbank. Within the study area, the line travels along Victory Boulevard. This service provides an approximate frequency of 10-20 minutes during the weekday peak periods**.**
- **Metro Line 165** operates as an east-west regional bus route that provides service between West Hills, Woodland Hills, Canoga Park, Reseda, Lake Balboa, Van Nuys, North Hollywood, and Burbank. Within the study area, the line travels along Vanowen Street. This service provides an approximate frequency of 10 to 20 minutes during the weekday peak periods.
- **Metro Line 224** operates as a north-south regional bus route that provides service between Universal City, North Hollywood, Sun Valley, Pacoima, San Fernando, and Sylmar. Within the study area, the line travels along Lankershim Boulevard. This service operates at an approximate trip frequency of eight to twelve minutes during weekday peak periods.
- **Metro Lines 353 and 363** operates as north-south limited-stop bus routes that provides service between North Hollywood Metro Red Line Station, Sun Valley, Panorama City, Northridge, Canoga Park, and Chatsworth. Within the study area, the line travels along Lankershim Boulevard. Line 353 is a limited stop service that provides services approximately from 5:30 a.m. to 10:00 a.m., then resumes from 3:30 p.m. to 7:30 p.m. Line 363 is also a limited stop service that provides services approximately from 5:00 a.m. to 9:30 a.m., then resumes from 3:30 p.m. to 8:00 p.m. Both lines operate at an approximate trip frequency of 30 minutes during weekday peak periods.

Burbank Boulevard (Phase UR2). The following MTA and City of Burbank public transit lines serve the proposed project corridor on Burbank Boulevard:

- **Metro Line 152 and 153** operates as a north-south regional bus that provides service between North Hollywood, Sun Valley, Panorama City, Van Nuys, Reseda, Canoga Park, and Woodland Hills. Within the study area, both lines operate along Vineland Avenue with different time schedules. Both lines provide an approximate frequency of 20-60 minutes during weekday peak periods.
- **The Burbank Bus No-Ho – Empire Line** operates as a local bus route that provides service within the Cities of Burbank and Los Angeles. Within the study area, the line travels along Burbank Boulevard, Empire Avenue, Buena Vista Street, and Hollywood Way. This service operates at an approximate trip frequency of 10-20 minutes during weekday peak periods.

3.2.4 Impacts and Mitigation Measures

Construction Assumptions

A typical construction spread (width of the work area) for this project would require the closure of three travel lanes. Intersections where open trench construction is used would be affected for approximately four weeks with turning traffic affected considerably longer. Active trenching per segment would take 30 days, including restoration of roadway surface paving and striping. Work areas for tunneling and jacking shafts would remain active for three to six months (longer duration for tunnel shafts). Section 2.0 (Project Description) Table 2-2 provides a summary of the proposed pipeline route's construction phase details, pipeline length, pipeline diameter, and general construction method(s).

Construction will generally be scheduled between the hours of 7:00 a.m. and 6:00 p.m. on weekdays and 8:00 a.m. to 5:00 p.m. on Saturdays. Intersections where open trench construction is used would be affected for approximately four weeks with turning traffic affected considerably longer.

LADWP has designed the project to avoid any above ground structures within the City of Burbank, including parks and the Whitnall Highway green space corridor. While there will be no flow control valves within the City of Burbank, some air vacuum valves may be required to adequately vent the pipeline. Traffic flow would not be negatively affected by construction related to these appurtenant structures.

Staging Areas

All of the construction methods to be utilized will require off-site staging area for the storage of supplies and materials. The staging area for the southern end of the proposed project corridor is planned to be located at Johnny Carson Park, located south of the SR-134 (Ventura Freeway) in Burbank. This Park is physically within and operated by the City of Burbank, but owned by the City of Los Angeles.

A minimum 15,000 square feet of the portion of Johnny Carson Park between Route 134 and Riverside drive is proposed as a staging area for tunneling and river crossing work under project Phase UR3. The area would be used for staging, field offices, material storage and handling, work area and shafts for tunneling and jacking. Use of this site would be required for the duration of work on Phase UR3.

Methodology

The proposed project was analyzed by phase, and included the following:

- The use of collected daily volumes to analyze general roadway operations, as necessary.
- Analysis of lane closures at jacking pits and shaft locations within roadway right-of-way, utilizing cross-sectional widths measured in the field.
- Analysis of on-street parking area closures for curb-lane work and general construction work areas.

Traffic counts utilized for base volumes at the study roadway segments were conducted during the week of March 26, 2007. Traffic count locations were chosen based on the analyzed roadway corridors and their characteristics. Where characteristics or surrounding land uses changed significantly, an additional traffic count was taken at another location on the corridor. Otherwise, a count within a long segment of a roadway where characteristics were significant throughout was considered to represent a typical volume for the entire segment.

Construction of open trenches and tunnel shafts for the proposed project will have the greatest traffic circulation impact. Current LADWP project assumptions indicate that trenching operations will necessitate the closure of up to three travel lanes. Construction of tunnel shafts will also necessitate similar closures.

Analysis of potential traffic circulation and area access impacts were analyzed based on these typical roadway closures. The required dimensions of construction work areas were applied to the surveyed width of roadway cross-sections. Roadway width that would remain during closures was then analyzed to determine what capacity could remain (available travel lane width, on-street parking area width, etc.)

Significance Criteria

Impact thresholds defined by the LADOT and the County of Los Angeles Congestion Management Program (CMP) were not utilized for the proposed project traffic analysis. These standards apply to significant impacts

and the long-term mitigation of such impacts through the provision of additional traffic signal or roadway capacity. As construction of the proposed project will constrict roadway capacity with no capability to provide more capacity in affected segments, the discussion was concentrated on the capacity that can be provided during construction and alternative/detour routes that may be necessary. Therefore, the impact analysis was based on roadway flow during construction, pedestrian and bicycle access, and generalized application of volume-to-capacity calculations.

The traffic/transportation significance criteria are based on the CEQA checklist in Appendix G of the CEQA Guidelines and a review of the environmental documentation for other utility projects in California. Traffic/transportation impacts would be significant if one or more of the following conditions resulted from construction:

- Criterion T-1: The installation of the water line within, adjacent to, or across a roadway would reduce the number of, or the available width of, one or more travel lanes during the peak traffic periods, resulting in a temporary disruption to traffic flow and/or increased traffic congestion.
- Criterion T-2: A major roadway (arterial or collector classification) would be closed to through traffic as a result of construction activities and there would be no suitable alternative route available.
- Criterion T-3: Construction activities would restrict access to or from adjacent land uses and there would be no suitable alternative access.
- Criterion T-4: Construction activities would restrict the movements of emergency vehicles (police cars, fire trucks, ambulances, and paramedic units) and there would be no reasonable alternative access routes available.
- Criterion T-5: Construction activities or staging activities would increase the demand for and/or reduce the supply of parking spaces and there would be no provisions for accommodating the resulting parking deficiencies.
- Criterion T-6: Construction activities would disrupt public transit service and there would be no suitable alternative routes or stops.
- Criterion T-7: Construction activities of the project would result in safety problems for vehicular traffic, pedestrians, transit operations, or trains.

Project Impacts

Impacts to Traffic Flow (Criterion T-1 and T-2)

Construction. Construction of the proposed project would generate additional traffic on the regional and local roadways. Construction worker commute trips, project equipment deliveries and hauling materials such as pipe, concrete, fill, and excavation spoils would increase existing traffic volumes in the project area. As noted earlier, a typical construction activity would require the closure of three travel lanes. Intersections where open trench construction is used would be affected for approximately four weeks with turning traffic affected considerably longer. The following outlines street closures and impacts by phase:

Phase UR1

Average daily traffic volumes on Lankershim Boulevard range from 25,000 to 27,000 vehicles. Construction of tunnel portals at or near the intersections of Lankershim Boulevard and Hart Street, Morella Street and Hart Street, and Morella Street at the Pump Station, could create full but temporary closures of the local roadways. The curb-to-curb width of Lankershim Boulevard along this phase is 75 feet. If the maximum anticipated work area width of 35 feet were utilized, the remaining available roadway width would be 40 feet.

Specific Closures – Shaft Construction. Construction within Phase UR1 will include the construction of open shafts for pipe tunneling and associated work areas. The locations of these shafts, as identified by LADWP, are as follows:

- **Lankershim Boulevard at Hart Street**. Within this intersection, a tunneling shaft would be constructed that encompasses three travel lanes. Based on the location identified by LADWP, one southbound travel lane and two northbound travel lanes could be provided if on-street-parking is temporarily removed. It would not be possible to provide directional capacity (two lanes peak direction, one lane off-peak direction) based on the planned location of the shaft.
- **Lankershim Boulevard, north of Victory Boulevard.** Immediately north of the Victory Boulevard intersection approach, a tunnel shaft would be constructed that encompasses two travel lanes and the northbound left turn lane onto Gilmore Street. Based on the identified location, up to four travel lanes (matching existing conditions) could be provided if on-street-parking is temporarily removed.

Provision of less than three travel lanes (accommodating peak directional flow with two lanes) during construction could create significant and unavoidable impacts, though temporary, along Lankershim Boulevard. However, with the implementation of Mitigation Measures T-1 and T-2, impacts along this phase would be reduced to a less- than-significant level.

Phase UR1a

An alternate corridor is being considered within the project northern terminus area by LADWP. This route, identified as Phase UR1a, would proceed to the south on Morella Street from the Pump Station, cross under Vanowen Street, and then connect back to Lankershim Boulevard via Archwood Street. The local roadway characteristics along this alternate UR1a route are similar to those along the Phase UR1 route. Tunnel Shaft locations along the Phase UR1a route are not yet known, but impact and roadway closure issues would be similar to those identified for the Phase UR1 route. Provision of less than three travel lanes (accommodating peak directional flow with two lanes) during construction could create significant and unavoidable impacts, though temporary. However, with the implementation of Mitigation Measures T-1 and T-2, impacts along this phase would be reduced to a less-than-significant level.

Phase UR2

Lankershim Boulevard

The curb-to-curb width of Lankershim Boulevard along this phase is 65 feet. If the maximum anticipated work area width of 35 feet were utilized, the remaining available roadway width would be 30 feet.

Specific Closures – Tunnel Shaft and Jacking Pit Construction. Within this project segment, construction will include tunnel shafts and open pits for pipe jacking and associated work areas. The locations of these shafts and pits, as identified by LADWP, are as follows:

- **Lankershim Boulevard, south of Victory Boulevard.** Immediately south of the Victory Boulevard intersection approach, a shaft would be constructed that encompasses two travel lanes. Based on the identified location, up to three travel lanes could be provided if the northbound left turn lane onto Victory Boulevard was temporarily reduced in length.
- **Lankershim Boulevard, north of Oxnard Street.** Immediately north of the Oxnard Street intersection approach, a jacking pit would be constructed that encompasses two travel lanes. Based on the identified location, up to three travel lanes could be provided if on-street-parking is temporarily removed.

- **Lankershim Boulevard, south of Oxnard Street.** At the northbound approach to the Oxnard Street intersection, a jacking pit would be constructed that encompasses two travel lanes. Based on the identified location, up to three travel lanes could be provided if on-street-parking is temporarily removed and the northbound left turn lane onto Oxnard Street is temporarily reduced in length.
- **Lankershim Boulevard, north of Hatteras Street.** Immediately north of the Hatteras Street intersection approach, a jacking pit would be constructed that encompasses two travel lanes. Based on the identified location, up to three travel lanes could be provided if on-street-parking is temporarily removed and the northbound left turn lane onto Emelita Street is temporarily reduced in length.
- **Lankershim Boulevard, north of Miranda Street.** Immediately north of the Miranda Street intersection approach, a jacking pit would be constructed that encompasses two travel lanes. Based on the identified location, up to three travel lanes could be provided if the northbound left turn lane onto Hatteras Street is temporarily reduced in length.
- **Lankershim Boulevard, north of Burbank Boulevard.** Immediately north of the Burbank Boulevard intersection approach, a jacking pit would be constructed that encompasses the western on-street parking area, two travel lanes, and the southbound left turn lane onto Burbank Boulevard. Based on the identified location, up to three travel lanes could be provided if on-street-parking is temporarily removed and the southbound left turn lane onto Burbank Boulevard is temporarily closed.

Provision of less than three travel lanes (accommodating peak directional flow with two lanes) during construction could create significant and unavoidable impacts, though temporary, along Lankershim Boulevard. However, with the implementation of Mitigation Measures T-1 and T-2, impacts along Lankershim Boulevard within this phase would be reduced to a less-than-significant level.

Burbank Boulevard

Average daily traffic on Burbank Boulevard ranges from 16,000 to 31,000 vehicles. The curb-to-curb width of Burbank Boulevard within the proposed project corridor ranges from 50 to 60 feet. Based on typical construction closures of 35 feet along the roadway, there would be 15 to 25 feet of width available for temporary travel lanes. As minimum lane widths should be 10 feet, closures within the narrower portions of Burbank Boulevard (west of Cartwright Avenue) would allow for only one travel lane during construction. Turn movements may be restricted from cross-streets within the Burbank Boulevard corridor during construction. Jacking would be utilized, however, under many major intersections within the corridor, minimizing significant impacts to area access.

It should be noted that the City of Los Angeles Bureau of Engineering is planning to widen Burbank Boulevard, with a planned schedule between December 2010 and May 2012. Construction of this improvement project has the potential to overlap with the construction of the proposed project on Burbank Boulevard. LADWP has been actively coordinating with the Bureau of Engineering to coordinate construction activities for these two projects as closely as possible. For this report, the analysis is based on the existing roadway width.

Specific Closures – Pit/Shaft Construction. Construction within this project segment will include the construction of open pits for pipe jacking and shafts for tunnel construction and associated work areas. The locations of these pits and shafts, as identified by LADWP, are as follows:

- **Burbank Boulevard, east of Lankershim Boulevard.** At the westbound approach to the intersection with Lankershim Boulevard, a pipe jacking access pit would be constructed that encompasses one travel lane and the westbound left turn lane. Based on the location identified by LADWP, two travel lanes could continue to operate if on-street parking is temporarily removed.

- **Burbank Boulevard, west of Vineland Avenue.** At the end of the eastbound approach to the intersection with Vineland Avenue, a tunnel shaft would be constructed on the north side of the roadway. This shaft would be located outside of any travel lanes or on-street parking areas.
- **Burbank Boulevard, east of Cartwright Avenue.** At the end of the eastbound approach to the intersection with Vineland Avenue, a tunnel shaft would be constructed on the north side of the roadway. This shaft would be located outside of any travel lanes but would overlap with the on-street parking area at the north curb.
- **Burbank Boulevard, at Cahuenga Boulevard.** Two jacking access pits would be constructed in the vicinity of the intersection with Cahuenga Boulevard. At the eastbound approach, a pit would be constructed on the north side of the roadway, within the sidewalk and on-street parking area. At the westbound approach, a pit would be constructed within the southern travel lane and the westbound left turn lane. Travel lanes could remain during construction, if on-street parking is temporarily removed near the westbound approach. A new temporary westbound left turn lane could also be provided.
- **Burbank Boulevard, west of Biloxi Avenue.** To the west of the intersection with Biloxi Avenue, a tunnel shaft would be constructed near the centerline of the roadway. This shaft would be located within the continuous center left turn lane and partially within the eastbound travel lane. Travel lanes could remain during construction, if on-street parking is temporarily removed within the vicinity of the work area.

At the locations of higher vehicle volumes (occurring toward the western end of the corridor near Lankershim Boulevard), significant and unavoidable impacts will result unless two travel lanes remain open during construction. However, with the implementation of Mitigation Measures T-1 and T-2, impacts along Burbank Boulevard within this phase would be reduced to a less-than-significant level.

Phase UR2a

An alternate corridor is being considered by LADWP along Burbank Boulevard. This route, identified as Phase UR2a, would follow the same route as UR2 but includes extended tunneling along Burbank Boulevard from Fair Avenue to Cartwright Avenue. The local roadway characteristics along this alternate UR2a route are similar to those along the Phase UR2 route. While the extended tunneling along Burbank Boulevard from Fair Avenue to Cartwright Avenue would reduce intersection and lane closure impacts through this segment, the remaining portions of the UR2a route would be subject to similar impacts as those identified for the Phase UR2 route above. Provision of less than three travel lanes (accommodating peak directional flow with two lanes) during construction could create significant and unavoidable impacts, though temporary. Therefore, the implementation of Mitigation Measures T-1 and T-2 would be required for Phase UR2a to reduce traffic flow impacts to a less-than-significant level.

Phase UR3

Tunneling within Whitnall Highway Corridor

From the shaft at Burbank Boulevard, west of Biloxi Avenue, the pipeline would be placed underground in a tunnel that would extend east to the Whitnall Highway corridor and then it would continue south under the Whitnall Highway corridor until it reaches an area north of Forest Lawn Drive. Construction of this tunnel would be executed from staging areas on the south end of the proposed project alignment at Johnny Carson Park and the Headworks Property. The only surface disruptions that would occur within the City of Burbank jurisdiction along the tunneling route would be for the installation of vents and other related features (see Figure 2-2).

These tunneling surface features would be installed within the utility corridor and not within public roadway rights-of-way. Related construction activities would not generate a significant number of construction truck trips, nor would these activities create any major surface street closures within the City of Burbank.

Therefore, construction activities within the Whitnall Highway would generate less-than significant traffic impacts.

Forest Lawn Drive

Project construction along Forest Lawn Drive would likely require only partial closure of the roadway. The relatively high traffic volumes (approximately 25,000 daily vehicle trips across four travel lanes) along Forest Lawn Drive could generally be accommodated if two travel lanes remain open. As the current roadway width is 70 feet, roadway closures of up to 35 feet in width would allow for a remaining 35 feet of width to remain open. This remaining width could accommodate two travel lanes and additional width for emergency shoulders, construction zone buffer space, or turn lanes. The total length of any project-related work area would be 1,400 feet under worst-case conditions (500 feet for the active construction process, an additional 500 feet for tail-end dirt hauling and related operations, and 200-foot traffic transitions on both sides of the work area).

Specific Closures – Tunnel Shaft Construction. Three tunnel shafts would be constructed on Forest Lawn Drive, in the vicinity of the intersection of this roadway with the extension of the Whitnall Highway utility corridor to the north of the Los Angeles River. Construction of these shafts would encompass the two westbound travel lanes and a partial area of one of the eastbound travel lanes. With minor travel lane width reductions, the provision of two travel lanes within the work area extents for these two shaft locations appears to be feasible. Significant and unavoidable impacts will result unless two travel lanes remain open during construction. However, with the implementation of Mitigation Measures T-1 and T-2, impacts along Forest Lawn drive within this phase would be reduced to a less-than-significant level.

Staging Area – Johnny Carson Park

The truck-hauling route to and from the staging area would provide direct on/off capabilities from the SR-134, with no through movements on area roadways. Trucks would cross Bob Hope Drive and Riverside Drive at single points to travel between the SR-134 freeway ramps and the staging area site. Both ramp locations, however, are unsignalized. A pipe jacking access pit would be constructed within the park near the north edge of Riverside Drive, but would not affect the public right-of-way. To ensure traffic generated at the staging area would not impact traffic flow, Mitigation Measures T-1, T-3, and T-4 are required to ensure that staging activities proposed at Johnny Carson Park would be reduced to a less-than-significant level.

Mitigation Measures

T-1 Prior to the start of construction, LADWP shall submit a Construction Traffic Management Plan to the Los Angeles Department of Transportation and City of Burbank for review and approval prior to the start of any construction work. The plan shall show the location of roadway or lane closures, traffic detours, haul routes, hours of operation, and local access (maintenance of), including bike lanes if applicable. The Plan shall also discuss the use of flag persons, warning signs, lights, barricades, cones, etc. according to standard guidelines outlined in the Caltrans Traffic Manual, the Standard Specifications for Public Works Construction, and the Work Area Traffic Control Handbook (WATCH).

T-2 Pending approval from Los Angeles Department of Transportation, LADWP or its construction contractor shall implement the following roadway measures during construction:

- **Lankershim Boulevard.** Three travel lanes shall be provided during the construction period - two travel lanes in the peak direction of travel. For pit/shaft construction at the Lankershim Boulevard and Hart Street intersection, two lanes of travel may not be possible for the peak travel time/direction (southbound in the a.m. peak period). In order to avoid significant traffic impacts, a recommended alternate route (not a full detour route) shall be established and signed for southbound traffic on Lankershim Boulevard. This route shall utilize eastbound Sherman Way, southbound Tujunga Avenue, and westbound Hart Street.
- **Burbank Boulevard.** LADWP shall provide narrower rectangular working areas for jacking pit and shaft operations, where feasible, to provide for two travel lanes along the narrower portions of Burbank Boulevard. Work area width shall be reduced to 25 to 30 feet to allow for two 10-foot temporary travel lanes.
- **Forest Lawn Drive**. Directional capacity (westbound in the a.m. peak and eastbound in the p.m. peak) shall be considered in roadway closure planning. The provision of two travel lanes in the peak direction, while providing one travel lane for the opposite direction of traffic flow, shall be provided. This peak provision may not be possible within the vicinity of the pit/shaft work areas.

T-3 At the egress point on the eastern side of the Johnny Carson Park staging area site, flag persons shall be provided for truck movements from the site to the SR-134 eastbound on-ramp.

T-4 So that delays are not significant for motorists on Bob Hope Drive and Riverside Drive, flag persons shall limit truck movements into and out of the site to one or two trucks at a time. Inbound truck movements shall be scheduled to allow this management to be effective, and outbound truck movements shall be held if necessary.

Operation. Once operational, the proposed project would not result in traffic volumes above those currently generated for inspection and maintenance along the Upper Reach pipeline route. Inspection and maintenance activities would be limited to periodic inspections of the pipeline. These activities would result in periodic vehicle trips, but would result in negligible impacts to traffic volumes and the parking capacities of the roadways along the route over the life of the proposed project. Because these trips would be temporary in nature, operation of the proposed project would have no lasting impact on the study roadways or the adjacent roadway systems. Therefore, traffic impacts from operations of the proposed project would be less than significant and no mitigation measures would be required.

Impacts to Public Access (Criterion T-3)

Construction. When construction occurs in the outer lane and/or shoulders of roads, access to driveways would be temporarily blocked by the construction zone, thereby affecting access, and parking for the adjacent residences, institutions, businesses and other land uses. Along all phases, access to side streets, entrances, and driveways would be temporarily disrupted and possibly blocked during construction. This could potentially deprive business owners of customer patronage and could prevent residents from enjoying full use of their properties. While in most cases and at most times, alternative access would be available via minor detours, in a limited number of instances automobile access could be completely blocked during construction. This would represent a conflict with an established land use. However, even under a worst-case situation, reasonable pedestrian access would be available at all times, to all businesses and residences. In such a worst-case situation, for example, a business patron could be obliged to park up to a few hundred feet away from a destination. Reasonable vehicular and full pedestrian access to private homes located along the alignment would be available at all times. There

may be some isolated locations along the proposed Upper Reach pipeline alignment where construction could block the driveway to a private off-street parking lot serving a business. In these instances, such disruption could potentially deprive a business of patronage; however, such disruption would be short-term in nature.

At the staging area, there is no direct access to neighboring land uses to and from Bob Hope Drive and Riverside Drive in the immediate vicinity of Johnny Carson Park. Nearby major land uses such as the St. Joseph hospital and Disney Studios to the north on Buena Vista Street do not likely have significant trip distribution to the roadways surrounding the Park. Access to and from the SR-134 eastbound ramps could be temporarily affected during truck maneuvers between the freeway and the Johnny Carson Park site.

While the potential disruption of established land uses along the pipeline alignment would be short-term, it would be a significant impact. To reduce the severity of public access impacts, Mitigation Measures T-5 through T-7, below, are recommended. The implementation of these measures would reduce potential access impacts to a less-than-significant level.

Mitigation Measures

T-5 LADWP shall provide a minimum of 48-hour advance notification of the potential for disrupted access to and parking for any business, residence, or recreational facility that may experience delayed access or reduced parking capacity in the vicinity. The notification shall include information on restoring access and the estimated amount of time that access may be blocked.

T-6 If vehicular access to businesses, residences, and recreational facilities cannot be restored within eight (8) hours, LADWP or its construction contractor shall provide a one lane temporary vehicular bridge for access (LADWP Specification F01560 - Project Controls, Section 3.07D).

T-7 The westbound left turn lane into the Forest Lawn cemetery shall be maintained during proposed project construction, as well as the right turn access into the cemetery from the eastbound curb lane.

Operation. Once operational, the proposed project would not result in lane closures or any other restrictions to surrounding site access along the project route. Operations of the proposed project would not impact existing public access locations or routes. Therefore, access impacts from operations of the proposed project would be less than significant and no mitigation measures would be required.

Impacts to Emergency Vehicle Access (Criterion T-4)

Construction. Construction activities could potentially interfere with emergency response by ambulance, fire, paramedic, and police vehicles. The loss of a lane and the resulting increase in congestion could lengthen the response time required for emergency vehicles passing through the construction zone. At the staging area site, emergency vehicle access to and from the St. Joseph hospital facilities would be maintained, as traffic closures would be short and access to and from the freeway ramps would be maintained. Access to areas of Burbank to the south of the SR-134 freeway for emergency vehicles would also be maintained. Moreover, there is a possibility that emergency services may be needed at a location where access is temporarily blocked by the construction zone. To ensure emergency access is available during construction, Mitigation Measures T-3 (above), T-6 (above), and T-8 (below) are recommended to reduce potentially significant emergency vehicle access impacts to less-than-significant levels.

Mitigation Measures

T-8 LADWP shall coordinate in advance with emergency service providers to avoid restricting movements of emergency vehicles. Police departments, fire departments, ambulance services, and paramedic services shall be notified in advance by LADWP of the proposed locations, nature, timing, and duration of any construction activities and advised of any access restrictions that could impact their effectiveness. At locations where access to nearby property is blocked, provision shall be ready at all times to accommodate emergency vehicles, such as plating over excavations, short detours, and alternate routes in conjunction with local agencies. The Traffic Construction Management Plan (T-1) shall include details regarding emergency services coordination and procedures.

Operation. Once operational, the proposed project would not result in lane closures or any other restrictions to surrounding site access along the project route. Operations of the proposed project would not impact existing emergency vehicle access locations or routes. Therefore, access impacts from operations of the proposed project would be less than significant and no mitigation measures would be required.

Impacts to Parking (Criterion T-5)

Construction. Parking for worker vehicles would be provided at the construction staging sites and surrounding locations. From these points, some workers would drive or ride in project vehicles to work areas along the Upper Reach pipeline right-of-way (ROW). In addition, construction activities may result in short-term elimination of a limited amount of parking spaces immediately adjacent to the construction ROW.

The prohibition of on-street parking within construction areas will be necessary along both project Phases UR1 and UR2 along Lankershim Boulevard. As parking will be available just outside of the construction area, and on-street parking on Lankershim Boulevard is not used as intensely as Burbank Boulevard, significant impacts would be unlikely during the four to six week construction timeframe for each work area.

Project construction along the Burbank Boulevard corridor could create a temporary but significant effect to the on-street parking supply. Along all segments of the roadway, the existing curb-to-curb configuration is not of adequate width to provide temporary travel lanes and on-street parking. As the proposed project construction extents will be limited to 1,400-foot linear segments, parking could be found within adjacent blocks, but on-street parking supplies for the immediate area (one block) would be significantly impacted for the four to six week period of construction within each work area. Parking demand that is currently absorbed by Burbank Boulevard would then move to side streets (which are also currently well utilized by both Burbank Boulevard businesses and adjacent residential uses) or adjacent Burbank Boulevard blocks. Impacts along some segments will be minimized where jacking or tunneling is utilized. Otherwise, significant and unavoidable parking impacts would occur, as demand may exceed supply within on- street parking areas in the immediate vicinity of the work areas. Therefore, the proposed project could result in a significant decrease to available parking along the Phase UR2 alignment. Implementation of Mitigation Measure T-1 would reduce impacts; however, parking impacts would still be significant.

Operation. Once operational, the proposed project would not result in lane closures or any other restrictions to surrounding parking along the project route. Operations of the proposed project would not impact existing parking along the route.

Impacts to Public Transit (Criterion T-6)

Construction. There are no scheduled public transit routes that utilize ~~this portion of~~ the proposed project area along Forest Lawn Drive. However, impacts to transit service would be likely within project segments along Lankershim Boulevard and Burbank Boulevard during construction. Service on the Metro Bus lines that operate on Vineland Avenue would not be significantly impacted by proposed project construction within the Burbank Boulevard corridor. As jacking would be utilized within UR2 under Oxnard Street, Victory Boulevard, and tunneling would be utilized within project Phase UR1 under Vanowen Street, there would not be any significant impacts to Metro Bus Lines 154, 164, and 165. Metro Bus Lines 224, 353, and 363 travel on Lankershim Boulevard within the project area. As travel lanes would likely be kept open during construction, access for these bus lines would continue but stops would need to be temporarily moved within construction zones. As jacking will be utilized at major intersections, access to transfer points at these major intersections would continue. Although some time delays may result, there would not be any significant impacts to transit service within the Lankershim Boulevard corridor during project construction.

Service on the Burbank bus line would not be significantly impacted by the proposed project. The City of Burbank utilizes smaller shuttle-size buses that can more readily access temporary stops with smaller turning radii. Temporary bus stop closures could easily be accommodated with temporary bus stops outside of the immediate work area. The implementation of Mitigation Measure T-9 described below is recommended to reduce potentially significant public transit impacts to less-than-significant levels.

Mitigation Measures

T-9 LADWP shall coordinate in advance with City of Los Angeles Department of Transportation (LADOT), City of Burbank, and the Metropolitan Transportation Authority (Metro) to avoid restricting movements of public transportation. Notification shall include proposed locations, nature, timing, and duration of any construction activities and any access restrictions that could impact existing bus stops and service routes. The Traffic Construction Management Plan (Mitigation Measure T-1) shall include details regarding public transportation coordination and procedures. Copies of the plan shall be provided to the LADOT, City of Burbank, and Metro.

Operation. Once operational, the proposed project would not result in lane closures or any other restrictions to surrounding MTA or City of Burbank transit routes or stops. Operations of the proposed project would not impact existing MTA or City of Burbank transit operations along the route. Therefore, public transit impacts from operations of the proposed project would be less than significant and no mitigation measures would be required.

Impacts to Pedestrian Safety (Criterion T-7)

Construction. Pedestrian and bicycle circulation would be affected by project construction activities if pedestrians and bicyclists were unable to pass through the construction zone or if established pedestrian and bike routes were blocked. On-street parking is prohibited along Forest Lawn Drive, but there are bicycle lanes on both shoulders. Closure of these lanes, which link to recreation trails within Griffith Park, could be necessary during project construction. If these lanes are closed and direct alternates are not provided during construction, significant impacts would occur, as outside of east-west roadways to the north of the SR-134 freeway there are

no direct nearby alternate bicycle routes. Mitigation Measure T-10 is recommended to ensure that impacts to these bicycle lanes located on Forest Lawn Drive would be less than significant.

Mitigation Measures

T-10 LADWP shall ensure bicycle route closure signs are posted at major intersections to the west and east of the construction area (Griffith Park area and Barham Boulevard).

Operation. Once operational, the proposed project would not result in lane closures or any other impedance to pedestrians and bicyclists along the project route. Therefore, public safety impacts from operations of the proposed project would be less than significant and no mitigation measures would be required.

3.2.5 Level of Significance After Mitigation

The proposed project would result in significant impacts during construction along Lankershim Boulevard and Burbank Boulevard where open trenching would be used as construction activities in these areas would reduce capacities on the roadways directly affected and divert traffic to adjacent roadways that are also heavily traveled. However, areas where jacking and tunneling construction methods would be utilized would minimize traffic impacts and, implementation of the mitigation measures identified above would reduce impacts to traffic flow associated with construction of the proposed project to less-than-significant levels. Furthermore, with implementation of mitigation, impacts to public and emergency vehicle access, public transit, and pedestrian safety would be reduced to less-than-significant levels. Potentially significant on-street parking supply impacts cannot be mitigated and would remain significant and unavoidable during the construction period.

3.2.6 Cumulative Impacts

Operation of the proposed project would result in periodic vehicle trips associated with inspection and maintenance activities that would generate negligible emissions over the life of the project. Therefore, the focus of this cumulative impact discussion is based on short-term construction impacts. During construction of the proposed project, other construction projects identified within the project area and within approximately 2.5 miles of the proposed project corridor would only have the potential to cause cumulatively significant impacts if they were constructed concurrently with the proposed project. Several of the cumulative projects identified in Section 2.8 would be constructed at least partly during the construction period of the proposed project. In addition, it is anticipated that the majority of the projects would involve some level of contribution to cumulative traffic congestion that would result in significant traffic impacts to existing levels of service. Therefore, the cumulative projects identified in Section 2.8 could further increase the projected short-term significant construction traffic impacts identified for the proposed project if they were constructed at the same time. Cumulative impacts are considered to be significant and unavoidable.

3.3 Air Quality

3.3.1 Introduction

This section provides information on ambient air quality conditions in the vicinity of the proposed Upper Reach pipeline alignment and identifies potential impacts that would occur to local air quality as a result of construction and operation of the proposed project.

3.3.2 Regulatory Setting

Ambient Air Quality Standards

Regulation of air pollution is achieved through a combination of ambient air quality standards and emission limits for individual sources and categories of sources of air pollutants. The federal Clean Air Act requires the U.S. Environmental Protection Agency (USEPA) to identify National Ambient Air Quality Standards (NAAQS or federal ambient air quality standards) to protect public health and welfare. The NAAQS are established for ozone, carbon monoxide, nitrogen dioxide, sulfur dioxide, particulate matter, and lead. These pollutants are called "criteria" air pollutants because the intent of the standards is to meet specific public health and welfare criteria. California has adopted more stringent ambient air quality standards (CAAQS or State ambient air quality standards) for most of the criteria air pollutants. The applicable federal and State ambient air quality standards (AAQS) and a brief discussion of the related heath effects and principal sources for each pollutant are presented in Table 3.3-1. As indicated in this table, the averaging times (the duration over which they are measured) for the various air quality standards range from 1-hour to annual. The standards are read as a volume fraction, in parts per million (ppm), or as a concentration, in milligrams and/or micrograms of pollutant per cubic meter of air (mg/m^3 or $\mu g/m^3$).

As required by the federal Clean Air Act, the USEPA classifies air basins or portions thereof, as either "attainment" or "nonattainment" for each criteria air pollutant, based on whether or not the national standards have been achieved. The California Clean Air Act also requires designation of areas as "attainment" or "nonattainment" for the State standards, rather than the national standards. Thus, areas in California have two sets of attainment/nonattainment designations: one set with respect to the national standards and one set with respect to the State standards. The proposed project would be located in the Los Angeles County sub-area of the South Coast Air Basin (SCAB), which is under the jurisdiction of the South Coast Air Quality Management District (SCAQMD). Table 3.3-2 summarizes the federal and State attainment status of criteria pollutants for the SCAB.

Rules and Regulations

Federal, State, and regional agencies have established air quality rules and regulations that affect the project area. The following regulatory considerations may apply to the project area.

Table 3.3-1. Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone (O_3)	8 Hour	0.075~~8~~ ppm (14~~5~~7 µg/m^3)	0.070 ppm (137 µg/m^3)	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when reactive organic gases (ROG) and nitrogen oxides (NO_X) react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/ industrial mobile equipment.
	1 Hour	—	0.09 ppm (180 µg/m^3)		
Carbon Monoxide (CO)	8 Hour	9 ppm (10 mg/m^3)	9.0 ppm (10 mg/m^3)	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	1 Hour	35 ppm (40 mg/m^3)	20 ppm (23 mg/m^3)		
Nitrogen Dioxide (NO_2)	Annual Avg.	0.053 ppm (100 µg/m^3)	0.030 ppm (57 µg/m^3)~~a~~	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	1 Hour	—	0.18 ppm (339~~8~~ µg/m3)~~a~~		
Sulfur Dioxide (SO_2)	Annual Avg.	0.030 ppm (80 µg/m^3)	—	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	24 Hour	0.14 ppm (365 µg/m^3)	0.04 ppm (105 µg/m^3)		
	3 Hour	0.5 ppm (1300 µg/m^3)	—		
	1 Hour	—	0.25 ppm (655 µg/m^3)		
Respirable Particulate Matter (PM10)	Annual Avg.	—	20 µg/m^3	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	24 Hour	150 µg/m^3	50 µg/m^3		
Fine Particulate Matter (PM2.5)	Annual Avg.	15 µg/m^3	12 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_X, sulfur oxides, and organics.
	24 Hour	35 µg/m^3	—		
Lead	Calendar Quarter	1.5 µg/m^3	—	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurologic dysfunction.	Present source: lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.
	30 Day Average	—	1.5 µg/m^3		

Source: CARB, 2007a, 2008; SCAQMD, 1993.

~~Note:~~

~~a) The Office of Administrative Law approved amendments to the regulations for the State Ambient Air Quality Standard for NO_2. Those amendments reduce the current 1-hour standard for NO_2 of 0.25 ppm to 0.18 ppm (338 ug/m^3), not to be exceeded, and established a new annual standard for NO_2 of 0.030 ppm (56 ug/m^3). The new standards become effective on March 20, 2008.~~

Table 3.3-2. Attainment Status for the South Coast Air Basin

Pollutants	Federal Classification/Designation	State Classification/Designation
Ozone	Severe Non-Attainment (8-hr) a	Extreme Non-Attainment (1-hr) Non-Attainment (8-hr)
PM10	Serious Non-Attainment	Non-Attainment
PM2.5	Non-Attainment	Non-Attainment
CO	Serious Non-Attainment	Attainment
NO_2	Attainment	Attainment
SO_2	Attainment	Attainment

Source: CARB, 2006, USEPA, 2007a.

~~Note(s)~~Definitions: CO = carbon monoxide; NO_2 = nitrogen dioxide; SO_2 = sulfur dioxide; PM10 = particulate matter less than 10 micrograms in diameter; N/A = Not Applicable.

Note: a) SCAQMD has requested reclassification of the SCAB to extreme non-attainment for the federal 8-hour ozone standard.

Federal Regulations

- The 1990 federal Clean Air Act (CAA) Amendments overhauled the planning provisions for areas not meeting the NAAQS. The amendments identified specific emission reduction goals, required both a demonstration of reasonable further progress and attainment by specified dates, and incorporated more stringent sanctions for failure to attain the NAAQS or to meet interim attainment milestones.
- The USEPA implements New Source Review (NSR) and Prevention of Significant Deterioration (PSD). PSD applies to major sources with annual emissions exceeding either 100 or 250 tons per year (tpy) depending on the source, or that cause or contribute adverse impacts to any federally classified Class I area. PSD would not apply to the proposed project.
- The USEPA implements the NAAQS and determines attainment of federal air quality standards on a short- and long-term basis.

State Regulations

- The California Air Resources Board (CARB) establishes and periodically updates the CAAQS and determines attainment status for criteria air pollutants.
- The California CAA went into effect on January 1, 1989, with the mandate that local air districts achieve the health-based CAAQS at the earliest practicable date.
- The Statewide Portable Equipment Registration Program established by CARB allows operation of portable equipment throughout California without having to obtain individual permits from local air districts.

Local Rules and Regulations

Emissions that would result from construction of the proposed project are subject to the rules and regulations of the SCAQMD. Rules and regulations of this agency are designed to achieve defined air quality standards that are protective of public health. To that purpose, they limit the emissions (during both construction and operation phases of projects) and the permissible impacts of emissions from projects, and specify emission controls and control technologies for each type of emitting source in order to ultimately achieve the air quality standards. SCAQMD rules and regulations that may be applicable to the proposed project include:

- Rule 401 – Visible Emissions: limits visual exhaust emission discharges that occur for more than three minutes an hour;
- Rule 402 – Nuisance: restricts discharges of air contaminants in quantities that could cause injury, detriment, nuisance, or annoyance;
- Rule 403 – Fugitive Dust: reduces the amount of particulate matter entrained in the ambient air as a result of man-made fugitive dust sources by requiring actions to prevent, reduce, or mitigate fugitive dust emissions;
- Rule 1110.2 – Emissions from Gaseous- and Liquid-Fueled Engines: reduces oxides of nitrogen (NOx), volatile organic compounds (VOC), and carbon monoxide (CO) from all stationary and long-term use portable engines over 50 brake horsepower; and
- Rule 1166 – Volatile Organic Compound Emissions from Decontamination of Soil: sets requirements to control the emission of VOCs from excavation, grading, handling, and treating VOC-contaminated soil as a result of leakage from storage or transfer operations, accidental spillage, or other deposition.

3.3.3 Environmental Setting

Meteorological Conditions

The study area lies within the SCAB (see Figure 3.3-1), which is characterized as a Mediterranean climate with mild winters, when most rainfall occurs, and hot, dry summers. The regional climate is dominated by a strong and persistent high-pressure system that frequently lies off the Pacific coast (generally known as the *Pacific*

High). The Pacific High shifts northward or southward in response to seasonal changes or the presence of cyclonic storms. Besides the influence from the Pacific High, other important meteorological characteristics influencing air quality in the study area are the persistent temperature inversions, predominance of onshore winds, mountain ridge and valley topography, and prevalent sunlight.

A monthly climate summary for Burbank, California was selected to characterize the climate of the study area. As described in Table 3.3-3, average summer (July) high and low temperatures in the study area are 89°F and 62°F, respectively. Average winter (January) high and low temperatures in the study area are 67°F and 42°F, respectively. The average annual precipitation is approximately 17.5 inches with approximately 79 percent occurring between December and March. Little precipitation occurs during summer because a high-pressure cell blocks migrating storm systems over the eastern Pacific.

Table 3.3-3. Monthly Average Temperatures and Precipitation

Month	Temperature, °F		Precipitation, inches
	Maximum	Minimum	
January	67	42	3.56
February	70	44	4.29
March	71	46	3.88
April	75	50	1.02
May	77	54	0.37
June	83	58	0.12
July	89	62	0.02
August	90	62	0.18
September	87	60	0.30
October	82	54	0.55
November	74	45	1.05
December	68	41	2.15
Annual average/total	78	52	17.49

Source: Weather Channel, 2007.

Wind patterns in the project vicinity display a unidirectional on-shore flow that tends to wrap around the Santa Monica Mountains from the southeast. Winds are strongest during the summer, with a weaker offshore return flow that is strongest during winter nights when the land is colder than the ocean. The on-shore winds that sweep across the region average from eight to twelve miles per hour (mph) with stronger winds occurring during the summer. The offshore flow is often calm or drifts slowly southeasterly at three to eight mph, with winter nights showing the strongest effects (SCAQMD, 1993).

Existing Air Quality

Existing and historical ambient air quality trends in the project area are best documented by measurements recorded at the SCAQMD air monitoring station closest to the project area. Data collected at the Burbank West Palm Avenue (Burbank) monitoring station was selected to represent ambient air quality conditions in the vicinity of project area. The Burbank monitoring station is located at 228 W. Palm Avenue, which is approximately two miles east of the Whitnall Highway. Monitored air pollutants at the Burbank monitoring station include carbon monoxide (CO), particulate matter (PM10, PM2.5), ozone (O_3), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). Air quality trends recorded at the Burbank monitoring station from 2004 to 2006 are presented in Table 3.3-4.

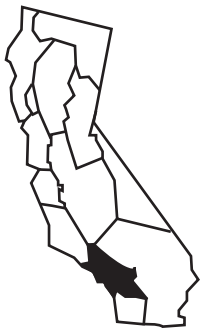
Figure 3.3-1

South Coast Air Basin

Aspen Environmental Group

Source: CARB, 2000

California Air Basin



G Gaseous Monitoring
P Particulate Monitoring

N

0 ¼ ½ 1

Scale in Miles

Table 3.3-4. Ambient Air Quality Monitoring Data from the Project Area

Pollutant Standards	Burbank West Palm Avenue Monitoring Station		
	2004	2005	2006
Carbon Monoxide (CO)			
Maximum 8-hour concentration (ppm)	3.80	3.40	3.38
No. Days Standard Exceeded			
CAAQS/NAAQS (8-hour) > 9.0 ppm	0	0	0
Particulate Matter (PM10)			
Maximum 24-hour concentration ($\mu g/m^3$)	74.0	92.0	64.0
No. Samples Exceeding Standards			
NAAQS (24-hour) > 150 $\mu g/m^3$ CAAQS (24-hour) > 50 $\mu g/m^3$	0 6	0 5	0 N/A
Particulate Matter (PM2.5)			
1-year 98th Percentile 24-hour concentration ($\mu g/m^3$)*	49.3	N/A	43.4
Ozone (O_3)			
Maximum 1-hour concentration (ppm)	0.137	0.142	0.166
No. Days Standard Exceeded			
CAAQS (1-hour) > 0.09 ppm	27	13	25
Maximum 8-hour concentration (ppm)	0.109	0.108	0.128
No. Days Standard Exceeded			
CAAQS (8-hour) > 0.070 ppm	52	23	34
NAAQS (8-hour) > 0.08 ppm	7	2	12
Nitrogen Dioxide (NO_2)			
Maximum 1-hour concentration (ppm)	0.122	0.089	0.103
No. Days Standard Exceeded			
CAAQS (1-hour) > 0.18 ppm	0	0	0
Sulfur Dioxide (SO_2)			
Maximum 24-hour concentration (ppm)	0.009	0.006	0.004
No. Days Standard Exceeded			
NAAQS (24-hour) > 0.14 ppm CAAQS (24-hour) > 0.04 ppm	0 0	0 0	0 0

Source: CARB, 2007a.
Notes: ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; N/A = Not Available.
* For PM2.5, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over three years, are equal to or less than the standard ($35 \mu g/m^3$). 3-year averages for PM2.5 are not currently available, as such the 1-year 98th percentile has been provided.

Sensitive Receptors

Some land uses are considered more sensitive to air pollution than others due to the types of population groups or activities involved. Sensitive population groups include children, the elderly, the acutely and chronically ill, and especially those with cardio-respiratory diseases.

Residential areas are also considered to be sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Although exposure periods are generally short, exercise places a high demand on respiratory functions, which can be impaired by air pollution. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent, as the majority of the workers tend to stay indoors most of the time.

A land use survey along the proposed pipeline route was conducted to identify sensitive receptors (e.g., local residences, schools, hospitals, churches, recreational facilities) in the general vicinity of the proposed project.

Residential receptors are dispersed along the entire project route. Several churches (Inglesa Pentecostal Unida Int., Inglesia Pentecostes Fuente de Luz, Inc., Multi-Congregational Church, Jehovah's Witness Congregation, Ministerio Palabra Verdad Y Vida, American Lutheran Church, etc.), parks (Whitnall Highway Park North and South, Johnny Carson Park, Forest Lawn Memorial Park, Mt. Sinai Memorial Park), schools and daycare facilities (Kiddy Academy, Medical Career College, Universal Adult Day Care, Media Center Montessori Pre-School, American Lutheran School, Robert Louis Stevenson Elementary School, Providence High School), and medical facilities (St. George Health Clinic, Lankershim Medical Clinic, Family Hope Medical Clinic, L.A. Urgent Care Clinic, Providence Saint Joseph Medical Center, Burbank Medical Plaza, Burbank Emergency Medical Group). For a complete listing of all land uses along the proposed pipeline route, refer to Appendix C (Sensitive Receiver Figures - Noise and Vibration Study).

3.3.4 Impacts and Mitigation Measures

Methodology

For the proposed project, the majority of construction activities are expected to occur beginning November 2008 and last until October 2012 (48 months or 4 years). Projected air emissions during construction were calculated based on the maximum amount of construction activity that would occur during one day, to provide both a conservative estimate of air emissions associated with the proposed project and to compare the daily emissions to the SCAQMD construction emission thresholds.

Air emissions for the proposed project were calculated using a standard calculation methodology accepted by the SCAQMD and incorporate SCAQMD Rule 403~~1~~ (Fugitive Dust) fugitive dust control requirements. For offroad and onroad vehicles, emission factors from SCAQMD for the year 2009 were used (SCAQMD, 2007), and USEPA spark ignition engine emission factors were used for any proposed small offroad gasoline engines (USEPA, 2005). Fugitive dust emissions are calculated using the USEPA's AP 42 emission factors (USEPA, 2007b) and various SCAQMD CEQA Handbook guideline parameters (e.g., unpaved road silt load content) (SCAQMD, 1993). PM2.5 emissions are estimated using the emission factor sources noted, or when no PM2.5 factor is listed the PM2.5 fraction is determined using the current California Emission Inventory Development and Reporting System (CEIDARS) particulate size fractions obtained from the SCAQMD website (SCAQMD, 2007). Fugitive emission controls necessary to comply with SCAQMD Rule 401 have been incorporated into the emission analysis. Emission calculations and detailed assumptions are provided in Appendix E (Air Pollutant Emission Calculations).

The calculated emissions for the proposed project were then compared to the significance criteria (defined below).

Criteria for Determining Significance

Project-related air emissions would have a significant effect if they resulted in concentrations that create either a violation of an ambient air quality standard (as identified in Table 3.3-1) or significantly contribute to an existing air quality violation. Should ambient air quality already exceed existing standards, the SCAQMD has established specific significance threshold criteria to account for the continued degradation of local air quality. Table 3.3-5 presents the allowable contaminant generation rates at which construction and operational emissions are considered to have a significant regional effect on air quality throughout the SCAB.

Table 3.3-5. Regional Significance Thresholds

Air Pollutant	Construction Phase (lbs/day)	Operational Phase (lbs/day)
Volatile Organic Compounds (VOCs)	75	55
Carbon Monoxide (CO)	550	550
Nitrogen Oxides (NOx)	100	55
Sulfur Oxides (SOx)	150	150
Particulate Matter (PM10)	150	150
Fine Particulate Matter (PM2.5)	55	55

Source: SCAQMD, 2007.

In addition to the thresholds provided in Table 3.3-5, the SCAQMD provides additional relevant localized significance thresholds (LSTs) for toxic air contaminants, odors, and ambient air quality as shown in Table 3.3-6.

Table 3.3-6. Localized Significance Thresholds for the South Coast AQMD

Criteria Pollutant	Toxic Air Contaminants (TACs) and Odor Thresholds
TACs (including carcinogens and non-carcinogens)	Maximum Incremental Cancer Risk ≥ 10 in 1 million Hazard Index ≥ 1.0 (project increment) Hazard Index ≥ 3.0 (facility-wide)
Odor	Project creates an odor nuisance pursuant to SCAQMD Rule 402
Criteria Pollutant	**Ambient Air Quality for Criteria Pollutants** [a]
NO2 1-Hour Average Annual Average	Project is significant if it causes or contributes to an exceedance of the following attainment standards: 0.25 ppm (state) 0.053 ppm (federal)
PM10 24-Hour Average	 10.4 μg/m^3 (recommended for construction) [b] 2.5 μg/m^3 (operation)
PM2.5 24-hour average	 10.4 μg/m^3 (construction)[b] & 2.5 μg/m^3 (operation)
CO 1-Hour Average 8-Hour Average	Project is significant if it causes or contributes to an exceedance of the following attainment standards: 20 ppm (state) 9.0 ppm (state/federal)

Source: SCAQMD, 2007.
Notes: lbs/day = pounds per day; ppm = parts per million; ug/m3 = micrograms per cubic meter; ≥ greater than or equal to
a. Ambient air quality threshold for criteria pollutants based on SCAQMD Rule 1303, Table A-2 unless otherwise stated.
b. Ambient air quality threshold based on SCAQMD Rule 403.

Specific onsite emission thresholds have been developed for assessment of the LSTs. These thresholds are determined by Sensitive Receptor Areas (SRAs) within the SCAB. The main project area is located within SRA 7, although a very small portion of the south tip of the route may be in SRA 1 (East San Fernando Valley). The specific emission thresholds, based on the distance to sensitive receptors for SRA 7 are listed in Table 3.3-7.

Note that ozone is not included in Tables 3.3-5 through 3.3-7. Ozone is not directly emitted from stationary or mobile sources; rather it is formed as the result of chemical reactions in the atmosphere between directly emitted air pollutants, specifically oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). Therefore, it cannot be directly regulated.

Table 3.3-7. Applicable SCAQMD LST Emission Thresholds for SRA 7 (lbs/day)

Meters to Receptor	Pollutant			
	NOx	CO	PM10	PM2.5
25	126	389	4	3
50	127	573	13	4
100	148	1,086	26	8
200	191	2,088	54	18
500	300	6,813	136	68

Source: SCAQMD, 2007.

a. Values are for a 1 acre active site and are determined based on the minimum distance from the construction site to sensitive receptors.

For this analysis, the proposed project may result in significant impacts if:

- Criterion AQ-1:The proposed project would generate emissions of air pollutants that would exceed any SCAQMD, regional air quality standard as defined in Table 3.3-5.
- Criterion AQ-2: The proposed project would generate emissions of air pollutants that would exceed any SCAQMD localized significance threshold or toxic air contaminant threshold as defined in Tables 3.3-6 and 3.3-7.
- Criterion AQ-3: The project would contribute air emissions to the region, which would be cumulatively considerable.

As discussed in the Initial Study (see Appendix A.2), the proposed project would not conflict with or obstruct implementation of an applicable air quality plan, and odor emissions associated with the proposed project would be less than significant. Therefore, these issues are not discussed further in this EIR.

Project Impacts

Emissions Exceed Regional Thresholds (Criterion AQ-1)

Construction. Construction of the Upper Reach pipeline would result in short-term impacts to ambient air quality in the study area during construction. Temporary construction emissions would result from on-site construction, such as open trench and pipe jacking activities. Emissions would also result from off-site construction activities from construction related haul trips and construction worker commuting patterns. Pollutant emissions would vary from day to day depending on the level of activity, the specific construction activities, the location of the construction sites, and the prevailing weather.

Table 2-3 of the Project Description presents the project construction schedule per construction phase. As a worse-case scenario, assuming simultaneous construction of Phases UR1, UR2, and UR3 or UR1a, U2a, and UR3, or any combination thereof, peak daily air quality emissions assume concurrent overlap of three pipe jacking operations, three open trench operations, three tunneling operations, and three site restoration construction spreads. On-site heavy construction equipment would include machinery such as backhoes, forklifts, loaders, excavators, compactors, cranes, and welding trucks.

During construction of the proposed project (see Appendix E, Table E-3), it is estimated that a total of approximately 126 personnel would be employed during the peak construction period and would drive private vehicles to the project sites each workday, averaging approximately 30 miles per trip. Additionally, it is assumed that a total of 364 haul truck trips (heavy heavy-diesel vehicles) and 20 crew truck trips (SCAQMD delivery-sized vehicles) would be required to deliver construction equipment and materials to the project sites each workday. The daily haul truck trip estimate include: 144 trips to deliver materials such as grout, backfill, and

steel pipe; 12 trips for water trucks; 208 trips to haul excavated soil waste. For the purposes of this air quality analysis, it is assumed that the haul truck trips would average approximately 30 miles per trip. Crew trucks would average 20 miles per trip.

Table 3.3-8 presents the estimated total maximum (worst-case) mitigated daily construction emissions for the proposed project. Emission estimates assume the use of SCAQMD offroad and onroad 2009 emission factors, use of ultra-low sulfur fuel, and implementation of SCAQMD Rule 403 measures. Maximum daily construction emission calculations and assumptions are presented in Appendix E.

Table 3.3-8. Mitigated Maximum Daily Construction Emissions (lbs/day)

	CO	NO_x	VOC	SO_x	PM10	PM2.5
On-Site						
Construction Equipment (Offroad)	367.35	753.27	115.46	0.78	41.71	38.37
Fugitive Dust (Trenching and soil handling)	---	---	---	---	13.53	2.55
Off-site						
Worker Travel (Onroad)	36.61	3.80	3.75	0.04	0.33	0.20
Truck Deliveries (Onroad)	148.09	465.90	37.08	0.45	20.56	18.92
Paved Road Dust	---	---	---	---	314.62	74.99
Total Emissions	552.05	1,222.97	156.29	1.27	390.76	135.03
Emissions Thresholds	550	100	75	150	150	55

Source: Appendix E, Tables E-2, E-3, and E-4.

As shown in Table 3.3-8, daily construction emissions would not be significant for SO_x. However, with regard to CO, NO_x, VOC, PM10 and PM2.5, the proposed project would result in emissions that are greater than the SCAQMD's construction emissions thresholds. It should be noted that since the calculated worse-case CO emissions were found to be just over the SCAQMD threshold limit, it is possible CO would not exceed the 550 lbs/day SCAQMD threshold during actual construction; although, this depends on how conservative the worse-case scenario assumptions are when compared to actual construction operations. Similarly, it is possible that the conservative paved road dust calculation procedures used to determine the off-site emission potential may significantly overestimate the paved road dust emission potential and the actual daily PM10 and PM2.5 emissions may never exceed 150 and 55 lbs/day, respectively. However, no mitigation measure or change in calculation procedures, other than a drastic change in the construction schedule, could reduce the NO_x or VOC emissions below the SCAQMD significant emission threshold. Therefore, construction of the proposed project would result in significant air quality impacts.

Implementation of the Best Available Control Measures required under SCAQMD Rule 403 to reduce PM10 and PM2.5 in addition to the following mitigation measure would reduce impacts associated with construction of the proposed project to the extent feasible:

AQ-1 LADWP shall implement the following mitigation measures to reduce NO_x, PM10, and PM2.5 emissions from non-road construction vehicles during construction:

- Tier ~~1~~ 2 non-road diesel mobile construction equipment shall be used on-site. Prior to construction, the construction contractor shall provide LADWP a list of equipment over 50 hp and forecasted to be used for at least a month during construction, including model year, engine horsepower rating, and applicable tier designation.

- Tier 2 or newer diesel generators, or alternative-fueled (e.g., gaseous fuel) generators shall be considered as an alternative to diesel generators for use during the pipe jacking/tunnel operations.
- Construction equipment shall be maintained in tune per manufacturer's specifications. The construction contractor shall provide LADWP with maintenance records on a monthly basis for non-road diesel mobile construction equipment over 50 hp used for at least a week in any given month, including but not limited to records of engine tune-ups.
- Diesel engine idle time shall be restricted to no more than five minutes, except for construction equipment that needs to be maintained at idle to perform.

As shown in Table 3.3-8, implementation of Best Available Control Measures required under SCAQMD Rule 403 and Mitigation Measure AQ-1 would reduce construction related air quality impacts; however, due to the magnitude of the construction activities, the air pollutant emissions impacts for CO, NO_x, VOC, PM10, and PM2.5 would continue to be significant and unavoidable.

Operation. Once operational, the proposed project would not result in local emissions above those currently generated by the existing Upper Reach RSC pipeline system. Inspection and maintenance activities would be limited to periodic inspections of the isolation, air, and vacuum valves, as well as testing the isolation valves. These activities would result in periodic vehicle trips that would generate negligible emissions over the life of the project. Operation of the proposed project would not generate pollutants in excess of SCAQMD emission thresholds. Therefore, air quality impacts from operations of the proposed project would be less than significant and no mitigation measures would be required.

Emissions Exceed Localized Significance Criteria (Criterion AQ-2)

The construction route of the proposed project extends to within 25 meters or 82 feet of residences**,** as shown in the sensitive receiver figures provided in Appendix C (Phase 1: Figures 8-9, Phase 2: Figures 12-14, and Phase 3: Figures 18-23). Table 3.3-9 shows the maximum construction spread emissions for each project element (one spread only) in comparison with the appropriate worst-case SCAQMD significant emission thresholds for the nearest sensitive receptor (assuming minimum of 25 meters).

Table 3.3-9. Proposed Project Localized Construction Emissions

Activity	NOx	CO	PM10	PM2.5
Pipe Jacking/Tunneling Maximum Daily Emissions	84.84	37.99	4.34	3.89
Localized Significance Thresholds (SRA 7, 1-acre site, 25/50 meters)	126/127	389/573	4/13	3/4
Exceeds (YES/NO)	NO	NO	YES	YES
Trenching Maximum Daily Emissions	46.99	31.53	6.09	3.60
Localized Significance Thresholds (SRA 7, 1-acre site, 25/50 meters)	126/127	389/573	4/13	3/4
Exceeds (YES/NO)	NO	NO	YES	YES
Restoration Maximum Daily Emissions	34.42	14.96	2.02	1.75
Localized Significance Thresholds (SRA 7, 1-acre site, 25/50 meters)	126/127	389/573	4/13	3/4
Exceeds (YES/NO)	NO	NO	NO	NO

Source: Appendix E, Table E-5.
Notes: This represents onsite emissions only. Onroad vehicle emissions to and from the construction sites are not included.

As shown in Table 3.3-9 select construction activities are predicted to cause daily construction site emissions that exceed PM10 and PM2.5 LST thresholds. No construction activities are predicted to exceed the NO_x or CO LST thresholds. The construction activities that are predicted to cause emissions greater than the appropriate PM10 and PM2.5 LSTs include pipe jacking, tunneling, and trenching, and only occur where sensitive receptors are very close to the work areas (within 25 meters or 82 feet). Due to the predicted LST exceedances, the proposed

project would cause significant and unavoidable localized PM10 and PM2.5 impacts for nearby sensitive receptors located along the proposed route.

The emission estimates, per SCAQMD's LST methodology, are limited to the onsite emission sources only. They do not include the paved or unpaved road travel needed to get personnel and materials to the construction sites or the emissions from access road construction, which do not occur at a single site but rather over a long stretch of road. Fugitive dust mitigation measures are assumed to be implemented in these emission estimates.

The proposed project does not include any stationary sources or have any significant sources of toxic air contaminants. The proposed project would use diesel and gasoline fueled equipment that would emit minor amounts of air toxic compounds; however, the project's diesel particulate emissions and other engine emission toxic air contaminants would be emitted in small quantities over a large project area. The health risk from toxic air contaminants would be less than significant.

As shown in Table 3.3-9, implementation of Best Available Control Measures required under SCAQMD Rule 403 and Mitigation Measure AQ-1, listed above, would reduce impacts to air quality during construction to the maximum degree feasible but would not eliminate all potentially significant impacts. The proposed project's PM10 and PM2.5 emissions, even after implementation of these feasible mitigation measures, would remain above the SCAQMD LST significance threshold values for selected construction activities and locations. Therefore, the daily emissions from the proposed project would temporarily cause significant and unavoidable impacts to sensitive receptors.

3.3.5 Level of Significance After Mitigation

As shown in Tables 3.3-8 and 3.3-9, implementation of Best Available Control Measures required under SCAQMD Rule 403 and Mitigation Measure AQ-1 would reduce construction-related air quality impacts; however, due to the magnitude of the construction activities the air pollutant emissions would continue to be significant and unavoidable. Specifically, CO, NO_x, VOC, PM10, and PM2.5 construction emissions would continue to exceed the SCAQMD regional thresholds and PM10 and PM2.5 would continue to exceed the SCAQMD LST significance threshold values.

3.3.6 Cumulative Impacts

Air Emissions that are Cumulatively Considerable (Criterion AQ-3)

Operation of the proposed project would result in periodic vehicle trips associated with inspection and maintenance activities that would generate negligible emissions over the life of the project. Therefore, the focus of this cumulative impact discussion is based on short-term construction impacts. The majority of construction for the proposed project is scheduled to occur over a 48-month period (4 years), and is tentatively scheduled from November 2008 to October 2012. Other construction projects identified within the SCAB and within approximately 2.5 miles of the proposed project corridor include various land development (e.g., mixed uses, office buildings, residential, etc.), transportation infrastructure (e.g., street improvements, traffic signals, etc.), utility infrastructure (e.g., Lower Reach RSC Project), and other redevelopment projects (see Section 2.8, Cumulative Projects).

Emissions from these projects would only have the potential to cause cumulatively significant impacts if they were constructed concurrently with the Upper Reach pipeline. Several of the cumulative projects identified in

Section 2.8 would be constructed at least partly during the construction period of the proposed project. In addition, it is anticipated that the majority of the projects would involve some level of ground disturbance, such as grading and trenching, that would result in at least moderate levels of diesel exhaust emissions and fugitive dust. Therefore, the cumulative projects identified in Section 2.8 could further increase the projected short-term significant air quality impacts identified for the proposed project if they were constructed at the same time. Cumulative impacts are considered to be significant and unavoidable.

Global Climate Change

Background. Global climate change refers to variances in Earth's meteorological conditions, which are measured by wind patterns, storms, precipitation, and temperature. The term climate change is often used interchangeably with the term global warming, but according to the National Academy of Sciences, "the phrase 'climate change' is growing in preferred use to 'global warming' because it helps convey that there are [other] changes in addition to rising temperatures." Climate change is any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). Climate change may result from:

- Natural factors, such as changes in the sun's intensity or slow changes in the Earth's orbit around the sun;
- Natural processes within the climate system (e.g., Changes in ocean circulation); or
- Human activities that change the atmosphere's composition (e.g., through burning fossil fuels) and the land surface (e.g., deforestation, reforestation, urbanization, desertification, etc.).

Global warming is an average increase in the temperature of the atmosphere near the Earth's surface and in the troposphere, which can contribute to changes in global climate patterns. Global warming can occur from a variety of causes, both natural and human induced. In common usage, "global warming" often refers to the warming that can occur as a result of increased emissions of greenhouse gases from human activities.

On September 27, 2006, Assembly Bill (AB) 32, the California Global Warming Solutions Act of 2006, was enacted by the State of California. The legislature stated that "global warming poses a serious threat to the economic well-being, public health, natural resources, and the environment of California." AB 32 caps California's greenhouse gas (GHG) emissions at 1990 levels by 2020. AB 32 defines GHG emissions as all of the following gases: carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons, perfluorocarbons and sulfur hexaflouride. This bill represents the first enforceable Statewide program in the United States to cap all GHG emissions from major industries. While acknowledging that national and international actions will be necessary to fully address the issue of global warming, AB 32 lays out a program to inventory and reduce GHG emissions in California and from power generation facilities located outside the State that serve California residents and businesses.

CARB has been tasked to establish a "scoping" plan by January 1, 2009 for achieving reductions in GHG emissions, and regulations by January 1, 2011 for reducing GHG emissions to achieve the emissions cap by 2020, which rules would take effect no later than 2012. In designing emission reduction measures, CARB must aim to minimize costs, maximize benefits, improve and modernize California's energy infrastructure, maintain electric system reliability, maximize additional environmental and economic benefits for California, and complement the State's ongoing efforts to improve air quality. AB 32 also directs CARB to "recommend a de minimis threshold of greenhouse gas emissions below which emissions reduction requirements will not apply"

by January 1, 2009 (HSC §38561[e]). CARB has suggested a 25,000 metric ton emissions level as a possible de minimis threshold.

California Senate Bill (SB) 97, passed in August 2007, is designed to work in conjunction with the CEQA and AB 32. CEQA requires the State Office of Planning and Research (OPR) to prepare and develop guidelines for the implementation of CEQA by public agencies. SB 97 requires OPR by July 1, 2009 to prepare, develop, and transmit to the State Resources Agency its proposed guidelines for the feasible mitigation of GHG emissions, as required by CEQA, including, but not limited to, effects associated with transportation or energy consumption. The Resources Agency is required to certify and adopt the guidelines by January 1, 2010, and OPR is required to periodically update the guidelines to incorporate new information or criteria established by the CARB pursuant to AB 32. SB 97 would apply to any proposed or draft environmental impact report, negative declaration, mitigated negative declaration, or other document prepared under CEQA that has not been certified or adopted by the CEQA lead agency as of the effective date of the new guidelines.

In addition to the State regulations, the City of Los Angeles has issued guidance promoting green building to reduce GHG emissions. The goal of the Green LA Action Plan (Plan) is to reduce greenhouse gas emissions 35 percent below 1990 levels by 2030 (City of Los Angeles, 2007). The Plan identifies objectives and actions designed to make the City a leader in confronting global climate change. The measures would reduce emissions directly from municipal facilities and operations, and create a framework to address City-wide GHG emissions. The Plan lists various focus areas in which to implement GHG reduction strategies. Focus areas listed in the Plan include energy, water, transportation, land use, waste, port, airport, and ensuring that changes to the local climate are incorporated into planning and building decisions.

LADWP has modified its generation resource mix and undertaken numerous programs to reduce greenhouse gas emissions since 1990. In 1995, LADWP signed a Climate Challenge Participation Accord with the U.S. Department of Energy, voluntarily committing to reduce CO_2 emissions from electricity generation to keep LADWP's average annual CO_2 emissions from 1991 to 2000 below its 1990 baseline. In 2000, LADWP's Integrated Resource Plan set a new goal to reduce greenhouse gas emissions by at least 5 percent below 1990 levels by 2012. Due to these efforts, LADWP's 2006 CO_2 emissions were 7 percent lower that its 1990 emissions, while total electricity generation (MWh) grew 14 percent over the same period. In 2002, LADWP became a Charter Member of the California Climate Action Registry, and has reported its 2000-2006 entity-wide greenhouse gas emissions to the Registry. Currently, LADWP is aggressively pursuing a Renewable Portfolio Standard goal of meeting 20 percent of its customer's energy needs with renewable generation by 2010, with a longer term goal of 35 percent renewable energy by 2020. In addition, LADWP has implemented a number of programs with emission reduction benefits, including water conservation, customer energy efficiency and demand side management, solar power, building energy efficiency retrofits, recycling, operating electric and fuel-efficient vehicles, and tree planting (urban forestry).

GHG Project Impacts. As previously discussed, OPR has been tasked with developing CEQA global warming significance thresholds. OPR has indicated that many significant questions must be answered before a consistent, effective, and workable process for completing global warming analyses can be created for use in CEQA documents. OPR has also indicated that there may not be sufficient amount of information or research available to develop significance thresholds. In the absence of project-specific significance thresholds established by any State or local air quality management agency, the analysis of potential impacts should focus on regional emissions and compliance with plans aimed at reducing GHG emissions.

For the proposed project a small amount of GHG emissions, as compared to statewide totals, would be emitted temporarily during the project's construction activities, which would occur between November 2008 and October 2012. To reduce GHG emissions during construction, as part of the proposed project LADWP would use Tier 1 mobile construction equipment (MM AQ-1), minimize engine idling time (MM AQ-1), reduce the vehicle miles traveled by having workers meet at predetermined staging areas and proceeding to construction sites in work crews (Section 2.5.1), and use alternative fuels (i.e., propane, use of electrical grid for stationary motors) where available and feasible for construction equipment and on-site generators (Section 2.5.5). Once operational, GHG emissions related to the proposed project would be negligible. Therefore, the proposed project would result in less-than-significant impacts to global climate change.

3.4 Recreation

3.4.1 Introduction

This section describes the impacts to recreation and recreational resources associated with the construction and operation of the proposed project. The EIR considers existing and proposed recreational resources, such as recreational facilities (parks, open space, playgrounds, play fields, etc.), recreational activities (bicycling, hiking, etc.), and recreationists.

The extent of the area to be analyzed for recreation impacts is considered the Recreation Study Area. While other issue areas in this EIR may identify a Study Area with a different radius, the Recreation Study Area has been defined by the following:

- Recreation uses immediately adjacent to the proposed project;
- Recreation uses located near the construction equipment/materials transportation routes; and
- Recreation uses affected by proposed project construction and operation activities.

3.4.2 Regulatory Setting

The discussion below presents the regulatory setting for the proposed project to assist LADWP in determining the proposed project's consistency with applicable plans, policies, and regulations. Federal, State, and local agency resources were researched to identify applicable recreation goals and policies. This discussion focuses on local agency plans; there are no applicable federal or State regulations that affect the Recreation Study Area.

The proposed project would cross lands within the City of Los Angeles and the City of Burbank. The following discussion summarizes the local plans and policies taken into consideration for the proposed project[2].

City of Burbank General Plan

The Draft General Plan Land Use Element (April 24, 2006) and the Draft Bicycle Plan (April 24, 2006) were reviewed to identify applicable recreation policies. Two goals and five policies in the Land Use Element addressed recreation. However, none of these goals/policies were applicable to the proposed project. The goals and policies of the Draft Bicycle Plan have not received final approval by the City of Burbank, and are subject to change.

Draft Bicycle Plan, April 24, 2006

Policy Action 3.2

Coordinate roadway improvements to provide reasonable alternate routes if necessary and minimize disruption for cyclists. This includes maintaining bikeway access through construction zones or providing bikeway detours.

[2] The following plans were also reviewed, but these plans did not include recreation policies that applied to the proposed project: City of Burbank Pedestrian Master Plan; City of Burbank Media District Specific Plan; City of Los Angeles General Plans - Sherman Oaks-Studio City-Toluca Lake- Cahuenga Pass Community Plan and Hollywood Community Plan.

Top Priority Projects – Project 5: The Los Angeles River Bikeway

This is a proposed route that would follow the Los Angeles River, and traverse the cities of Los Angeles and Burbank. The proposed bikeway would be 2.1 miles in length, most of which would be within Los Angeles city limits. The portion within Burbank would be located from Bob Hope Drive to Riverside Drive. The bikeway would intersect the proposed Project at the southeast corner of Johnny Carson Park.

City of Los Angeles General Plan

The City of Los Angeles General Plan consists of seven State mandated elements and several optional elements. The Land Use element was addressed at a community planning level and was divided into 35 Community Planning Areas. These Community Plans are the official guide to the future development within the City. The Upper Reach project occurs in the North Hollywood – Valley Village Plan Area. All applicable policies are listed below.

North Hollywood - Valley Village Plan

Parks and Recreation – Criteria and Features

- At times, it may be necessary for portions of recreational sites to be used for public right-of-way and easements.
- The Plan proposes utilization of flood control and power line right-of-ways for open space and purposes and/or hiking and bicycle trails, where appropriate.

Los Angeles River Revitalization Plan

Applicable Goals and Objectives

- Provide a safe environment and a variety of recreational opportunities along the river.
- Ensure safe access to and compatibility between the river and other activity centers.
- Provide a network of continuous multi-use trails.
- Ensure access and compatibility between the river and other activity centers.
- Provide for a variety of active and passive recreation opportunities.
- Ensure public safety and security along the river.

Reach 5: San Fernando Valley- Recommendations Based on Master Plan Goals

- Expand and improve existing recreational facilities in the Sepulveda Basin.
- Provide access to the river via existing public facilities.
- Establish a bicycle trail connecting the Sepulveda Basin with Griffith Park.
- Explore the potential for recreation-related economic improvements at several sites.
- Develop the spreading grounds at Forest Lawn into a multi-purpose park and interpretive site.

3.4.3 Environmental Setting

The proposed project would traverse the City of Los Angeles and the City of Burbank (see Figure 2-1). Along the proposed 5.98-pipeline route, there are several recreational resources consisting of parks, open space, an equestrian trail, as well as schools with playfields. Table 3.4-1 includes all of the parks or recreation areas within 2.7 miles of the proposed alignment. In addition to the park and recreation areas, ~~two~~three elementary schools,

two of which have ~~with~~ playfields that abut the proposed route, have been included in ~~the t~~Table 3.4-1. As public facilities, schools are often used as a recreation resource for neighboring communities. These resources comprise the Recreation Study Area of the proposed project.

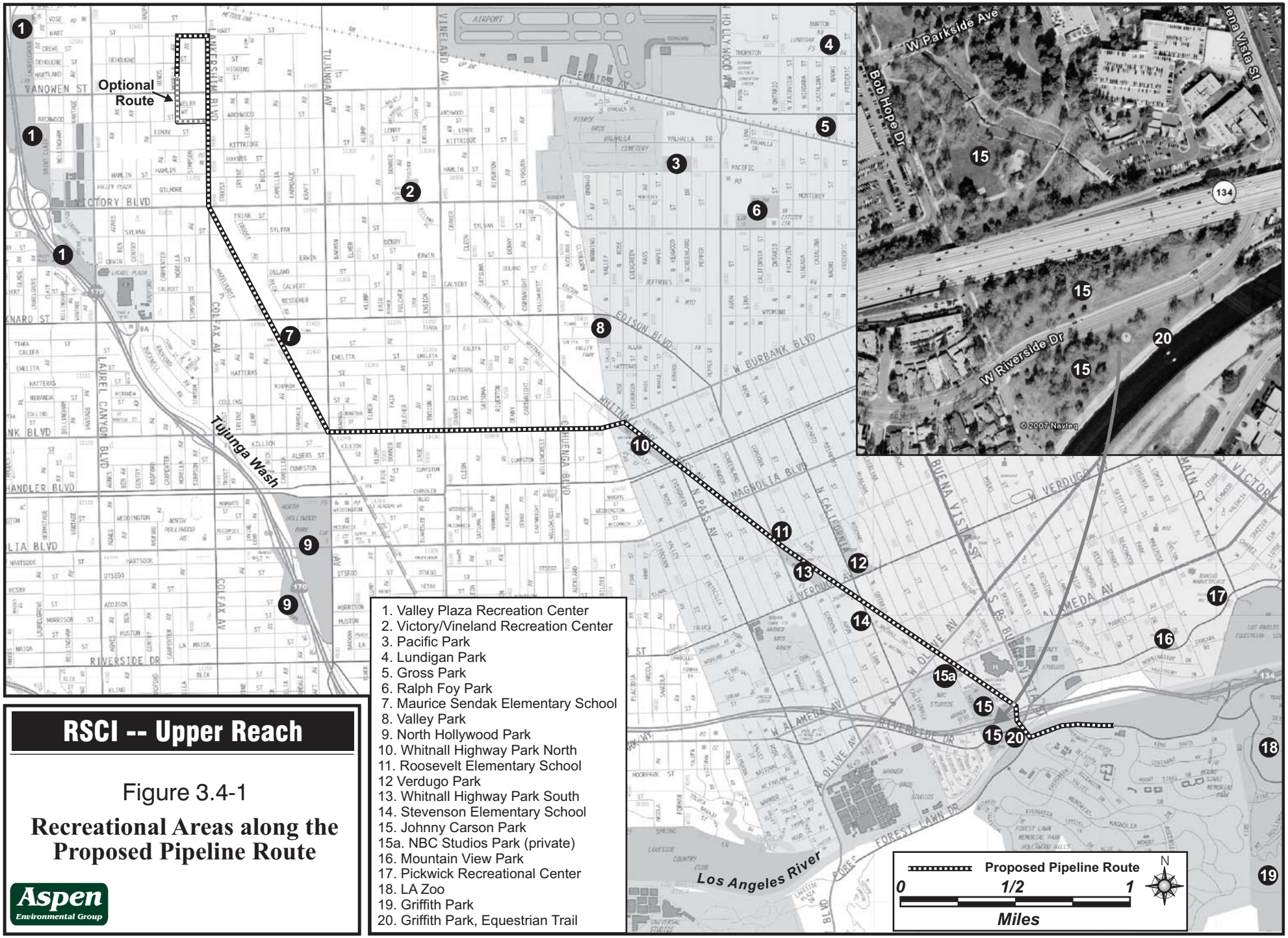
Table 3.4-1. Recreational Areas within the Study Area

Recreational Resource Area (Figure 3.4-1 ID #)	Proximity to Project Alignment
Valley Plaza Recreation Center (1)	0.7 miles to the west
Victory/Vineland Recreation Center (2)	0.9 miles to the east
Pacific Park (3)	2 miles to the east
Lundigan Park (4)	2.7 miles to the east
Gross Park (5)	2.6 miles to the east
Ralph Foy Park (6)	2.3 miles to the east
Maurice Sendak Elementary School (7)	Abuts east side of project route
Valley park (8)	1.4 miles to the east
North Hollywood Park (9)	0.3 miles to the south
Whitnall Highway Park North (10)	Project will tunnel under park
Roosevelt Elementary School (11)	0.5 miles to the east
Verdugo Park (12)	0.2 miles to the east
Whitnall Highway Park South (13)	Project will tunnel under park
Stevenson Elementary School (14)	Abuts west side of project route
Johnny Carson Park (15)	Abuts route; staging area
Mountain View Park (16)	0.7 miles to the east
Pickwick recreational Center (17)	1 miles to the east
Los Angeles Zoo (18)	1.7 miles to the east
Griffith Park, main park (19)	1.6 miles to the southeast
Griffith Park, Equestrian Trail leading to Swinging Bridge(20)	Project will jack/tunnel under trail

Note: The numbers next to each of the recreation areas correlate to the numbers on Figure 3.4-1.

Those recreational areas directly crossed or immediately adjacent to the proposed project route are described below:

- **Griffith Park (4730 Crystal Springs Drive, Los Angeles).** Griffith Park is the largest municipal park with urban wilderness area in the United States with 4,210 acres (LADPR 2007a). The proposed project route would be located under a hiking/horse trail (described below) that runs along the northern edge of the Los Angeles River where it would then travel through the Headworks Spreading Grounds and where it would be located within Forest Lawn Drive along which runs the Griffith Park North Bike Route. This area is located in the northwest corner of Griffith Park, which is managed by the City of Los Angeles Department of Parks and Recreation (LADPRb).
- **Equestrian Trail leading to Swinging Bridge (within Griffith Park).** As mentioned above, an equestrian trail runs along the northern portion of the Los Angeles River just south of the lower section of Johnny Carson Park. This trail is a Los Angeles County and Army Corps of Engineers flood control easement that is managed by LADPR within Griffith Park (LADPR 2007b). This easement runs along the northern portion of the Los Angeles River where it meets the Circle K Stables and crosses the river by way of the Swinging Bridge to the Pollywog Equestrian Area. This trail within the project area consists of a soft earthen path with a wooden post fence running along the north and a chain link fence along the south separating the trail from the river. No other equestrian amenities were observed along the trail in the project area. The proposed project would require jacking/tunneling under this trail as well as the Los Angeles River.
- **NBC Studios Park (Private).** A small private park or open space is located on the southwest corner of Alameda Avenue and Bob Hope Drive. Based on a site visit, the park includes park benches (about three), landscaped area, and a short walking pedestrian path. There is also a transmission tower within the park area.



RSCI -- Upper Reach

Figure 3.4-1

Recreational Areas along the Proposed Pipeline Route

Aspen Environmental Group

1. Valley Plaza Recreation Center
2. Victory/Vineland Recreation Center
3. Pacific Park
4. Lundigan Park
5. Gross Park
6. Ralph Foy Park
7. Maurice Sendak Elementary School
8. Valley Park
9. North Hollywood Park
10. Whitnall Highway Park North
11. Roosevelt Elementary School
12 Verdugo Park
13. Whitnall Highway Park South
14. Stevenson Elementary School
15. Johnny Carson Park
15a. NBC Studios Park (private)
16. Mountain View Park
17. Pickwick Recreational Center
18. LA Zoo
19. Griffith Park
20. Griffith Park, Equestrian Trail

A rod-iron fence completely encloses the park and "No Trespassing" signs are posted on the locked entry gates. NBC Studios sits directly east and south of this private park. According to signs posted at the park, the property is owned and camera-monitored by NBC Studios.

- **Johnny Carson Park (400 South Bob Hope Drive, Burbank).** The Johnny Carson Park is a 20-acre park that consists of land north and south of Highway 134 bounded by Bob Hope Drive to the west, West Parkside Avenue to the north, Providence St. Joseph Medical Center to the east, and the Los Angeles River to the south. Highway 134 and Riverside Drive run through the park (east to west), thereby dividing it into three separate land areas. The main portion of the park is the larger northern-most section, located immediately north of Highway 134. This area of Johnny Carson Park is approximately 11.5 acres and includes a playground, exercise circuit training path, restrooms, outdoor stage, multiple park benches (4) and picnic tables (20), and a stream-like drainage channel with two bridge crossings. In addition to these recreational amenities, the park includes large Sycamores and non-native park trees, of which those occurring under the transmission line are routinely trimmed. This area of the park receives approximately 50,000 annual visitors and typically, hosts one large event per month from March through November, with attendance ranging from 1,000 to 5,000 people. According to the City of Burbank Parks, Recreation and Community Services Department, specific events include car shows in April, June, September, and October; The St. Francis Xavier Church picnic in April; the Providence High School picnic in May; the Burbank Burroughs High School Alumni picnic in June; and the City-sponsored Red Ribbon Day in October. Providence High School uses the park throughout the school year for their track team and a variety of organized school events. In addition, this area hosts smaller events (150 to 300 people) on a weekly basis, including dog shows, picnics, and church events. All events typically occur in the main event area, near the outdoor stage and restrooms.

  Riverside Drive bisects (west to east) the remaining portion of the park located south of Highway 134 (see Figure 3.4-1). These two park areas were once differentiated as Buena Vista Park (south of Riverside Drive) and Johnny Carson Park (north of Riverside Drive); however, they are now considered one entity, Johnny Carson Park. The section of the park located north of Riverside Drive and immediately south of Highway 134 is approximately five acres and consists of a large grassy area with many large Sycamores, non-native park trees, and an electric transmission tower at the east end. Two park benches were observed during a November site visit; otherwise no other amenities occur on site.

  The section of Johnny Carson Park located south of Riverside Drive is approximately 3.75 acres and is bordered to the south by an equestrian trail (described separately above) and the Los Angeles River, which has been channelized into a concrete box channel. This southern-most section of the park also contains numerous large Sycamores and non-native park trees as well as two park benches and one picnic table. The two benches are located in the center of the park on a circular concrete slab and are set on opposite sides of a park monument.

- **Whitnall Highway Park North/South (2302 North Whitnall Highway/610 North Whitnall Highway, Burbank).** The Whitnall Highway Parks (North and South) are electric utility easements that have been developed into community parks. The North Whitnall Highway Park is bordered by West Burbank Boulevard to the north and West Chandler Boulevard to the south. This park is approximately 4.5 acres and is comprised of grass and small non-native park trees. No recreational amenities occur on site.

  South Whitnall Highway Park is located north of West Verdugo Avenue and south of West Clark Avenue. This park is approximately 4.5 acres and includes a large grassy areas surrounded by walking paths to the south and a circuit training equipment path to the north. One (1) park bench and five (5) picnic tables are scattered around the circuit training path. This park has been integrated into the surrounding community, which includes apartment and condominium complexes along both sides. Combined, both parks receive approximately 15,000 to 20,000 annual visitors, with the majority visiting South Whitnall Highway Park. The proposed project would be located under these parks by way of tunneling.

- **Maurice Sendak Elementary School (11414 West Tiara Street, North Hollywood).** The Maurice Sendack Elementary School is an elementary school within the Los Angeles Unified School District serving kindergarten through grade five with 875 two-semester seats. The elementary school includes an outdoor

playfield. The proposed Upper Reach project would run along Lankershim Boulevard (via jacking), which abuts the back of the Maurice Sendak school property, which is currently undeveloped play fields.

- **Robert Louis Stevenson Elementary School of the Arts (3333 W Oak Street, Burbank).** The R. L. Stevenson Elementary School is an elementary school within the Burbank Unified School District serving kindergarten through grade five and includes an outdoor playfield. The proposed Upper Reach pipeline route would run along Whitnall Highway (by way of tunneling), which abuts the east side of the R. L. Stevenson school property. Uses on this site include the school parking lot and a small portion of the playfield.

3.4.4 Impacts and Mitigation Measures

Methodology

The proposed project or activities associated with its implementation could be considered incompatible with existing recreational resources if they create noise, visual impacts, or other environmental impacts that disturb or preclude use of existing recreational facilities. This section evaluates the consistency of the proposed project with applicable recreation plans and policies, and considers the impact the proposed project may have on existing and proposed recreational resources. The assessment includes an evaluation of recreational resources identified during site reconnaissance in February and November 2007and an analysis of the consistency of the proposed project with federal, State, and local plans and policies

Criteria for Determining Significance

Impacts to recreation would be significant if:

- Criterion REC-1: The proposed project would conflict with Federal, State, and/or local plans and recreation policies.
- Criterion REC-2: The proposed project would directly and/or indirectly disrupt access to or activities within established recreational areas.
- Criterion REC-3: The proposed project would result in cumulatively considerable recreational impacts.

As discussed in the Initial Study (see Appendix A.2), the proposed project would not include recreational facilities or require the construction or expansion of recreational facilities that could have an adverse physical effect on the environment. Therefore, these potential impacts associated with the proposed project would be less than significant, and are not discussed further in this EIR.

Project Impacts

Conflict with Federal, State, and/or Local Plans and Policies (Criterion REC-1)

There are no Federal or State plans or policies applicable to the proposed project. As discussed in Section 3.4.2, the proposed project extends within the jurisdictions of the City of Burbank and the City of Los Angeles. A review of the applicable regulatory documents within these jurisdictions was conducted and the goals, objectives, and policies (as described in Section 3.4.2) relevant to recreation were reviewed. As presented in Table 3.4-2, the project would be consistent with policies that address recreation in the Cities of Burbank and Los Angeles.

Disrupt Access to or Activities within Established Recreational Areas. (Criterion REC-2)

As shown on Figure 3.4-1, the proposed project alignment would be under or near eight recreational areas including the Whitnall Highway Park North, Whitnall Highway Park South, both elementary schools (Maurice Sendak and Stevenson), and the northern and southern portions of Johnny Carson Park. With the exception of

Johnny Carson Park, these parks would not be ~~physically~~ significantly impacted by the presence of the proposed pipeline (Table 3.4-1) because the pipeline would be constructed from staging areas outside of the Whitnall Highway parks (see Figure 2-1 for shaft locations) or near (not in) the other parks and playfields, and only a temporary construction shaft would be placed south of Whitnall Highway North Park. This potential construction shaft would be an approximately 48-inch (four-feet) to 60-inch (five-feet) diameter shaft protected by an approximately 15-foot by 15-foot k-rail (concrete temporary barrier), fencing, and screening. The construction shaft would be placed within the utility ROW.

~~However, d~~During project construction, approximately ~~15,000 square feet~~ five acres of Johnny Carson Park (the area south of Highway 134 and north of Riverside Drive) would be used as a staging area for construction activities including the storage of equipment such as machinery and pipe. In addition, this area would be used for field offices, general work, material storage and handling, as well as the location of a tunneling shaft (approximately 15,000 square-feet of surface area). This middle section of Johnny Carson Park would remain closed for the entire duration of construction activities, currently expected to be approximately three years. During this time, the entire ~~15,000 square foot~~ five-acre area of the park would be fenced off and no public uses would be allowed. ~~No other recreational areas would be impacted by construction of the project.~~

Table 3.4-2. Consistency with Applicable Recreation Plans and Policies

Agency	Plan/Policy	Consistency	Explanation
City of Burbank	Draft Bicycle Plan, April 24, 2006		
	Policy 3.2 Coordinate roadway improvements	Yes	The proposed project includes Mitigation Measure T-15 that provides for notification of bikeway closures. The project is consistent with this policy.
	Top Priority Projects Project 5: Los Angeles River Bikeway	Yes	Once construction has been completed, the pipeline would be underground and would not impact the City's plan to build a bikeway along the Los Angeles River. Therefore, the proposed project is consistent with this policy.
City of Los Angeles	General Plan		
	North Hollywood – Valley Village Plan	Yes	The proposed project is consistent with this policy. The project would temporarily use Johnny Carson Park as a staging area. Although this park is within the City of Burbank, the portion of the park that will be used for the Upper Reach project is owned by the City of Los Angeles.
	Los Angeles River Revitalization Plan		
	Goals and Objectives	Yes	The proposed project would not impact the proposed improvements to the Los Angeles River. The pipeline will be tunneled under the river. The proposed project is consistent with this plan.
	Reach 5: San Fernando Valley Recommendations	Yes	The proposed project would not impact the proposed improvements to the Los Angeles River. The pipeline will be tunneled under the river. The proposed project is consistent with the Revitalization Plan recommendations.

Of the three areas comprising Johnny Carson Park, the middle section (north of Riverside Drive and south of highway 134) appears to be the least used, as noted during repeated site visits by Aspen Environmental Group (December 2006, February, November, and December 2007). The northern-most section (north of highway 134) was heavily utilized with over 10 different groups of people (ranging from 1 to 4 individuals) observed in the park during the November 2007 site visit. Activities included walking, jogging, stationary exercise, and dog walking. In December 2007, five women were noted utilizing the southern-most section for a Tai Chi class as well as a few individuals walking along the river and the horse trail. No individuals were observed north of Riverside Drive in the middle section of the park during any of the site visits.

The amenities and size of the northern portion of the park can adequately accommodate any uses that would take place south of Highway 134. However, the northern and the southern sections of the park offer different amenities. The southern parks appear to be calmer, most likely due to the limited amenities on site as well as the abundance and variety of amenities available at the northern park, which is less than a five-minute walk. Although many individuals chose the northern park for their recreational needs, others may prefer the calm, quiet nature of the southern parks. For this reason, not all park users will find the northern section as a suitable alternative. Mitigation Measure R-1 is recommended to reduce impacts associated with the temporary closure of the middle section of Johnny Carson Park, however the level and duration of the park closure results in a significant, unavoidable impact.

Directly or indirectly disrupt activities in recreational areas. Construction noise, traffic, or undesirable visual features and other factors could reduce the recreational value of the park/open space and reduce visitation to recreational facilities. These impacts may occur in recreational areas that remain open during construction and are located directly or immediately adjacent to the proposed project route. For example, both the level of noise and activity occurring in the middle Johnny Carson Park may temporarily disturb horses and riders utilizing the equestrian trail south of the lower portion of the park. Similarly, recreationists utilizing the lower section of Johnny Carson Park may also be disturbed by activities occurring in and around the middle portion of the park. The sensitivity of the recreational users and the close proximity to the open recreational areas in Johnny Carson Park would result in a significant impact. The underground tunneling planned for the Whitnall Highway corridor may result in noise and vibration where the route crosses under recreational uses, such as Whitnall Highway Park North and South. No impacts would occur to recreational uses in Whitnall Highway Park South which is surrounded by heavily urbanized development and consists primarily of limited recreational uses. Similarly, due to the limited public use of Whitnall Highway Park North no impacts would occur.

During the proposed tunneling, intermittent ventilation shafts would be necessary for tunnel safety and to provide emergency ingress/egress shafts. These ventilation shafts are necessary along the Whitnall Highway (City of Burbank) because the tunneling in this area would exceed 11,000 feet in length. ~~While the location and size of these ventilation shafts has not been determined, t~~There is the potential that one or more ventilation shafts would be necessary on or near the parks along the Whitnall Highway. The shafts would be placed in areas shielded from public view and would not be expected to disrupt recreational activities on the Whitnall Highway. In addition, the advance notification proposed under Mitigation Measure N-1, would further limit any construction impacts to recreational uses <u>by informing residents of the proposed location and duration of construction activities so that they can plan their use of park facilities.</u>

As noted in Section 2.4.2.4, permanent above ground structures would be necessary to support the underground pipeline maintenance (see Figure 2-2). Air-vacuum valves would be placed every 1,200 to 2,600 feet along the pipeline route. Construction of the air-vacuum valves would be short-term in nature and would not limit recreational uses. While the air-vacuum valves would generate noise when the line is filled or drained, the noise associated with the valves would be infrequent and would not significantly impact recreation areas along the pipeline route.

Physical degradation of existing recreational areas. In addition to impacts associated with the loss of recreational uses, the recreation facility itself may incur impacts associated with the ongoing closure. Currently the middle section of Johnny Carson Park is scheduled to be used as a staging area to include field offices, material storage and handling, as well as the work area and shaft location for tunneling and jacking. This activity

coupled with the duration (approximately three years) may result in the degradation of the park facilities, including the extensive grass area and large park trees (Sycamores and non-native trees). Mitigation Measures R-1, and N-1 and BIO-3 (from Initial Study, Appendix A.2) would reduce impacts associated with the physical degradation of recreation areas to less than significant.

R-1 No less than 60 days prior to construction, LADWP shall coordinate construction activities and the project construction schedule with the City of Burbank, Department of Parks and Recreation and City of Los Angeles, Department of Parks and Recreation regarding the use of a portion of Johnny Carson Park as a construction staging area. This coordination shall include consideration of heavy recreational use periods, including major holidays, in construction scheduling, and providing construction notification at park facilities and offices. The notice shall also identify alternate park facilities. In addition, coordination shall include discussion of the schedule and planning for restoration of the affected park area (vegetation and infrastructure including irrigation systems and park amenities) after construction.

3.4.5 Level of Significance After Mitigation

Implementation of Mitigation Measures R-1, N-1, and BIO-3 would reduce construction-related recreational impacts; however, due to the magnitude and duration of the impacts associated with construction activities in Johnny Carson Park, impacts to recreation would remain significant and unavoidable. Impacts associated with construction of air valves in the Whitnall Highway corridor would be short-term in nature, would not limit the recreational uses in the parks, and the advance notification proposed under Mitigation Measure N-1 would further limit any construction impacts to the recreational uses along the proposed pipeline route to a less-than-significant level.

3.4.6 Cumulative Impacts

Result in Cumulatively Considerable Recreational Impacts (Criterion REC-3)

Operation of the proposed project would result in periodic inspection and maintenance activities. As these occurrences would be periodic and not ongoing, the project would not impact recreation resources during operation. Therefore, this discussion focuses on short-term construction impacts.

The proposed project would directly impact Johnny Carson Park during construction and would increase noise, traffic, and visual features that could impact other parks or open space areas along the route. Other construction projects that would be within approximately 2.5 miles of the proposed project corridor include various land development (e.g., mixed uses, office buildings, residential, etc.), transportation infrastructure (e.g., freeway widening, on-ramp construction, etc.), utility infrastructure (e.g., wastewater facilities [Integrated Resources Plan], Lower Reach RSC Project, etc.), and other redevelopment projects (see Section 2.8, Cumulative Projects). Cumulative projects could further increase potentially significant recreation impacts associated with construction of the proposed project. Mitigation measures identified for the proposed project (R-1, N-1, and BIO-3) would reduce the project impacts to recreation; however, recreation impacts would remain significant. Project impacts could combine with the impacts from other (cumulative) projects constructed during the same time frame. Therefore, cumulative recreation impacts would be significant and unavoidable.

3.5 Geology and Hydrogeology

3.5.1 Introduction

The Initial Study (Appendix A) included a discussion of Geology and Soils for the proposed project. The Initial Study concluded that these issues would be less than significant with mitigation. Comments on the Initial Study requested additional detail regarding the project's impact on geology and hydrogeology. In response to these comments, this section addresses the environmental setting and impacts related to the construction and operation of the proposed project involving the issues of geology and hydrogeology.

3.5.2 Regulatory Setting

Federal

Uniform Building Code

Published by the International Conference of Building Officials, the Uniform Building Code (UBC) provides complete regulations covering all major aspects of building design and construction relating to fire and life safety and structural safety. This is the code adopted by most western states. The provisions of the 1997 Uniform Building Code, Volume 1, contain the administrative, fire and life-safety, and field inspection provisions, including all nonstructural provisions and those structural provisions necessary for field inspections. Volume 2 contains provisions for structural engineering design, including those design provisions formerly in the UBC Standards. Volume 3 contains the remaining material, testing and installation standards previously published in the UBC Standards.

State

Alquist-Priolo Earthquake Fault Zoning Act of 1972

The Alquist-Priolo Earthquake Fault Zoning Act of 1972 (formerly the Special Studies Zoning Act) regulates development and construction of buildings intended for human occupancy to avoid the hazard of surface fault rupture. While this act does not specifically regulate underground pipelines, it does help define areas where fault rupture is most likely to occur. This Act groups faults into categories of active, potentially active, and inactive. Historic and Holocene age faults are considered active, Late Quaternary and Quaternary age faults are considered potentially active, and pre-Quaternary age faults are considered inactive. These classifications are qualified by the conditions that a fault must be shown to be "sufficiently active" and "well defined" by detailed site-specific geologic explorations in order to determine whether building setbacks should be established.

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act (the Act) of 1990 (Public Resources Code, Chapter7.8, Division 2) directs the California Department of Conservation (DOC), Division of Mines and Geology (DMG) [now called California Geological Survey (CGS)] to delineate Seismic Hazard Zones. The purpose of the Act is to reduce the threat to public health and safety and to minimize the loss of life and property by identifying and mitigating seismic hazards. Cities, counties, and State agencies are directed to use seismic hazard zone maps developed by CGS in their land-use planning and permitting processes. The Act requires that site-specific geotechnical investigations be performed prior to permitting most urban development projects within seismic hazard zones.

Division of Occupational Safety and Health (Cal/OSHA)

Cal/OSHA oversees underground construction and classifies the gas hazard of every tunnel project in accordance with Title 8 of the California Code of Regulations (CCR). The Cal/OSHA Mining and Tunneling gas classification requirement applies to each tunnel and jack-and-bore segment. LADWP would be required to request the gas hazard classification from the Mining and Tunnel Unit (MTU) of Cal/OSHA prior to the start of construction. The MTU enforces the Tunnel Safety Orders (TSO) that include gas classification, preconstruction safety conference, personnel certifications, blasting licenses, and underground operation of diesel engines.

California Building Code

The California Building Code (CBC, 2001) is based on the 1997 Uniform Building Code, with the addition of more extensive structural seismic provisions. Chapter 16 of the CBC contains definitions of seismic sources and the procedure used to calculate seismic forces on structures.

Local

The safety elements of General Plans for the cities along the proposed route contain policies for the avoidance of geologic hazards and/or the protection of unique geologic features. A survey of general plans along the proposed route indicated that the Cities of Los Angeles and Burbank require submittal of construction and operational safety plans for proposed construction in areas of identified geologic and seismic hazards for review and approval prior to issuance of permits. County and local grading ordinances establish detailed procedures for excavation and grading required for underground construction.

All projects are required to comply with Burbank Municipal Code and undergo the appropriate CEQA review.

The City of Burbank General Plan Safety Element provides analysis of seismic hazards in the City, including ground shaking, fault rupture and liquefaction. The Safety Element outlines Seismic Safety Policies to prevent loss of life, maintain functioning of critical facilities and minimize property loss or damage (City of Burbank, 1997). Policies relevant to the proposed project include: Policy 1 requires new projects to evaluate the liquefaction potential; and Policy 3 requires new projects develop seismic design parameters in accordance with Uniform Building Code and Burbank Municipal Code.

City of Burbank Media District Specific Plan incorporates the Safety Element of the Burbank General Plan.

City of Los Angeles General Plan Safety Element outlines seismic hazards including ground shaking, fault rupture and liquefaction. The North Hollywood-Valley Village Community Plan outlines no seismic safety issues or policies. Hollywood Community Plan indicates that the proposed project will be located in open space land use at Griffith Park. Los Angeles River Revitalization Plan provides guidance that new projects should not impede opportunities to enhance habitats, public access, recreation, or reconstruction of the river in a natural channel along the affected reach.

3.5.3 Environmental Setting

Geology

The Upper Reach alignment is located in the eastern end of the San Fernando Valley and extends from the North Hollywood Pump Station in Van Nuys, through North Hollywood and southeast Burbank, and across the Los Angeles River to the terminus at the west end of the Headworks Spreading Grounds facility near Griffith Park.

The San Fernando Valley is an east-west structural trough within the Transverse Ranges geologic province of southern California. The mountains that bound the trough are actively deforming anticlinal ranges bounded on their south sides by thrust faults. As these ranges have risen and deformed, the San Fernando Valley has subsided and been filled with sediment. The eastern portion of the valley has primarily received sediment in the form of broad alluvial fans deposited by the Pacoima and Tujunga washes (CGS, 2000). These washes are associated with large river systems with their sources in the steep, rugged San Gabriel Mountains, which are comprised of crystalline bedrock. The rivers have deposited a broad alluvial fan composed of sand, silt, and gravel that blankets most of the eastern San Fernando Valley. The remainder of the San Fernando Valley is covered by smaller alluvial fans that have been deposited by local streams. Streams from the Verdugo Mountains have deposited alluvial fans composed of sand and silty sand similar to the larger Tujunga fan. Small streams that drain the Santa Monica Mountains are so much smaller than the Tujunga fan that they do not form recognizable deposits beyond the narrow canyons in the Santa Monica Mountains. The local geology is depicted in Figure 3.5-1, Geologic Map.

The San Gabriel Mountains, and their southern outlier the Verdugo Mountains, which bound the valley on the northeast, are composed of Precambrian to Mesozoic plutonic and metamorphic rocks (USGS, 2005) that are being elevated along thrust faults over the valley from the north. The eastern Santa Monica Mountains near the project are comprised of Tertiary age sedimentary and late Cretaceous age plutonic rock (USGS, 2005). As the mountains have risen and been deformed, the San Fernando Valley has subsided and filled with sediment.

Geotechnical Studies

A geotechnical investigation for the proposed project is currently being performed to provide preliminary subsurface information for the design of the pipeline and tunnel segments (URS, 2007). Geotechnical logs from 92 borings were reviewed for this analysis to identify the earth materials and groundwater depth along the project alignment. The exploratory borings were drilled to depths ranging from 50 to 100 feet.

Material encountered in the borings consisted of a surface layer of artificial fill ranging from two to 12 feet thick. Below the artificial fill alluvial deposits consist predominantly of poorly graded, fine to medium grained sand with minor amounts of small gravel. Interbeds of silty sand, gravelly sand and gravel are common and generally 1 to 5 feet thick. Thin layers of silt, sandy clay and silty clay occur locally. Alluvial materials are generally medium dense grading to dense below a depth of 35 feet. Large boulders that may represent an obstruction to tunneling were not identified by the subsurface exploration (URS, 2007).

Topanga Formation bedrock comprised of pebbly sandstone and conglomerate was encountered below the alluvium in borings near the Los Angeles River. Groundwater was encountered from south of Verdugo Avenue to the south side of the River. The depth of groundwater decreases from 96 feet below ground surface near Verdugo Avenue to a depth of 59 feet on the south side of the Los Angeles River (URS, 2007).

Faults

Seismicity of southern California is dominated by the intersection of the north-northwest trending San Andreas fault system and the east-west trending Transverse Ranges fault system. Both systems are responding to strain produced by the relative motions of the Pacific and North American Tectonic Plates. This strain is relieved by right-lateral strike-slip faulting on the San Andreas and related faults and by vertical, reverse-slip or left-lateral

Source: USGS Open-File Report 2005-1019

Legend

River Supply Conduit Upper Reach Alignment

- UR1 - Tunnel
- Option UR1a - Tunnel
- UR2 - Trench
- UR2 - Tunnel
- Option UR2a - Tunnel
- UR3 - Trench
- UR3 - Tunnel

Geologic Units

- Qaf - Artificial Fill
- Qyf - Young Alluvial-Fan Deposits
- Qf - Alluvial-Fan Deposits
- Qof - Old Alluvial-Fan Deposits
- Tm - Modelo Formation
- Tt - Topanga Formation
- Mzbqd - Biotite-Quartz Diorite

Source: GTC, 2007.

RSCI -- Upper Reach

Figure 3.5-1

Geologic Map

Aspen Environmental Group

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strike-slip displacement on faults in the Transverse Ranges. The effects of this deformation include mountain building; basin development; deformation of Quaternary terraces; widespread regional uplift; and generation of earthquakes.

The project area will be subject to ground shaking associated with earthquakes on faults of both the San Andreas and Transverse Ranges fault systems. Active faults of the San Andreas system are predominantly strike-slip faults accommodating translational movement. The Transverse Ranges fault system consists primarily of blind reverse and thrust faults accommodating tectonic compressional stresses in the region. Blind faults have no surface expression and have been located using subsurface geologic and geophysical methods. This combination of translational and compressional stresses gives rise to diffuse seismicity across the region.

Active reverse or thrust faults in the Transverse Ranges include blind thrust faults responsible for the 1987 Whittier Narrows Earthquake and 1994 Northridge Earthquake, and the range-front faults responsible for uplift of the Santa Monica and San Gabriel Mountains. The range-front faults include the Malibu Coast, Santa Monica-Hollywood, Raymond, Verdugo, and San Fernando-Sierra Madre faults. Active right lateral strike slip faults within 25-miles of the San Fernando Valley include the San Andreas, Palos Verdes, Newport-Inglewood, and San Gabriel faults, all associated with the San Andreas fault system.

Both the Transverse Ranges and northern Los Angeles area are characterized by numerous geologically young faults. These faults can be classified as historically active, active, potentially active, or inactive, based on the following criteria (CGS 1999):

- Faults that have generated earthquakes accompanied by surface rupture during historic time (approximately the last 200 years) and faults that exhibit aseismic fault creep are defined as Historically Active.
- Faults that show geologic evidence of movement within Holocene time (approximately the last 11,000 years) are defined as Active.
- Faults that show geologic evidence of movement within the Quaternary (approximately the last 2,000,000 years) are defined as Potentially Active.
- Faults that show direct geologic evidence of inactivity during all of Holocene time or longer may be classified as Inactive.

Although it is difficult to quantify the probability that an earthquake will occur on a specific fault, this classification is based on the assumption that if a fault has moved during the Holocene epoch, it is likely to produce earthquakes in the future. Blind thrust faults do not intersect the ground surface, and thus they are not classified as active or potentially active in the same manner as faults that are present at the earth's surface. Blind thrust faults are seismogenic structures and thus the activity classification of these faults is predominantly based on historic earthquakes and microseismic activity along the fault.

The proposed project is located in an area with many major active faults in the vicinity. The major active faults in the project area include the Northridge Thrust, Verdugo, Hollywood, and Santa Monica. These faults along with other faults considered to be potentially significant seismic sources are listed in Table 3.5-1. Data presented in this table include the type of fault, estimated earthquake magnitude, estimated site intensity, and distance between the fault and the project area. Locations of these faults are shown on Figure 3.5-2.

Table 3.5-1. Significant Active Faults in the Project Area

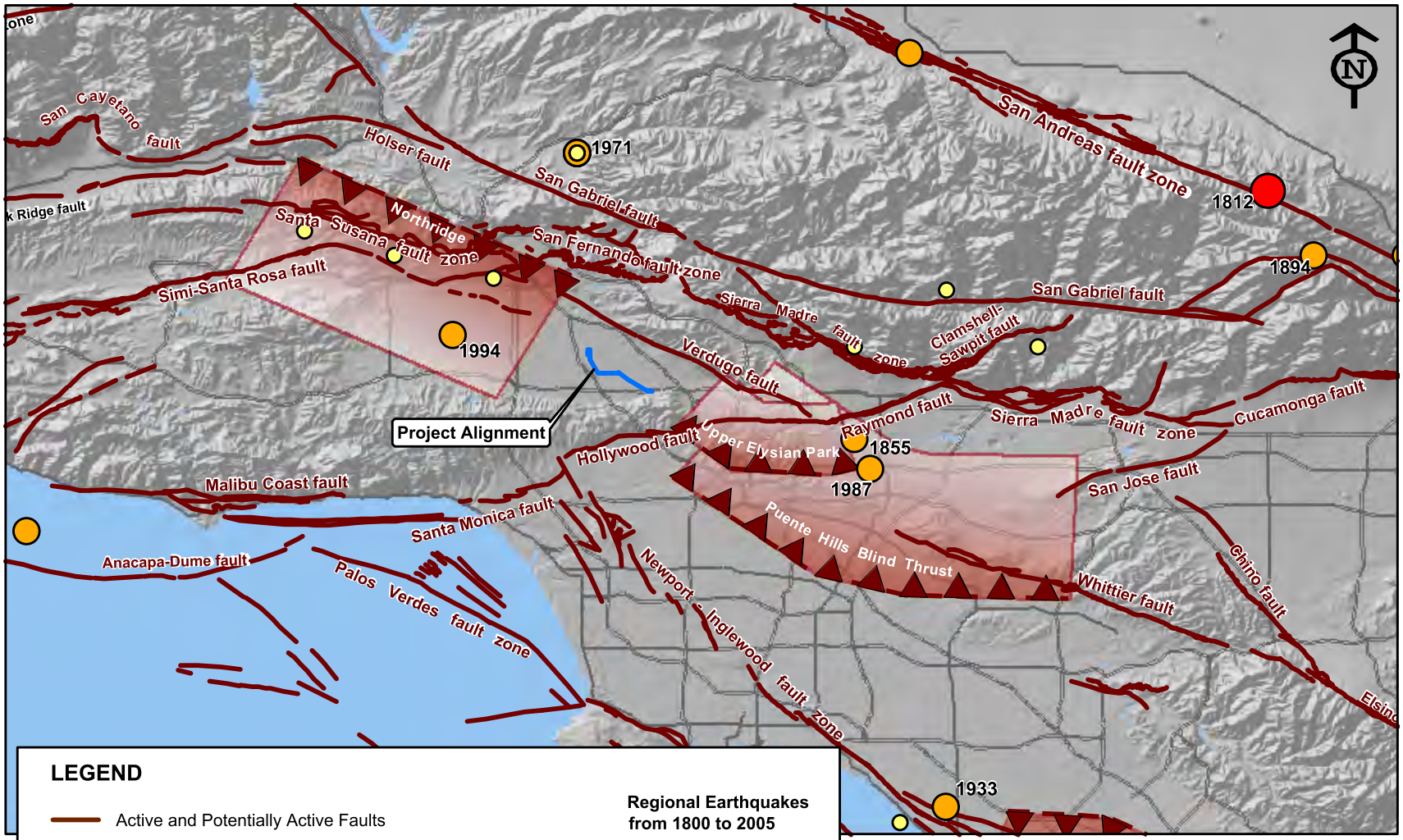
Fault Name	Approx. Closest Distance to Alignment (miles)[1]	Estimated Max. Earthquake Magnitude[2, 3]	Fault Type and Dip Direction[3]	Slip Rate (mm/yr)[3, 4]
Verdugo	2.5	6.9	Reverse, 45° NE	0.5
Hollywood	3.0	6.4	Left Lateral Reverse Oblique, 70° N	1.0
Upper Elysian Park Blind Thrust	3.0	6.4	Blind Thrust, 50° NE	1.3
Northridge Thrust	3.5	7.0	Blind Thrust, 42° S	1.5
Raymond	4.0	6.5	Left Lateral Reverse Oblique, 75° N	1.5
Puente Hills Blind Thrust	5.0	7.1	Blind Thrust, 25° N	0.7
San Fernando	6.0	6.7	Reverse, 45° N	2.0
Newport-Inglewood	7.0	7.1	Right Lateral Strike Slip, 90°	1.0
Santa Monica	7.5	6.6	Left Lateral Reverse Oblique, 75° N	1.0
Sierra Madre	7.5	6.7	Reverse, 45° S	2.0
Santa Susana	9.5	6.7	Reverse, 55° N	5.0
San Gabriel	10.0	7.2	Right Lateral Strike Slip, 90°	1.0
Simi-Santa Rosa	15.0	7.0	Left Lateral Reverse Oblique, 60° N	1.0
Oak Ridge	15.5	7.0	Reverse, 65° S	4.0
Palos Verdes	16.5	7.3	Right Lateral Strike Slip, 90°	3.0
Clamshell-Sawpit	17.0	6.5	Reverse, 45° NW	0.5
Holser	17.5	6.5	Reverse, 65° S	0.4
Malibu Coast	18.5	6.7	Left Lateral Reverse Oblique, 75° N	0.3
Whittier	18.5	6.8	Right Lateral Strike Slip, 90°	2.5
Anacapa-Dume	22.0	7.5	Reverse Left Lateral Oblique, 45° N	3.0
San Cayetano	27.0	7.0	Reverse, 60° N	6.0
San Andreas – Full Length	28.0	8.0	Right Lateral Strike Slip, 90°	34.0

Notes:

1. Fault distances obtained to the closest one-half mile using GIS fault data; data obtained from the USGS Earthquake Faults and Folds database.
2. Fault parameters from the CGS Revised 2002 California Probabilistic Seismic Hazard Maps report, Appendix A - 2002 California Fault Parameters.
3. Maximum Earthquake Magnitude – the maximum earthquake that appears capable of occurring under the presently known tectonic framework, using the Richter scale.
4. References to fault slip rates are traditionally presented in millimeters per year.

The Verdugo fault, located only 2.5 miles east of the proposed project, is part of the Verdugo Fault System, comprised of the Verdugo, Eagle Rock, and San Rafael faults, which extends in a northwest direction along the western edge of the Verdugo Mountains. The Verdugo fault is an active fault that dips steeply to the north. Although not an Alquist-Priolo Zoned fault, this fault is considered active by the State Geologist (Jennings, 1994) and a fault rupture hazard zone has been designated for it by the City of Burbank (1997).

Approximately 3.5 miles to the northwest is the Northridge Thrust, a southwest dipping deep thrust fault considered to be the eastern extension of the Oak Ridge fault. The Northridge thrust is located beneath most of the northern San Fernando Valley and was responsible for the January 17, 1994 M 6.7 Northridge Earthquake. This fault is not exposed at the surface and is not a hazard for surface rupture. Peterson et al. (1996) estimates a slip rate of 1.5 mm/yr. and a maximum earthquake magnitude of 6.9 for this fault.



Data Sources: Fault locations based on USGS GIS from the Earthquakes Hazards Program Quaternary Faults and Folds Database ; Earthquake magnitudes and locations from CGS 1800 - 2000 earthquake catalog and California Earthquake Data Center (SCEDC) catalogs for 2001 to January 2005

Source: GTC, 2007.

RSCI -- Upper Reach

Figure 3.5-2

Regional Fault Map

Aspen Environmental Group

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The east-west trending Hollywood and Santa Monica faults are known active faults with predominantly left lateral motion with a component of reverse slip. The Hollywood and Santa Monica faults are part of a larger fault system that also includes the Raymond fault. This fault system forms the southern margin of the western Transverse Ranges and lies at the southern edge of the Santa Monica Mountains.

The North Hollywood fault (City of Burbank, 1997) lies just north of the North Hollywood Pump Station and is based on east-northeast trending linear break in topography evident on 1901 and 1926 topographic maps (City of Burbank, 1997). However, there is no conclusive evidence that the inferred fault has experienced Holocene fault movement. The North Hollywood fault is not included in the State of California Alguist-Priolo Earthquake Fault Zone Map.

Three unnamed inferred faults are mapped near the Whitnall Highway segment of the project and identified as groundwater barriers (City of Burbank, 1997). There is no conclusive evidence that these inferred faults have experienced Holocene fault movement. These unnamed faults are not included in a State of California Alquist-Priolo Earthquake Fault Zone and thus are not considered significant active earthquake sources.

Strong Ground Shaking

An earthquake is classified by the amount of energy released, which traditionally has been quantified using the Richter scale. Recently, seismologists have begun using a Moment Magnitude (M) scale, because it provides a more accurate measurement of the size of major and great earthquakes. For earthquakes of less than M 7.0, the Moment and Richter Magnitude scales are nearly identical. For earthquake magnitudes greater than 7.0, readings on the Moment Magnitude scale are slightly greater than a corresponding Richter Magnitude.

Seismic analyses generally include discussions of design level and upper bound earthquakes. An upper bound earthquake is defined as an event that has a 10 percent probability of occurrence in 100 years. The design level earthquake is defined as an event that has a 10 percent probability of occurrence in 50 years.

The intensity of the seismic shaking, or strong ground motion, during an earthquake is dependent on the distance between the project area and the epicenter of the earthquake, the magnitude of the earthquake, and the geologic conditions underlying and surrounding the project area. Earthquakes occurring on faults closest to the project area would most likely generate the largest ground motions. The Modified Mercalli Scale is commonly used to indicate the site intensity of an earthquake as a subjective measure of the strength of an earthquake at a particular place as determined by its effects on persons, structures, and earth materials.

A review of historic earthquake activity from 1800 to 2005 indicates that nine earthquakes of magnitude M 6.0 or greater have occurred within 50 miles (80 kilometers) of the proposed project area. Distance from the project area, magnitude, and site intensity for each of these nine earthquake events is presented in Table 3-5.2. The M 5.9 Whittier Narrows earthquake of 1987 is also included in the table because it was a significantly damaging earthquake within 25 miles of the project site. There have been nine additional earthquakes with magnitudes between M 5.5 and M 6.0 within 50 miles of the project area between 1800 and 1999.

Table 3.5-2. Significant Historic Earthquakes

Date	Approx. Closest Distance to Alignment (miles)[1]	Earthquake Magnitude[1]	Name, Location, or Region Affected	Reported Damage or "Felt" Effects[2]
December 8, 1812	41	Estimated between 7.0 to 7.5	Wrightwood Earthquake	Caused collapse of Mission at San Juan Capistrano resulting in the death of 40 people.
July 11, 1855	13	6.0	Los Angles Region	The bells at San Gabriel Mission Church were thrown down and twenty-six buildings in Los Angeles were damaged.
July 29, 1894	42.5	6.2	Lytle Creek region	Felt from Bakersfield to San Diego. Minor damage in the Mojave and Los Angeles areas.
March 11, 1933	36.5	6.3	Long Beach Earthquake	Resulted in the death of 12 people and $60 million in property Damage.
February 9, 1971	15	6.6	San Fernando (Sylmar) Earthquake	This earthquake caused over $500 million in damage and resulted in 65 deaths. As a result of the damage from this earthquake, building codes were strengthened and the Alquist Priolo Special Studies Zone Act of 1972 was passed.
October 1, 1987	15	5.9	Whittier Narrows Earthquake	Resulted in eight deaths and $358 million in property damage. This earthquake occurred on a previously unknown blind thrust fault, the Puente Hills Fault.
January 17,1994	8.5	6.7	Northridge Earthquake	Resulted in 60 deaths and approximately $15 billion in property damage. Damage was significant and widespread, including collapsed freeway overpasses and more than 40,000 damaged buildings in Los Angeles, Ventura, Orange, and San Bernardino Counties.

Notes:
1. Earthquake magnitudes and locations before 1932 are estimated based on reports of damage and felt effects.
2. Earthquake damage information compiled from the Southern California Earthquake Center (SCEC, 2007) and National Earthquake Information Center (NEIC, 2007) websites.

Three significant damaging historic earthquakes have occurred in the last century within 25 miles of the proposed project. The closest and most recent significant earthquake near the project site was the January 17, 1994, M 6.7 Northridge Earthquake. This earthquake occurred on a blind thrust fault and produced the strongest ground motions ever instrumentally recorded in an urban setting in North America. The maximum recorded acceleration exceeded 1.0g (g is the acceleration due to gravity) at several sites, with the largest recorded (1.8g) at Tarzana, about 4 miles south of the epicenter (National Earthquake Information Center, 2007).

The next closest significant earthquake was the February 9, 1971 M 6.4 San Fernando Earthquake, also known as the Sylmar Earthquake. The earthquake was located approximately 15 miles north of the project site and caused strong ground shaking and damage throughout San Fernando Valley. The October 1, 1987 M 5.9 Whittier Narrows earthquake caused significant damage in the Los Angeles region. This earthquake was located approximately 23 miles southeast of the project site. The Whittier Narrows earthquake occurred on a previously unknown blind thrust fault, the Puente Hills fault, and like the Northridge earthquake on a blind thrust fault, caused significant shaking and damage (SCEC, 2007).

Liquefaction

Liquefaction is the phenomenon in which saturated granular sediments temporarily lose their shear strength during periods of earthquake-induced, strong groundshaking. The susceptibility of a site to liquefaction is a function of the depth, density, and water content of the granular sediments, and the magnitude and frequency of earthquakes in the surrounding region. Saturated, unconsolidated silts, sands, and silty sands within 50 feet of the ground surface are most susceptible to liquefaction. Liquefaction-related phenomena include lateral spreading, ground oscillation, flow failures, loss of bearing strength, subsidence, and buoyancy effects (Youd and Perkins, 1978). In addition, densification of the soil resulting in vertical settlement of the ground can also occur.

Due to the generally deep water table (greater than 75 feet) in most of the project area (with the exception of areas adjacent to the Los Angeles River), liquefaction is not considered a potential hazard in most of the project area. However, based on historic high groundwater levels (1944), the CGS has mapped much of the southern and eastern San Fernando Valley alluvial sediments with a high liquefaction potential (CGS, 1997; CGS 1998). Assignment of a liquefaction zone is intended to prompt site-specific geotechnical investigation and liquefaction analysis as required by the Seismic Hazards Mapping Act (CGS, 1998).

Hydrogeology

The San Fernando Valley Groundwater Basin includes the water-bearing sediments beneath the San Fernando Valley, Tujunga Valley and the alluvial areas surrounding the Verdugo Mountains. The groundwater basin is an important source of drinking water for the Los Angeles metropolitan area. The San Fernando Valley is recharged by the Los Angeles River and its tributaries (DWR, 2004).

The water-bearing sediments consist of the lower Pleistocene Saugus Formation, and Pleistocene and Holocene age alluvium. Groundwater in the basin is mainly unconfined and the basin typically has high well yields (1000 to 3000 gpm). Holocene and Pleistocene age alluvium consists primarily of highly permeable coarse-grained unsorted gravel and sand deposited by coalescing alluvial fans emanating from the surrounding highlands. The thickness of the alluvium is about 1,200 feet in the eastern San Fernando Valley (CH2M Hill, 2004). The Saugus Formation is composed of continental and shallow marine deposits of conglomerates, sands, silts, and clays, with permeability less than that of the Pleistocene alluvium (DWR, 2004). The Saugus Formation is generally considered bedrock and is not tapped by municipal supply wells in eastern San Fernando Valley.

The water-bearing sediments in the eastern San Fernando Basin are subdivided into four layers: Deep, Lower, Middle, and Upper (USEPA, 1993). The Deep Zone extends to the top of bedrock at depths of 1,200 feet or deeper in the eastern Basin and has not historically been an important source of groundwater (USEPA, 1993). The Lower Zone, overlies the Deep Zone, is comprised of coarse sand and gravel at depths of 250 to 500 feet, and is the production aquifer for most of the wells in the eastern Basin (USEPA, 1993). The Middle Zone is predominantly fine grained sand, silt and clay and is only 0 to 50 feet thick. The Upper Zone extends from the ground surface to depths of 200 to 250 feet and consists of sand, silt and gravel. With groundwater levels generally 50 to 200 feet below ground surface, only portions of the Upper Zone contains groundwater locally. The Upper and Middle Zones produce very little groundwater supply (USEPA, 1993).

Groundwater flows generally from east to west across the basin, then south and east to the Los Angeles River Narrows where it drains into the Central Subbasin of the Coastal Plain Basin (DWR, 2004). In the eastern part

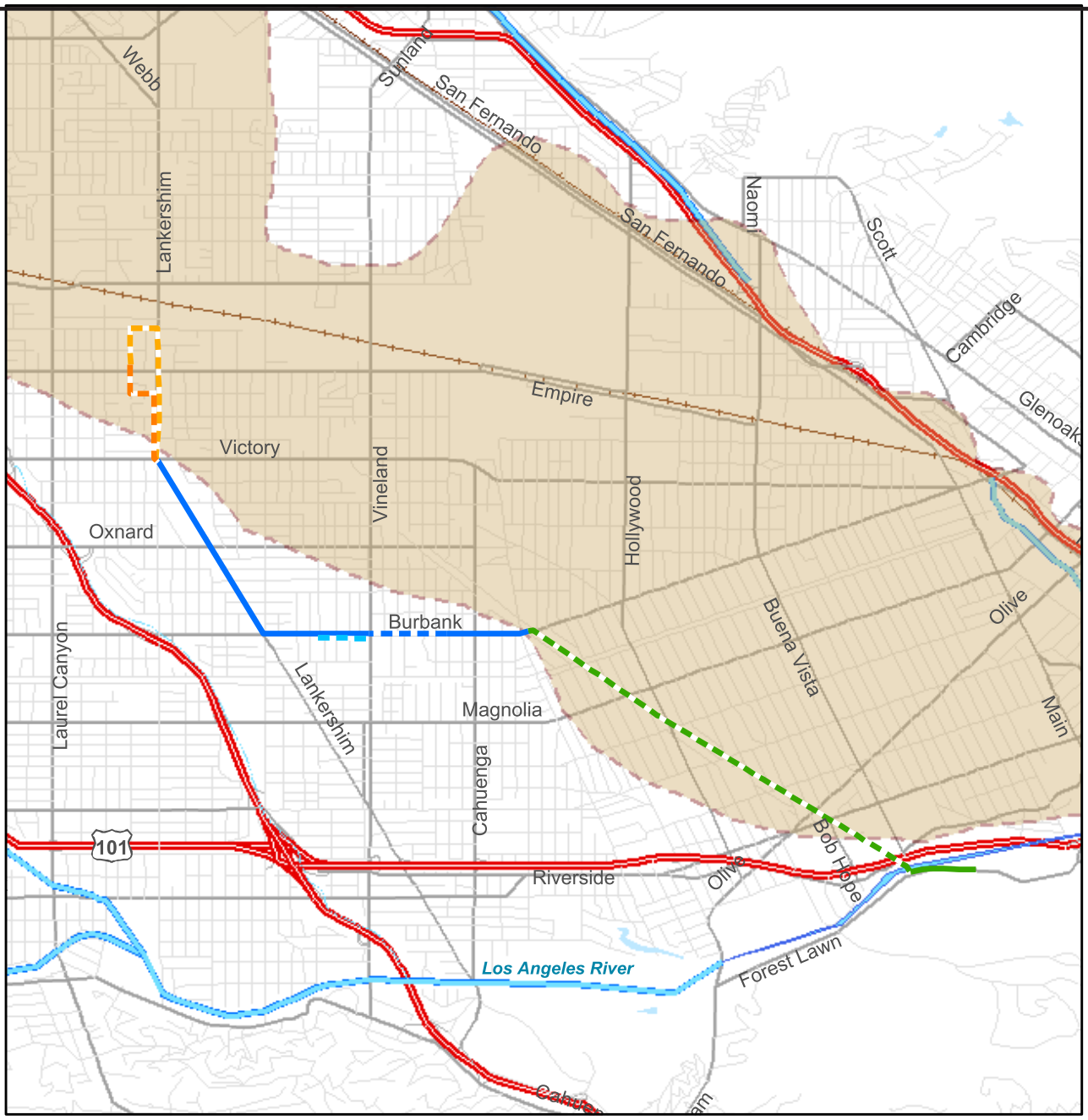
of the San Fernando Basin near the proposed project, groundwater flows east. Groundwater levels show seasonal response to precipitation, runoff and pumping.

The groundwater depth identified during the project-specific geotechnical investigation decreases from 96 feet below ground surface near Verdugo Avenue to a depth of 59 feet on the south side of the Los Angeles River. These depths correspond to the regional water table. Perched groundwater was not encountered in any of the geotechnical borings (URS, 2007). Based on the estimated trench depths of 25 feet and maximum tunnel invert of 60 feet, the likelihood of encountering groundwater during construction is limited and localized to the Los Angeles River crossing.

Groundwater Contamination

Groundwater in the eastern San Fernando Basin has been impacted by trichloroethylene (TCE) and perchloroethylene (PCE). Several municipal supply wells in North Hollywood, Burbank and Glendale are located within a Superfund area established to address the regional groundwater clean up (USEPA, 2003) of the volatile organic compounds (VOC). The east San Fernando Basin Superfund sites were placed on the National Priorities List (NPL) in 1986 and subdivided into four study areas (USEPA, 2003). The project alignment passes through part of the North Hollywood and Crystal Springs study areas. Groundwater clean up uses a system of wells, conveyance pipelines, treatment plants, and blending of the treated with other potable water supplies to control plume migration, restore the water quality and use the valuable resource. Within the North Hollywood Area two treatment systems, designated the North Hollywood and Burbank Operable Units, are designed to recover and treat 2,000 gallons per minute (gpm) and 9,000 gpm, respectively. The treated, blended water meets all drinking water standards and is delivered to the public (USEPA, 2003). The Glendale North Plume and Glendale South Plume Operable Units, located in the Crystal Springs Area, are designed to treat groundwater and blend with other sources for public use at rates of 3,300 gpm and 1,700 gpm, respectively.

The proposed project traverses two areas within the groundwater plume western boundary based on 2001 water quality data (USEPA, 2003). The VOC plume extent and relation to the project alignment is presented on Figure 3.5-3. Approximately one mile of the proposed tunnel alignment from North Hollywood Pump Station to Victory Boulevard lies above the groundwater plume; no groundwater was encountered in the geotechnical borings to depths of 75 feet. The groundwater contamination in this area contains low (less than 5 µg/L, drinking water maximum contaminant level) to moderate TCE levels (5 µg/L to 100 µg/L), and low levels of PCE (less than 5µg/L, drinking water maximum contaminant level). The tunnel alignment from Burbank Boulevard south to Olive Avenue is also above the water table and groundwater plume, which is characterized by low TCE contaminant levels (less than 5µg/L) and no PCE contamination (USEPA, 2003). Continuing south of Olive Avenue, the 60-foot deep tunnel excavation may encounter groundwater identified at depths of 59 to 75 feet (URS boring logs B-76 to B-83). Shallow groundwater near the tunnel crossing of the Los Angeles River is outside of the contaminant plume boundary.



Legend

- UR1 - Tunnel
- Option UR1a - Tunnel
- UR2 - Trench
- UR2 - Tunnel
- Option UR2a - Tunnel
- UR3 - Trench
- UR3 - Tunnel
- VOC Plume Extent

Data Source: VOC plume data from EPA 2003.

0 0.5 1 1.5 2 Miles

Source: GTC, 2007.

RSCI -- Upper Reach

Figure 3.5-3

Groundwater VOC Plume Extent Map

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Soils

The U.S. Department of Agriculture's Soil Survey of the San Fernando Valley Area (1917) indicates that soils underlying the project are typical of the broad alluvial fans of the Tujunga Wash throughout the eastern Valley. Three soils underlie the project alignment: the Tujunga Sandy Loam, Tujunga Fine Sandy Loam and the Tujunga Sand. The Tujunga Sandy Loam occurs near the Hollywood Pump Station and has good to excessive surface drainage. This soil typically consists of micaceous gray or brownish-gray friable fine sandy loam. In localized areas the fine loam is interbedded with gravelly sandy to coarse sandy loam.

The Tujunga Fine Sandy Loam underlies most of the proposed project and is the predominant soil throughout the North Hollywood and Burbank area. The soil is typically a light gray or light brownish-gray micaceous, fine sandy loam of friable structure (USDA, 1917). The Tujunga Fine Sandy Loam was known to support most of the intensive agriculture in the area (USDA, 1917).

The Tujunga Sand is generally 2 to 3 feet thick and is excessively drained due to its porous nature. It is characterized by gray or brown-gray sand. The subsoil varies widely in texture, generally finer on the distal parts of the alluvial fans. This soil is closely associated with the general courses of the channels that carry flood waters across the alluvial fans.

3.5.4 Impacts and Mitigation Measures

Methodology

This section explains how impacts are assessed and presents the significance criteria on which impact determinations are based. Geologic conditions were evaluated with respect to the impacts the project may have on local geology, as well as the impact that specific geologic hazards may have upon the proposed pipeline and its related facilities. The significance of these impacts was determined on the basis of CEQA statutes, guidelines and appendices, thresholds of significance developed by local agencies, government codes and ordinances.

Criteria for Determining Significance

Impacts of the project on the geologic environment would be considered significant if project construction or operation would result in any of the following criteria being met:

- Criterion GEO1: High potential for earthquake-related ground rupture in the vicinity of major fault crossings would cause the project to expose people or structures to potential risk of loss or injury.
- Criterion GEO2: High potential for seismically-induced ground shaking, landslides, liquefaction, settlement, lateral spreading, and/or surface cracking would cause the project to expose people or structures to potential risk of loss or injury.
- Criterion GEO3:Geologic processes, such as substantial soil erosion or loss of topsoil, could be triggered or accelerated by construction of the project.
- Criterion GEO4: The presence of an unstable geologic unit or a geologic unit would, as a result of the project, become unstable and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.
- Criterion GEO5:The project would be located on expansive or corrosive soils that would expose people or structures to potential risk of loss or injury.
- Criterion GEO6: The project would have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater.

- Criterion GEO7: Project dewatering could encounter contaminated groundwater.

As discussed in the Initial Study (see Appendix A.2), the proposed project would not expose people or structures to fault rupture or landslides. The proposed project would also not result in substantial soil erosion, on- or off-site landsliding, lateral spreading or soil collapse, or the use of septic tanks and alternative wastewater disposal. Therefore, consistent with the results of the Initial Study, the potential impacts associated with Criterion GEO-1, GEO-2 (except strong seismic ground shaking and liquefaction), GEO-3, GEO-4 (except subsidence), and GEO-6 of the proposed project would be no impact or less than significant, and are not discussed further in this EIR.

Project Impacts

Project Structures Could Be Damaged by Strong Seismic Ground Shaking (Criterion GEO-2)

Construction. Strong to severe groundshaking would be experienced along all three segments of the Upper Reach Pipeline in the event of an earthquake on the faults in the project area. Estimated peak ground accelerations (pga) range from 0.5 g to 0.6g for the project area, which is generally associated with strong to severe perceived shaking (felt by human observers) and light to moderately heavy damage (Wald, et al, 1999). Strong to severe seismically induced groundshaking could cause damage to project structures resulting in a significant impact.

It is likely that the project facilities would be subjected to at least one moderate or larger earthquake occurring close enough to produce strong groundshaking in the project area. LADWP is conducting geotechnical studies to identify site-specific geologic conditions prior to final design of the pipeline, tunnel, and vaults. The design-level geotechnical investigation will include site-specific seismic analyses to evaluate the peak ground accelerations for design of project ~~components~~ structures (buried shafts and vaults, equipment foundations and anchorage, and above ground structures). Implementation of ~~this standard design practice will fulfill the requirement outlined by~~ revised Mitigation Measure GEO-1 (originally identified in the Initial Study) ~~and~~ would reduce this impact to a less-than-significant level and no additional mitigation ~~measure~~ is required. (Refer to Appendix F, Comment Set D, Response D-22, for a description of the changes made to this mitigation measure since publication in the Initial Study.)

GEO-1 Prior to final project design, LADWP or its consultant shall prepare a geotechnical investigation to determine areas that will be susceptible to liquefaction related phenomena and to identify the local and regional geologic and seismic setting, subsurface soil conditions, presence and character of perched or continuous groundwater including aquifer parameters, presence of toxic or combustible gases along tunnel segments or deep excavations, and potential for corrosive and expansive soil. This investigation shall be conducted by a qualified professional and conform to the requirements of the City of Los Angeles. Based on the findings of this investigation, appropriate measures will be developed to reduce potential damage due to liquefaction related phenomena and to address site-specific subsurface conditions and excavation methodology. The geotechnical analysis will determine seismic design ground shaking and liquefaction potential. Results of the geotechnical analysis will support design considerations to address seismic shaking and to implement liquefaction and lateral spreading control measures. Although it is considered unlikely that groundwater levels will be affected by the project, LADWP shall conduct a post-construction monitoring program in areas where the bottom of the pipe is at or below the historic high groundwater level. Monitoring will be conducted two to four times per year over two rainy seasons. If monitoring identifies mounding which exceeds the historic high groundwater level, an evaluation for increased liquefaction potential

will be performed. If increased liquefaction potential is identified, control measures will be developed to address any substantial effects that may result during a design level earthquake.

Operation. Once operational, the proposed project would not cause additional seismic ground shaking that was not considered during design. Therefore, strong seismic groundshaking impacts from operations of the proposed project would be less than significant and no mitigation measures would be required.

Options UR1a and UR2a would experience strong seismic shaking identical to the proposed project. Following standard design practices that consider the site-specific groundshaking for these options will reduce this impact to less than significant.

Project Structures Could Be Damaged by Liquefaction (Criterion GEO-2)

Construction. Due to the depth of groundwater along the alignment there is a high potential for liquefaction to occur near the Los Angeles River and a low potential elsewhere along the alignment, including options UR1a and UR2a. Liquefaction occurs in areas where saturated noncohesive sediments are found. The potential for liquefaction to cause damage to the shallow buried pipeline segments and the much deeper tunnel segments structures must be evaluated for each location as geologic, groundwater and depth of burial varies along the alignment.

Consistent with the *Engineering Standards Manual, Water Operating Division, Department of Water and Power, City of Los Angeles, Second Edition, Effective August 3, 1992*, the LADWP is in the process of preparing a geotechnical study to identify site-specific geologic conditions and assess the liquefaction potential of the proposed alignment (Mitigation Measure GEO-~~2~~1 of the Initial Study, Appendix A.2). The liquefaction analysis will consider historic high water table levels as a conservative design standard. Based on the findings of this investigation, recommendations will be developed to reduce the potential for environmental impacts. Results of the geotechnical investigation will support design considerations of constructing liquefaction measures and/or repair of the damaged pipeline. The latter option is the standard practice for non-hazardous material pipelines and typically includes consideration of economic factors. Ground subsidence and post-construction settlement along the trench, tunnel and at shafts will be evaluated during the geotechnical analysis and a subsidence monitoring program will be developed and implemented during construction. The soil corrosion potential along the alignment will be evaluated to identify appropriate engineering controls, if necessary. The groundwater conditions assessment will identify areas where groundwater will be encountered and the water quality (PCE, TCE and other NPDES constituents) in those areas. A dewatering plan, including storage, treatment and disposal requirements, will be developed to insure compliance with the project NPDES permit.

Prior to final design of the pipeline, tunnels, shafts and vaults, LADWP will incorporate the recommendations of the geotechnical study. With LADWP'S implementation of the geotechnical study recommendations, liquefaction impacts would be less than significant and no other mitigation measures would be required.

Operation. Once operational, the proposed project would not cause liquefaction susceptibility, provided groundwater levels higher than present are considered during design. If leakage from the pipeline were to occur at very low and undetectable rates it is unlikely that volume would raise the water table and alter the liquefaction susceptibility. Large flow leaks or rupture would be detected by SDAC and the flow stopped before appreciable changes in the water table or liquefaction susceptibility would occur. Therefore, liquefaction impacts from operation of the proposed project would be less than significant and no mitigation measures would be required.

Tunnel construction with a pressure-face TBM would not affect the soil strength properties or the groundwater table. Consequently, the post-construction liquefaction potential of the native soils will not be changed and no mitigation is required.

Project Could Cause Subsidence and Damage to Overlying Structures (Criterion GEO-4)

Construction. There is potential for tunneling activities to encounter unstable geologic units or cause geologic units to become unstable and cause local subsidence and settlement of the overlying ground surface and result in damage to structures adjacent to the alignment. Tunneling through the unconsolidated alluvium could encounter flowing or running sands although the use of an earth pressure-balanced (pressurized-face) TBM will effectively control rapid or excessive inflows. Recent earth-pressure balanced tunneling in the Los Angeles area has limited ground settlement to 0.5-inches. Implementation of a Subsidence Monitoring Program is standard practice during construction of large diameter pipelines and tunnels in urban areas. LADWP will analyze the potential for ground subsidence to occur during tunneling, and will identify project-specific trigger levels that would require corrective action should subsidence occur. ~~As determined to be necessary, t~~The tunnel contractor will implement a subsidence monitoring program during tunneling to detect subsidence, including measurements of groundwater levels, surface and subsurface settlement, ground movement and displacement, and movement in existing infrastructure as needed (see Section 2.5.6 LADWP Project Measures). LADWP will implement corrective actions, such as increased tunnel support, if measured displacement reaches the specified trigger levels. Implementation of standard design and construction monitoring practices would reduce this impact to a less-than-significant level and no mitigation measure is required.

Subsidence caused by dewatering during construction would not occur as dewatering is not expected due to the use of a pressure-face TBM, even for the Los Angeles River undercrossing where groundwater would be encountered. Dewatering is also not anticipated at the shafts, which would use water-tight boxes. Implementation of these specialized construction practices and LADWP standard practice (see Section 2.5.6 LADWP Project Measures) as discussed in Criterion GEO-2 would reduce this impact to a less-than-significant level.

Operation. Post-construction settlement, including seismically-induced, could occur locally due to a loss of soil strength resulting from the tunneling process. Advancement of the TBM in full-pressure mode will not result in loss of soil strength above or around the tunnel. The project specifications will require that the contractor conduct the tunneling process under pressure at all times to prevent soil loss and the development of narrow chimneys that may migrate to the surface. Maintaining the soil properties will not increase the potential for seismically-induced settlements which existed before tunneling. Although settlement of the ground surface is estimated to be low due to the construction method (earth pressure-balanced TBM), an analysis of settlement will be completed during design. The settlement analysis would evaluate conditions along the tunnel and at and adjacent to the proposed tunnel shafts. Implementation of LADWP standard practice as discussed in Criterion GEO-2 and Section 2.5.6 LADWP Project Measures would reduce this impact to a less-than-significant level.

Project Structures Could Be Damaged by Corrosive Soils (Criterion GEO-5)

Construction. There is potential for corrosive soils to occur along the Upper Reach Pipeline alignment, including options UR1a andUR2a. Other unsuitable soils, such as expansive soil, are unlikely along the project alignment or to impact the buried pipeline or the deep tunnel segments. The potential for corrosive soils to slowly degrade the pipeline materials and ultimately cause leaks or ruptures will be evaluated along the entire alignment.

Prior to final design of the pipeline, tunnels, shafts and vaults, LADWP will implement recommendations from the geotechnical studies to identify site-specific soil corrosion potential and then select the appropriate materials or protection schemes. Use of select steel, sulfate resistant concrete, or use of cathodic protection are standard practice for pipeline design. Implementing the recommendations of the geotechnical study and corrosion analysis as part of standard design practices would reduce this impact to a less-than-significant level and no mitigation measure is required.

Operation. Once operational, the proposed project pipeline would be underground and monitored. LADWP will periodically evaluate pipeline integrity (interior and exterior corrosion) during the project life and take corrective actions as necessary (see Section 2.7 Operation and Maintenance). Therefore, corrosion impacts from operations of the pipeline would be less than significant and mitigation measures would not be required.

Dewatering Could Encounter Contaminated Groundwater (Criterion GEO-7)

Construction. Due to the proximity of the project alignment to the San Fernando Valley VOC groundwater plume in the Shallow Zone aquifer and the potential for seasonal groundwater level fluctuation, there is a small likelihood that dewatering operations would encounter these contaminants. The PCE and TCE concentrations at the upgradient boundary of the contaminant plume are anticipated to be very low and may not exceed regulatory levels requiring special permits or disposal. Only one tunnel segment (near the Los Angeles River) has groundwater near tunnel grade and the remaining tunnel segments would be located above the water table. However, due to the use of an earth pressure-balanced TBM, routine dewatering is not required during tunneling activities. The remaining alignment and Options UR1a and UR2a would be constructed above the water table.

However, in the event tunnel muck is saturated and/or groundwater dewatering is required, a plan for proper handling and disposal of contaminated effluent will be developed prior to construction. Groundwater samples will be collected prior to construction to determine contaminant levels near the project alignment and assess regulatory restrictions for the handling, treatment and disposal of dewatering effluent. An NPDES permit or coverage under an existing general permit will be required for the project prior to the discharge of dewatering effluent. The NPDES permit will have specific testing, monitoring, and discharge requirements. During final design, as part of the ongoing geotechnical investigation, and prior to construction, LADWP will evaluate groundwater conditions (depth and water quality) near the project alignment to identify where groundwater may be encountered and, if present, the quality of water that would be discharged. If necessary, a groundwater dewatering, storage, treatment and discharge plan would be developed by LADWP or required of the contractor by the project plans and specifications. The dewatering plan would identify the water quality and methods to avoid violating any water quality standards or waste discharge requirements. A groundwater assessment and discharge plan that meets the requirements of the Los Angeles RWQCB NPDES permit and implementation of LADWP standard practice (see Section 2.5.6 LADWP Project Measures) ~~as discussed in GEO-2~~ would reduce this impact to a less-than-significant level.

Operation. Once operational, the proposed project would generally remain above the water table and would not experience any impacts from groundwater contamination. Where the pipeline within the tunnel is below the water table, groundwater will not infiltrate the lined and sealed tunnel. Also, the internal pressure within the pipeline is greater than the piezometric pressure of the groundwater, which would prevent groundwater inflow into the pipeline. Therefore, groundwater quality impacts from operations of the pipeline would be less than significant and no mitigation measures would be required.

3.5.5 Level of Significance After Mitigation

The LADWP will implement standard design and construction practices during construction and operation of the pipeline. With the implementation of LADWP standard practices (see Section 2.5.6 LADWP Project Measures) and the previous geology and hydrology measures in the Initial Study (GEO-1 and ~~GEO-2~~WQ-1), impacts from geology and hydrogeology would be less than significant.

3.5.6 Cumulative Impacts

Construction and operation of the proposed project would contribute a less-than-significant increase to potential cumulative impacts. Implementing the recommendations of the geotechnical study would minimize any project-related impacts and would further minimize the potential for cumulative effects. Because other identified projects (Section 2.8 Cumulative Projects) would need to comply with best management practices and incorporate design requirements that address project area conditions, the effects of these projects in conjunction with the proposed project on the geologic and hydrogeologic environment are not cumulatively considerable.

4. Alternatives Analysis

4.1 Introduction and Overview

This chapter sets forth potential alternatives to the proposed project and evaluates them. Consistent with CEQA, this EIR does not consider an alternative whose effects could not be reasonably identified, whose implementation is remote or speculative, and that would not achieve the basic project objectives.

4.2 Alternative Screening Process

As described in Section 2.2, the LADWP's intention is to replace the existing Upper Reach RSC pipeline, which has provided over 50 years of continuous service to the City of Los Angeles. The key reasons for necessitating the proposed project include meeting California Department of Health Service Regulations, need for increased pipeline capacity, air entrainment that restricts water flow capacity, and reduced open reservoir storage due to more stringent state and federal water quality regulation. LADWP has defined the primary objectives of the proposed project as follows:

- Install a new larger water pipeline with supporting facilities in a new alignment
- Meet or exceed current governmental codes and regulations
- Allow for maximum operational capacity, flexibility, and reliability
- Design and construct the pipeline using the latest technology and methods available.

For purposes of this analysis, the project alternatives have been evaluated to determine the extent to which they attain the basic project objectives, while lessening any significant environmental effects of the proposed project. The goal for evaluating the alternatives is to identify ways to lessen or avoid the significant environmental effects resulting from implementation of the proposed project.

The proposed project is a linear route where potential alternatives are limited by required connections to specific reservoirs, pump stations, and the headworks facility and by the surrounding built environment. The proposed project pipeline would be located in public street rights-of-way, existing easements such as the Whitnall Highway and Headworks Spreading Grounds, new easements, and recreation areas within the City of Burbank and City of Los Angeles. The area through which the pipeline is proposed to be constructed is bounded by Sherman Way to the north, U.S. Highway 170/134 (Hollywood Freeway) to the west and southwest, Interstate 5 (Golden State Freeway) to the east, and Forest Lawn Drive to the south. The Upper Reach pipeline would be located in the LADWP East Valley service area. Within these limitations, the following alternatives have been identified:

- **No Project** – With this alternative, proposed project development would not occur; or the predictable or reasonably foreseeable circumstance that would result if the project did not proceed or was not approved would occur.
- **All-LA Route #1 Alternative** – This route uses major streets to reach Clybourn Avenue where it continues south to Forest Lawn Drive. The alignment would border the Los Angeles and Burbank city limits along Clybourn Avenue. Although this alternative goes through a portion of the City of Burbank, it is considered an all-Los Angeles alternative because it would not impact City of Burbank public streets.
- **All-LA Route #2 Alternative** – This alternative would include the use of a portion of the Whitnall Highway in an attempt to reduce project footage. It is considered an all-Los Angeles alternative because it would not impact City of Burbank public streets.

- **All-LA Route #3 Alternative** – This alternative is completely within the City of Los Angeles and would use Lankershim Boulevard to travel south from Victory Boulevard to Riverside Drive.
- **All-Whitnall Highway Route Alternative**– This alternative would use the Whitnall Highway from the North Hollywood Pumping Station (NHPS) in the north to Forest Lawn Drive in the south. Tunneling would be used for the entire route to minimize disruptions to traffic, residences, and businesses.
- **LA/Burbank Route Alternative** – This alternative includes rights-of-way (ROW) within both Los Angeles and Burbank and would start at the NHPS and continue south on Lankershim to Riverside Drive and then take Riverside Drive east, crossing the Los Angeles River to the Headworks Spreading Grounds.
- **Above Ground River Crossing Alternative** – This alternative would provide an alternative to jacking under the Los Angeles River. It would involve construction of a pipe bridge over the Los Angeles River.

Figure 4-1 displays the location of each alternative. Of these alternatives, the All-LA Route #2, LA/Burbank Alternative, and Above Ground River Crossing Alternative were eliminated from further consideration for the reasons noted below (Section 4.3). The other alternatives were carried forward for further analysis and are discussed in Section 4.4.

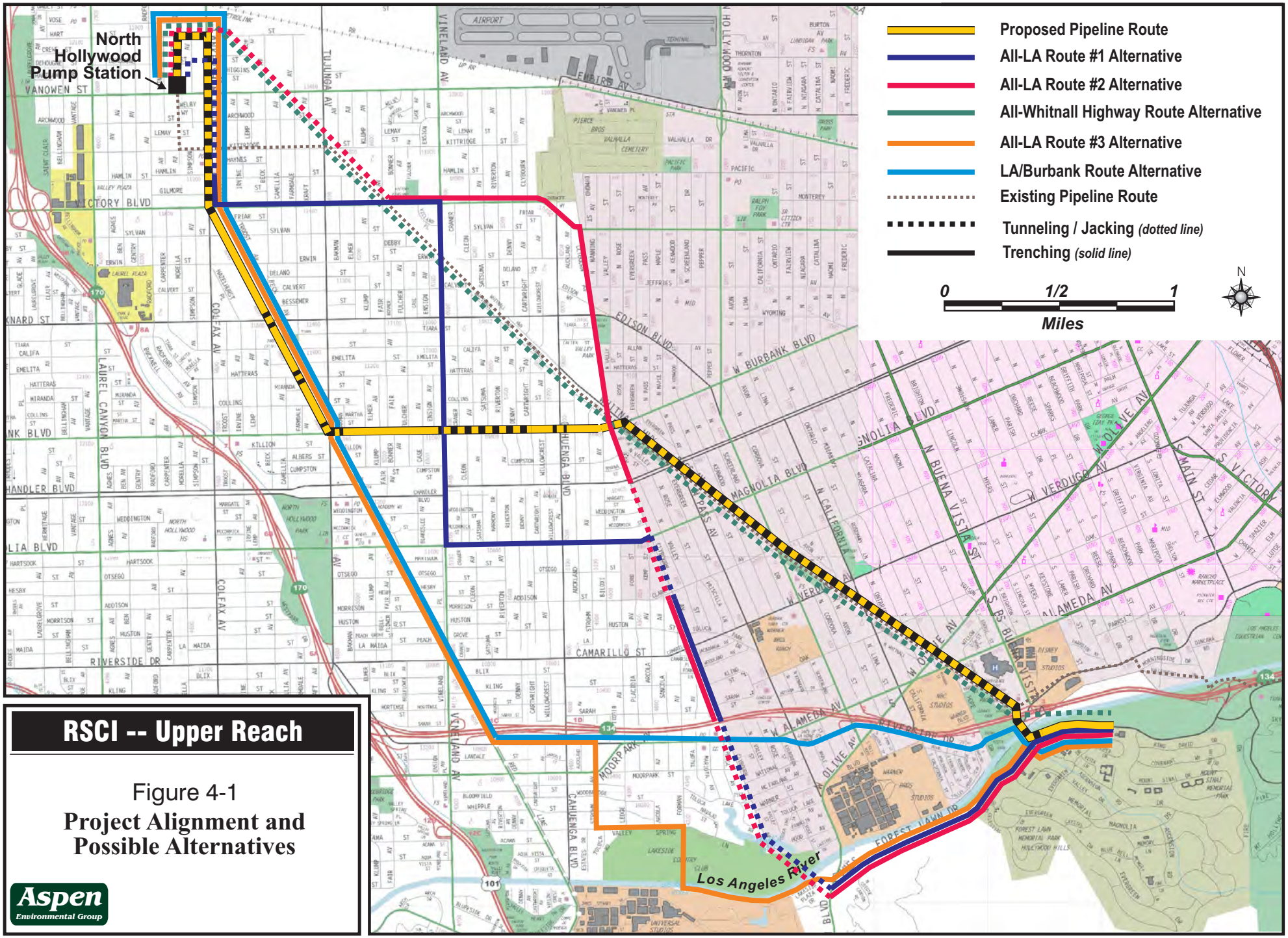
4.3 Alternatives Eliminated from Further Consideration

4.3.1 All-LA Route #2 Alternative

The All-LA Route #2 includes the construction of the project within the City of Los Angeles, except for a portion of the route on Clybourn Avenue between Magnolia Boulevard. and Clark Avenue, which is in the City of Burbank. In this small area, the pipeline would be tunneled under the City of Burbank (between Magnolia Boulevard. and Clark Avenue), and would not impact City of Burbank public streets. All-LA Route #2 would include a 78-inch diameter pipe that would be constructed as follows: microtunneling from NHPS north to Hart street then east to the Whitnall Highway ROW, then tunneling south from Whitnall Highway to Victory boulevard, and the open cut method, from Victory Boulevard east to Clybourn Avenue, and then a combination of open-cut/tunneling south from Chandler Boulevard to Forest Lawn Drive, finishing with open-cut method east from Forest Lawn Drive at Barham Boulevard to Headworks.

This alternative would avoid construction within the City of Burbank street ROW and reduce the overall project length thereby reducing construction related impacts associated with the proposed route while meeting the principal objectives of the project.

The major issue with this alternative is that by increasing the amount of tunneling, this alternative approached the same amount of tunneling length as the All-Whitnall Highway Route Alternative (discussed below). As a result, environmental impacts would not be substantially different from those of All-Whitnall Highway Alternative. Additionally, the All-Whitnall Highway Alternative still remains the shorter route with the potential for reduced impacts compared to the All-LA Route #2. The All-LA Route #2 also borders the City of Burbank boundary more than other alternatives, which would impact a larger area of City of Burbank property owners along the Burbank/Los Angeles city boundary. Therefore, this alternative has the potential to impact a greater number of City of Burbank residents in comparison to other alternatives and the proposed project, which is inconsistent with the purpose of this alternative. Therefore, the All-LA Route #2 was eliminated from further consideration.



RSCI -- Upper Reach

Figure 4-1

Project Alignment and Possible Alternatives

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4.3.2 LA/Burbank Alternative

The proposed Upper Reach pipeline would be located along/in City of Los Angeles and City of Burbank streets and parks (See Figure 4-1). Under this alternative, the portion of the pipeline in the City of Burbank would be 7,500 feet long, and the remaining 25,000 feet would be in the City of Los Angeles. The majority of the proposed pipeline would go through urban development consisting of commercial zones interspersed with residential zones.

The north end of the LA/Burbank Alternative would begin at the NHPS. Once exiting the station, the pipeline would proceed north along either Hinds Avenue or Morella Avenue, turning east onto Hart Street, then south onto Lankershim Boulevard, and east again onto Riverside Drive until reaching Johnny Carson Park, a municipal park, east of Bob Hope Drive. At this point, the pipeline would continue across the Los Angeles River to Forest Lawn Drive, and east to the west end of the Headworks Spreading Grounds site.

In this alternative, the pipeline would be installed by open trench and jacking. This alternative would include approximately 2,600 feet of jacking with steel or concrete cylinder casing, 24,300 feet of open trench excavation, and eleven (11) auger-bores (jacking method) or tunneling with steel casing across street intersections and the Los Angeles River.

This alternative was eliminated from consideration because it would have greater traffic, noise, and air quality impacts than the proposed project. The alignment would go through a heavily traveled street used to access movie and recording businesses along Riverside Drive. With open trenching, two to three lanes would need to be closed to place the pipeline underground. Because this area includes dense commercial and residential land uses, removing several lanes along Riverside Drive would be a significant, unavoidable impact with no mitigation available to reduce the impact. Noise impacts would be greater due to the movie and recording studios on Riverside Drive. Also, air quality impacts are expected to be greater due to the alternative's longer alignment in comparison to the proposed project (32,500 feet vs. 31,300 feet).

In addition, the City of Burbank expressed concern with routing the pipeline through the heart of the Media District because it would interfere with existing electrical and fiber optic facilities, and/or limit the future expansion/undergrounding of existing overhead lines in that area. The proposed pipeline would also have a potential conflict with the City of Los Angeles' 48-inch North Outfall Sewer located in Riverside Drive between Catalina and Buena Vista, which is important to the operation of the City of Burbank's sewer system.

This alternative was eliminated from further consideration as it would not reduce the significant impacts associated with the proposed project, as well as for the reasons noted above.

4.3.3 Above Ground River Crossing

The Above Ground River Crossing Alternative would result in the construction of a pipe bridge over the Los Angeles River. The purpose of this alternative would be to try and reduce the environmental impacts associated with the proposed jacking/tunneling activities required for the Upper Reach pipeline construction under the Los Angeles River from Johnny Carson Park to Forest Lawn Drive while still providing the necessary pipeline infrastructure.

As shown in Figure 4-2, a pipe bridge currently exists at the proposed Los Angeles River crossing location. This alternative would result in a 78-inch pipe bridge at this location to serve the new Upper Reach pipeline.

Figure 4-2
Existing Los Angeles River Pipe Bridge

Note: The pipeline in the above photo is significantly smaller than the proposed 78-inch diameter pipeline that would be used for the proposed project.

This alternative would require approval by several agencies, and cause significant hydrological and visual resources impacts. Emissions would be slightly reduced compared to the proposed project due to the fewer number of construction related haul trips required for transporting tunneling spoils. While the slight reduction in the total project emissions would be beneficial, with regard to NOx and PM_{10}, the alternative would not result in emissions that are less than the SCAQMD's construction emissions thresholds. Therefore, even with reductions in air quality emissions during construction, this alternative would continue to result in significant air quality impacts.

On-site noise during construction at the Los Angeles River from heavy-duty jacking and tunneling construction equipment would be eliminated under this alternative, and off-site noise would be reduced by a reduction in the number of trucks removing materials and equipment to the jacking construction locations. Because no sensitive receptors are located in the immediate vicinity of the river crossing location, overall noise impacts to the land uses in the area would decrease. Vibration levels from heavy equipment tunneling under the river could be perceptible to residents or workers in commercial and residential structures immediately adjacent to the river crossing site. The construction of this alternative would reduce peak vibration levels from construction activities. While no sensitive receptors were identified within 50-feet of the river crossing location, implementation of this alternative would require additional measures to reduce noise impacts to a less-than-significant level.

Construction of an above ground river crossing would result in slightly less disruptions to traffic flows compared to jacking construction activities to install the pipeline under the river. The number of construction related haul trips associated with the jacking activities would be slightly more than that required to construct the pipeline bridge river crossing. However, during construction of the pipe bridge, worker parking and construction related haul trips of equipment and materials to the site would occur along Riverside Drive and the surrounding arterial street network, which would cause similar traffic impacts as the proposed project.

Further, LADWP determined in its review of alternatives that a pipe bridge would not be practical for this project. The project pipe diameter of 78-inches is only capable of 50 to 70 feet of self-supported free-span. The Los Angeles River is an improved channel of 130-feet at project crossing. A successful pipe bridge crossing would require significant improvements such as onshore towers with pipe supporting suspension cables or at least one offshore pier footing. This alternative would require extensive design and permit requirements to mitigate any impacts to the river walls and channel bed. In addition, the significant infrastructure needed to support the pipe and the pipe itself would be inconsistent with the improvements proposed as part of the Los Angeles River Revitalization Plan. For these reasons, this alternative was eliminated from further consideration.

4.4 Alternative Impact Analysis

Along with the No Project Alternative, All-Los Angeles Route #1, All-Los Angeles Route #3 and All-Whitnall Highway Alternative are considered suitable for evaluation in this EIR due to their ability to meet the basic project objectives and potential to result in fewer significant environmental impacts than the proposed project. The potential environmental effects for these alternatives are presented below.

4.4.1 No Project Alternative

The "No Project" alternative represents the *status quo*, or maintaining the project site in its current state and using the existing LADWP RSC water transmission pipeline. The no-project analysis discusses the "no build" alternative, as well as what would be reasonably expected to occur in the foreseeable future if the proposed project were not approved, based on current plans and consistent with available infrastructure and community services.

Built in the 1940s, the existing RSC pipeline's purpose is to transport large amounts of water from the Van Norman Complex (Los Angeles Reservoir) and local groundwater wells to reservoirs and distribution facilities located in the central areas within the City of Los Angeles. Approximately 60,000 feet in length, the existing RSC pipeline begins at the NHPS and ends at the Ivanhoe Reservoir. Hollingsworth Spillway is located about midpoint along the pipeline, and is used to control the pressure of the downstream pipeline.

The section of existing pipe north of Hollingsworth Spillway is referred to as the Upper Reach, while the section south is referred to as the Lower Reach. About 70 percent of the existing pipeline is located in City of Los Angeles streets and property with the remainder located within easements in the City of Burbank. Various pipe sizes and material types were used to construct the existing RSC pipeline. For the Upper Reach, 98 percent of the pipeline is concrete pipe, with the remainder being steel.

There is a history of pipe leaks. It is suspected that the combination of aged materials and higher operating pressures have contributed to this. Low pressure problems are also present in the existing RSC. There are sections of pipe that are unpressurized or at pressures less than required by the California Department of Health Services Drinking Water Regulations. Minimum pipe pressure helps to prevent cross contamination from other buried utilities, in particular, sanitary sewer. In addition to these issues, loss of storage capacity within LADWP's water distribution system requires increased pipeline capacity to continue to adequately meet current water requirements of the City of Los Angeles.

4.4.1.1 Attainment of Project Objectives

Although the No Project alternative would provide for an ongoing source of water using the existing system, it would not meet the basic objectives of the project. The current system cannot provide a reliable supply of water, cannot provide for a larger flow capacity, would not provide a higher water pressure to meet state regulations, and would not compensate for loss of water storage.

4.4.1.2 Impacts

A "No Project" scenario assumes that the replacement of the existing Upper Reach pipeline would not occur. The No Project scenario would not preclude LADWP from developing other water supply projects in the area, as it must meet the Department of Health and Safety regulations and standards. Implementation of the No Project Alternative would not result in noise, traffic, air quality, recreation, or geology/hydrogeology impacts, as presented in Sections 3 and 5, which would occur under the proposed project. However, without improvements generated by the proposed project, additional solutions would be required and demands would increase. The No Project Alternative would not achieve the LADWP's goals and objectives (see Section 2.2).

4.4.2 All-LA Route #1 Alternative

The All-LA Route #1 would result in avoiding construction within the City of Burbank street ROW. It is assumed that a 78-inch diameter pipe would be installed using a combination of open cut, microtunnel, and tunnel methods for this alternative. This alternative would follow the proposed project at the beginning but would turn east at Victory and Lankershim Boulevards then south at Vineland and east at Magnolia again south at Clybourn Avenue to Forest Lawn Drive ending at Headworks. This alternative route is the longest of the routes at greater than 40,000 feet.

The purpose of this alternative would be to eliminate construction within City of Burbank street ROW, to reduce noise and vibration impacts associated with the proposed Upper Reach construction, and to reduce recreation impacts while meeting the principal objectives of the project.

4.4.2.1 Attainment of Project Objectives

This alternative reroutes a large portion of the pipeline route to avoid construction activities within the City of Burbank. Although this alternative is longer and may result in more impacts than the proposed project, the essential components of the proposed project are maintained, thus this alternative would achieve most of the project objectives.

4.4.2.2 Impacts

Noise/Vibration

This alternative would include trenching on most of the route with jacking/tunneling at the NHPS, along Clybourn Avenue, and at the golf course. This alternative would require similar construction activities as the proposed project. With this alternative, construction noise would impact residences along Clybourn Avenue, which borders the City of Burbank jurisdiction.

Tunneling on Clybourn Avenue and through the golf course would impact the residential community along this route. However, the amount of tunneling has been reduced in this alternative, which would reduce construction-

related vibration impacts to residences and businesses. Both noise and vibration would have limited impact on the major movies studios in this alternative. The tunneling on Clybourn Avenue would reduce construction impacts on residential streets and would reduce noise from trenching in residential areas. This alternative would have less impacts from noise and vibration as compared to the proposed project.

Transportation/Traffic

This alternative would include microtunneling at the NHPS but would include more open trenching than the proposed project. The open trenching would have a greater impact on traffic because it would require closing down travel lanes to accommodate the trenching operations. The uses along Clybourn Avenue are primarily residential, where the width of the street may further impact access to residences. This alternative would also include trenching on Forest Lawn Drive, which would require a reduction of lanes near the memorial parks. This alternative would have greater traffic impacts than the proposed project because a greater portion of the alignment would be trenched. However, this alternative would avoid impacts to the dense commercial area on Lankershim Boulevard and Burbank Boulevard.

Air Quality

This alternative would have greater air quality impacts during construction because the length of the alternative (40,000 feet) is longer than the proposed project (29,400 to 31,300 feet, depending on which option is used). Although this alternative and the proposed project would have air emissions that exceed thresholds, this alternative is expected to have more air quality impacts than the proposed project due to the longer route.

Recreation

This alternative would tunnel under the golf course but would not have impacts on recreation areas. This alternative would also jack/tunnel under the Los Angeles River, which means that the shafts or pits for the tunneling would need to be placed north and south of river for the jacking/tunneling. Even with these pits/shafts, this alternative would have less recreation impacts than the proposed project.

Geology / Hydrogeology

This alternative would be in a similar geologic and hydrogeologic environment as the proposed project and other project alternatives. This route has the same potential as the proposed project to be near active faults. Similar to the proposed project and standard practice for LADWP, a geotechnical investigation would be conducted for this route to identify soil and groundwater characteristics along the project alignment and recommendations would be developed specific to this alignment. Therefore, this alternative would have the similar impacts as the proposed project with regard to geology and soils.

This alternative however would not cross the operable unit VOC plume that is crossed at the Los Angeles River by the proposed project. Tunneling and jacking would be conducted outside of the VOC plume. Therefore, this alternative has the potential to have less impacts to geology/hydrogeology than the proposed project.

Other

This alternative has the potential to overlap with other proposed utility projects in the area that are proposed by the City of Los Angeles.

4.4.3 All-LA Route #3 Alternative

The All-LA Route #3 would be routed through the City of Los Angeles only. With this alternative, the proposed pipeline would start similar to the other alternatives at the NHPS and then would go south on Lankershim until it reaches Riverside Drive. At this point it would deviate from Riverside Drive at Strohm Avenue, head south on Strohm Avenue to Valley Spring Lane, then east to Forman Avenue, then south through the Lakeside Country Club (privately owned). At this point, the pipeline would continue across the Los Angeles River, head east along the northerly perimeter road of the Universal Studio's property to Lakeside Plaza Drive (private roadway) before returning to public rights-of-way at Barham Boulevard. From Barham Blvd, the pipeline would continue east along Forest Lawn Drive to the Headworks Spreading Grounds site. The entire pipeline (39,100 feet) would be in the City of Los Angeles. Additional easements within Lakeside Country Club and Universal Studios would be required for this alternative.

4.4.3.2 Impacts

The LADWP added this All-LA route to provide a potential route that would avoid construction of the proposed pipeline in the City of Burbank.

Noise / Vibration

During construction, residences along Strohm Avenue and Valley Spring Lane would be exposed to potentially significant noise levels generated by heavy construction equipment operating within the construction zones, which would otherwise be unaffected by the proposed project. Any one receptor adjacent to an open trench construction area could experience adverse noise levels for approximately one week. Noise levels associated with jacking or tunneling construction activities at the Los Angeles River could last for several weeks. Work along Strohm Avenue and Valley Spring Lane would likely result in unmitigated construction noise levels that violate Section 112.05 of the Los Angeles Municipal Code, resulting in periodic exposure to noise levels at or above 75 dBA. Measures could be applied similar to Mitigation Measures N-1 through N-13 to reduce impacts. However, even with mitigation, this alternative would expose more residents to construction noise than the proposed project.

This alternative would result in less groundbourne vibration impacts than the proposed project, as tunneling would only occur in the northern portion of the route in the vicinity of the NHPS.

Transportation/Traffic

The All-LA Route #3 would be placed on roadways within the City of Los Angeles only. This route would avoid the concern of impacting streets within the City of Burbank. Traffic impacts would be similar to those of the proposed project, but this route would impact businesses and residents to a greater extent than the proposed project because the alignment would be placed on major streets such as Lankershim Boulevard where the reduction of lanes would impact a larger commercial corridor. Also, in the southern areas of the alignment, this route would impact small residential streets near the golf course that have narrow streets. This alternative would have a greater impact on traffic because some of the roadways would impact residential streets that have narrow street widths.

Air Quality

The All-LA Route #3 would have greater air quality emissions than the proposed project because the length of this route is longer than the proposed project (39,100 feet vs. 29,400 to 31,300 feet, depending on which option is used). This alternative would have a different construction scenario than the proposed project because this alternative would have a greater amount of trenching. This means that the construction haul trips and worker commute trips would occur all along the route and not in concentrated areas like the proposed project, which includes more jacking/tunneling. Although this alternative and the proposed project would have air emissions that exceed thresholds, this alternative is expected to have more air quality impacts than the proposed project due to the longer route.

Recreation

The proposed project would not include the construction of or induce expansion of any recreational facilities. In addition, the All-LA Route #3 would not displace recreational demand such that new regional recreational opportunities would be demanded. This alternative would however include trenching in the Lakeside Country Club Golf Course. While the golf course is a privately-owned facility, this alternative would impact the use of the facility for an extended period of time during construction of the pipeline. However, construction within the golf course would be less than the proposed project's use of a park, and therefore this alternative would have less recreation impacts than the proposed project.

Geology / Hydrogeology

This alternative would be in a similar geologic and hydrogeologic environment as the proposed project and other project alternatives. This route has the same potential as the proposed project to be near active faults. Similar to the proposed project and standard practice for LADWP, a geotechnical investigation would be conducted for this route to identify soil and groundwater characteristics along the project alignment and recommendations would be developed specific to this alignment. Therefore, this alternative would have similar impacts as the proposed project with regard to geology and soils.

This alternative however would not cross the operable unit VOC plume that is crossed by the proposed project. Trenching would be conducted outside of the VOC plume. Therefore, this alternative has the potential to have less impacts to hydrogeology than the proposed project.

4.4.4 All-Whitnall Highway Route Alternative

The All-Whitnall Highway Route Alternative would develop the proposed pipeline within the Whitnall Highway, which is an existing LADWP 230-kilovolt electrical corridor that travels from Tujunga Avenue to West Olive Avenue in both the City of Burbank and the City of Los Angeles. As shown in Figure 4-3, the Whitnall Highway ROW is approximately 150-feet wide and contains three rows of electrical transmission line facilities.

The All-Whitnall Highway Route Alternative would avoid construction within the City of Burbank street ROW. It is assumed that a 78-inch diameter pipe would be installed using tunneling for the entire length. This alternative would not follow the proposed project route other than at the very beginning from NHPS to Hart Street. At that point the route would continue to the Whitnall Highway ROW and follow it to Forest Lawn Drive

to Barham Boulevard to Headworks. This alternative route is the shortest route (27,850 feet) among the alternatives evaluated in this EIR.

The purpose of this alternative would be to eliminate construction within City of Burbank street ROW, to reduce noise impacts associated with the proposed Upper Reach pipeline construction and to reduce traffic impacts while meeting the principal objectives of the project.

Figure 4-3
Whitnall Highway Utility Corridor

4.4.3.1 Attainment of Project Objectives

This alternative reroutes the pipeline route thru Whitnall Highway from Hart Street all the way to Headworks to avoid construction activities within the City of Burbank, and to reduce traffic impacts. This alternative would use tunneling for the entire length of the project, which would minimize disruptions to traffic, residences, and businesses. The essential components of the proposed project are maintained, thus this alternative would achieve the project objectives.

4.4.3.2 Impacts

Noise/Vibration

The All-Whitnall Highway Alternative would have reduced noise impacts compared to the proposed project, except at the tunnel shaft locations where residents and businesses would be exposed to greater noise impacts. This alternative, however, would result in greater vibration impacts than the proposed project because it would expose more residents and businesses to the affects of vibration from tunneling than the proposed project. While monitoring and other best management practices could be employed to reduce the vibration associated with tunneling activities, this alternative would continue to have greater vibration impacts than the proposed project.

Transportation/Traffic

Preliminary analysis indicates that potential traffic impacts would decrease considerably with this alternative. Although street crossings would occur, the majority of construction activities would occur within the Whitnall Highway ROW, thus reducing traffic impacts compared to the proposed project. Traffic would be centralized at the shaft locations in this alternative; however, this alternative would have less traffic impacts than the proposed project.

Air Quality

The length of this alternative is shorter than the proposed project route and would therefore have the potential to generate lower air quality emissions than the proposed project. With this alternative there would be no emissions related to trenching. In general, the emissions would be generated from construction traffic bringing materials and workers to the staging areas and at the shaft locations. As such, air emissions would generally be localized at the staging or work areas because the entire route would be tunneled. Best management practices would be implemented, similar to the proposed project, to reduce air quality emissions to the extent feasible. This alternative would have less air quality impacts than the proposed project.

Recreation

This alternative would have similar impacts to recreation as the proposed project. This alternative would not impact parks or recreation areas as part of the pipeline construction. Because tunneling is planned under the Whitnall Highway, noise and vibration may occur where the route crosses under recreational uses. However, due to the limited recreational uses at Whitnall Highway Park North and South and the surrounding urban development, no impacts to recreation uses would occur in these parks. The only area that would have the potential to be impacted is Johnny Carson Park. For this alternative it is likely that Johnny Carson would be used as a staging area for an extended period of time similar to the proposed project. Other staging areas and shaft locations could be set up on other LADWP property, street rights-of-ways, and open lots. This alternative would have similar impacts to recreation as the proposed project.

Geology / Hydrogeology

This alternative would be in a similar geologic and hydrogeologic environment as the proposed project and other project alternatives. This route has the same potential as the proposed project to be near active faults. Similar to the proposed project and standard practice for LADWP, a geotechnical investigation would be conducted for this route to identify soil and groundwater characteristics along the project alignment and recommendations would be developed specific to this alignment. Therefore, this alternative would have the similar impacts as the proposed project with regard to geology and soils.

This alternative however would cross the operable unit VOC plume almost for the entire route, except for a small area on the southern portion of the alignment. Tunneling in the northern end of the alignment would be above the water table (section 3.4 Geology/Hydrogeology) and the southern end near Olive Avenue could hit groundwater. Even though this alternative would include tunneling in a larger area of the VOC plume, this alternative has the potential to have similar impacts to hydrogeology in comparison to the proposed project because if this alternative were to hit groundwater it would be at a similar location as the proposed project.

4.5 Conclusions and Summary

An EIR is required to identify the environmentally superior alternative from among the range of reasonable alternatives that are evaluated. Ideally, this would be the alternative that results in fewer (or no) significant and unavoidable impacts. CEQA Guidelines §15126.6(e)(2) states that if the environmentally superior alternative is the No Project Alternative, the EIR shall also identify an environmentally superior alternative from among the other alternatives. Table 4-1 provides a comparison of the impacts associated with the proposed project and its alternatives.

Table 4-1. Comparison of Alternatives to the Proposed Project

Proposed Upper Reach Project	No Project Alternative	All-LA Route #1 Alternative	All-LA Route #3 Alternative	All-Whitnall Highway Route
Noise/Vibration				
Significant unavoidable impacts with Noise and Vibration during construction. Less than significant impacts associated with operation.	Less Noise and Vibration Impacts. This alternative would not have noise impacts except those associated with pipeline maintenance.	Less Noise and Vibration Impacts. Route would expose fewer residents to noise and vibration.	Greater Noise but Less Vibration Impacts. This alternative more trenching in comparison to the proposed project, which would increase noise impacts. Vibration impacts would only occur on the north end of the route with this alternative.	Less Noise but Greater Vibration Impacts. This alternative would concentrate noise at the tunnel shafts. Vibration has the potential to be felt in more areas than the proposed project route as more tunneling would occur along the route.
Transportation/Traffic				
Construction Traffic - less than significant with mitigation. Parking - significant and unavoidable during construction. Operation - less than significant for traffic and parking.	Less Traffic Impacts. This alternative would have less impacts than the proposed project because no substantial new traffic would be generated.	Greater Traffic and Parking Impacts. This alternative has more trenching than the proposed project and would require more detours and lane closures as a result.	Greater Traffic and Parking Impacts. Alternative has more trenching than the proposed project and would require more detours and land closures as a result.	Less Traffic and Parking Impacts. All tunneling for this alternative would concentrate traffic to designated areas. This route would reduce the number of lane closures or detours needed.
Air Quality				
Construction air emissions - significant and unavoidable Pipeline operation - less than significant	Less Air Quality Impacts. This alternative would not have air quality impacts, except emissions associated with periodic pipeline maintenance.	Greater Air Quality Impacts. Longer route than the proposed project, which will increase emissions, although both the project and alternative would exceed thresholds.	Greater Air Quality Impacts. Longer route than the proposed project, which would increase emissions, although both the project and alternative would exceed thresholds.	Less Air Quality Impacts. Shorter route and no trenching would reduce emissions. Tunneling would localize emissions to designated work sites affecting a fewer number of receptors.

Proposed Upper Reach Project	No Project Alternative	All-LA Route #1 Alternative	All-LA Route #3 Alternative	All-Whitnall Highway Route
Recreation				
Construction - significant and unavoidable impacts to park facilities. Operation – less than significant	Less Recreation Impacts. This alternative would not impact park facilities even for maintenance of the existing pipeline.	Less Impacts to Recreation. This alternative would not impact recreation resources along the route.	Less Recreation Impacts. This alternative would impact the golf course but because trenching would be used the golf course would be restored within a specified time frame.	Comparable Recreation Impacts. This alternative would likely use Johnny Carson Park during construction similar to the proposed project.
Geology/Hydrogeology (Geo/Hydro)				
Construction and operation - less than significant.	Less Geo/Hydro Impacts. There would be no development with this alternative.	Less Geo/Hydro Impacts. This alternative would not fall within the VOC plume area.	Less Geo/Hydro Impacts. This alternative would not fall within the VOC plume area.	Comparable Geo/Hydro Impacts. Similar location to proposed project. Larger area within VOC Plume for this route.

The No Project Alternative would be expected to reduce all proposed project impacts, but would not achieve any of LADWP's goals and objectives. Without the proposed project improvements, the LADWP would need to implement additional solutions to address the concerns with the current distribution system and to meet the Department of Health and Safety regulations and standards not achieved under this alternative. Because the No Project Alternative would not meet LADWP's goals and objectives, the environmentally superior alternative from among the remaining alternatives evaluated in this EIR would be the All-Whitnall Highway Alternative.

The All-Whitnall Highway Alternative would be have less parking and air quality impacts and comparable recreation and geology/hydrogeology impacts to the proposed project. However, the All-Whitnall Highway Alternative would have greater vibration impacts than the proposed project because it includes tunneling along the entire route, which would expose a greater number of residential (and other sensitive land uses such as schools) and commercial land uses to vibration impacts. Therefore, the proposed project would be environmentally preferred and would meet all the project objectives.

5. Other CEQA Considerations

This section presents the evaluation of environmental impacts required by CEQA that are not addressed within other chapters of this EIR. This section includes responses to those comments received during the IS public review period that apply specifically to the proposed Upper Reach pipeline, growth-inducing impacts, irreversible environmental changes and use of nonrenewable resources, effects not found to be significant, and significant unavoidable environmental impacts.

5.1 Response to Public Scoping Comments

During the public review period for the IS, comment letters and emails were received from the following agencies: California Department of Transportation (District 7); South Coast Air Quality Management District; City of Los Angeles, Department of Recreation and Parks (LADRP); City of Los Angeles, Bureau of Engineering; and City of Burbank, Community Development Department. These letters and emails are provided in Appendix A.3 for reference.

Several of the comments received from State and local agencies during the public review period for the IS addressed environmental issue areas that were determined to have less-than-significant impacts and are therefore not discussed in Section 3 of this ~~Draft~~Final EIR. Specifically for the Upper Reach, comments were received for the issue areas of Geology and Hydrogeology. Additional comments were made to request clarification on the project description. Therefore, comments not addressed within the other sections of this ~~Draft~~Final EIR are summarized below, along with responses, as appropriate.

Project Description

A comment was received regarding the need to provide more detail on the location of shafts and pits and the location of trenching, jacking, and tunneling construction. The project description maps include information on these issues (Section 2). In addition, the City of Burbank requested that the Project Description include reference to the approvals needed from the City in carrying out the project. Table 2-6 of the Project Description (Required Permits and Approvals) includes reference to approvals needed from the City of Burbank.

Air Quality

The City of Burbank requested additional information on how air quality emissions might impact sensitive receptors along the Whitnall Highway. Detailed sensitive receptor maps were prepared and made available to the project team to use for all issue areas addressed in the EIR. These maps were used to address air quality impacts associated with the proposed route. To avoid duplication and unnecessary reproduction, the maps are found in the Noise and Vibration Study in Appendix C, however, as noted earlier they were used and referred to by all issue area authors in the preparation of the EIR.

Geology / Soils

The City of Burbank asked for additional detail on geology, soils, and hydrogeology associated with the proposed project route. This issue was addressed in the Initial Study and determined to be less-than-significant with mitigation. However, to address the issues raised by the City of Burbank in more detail, the EIR supplements the discussion in the IS with a more detailed discussion of geology, soils, and hydrogeology.

Hazards and Hazardous Materials

This discussion provides information on the San Fernando Valley Superfund Sites to address comments from the City of Burbank, and to supplement the discussion of hazards and hazardous materials in the IS (Appendix A). The intent is to describe the proposed Upper Reach pipeline project in relation to the regional groundwater contaminant plume.

Construction of the proposed Upper Reach pipeline, principally the deeper tunnel segments, may encounter contaminated soil and groundwater and locally may alter the groundwater flow paths. Of particular concern is the presence of groundwater containing volatile organic compounds (VOCs) in a large contaminant plume known as the San Fernando Valley Superfund Sites. Contaminated soil and groundwater related to leaking underground fuel tanks may also impact the underground construction required for the project. This discussion describes the hydrogeology of eastern San Fernando Valley, location of the groundwater plume, groundwater quality near the project alignment, and the likelihood of the tunnel to encounter contaminated groundwater. Finally, this discussion summarizes the measures that will be implemented to assess the groundwater conditions along the affected tunnel segments and to develop groundwater monitoring plans.

Hydrogeology

Regional Setting

The San Fernando Valley Groundwater Basin includes the water-bearing sediments beneath the San Fernando Valley, Tujunga Valley and the alluvial areas surrounding the Verdugo Mountains. The groundwater basin is an important source of drinking water for the Los Angeles metropolitan area. The San Fernando Valley is recharged by the Los Angeles River and its tributaries (DWR, 2004).

The water-bearing sediments consist of the lower Pleistocene Saugus Formation, and Pleistocene and Holocene age alluvium. Groundwater in the basin is mainly unconfined and municipal supply wells in the basin typically have high yields (1,000 to 3,000 gpm). Holocene and Pleistocene age alluvium consists primarily of highly permeable coarse-grained unsorted gravel and sand deposited by coalescing alluvial fans emanating from the surrounding highlands. The thickness of the alluvium is about 1,200 feet in the eastern San Fernando Valley (CH2M Hill, 2004). The Saugus Formation is composed of continental and shallow marine deposits of conglomerates, sands, silts, and clays, with permeability less than that of the Pleistocene alluvium (DWR, 2004). The Saugus Formation is generally considered bedrock and is not tapped by municipal supply wells in eastern San Fernando Valley.

The water-bearing sediments in the eastern San Fernando Basin are subdivided into four layers: Deep, Lower, Middle, and Upper Zones (USEPA, 1993). The Deep Zone extends to the top of bedrock at depths of 1,200 feet or deeper in the eastern Basin and has not historically been an important source of groundwater (USEPA, 1993). The Lower Zone, overlies the Deep Zone, is comprised of coarse sand and gravel at depths of 250 to 500 feet, and is the production aquifer for most of the wells in the eastern Basin (USEPA, 1993). The Middle Zone is predominantly fine grained sand, silt and clay and is only 0 to 50 feet thick. The Upper Zone extends from the ground surface to depths of 200 to 250 feet and consists of sand, silt and gravel. With groundwater levels generally 50 to 200 feet below ground surface, only portions of the Upper Zone contains groundwater locally. The Upper and Middle Zones produce very little groundwater supply (USEPA, 1993).

Groundwater flows generally from east to west across the basin, then south and east to the Los Angeles River Narrows where it drains into the Central Subbasin of the Coastal Plain Basin (DWR, 2004). In the eastern part of the San Fernando Basin near the proposed project, groundwater flows east. Groundwater levels show seasonal response to precipitation, runoff and pumping.

Local Hydrogeology

LADWP's geotechnical subsurface investigation for the Upper Reach project consisted of borings drilled to depths 50 to 100 feet at spacing of 400 to 500 feet. The borings encountered predominantly medium to coarse grained, poorly graded sand and gravel with layers of cobbles; boulders were not identified (URS, 2007). Locally, fine-grained material such as silty sand, sandy silt, clayey sand, and rarely sandy clay were encountered as thin (up to 3 feet) layers. There was no evidence of perched groundwater in the geotechnical borings (URS, 2007) indicating that the regional water table is generally below the depth of exploration and where groundwater is present the finer grained layers do not restrict downward percolation.

The groundwater depth identified during the project-specific geotechnical investigation decreases from 96 feet below ground surface near Verdugo Avenue to a depth of 59 feet on the south side of the Los Angeles River. These depths correspond to the regional water table. Based on the estimated trench depths of 25 feet and maximum tunnel invert of 60 feet, the likelihood of encountering groundwater during construction is limited and localized to the Los Angeles River crossing. The river crossing will proceed from north to south in Holocene alluvium approximately 10 feet above the water table (August 2007) into sandstone and conglomerate bedrock of the Topanga formation with groundwater near the tunnel invert depth.

In general, the tunnel segments of the Upper Reach project will remain above the regional water table and will not alter groundwater flow paths. The tunnels are located in an urbanized area with no significant recharge potential due to the impermeable surfaces and storm drain system. Consequently, alteration of pathways for deep percolation and groundwater recharge will not be affected by the tunnels. Geology at the Los Angeles River crossing consists of Holocene alluvial sand and gravel with minor, thin interbeds of fine grained clay, and consolidated bedrock. When groundwater levels rise in this area the tunnel may partly interrupt groundwater flow paths across the 12-foot high tunnel profile. However, the natural alluvial formations are distinctly granular with moderate to high permeability and no unusual groundwater mounding or channeling is anticipated. Consequently, the potential to cause saturation of units that were typically unsaturated and thereby increase the liquefaction susceptibility is unlikely.

Groundwater Contamination

Volatile Organic Compounds

Groundwater in the eastern San Fernando Basin has been impacted by the industrial solvents trichloroethylene (TCE) and perchloroethylene (PCE). Several municipal supply wells in North Hollywood, Burbank, and Glendale are located within a Superfund area established to address the regional groundwater clean up (USEPA, 2003) of the volatile organic compounds (VOC). The east San Fernando Basin Superfund sites were placed on the National Priorities List (NPL) in 1986 and subdivided into four study areas (USEPA, 2003). USEPA is working in conjunction with the California Department of Toxic Substances Control (DTSC), the Cities of Burbank, Glendale and Los Angeles, and the Upper Los Angeles River Area Watermaster (ULARA Watermaster) to address the groundwater contamination issues. LADWP is currently undertaking a

comprehensive study of the San Fernando Basin to fully characterize the extent and composition of known and emerging contaminants (MWD, 2007).

Groundwater sampling and testing since 1999 has included methyl tertiary butyl ether (MTBE, a gasoline additive), perchlorate (rocket fuel oxidizer, fireworks, flares), and hexavalent chromium. MTBE and perchlorate have been detected at low concentrations in a small number of the USEPA 63 monitoring wells (USEPA, 2003). Hexavalent chromium is more widespread and occurs at concentrations exceeding the California drinking water maximum contaminant level (MCL) of 50 µg/L in four of the 63 monitoring wells (USEPA, 2003). The highest concentrations of hexavalent chromium in groundwater occur in the industrial areas of Burbank and Glendale (MWD, 2007) east of the Upper Reach alignment.

The four USEPA San Fernando Valley Superfund Sites study areas are designated North Hollywood, Crystal Springs, Verdugo and Pollock (USEPA, 2003). The Upper Reach project alignment passes through part of the North Hollywood and Crystal Springs study areas. Groundwater clean up uses a system of wells, conveyance pipelines, treatment plants, and blending of the treated with other potable water supplies to control plume migration, restore the water quality and use the valuable resource. Within the North Hollywood Area two treatment systems, designated the North Hollywood and Burbank Operable Units, are designed to recover and treat 2,000 gallons per minute (gpm) and 9,000 gpm, respectively. The treated, blended water meets all drinking water standards and is delivered to the public (USEPA, 2003). The Glendale North Plume and Glendale South Plume Operable Units, located in the Crystal Springs Area, are designed to treat groundwater and blend with other sources for public use at rates of 3,300 gpm and 1,700 gpm, respectively.

Based on 2001 water quality data, the Upper Reach alignment traverses two areas within the groundwater plume western boundary (USEPA, 2003). The VOC plume extent and relation to the project alignment is presented on Figure 3.5-3. Approximately one mile of the proposed tunnel alignment from NHPS to Victory Boulevard lies above the groundwater plume; no groundwater was encountered in the geotechnical borings drilled to depths of 75 feet (URS, 2007) and the water table in this area is approximately 200 feet below the ground (MWD, 2007). The groundwater contamination in this area contains low (less than 5 µg/L, drinking water MCL) to moderate TCE levels (5 µg/L to 100 µg/L), and low levels of PCE (less than 5µg/L, drinking water MCL). The tunnel alignment from Burbank Boulevard south to Olive Avenue is also 20 to 100 feet above the water table and groundwater plume, which is characterized by low TCE contaminant levels (less than 5µg/L) and no PCE contamination (USEPA, 2003). Continuing south of Olive Avenue, the 60-foot deep tunnel excavation may encounter groundwater identified at depths of 59 to 75 feet (URS boring logs B-76 to B-83). Shallow groundwater near the tunnel crossing of the Los Angeles River is outside of the contaminant plume boundary and the tunnel will not affect remediation efforts downgradient.

Gasoline

Groundwater contaminated with gasoline is suspected at only one site. Based on the EDR database search (Appendix A) there are 23 leaking underground fuel tank sites (LUFT) within one mile of the alignment; there are only ten LUFT sites along the project alignment. All ten sites near the alignment are considered to be "case closed" by the California State Water Resources Control Board (SWRCB, 2007). Although the leaking gasoline tanks at the Mobil Service Station (3020 Olive Avenue, Burbank) received closure status in October 2007, small concentrations of gasoline, benzene and methyl tertiary butyl ether (MTBE) remain in the groundwater (Adini, 2007). The LUFT site is located immediately upgradient of the proposed tunnel and

groundwater is present at a depth of 70 feet below ground. No contamination was identified at the downgradient well within the project alignment (MW-6, Adini, 2007). The tunnel invert is planned to be about 10 feet above the water table and if the water table rises prior to construction, the tunneling method (pressure-balanced TBM) will not require sustained dewatering. The potential for tunneling or minor dewatering to cause the residual groundwater contaminants to migrate to the tunnel are low.

Groundwater Assessment

LADWP will conduct a groundwater assessment and post-construction groundwater level monitoring for this project, which LADWP will address as part of the recommendations of the geotechnical investigation. It is unlikely that the tunnel construction or the presence of the tunnel near the Los Angeles River will disrupt groundwater flow paths or alter the local gradient. However, a change in water levels up and downgradient of the tunnel would be evident in post-construction monitoring, A program to monitor water levels two to four times per year in select piezometers would effectively identify groundwater mounding upgradient of the tunnel. See Section 2.5.6 (LADWP Project Measures) in the Project Description for a description of the groundwater assessment and the post-construction monitoring measures. Also, see revised Mitigation Measure GEO-1 in Section 3.5 (Geology and Hydrogeology) for information on the post-construction monitoring program.

~~LADWP will prepare a groundwater assessment, which will determine the likelihood that groundwater and contaminated groundwater will be encountered at the time of tunnel construction. The groundwater assessment will generally include:~~

- ~~Construct piezometers/monitoring wells along the alignment from Alameda Avenue to the south side of the Los Angeles River at an approximate 500-foot spacing. The well locations should be selected to remain functional during construction.~~
- ~~Contact the Mobil Service Station (3020 Olive Avenue) to gain access for monitoring of MW-6 (LUFT site downgradient well).~~
- ~~Conduct routine water level and water quality monitoring prior to construction to assess groundwater conditions, seasonal water level fluctuations, and water quality. The groundwater baseline data should span about one year and include a minimum of two water quality testing events. Water quality data should be current at the time of bidding.~~
- ~~Analyze the available data to determine the likelihood that groundwater and contaminated groundwater will be encountered during tunnel construction.~~
- ~~If necessary, develop, or require the tunnel contractor to develop, a dewatering plan that includes storage, treatment and disposal of groundwater, that complies with the requirements of the project NPDES permit.~~
- ~~Project plans and specifications will include the results of the groundwater assessment and the dewatering plan. The LADWP resident engineer will oversee the contractor's compliance with the dewatering plan and NPDES permit.~~

~~**Post-construction Groundwater Level Monitoring.** It is unlikely that the tunnel construction or the presence of the tunnel near the Los Angeles River will disrupt groundwater flow paths or alter the local gradient. However, a change in water levels up and downgradient of the tunnel would be evident in post-construction monitoring, which LADWP will address as part of the recommendations of the geotechnical investigation. A program to monitor water levels two to four times per year in select piezometers would effectively identify groundwater mounding upgradient of the tunnel. This water level monitoring program will include provisions to measure water levels in the same wells to establish pre-construction gradients. The pre- and post-~~

~~construction water level data will be evaluated to determine if a mound exists and, if so, whether the liquefaction susceptibility changed (increased) in those areas.~~

5.2 Growth-Inducing Impacts

The growth-inducing potential of a project would be significant if it fosters growth or a concentration of population above what is assumed in local and regional land use plans, which estimate future population growth. Significant growth impacts also could occur if the project would provide infrastructure or service capacity to accommodate growth levels beyond those permitted by local or regional plans and policies.

The Upper Reach Project would not, directly induce economic, population, or housing growth in the surrounding area. During construction, it is assumed that the construction workforce would come from within Los Angeles County. The Cities of Los Angeles and Burbank contain a considerable construction workforce (81,032 persons and 3,252 persons, respectively, in construction trades per Section 3.12, Appendix A.2). As such, construction personnel would not likely move to the project area and would not generate a permanent increase to population levels or result in a decrease in available housing. Therefore, no construction impacts to existing or future population growth levels would occur as a result of project construction. Operation of the proposed project would not require additional permanent employees and, therefore, would not entail any employment increase that might lead to demand for new housing or an increase in population growth.

The proposed project would replace and realign the existing Upper Reach pipeline, which has provided over 50 years of continuous service to the City of Los Angeles, but whose reliability and capacity are near its design life limits. Replacement of the existing Upper Reach pipeline would provide for a more reliable water supply to the central area of the City of Los Angeles, provide a larger flow capacity to adequately meet the current water requirements of the City of Los Angeles, ensure that the water distribution system has sufficient system pressure to meet the California Department of Health Services Drinking Water Regulations, and compensate for the loss of water storage within the LADWP water distribution system. The proposed project would not induce growth as it is intended to improve the existing water system. The Upper Reach pipeline is part of the water infrastructure within the City of Los Angeles. As a means to continue serving the area, the proposed project would respond to the current water requirements of the City of Los Angeles, thereby accommodating the current use in the area.

The potential exists that the improved infrastructure could encourage development; however, the intention of the proposed project is to respond to current water requirements and is not a part of any future housing development, nor is it intended for any specific development projects. Therefore, project construction and operation would not, directly or indirectly, induce economic, population, or housing growth in the surrounding area or the region.

5.3 Irreversible Environmental Changes and Use of Nonrenewable Resources

Determining whether the proposed project may result in significant irreversible effects requires a determination of whether key resources would be degraded or destroyed, such that there is a small possibility of restoring them. The actual construction of the Upper Reach pipeline would not result in the consumption of nonrenewable resources to the extent to which the project commits future generations to similar uses of

nonrenewable resources. No such degradation or destruction of resources would result with the proposed project.

While various natural resources, such as construction materials and petroleum-based fuel, would be used in construction, their use in this project would not result in substantial resource depletion. Once operational, maintenance would include periodic inspection on the isolation, air, and vacuum valves, and testing of the isolation valves. Therefore, the proposed project would not result in substantial resource depletion.

The construction and operation of the proposed project would not present any serious risk of an environmental accident likely to result in irreversible damage. During construction, the proposed project would use small volumes of petroleum hydrocarbons and their derivatives (e.g., gasoline, oils, lubricants, and solvents) to operate construction equipment. Storage of substantial quantities of these materials along the construction alignment would not occur. Construction vehicles on site may require routine or emergency maintenance that could result in the release of oil, diesel fuel, transmission fluid or other materials. However, existing regulations and best management practices for the handling of these substances and procedures for spill containment, as well as implementation of Mitigation Measures HAZ-1 through HAZ-6 (see Appendix A.2, Section 3.7) would reduce the potential for irreversible environmental damage to a less-than-significant level.

As discussed above, operation of the Upper Reach pipeline would require maintenance activities such as periodic inspection on the isolation, air, and vacuum valves, and testing of the isolation valves. Such activities would not present any serious risk of an environmental accident likely to result in irreversible damage. On the other hand, other external hazards (e.g., explosion) could damage the Upper Reach pipeline with the potential to then cause the spread of environmental contamination. To limit the effects of an environmental accident upon the Upper Reach pipeline, the LADWP has emergency response procedures in place to provide for a quick response and limit the area of impact (see Section 2.7.3). For example, as part of the pipeline design, valves would be placed approximately every 5,000 feet along the pipeline, which would allow any potential pipe leak to be isolated, evaluated, and corrected. Additionally, the higher pressures within the new Upper Reach pipeline would prevent cross-contamination of drinking water with other buried utilities, in particular, sanitary sewer. As such, the risk of a serious environmental accident associated with damage to the Upper Reach pipeline from an external source would be limited, and would therefore not result in irreversible damage.

5.4 Effects Not Found to be Significant

For the proposed project, the following environmental issue areas were determined by the Lead Agency (LADWP) to not have the potential to be significant: Aesthetics, Agricultural Resources, Biological Resources, Cultural Resources, Geology and Soils, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, Recreation, and Utilities and Service Systems. The LADWP determined that impacts related to these environmental issue areas would not need to be evaluated in the EIR because either: (1) there was substantial evidence demonstrating that impacts would not be significant; or (2) standard mitigation approaches were available to address potentially significant impacts and it was clear that the mitigation would reduce the impacts to less-than-significant levels. Impact discussions related to each of these issue areas are provided in the IS (see Appendix A.2).

Hazards and Hazardous Materials. Hazards and Hazardous Materials were determined to be less than significant with mitigation. Additional detail was provided in Section 5.1 to address comments from the City

of Burbank. The determination originally made in the Initial Study remains unchanged. However, to address these comments, page 40 of the Initial study is changed as follows:

> Based on the EDR database search, many sites have been identified in the surrounding area and adjacent to the proposed alignment, generally along Lankershim Boulevard and Burbank Boulevard. Table 3.7-1 provides a list of sites documented in various databases compiled pursuant to Government Code Section 65962.5 located within one mile of the proposed alignment (EDR, 2006). Although these facilities are listed on government hazardous materials databases, the storage, use, and disposal of such hazardous materials, or historic releases of such materials, is not expected to present a risk to the public or the environment as a result of the proposed project. Ten leaking underground fuel tank sites were identified along the project alignment and all sites are considered to be "case closed" by the California State Water Resources Control Board (SWRCB, 2007). Although, the leaking gasoline tanks at the Mobil Service Station (3020 Olive Avenue, Burbank) received closure status in October 2007, small concentrations of gasoline, benzene and methyl tertiary butyl ether (MTBE) remain in the groundwater (Adini, 2007). The LUFT site is located immediately upgradient of the proposed tunnel and groundwater is present at a depth of 70 feet below ground. No contamination was identified at the downgradient well within the project alignment (MW-6, Adini, 2007). The tunnel invert is planned to be about 10 feet above the water table. If the water table rises prior to construction, the tunneling method (pressure-balanced TBM) will not require sustained dewatering, and the potential to cause the residual groundwater contaminants to migrate to the tunnel are low. The existing LUFT site monitoring well will be included in the groundwater assessment planned for the Los Angeles River crossing. Regardless, the project plans and specifications should note these conditions for the contractor. If, during construction or operation of the proposed project, contamination is discovered with the potential to create a significant hazard to the public or the environment, the applicable regulatory agency would be contacted and the appropriate corrective actions undertaken to eliminate the hazard.

5.5 Significant Unavoidable Environmental Impacts

Construction of the Upper Reach pipeline would result in significant unavoidable impacts to noise/vibration, transportation/traffic, air quality and recreation. Each of these impacts are described below.

- **Noise/Vibration**. Airborne noise from construction equipment would occur at all points along the project route, except along the tunnel alignments. The primary areas of concern would be around the tunnel shafts and jacking pits. While airborne noise levels around the trenched areas would be substantially above ambient noise levels, the relatively high rate of trench progression (approximately 80 feet per day) would limit the duration to which any one receiver along the trench route would be exposed. Construction activities around tunnel shafts and jacking pits, however, would continue for considerably longer durations (more than six months), thus creating greater impacts on nearby receptors. Potentially significant construction noise impacts would be reduced to levels that would be less than significant through implementation of Mitigation Measures N-1 through N-11; however, due to the hours of construction, the proposed project would not comply with the local noise ordinances of both the Cities of Los Angeles and Burbank resulting in significant and unavoidable impacts. Ground vibration and groundborne noise impacts would be reduced through implementation of Mitigation Measures N-1, N-3, and N-10 through N-13; however, it is unlikely that impacts would be reduced to below the recommended thresholds due to the nature of ground vibration. As such, ground vibration and groundborne noise impacts would be significant and unavoidable.
- **Transportation/Traffic**. Construction of the pipeline and related facilities would result in significant impacts during construction along Lankershim Boulevard and Burbank Boulevard where open trenching

would be used. Therefore, construction activities in these areas would reduce capacities on the directly affected roadways and divert traffic to adjacent roadways that are also heavily traveled. Traffic impacts would be reduced in areas where jacking and tunneling construction methods would be utilized. Implementation of the Mitigation Measures T-1 through T-13 would help to reduce impacts associated with construction of the proposed project to the extent feasible. Furthermore, with implementation of mitigation, impacts to public and emergency vehicle access, public transit, and pedestrian safety would be reduced to less-than-significant levels. However, potentially significant on-street parking supply impacts cannot be mitigated and would remain unavoidable during the construction period.

- **Air Quality**. Temporary construction emissions would result from on-site construction, such as open trench and pipe jacking activities. Emissions would also result from off-site construction activities from construction related haul trips and construction worker commuting patterns. Implementation of Best Available Control Measures required under SCAQMD Rule 403 and Mitigation Measure AQ-1 would reduce construction-related air quality impacts (NOx, PM10, and PM2.5); however, due to the magnitude of the construction activities, the air pollutant emissions impacts would continue to be significant and unavoidable.
- **Recreation.** The middle section of Johnny Carson Park is scheduled to be used as a staging area to include field offices, material storage and handling, as well as the work area and shaft location for tunneling and jacking. This activity coupled with the duration (approximately three years) may result in the degradation of the park facilities, including the extensive grass area and large park trees (Sycamores and non-native trees). Construction-related recreational impacts would be reduced through implementation of Mitigation Measures R-1, N-1, and BIO-3; however, due to the magnitude and duration of the impacts associated with construction activities, impacts to recreation would remain significant and unavoidable.

Mitigation measures can not reduce the proposed project's noise/vibration, transportation/traffic (parking), air quality, and recreation impacts to a less-than-significant level. As such, a Statement of Overriding Considerations that addresses these four issues would be required to proceed with the proposed project.

6. (New) Public Review and Comments on the Draft EIR

The 45-day public review period for the Draft EIR began on March 31, 2008, and ended on May 15, 2008. At the request of the City of Burbank and to give the public and interested parties sufficient time to plan for the review of the Draft EIR, LADWP mailed the Notice of Availability prior to release of the EIR on March 19 and 20, 2008. Approximately 1,800 advance notices were mailed to property owners along the proposed project route, including optional routes. In addition, approximately 60 bound copies of the Draft EIR and the Notice of Availability were released to the public, organizations, and agencies on March 31, 2008, including 15 copies to the State Office of Planning and Research,[1] as required by CEQA, and three copies to public repository sites (local libraries).

During the public review period, six sets of written comments were received from organizations and agencies. The persons, organizations, and agencies that submitted comments on the proposed project are listed in Table 6-1.

Table 6-1. Written Comments Received on the Draft EIR

Comment Set	Organization	Name	Date
A	Forest Lawn Memorial-Parks and Mortuaries	Clint Granath	April 10, 2008
B	Resident	Carolyn Windsor	April 10, 2008
C	California Department of Transportation (Caltrans)	Elmer Alvarez	April 22, 2008
D	City of Burbank	Greg Hermann	May 14, 2008
E	L.A. County Metropolitan Transportation Authority (Metro)	Susan F. Chapman	May 15, 2008
F	Latham & Watkins	Nicole Kuklok-Waldman	May 15, 2008

Appendix F of the Final EIR includes copies of the written comments received during the Draft EIR comment period and LADWP's response to these comments. The key comments and concerns raised during the review of the Draft EIR are summarized below:

Project Description

Additional information was requested regarding the temporary and permanent ventilation structures proposed along the Whitnall Highway in the City of Burbank. The comments requested the proposed location of jacking pits, air shafts, vents, and equipment associated with the tunneling under the Whitnall Highway. At the time of publication of the Draft EIR, the locations had not been determined. Additional information on the location of the temporary shafts and permanent ventilation structures have been identified and included in Section 2 (Project Description) of the Final EIR.

Additional information was requested on LADWP standard practices that were identified in the Draft EIR The project description was revised to include a summary of standard practices that would be applied to the project and the environmental commitments that LADWP has incorporated into the project to reduce impacts. The environmental commitments include a groundwater assessment and monitoring program and a subsidence-monitoring program.

Comments were received regarding the need for the project to be designed to discharge clean water run-off. Table 2-6 (Summary of Required Permits and Approvals) in Section 2 (Project Description) of the Draft EIR identifies National Pollutant Discharge Elimination System (NPDES) Permit from the Regional Water Quality

[1] Although the Draft EIR was released to the public on March 31, 2008, Monday March 31st was a State holiday. Therefore, the State Office of Planning and Research (State Clearinghouse) recorded the start of the public review period for the proposed project as April 1, 2008.

Control Board to address water runoff during construction and construction dewatering discharges. LADWP has also committed to implement a dewatering plan if necessary based on the groundwater assessment.

Air Quality

Comments were received regarding modifications to the existing mitigation measures associated with air quality impacts. In summary, the suggested modifications addressed the need for the following: implement the use of newer construction equipment with reduced nitrogen emissions; submission of monthly maintenance records for all non-road diesel mobile construction equipment; implementation of a measure to develop a written corrective action plan to reduce on-site dust emissions; conduct visible emissions evaluations and implement corrective measures when necessary; and implement the use of double-trailer haul trucks for soil waste to maximize the amount of soil hauled and minimize the associated emissions.

LADWP revised Mitigation Measure AQ-1 to incorporate some of the suggestions such as submission of maintenance records and use of newer equipment. However, as described in Appendix F, the suggestion to use double-trailer haul trucks was not included because use of a larger trailer would potentially create other substantial impacts such as traffic impacts from their poor turning radius.

Geology, Hydrology and Soils

A comment was received regarding potential weakening of the roadway on Verdugo Avenue between California Street and Lima Street. The comment includes a statement by a Burbank resident who has experienced (for over 10 years) strong vibrations and shaking in her home when large trucks pass by her home. The resident is concerned that construction of the RSC could weaken the foundation and cause the roadway to be unstable. LADWP is in the process of conducting a geotechnical investigation regarding the soils, seismicity, and geology of the project area that will identify potential soil stability issues. The recommendations of this investigation will be incorporated in the design of the project.

In addition, comments were received regarding geology and soils analysis. Comments included suggestions for: more comprehensive groundwater assessments; additional geotechnical and engineering geologic investigations; additional monitoring prior to construction; a reassessment of tunneling and the potential presence of boulders; and consultation and coordination with the Army Corp of Engineers regarding construction methods pertaining to the Los Angeles River crossing. LADWP has added a summary of its standard practices to the Project Description and committed to a groundwater assessment and monitoring program and subsidence-monitoring program to address these concerns. In addition, with regard to coordination with other agencies, the Draft EIR acknowledges in the Project Description that LADWP will coordinate with other agencies, such as the Army Corps of Engineers, in obtaining permits to carry out the project.

Noise and Vibrations

Comments were received regarding the increase in ambient noise at Forest Lawn due to project construction. LADWP agrees to coordinate with Forest Lawn on construction activities that may temporarily increase noise levels above 75dBA. To reduce noise impacts, the Final EIR includes Other Identified Measure O-1, which requires a memorial park Construction Management Plan. The plan would include advanced notification to Forest Lawn and notification from Forest Lawn to LADWP to mitigate noise impacts related to funeral processions.

Comments were received regarding suggested modifications to existing noise mitigation measures including: additions to the number of notices and updates provided to residents, tenants, and property owners; the

establishment of thresholds included in initial monitoring evaluation, which would suspend operation if noise impacts were to exceed the threshold; and the requirement for instructions to construction crews prior to commencement of construction in noise-sensitive areas, as well as an expansion of LADWP's definition of "instruction." LADWP made changes to the noise mitigation measures to address some of the suggestions. For instance, a requirement to prepare a noise and vibration control plan was added to Mitigation Measure N-11, and further detail was provided in Mitigation Measure N-10 to address how LADWP would implement noise-sensitivity training or instruction.

Comments were received regarding the existing mitigations measures that address groundborne vibration. The suggested modifications included: an expansion of LADWP's proposed monitoring groundborne vibration program; implementation of a vibration control plan that would ensure that groundborne vibration does not exceed the applicable levels; and include all potentially eligible historic buildings in Mitigation Measure N-13, as well as a clear definition of "fragile" building. Similar to the changes noted above for noise, LADWP revised Mitigation Measure N-11 to require a noise and vibration plan. However, the extent of the historic and fragile buildings assessment was not changed, as the comment did not provide a rationale for why the study area needed to be expanded, and the distance identified in Mitigation Measure N-13 (200 feet) was based on the area of impact defined by the acoustical consultant.

Recreation

Comments were received regarding the project's impact on recreational resources such as parks, trails, and open space areas. There was concern with the potential to close parks as a result of the project and more detail was requested on how advanced notification of recreation disturbances would occur; and an explanation of exactly how interference with recreational uses and physical degradation would be reduced and restored. As noted in Appendix F (Draft EIR Comments and Responses) only a 15,000 square-foot portion of Johnny Carson Park would be closed during the construction of the project (three years). At the south end of Whitnall Highway Park North, LADWP would construct a temporary ventilation shaft as part of the tunneling effort under the Whitnall Highway. However, except during the eight-week construction period for the shaft, the Whitnall Highway Park North would not be significantly impacted and would not close during construction. In addition, there was concern that the recreational trail that runs along the Los Angeles River would be impacted during project construction. As noted in Section 3.4 (Recreation), the water pipeline would be jacked/tunneled under the trail, but there would be no physical obstruction on the surface to impede use of the trail during construction.

During construction, pedestrian access to Johnny Carson Park was also a comment on the Draft EIR. As noted in Appendix F (Draft EIR Comments and Responses), the construction staging area at Johnny Carson Park is proposed in the easternmost area of the park and north of Riverside Drive. Currently, this area is not easily accessed from the east because of the freeway onramp and the site's location on Riverside Drive. During construction of the project, pedestrians can access the park from the western and northern areas of the park, the location of most of the park amenities, and can use the park area south of Riverside Drive. The 15,000 square-foot area used for construction staging would occupy 2 percent of the 20-acre park.

Traffic and Transportation

Comments were received regarding potential traffic impacts during construction of the proposed project along Forest Lawn Drive. The comments include a suggestion for an alternate site for the receiving pit located north of the roadway (instead of through Forest Lawn Drive), and the use of tunneling instead of open-trench construction. Both suggestions may mitigate potential traffics impacts on Forest Lawn Drive; therefore, LADWP

is currently evaluating whether permitting agencies would allow these changes and whether the suggestions are feasible.

Several transit corridors would be affected by the proposed project, which would interfere with bus services. To reduce transit impacts, Section 3.2.4, Impacts and Mitigation Measures, indentifies the bus lines that have the potential to be impacted by the project. No significant impacts were identified to the bus lines from the proposed project. However, in response to the request for coordination with the Metropolitan Transportation Authority (Metro), Mitigation Measure T-9 has been modified to include coordination with the City of Los Angeles Department of Transportation (LADOT), the City of Burbank, and the Metro to avoid restricting movements of public transportation. In addition, the Traffic Construction Management Plan (Mitigation Measure T-1) will include details regarding public transportation coordination and procedures.

Lastly, comments requested additional traffic analysis for impacts associated with local City of Burbank streets, more specifically, potential street blockages and closures. Significant traffic impacts on local roadways within the City of Burbank would be unlikely, as roadway capacity reductions during project construction were not identified in the traffic study. As designed, the project would include a tunnel shaft along Burbank Boulevard in the City of Los Angeles. Mitigation Measure T-2 requires that two travel lanes be provided along Burbank Boulevard during construction. However, based on the traffic study the concern on Burbank Boulevard is with parking and not traffic capacity.

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8. Glossary of Terms and Acronyms

8.1 Glossary of Terms

A-weighted decibel scale (dBA). A frequency weighting scale that best reflects the human ear's reduced sensitivity to low frequencies and correlates well with human perceptions of the annoying aspects of noise.

Air quality standard. The specified average concentration of an air pollutant in ambient air during a specified time period, at or above which level the public health may be at risk; equivalent to Ambient Air Quality Standard (AAQS).

Air entrainment. Air in the form of bubbles dispersed in water.

Ambient air. Any unconfined portion of the atmosphere; the outside air.

Ambient Air Quality Standards (AAQS). Standards and emission limits for individual sources and categories of sources of air pollutants.

Appurtenant. Relating to something that is added but is not essential. Examples: access hole, flow meter, etc.

Attainment area. An area, such as the City of Los Angeles, that has air quality as good as or better than the national or state ambient air quality standards as defined in the federal Clean Air Act and the California Clean Air Act, respectively. An area may be an attainment area for one pollutant and a non-attainment area for others. The proposed project would be in an attainment area for the state and federal NO_2 and SO_2 standards.

Average. As a measure, the sum of the measurements (over a specified period) divided by the total number of measurements.

Backfill. Earth or soil that is replaced after a construction dig (excavation).

Baseline. A set of existing conditions against which change is to be described and measured.

Best management practices (BMPs). Those methods that have been determined to be the most effective, practical means of preventing or reducing environmental effects and are routine measures that are consistently applied or used by the Los Angeles Department of Water and Power.

California Ambient Air Quality Standards (CAAQS). Legal limits on outdoor air pollution designed to protect the health and welfare of Californians.

California Environmental Quality Act (CEQA). A California Statue that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate significant impacts to the extent feasible.

Carbon monoxide (CO). A colorless, odorless, very toxic gas that burns to carbon dioxide with a blue flame and is formed as a product of the incomplete combustion of carbon.

Clean Air Act (CAA). A series of detailed controlled federal and state requirements designed to guide states in controlling sources of air pollution.

Community Noise Equivalent Level (CNEL). A weighted average of sound levels gathered throughout a 24-hour period. This is essentially a measure of ambient noise. Different weighting factors apply to day, evening, and nighttime periods. This recognizes that community members are most sensitive to noise in late night hours and are more sensitive during evening hours than in daytime hours.

Construction staging area. The temporary location where construction equipment and materials are stored. Possible staging areas identified for the proposed project include the Headworks Spreading Grounds, Johnny Carson Park (north of Riverside Drive), open right-of-way within the Whitnall Highway, or local LADWP facilities including the North Hollywood Pump Station.

Contaminant. Any physical, chemical, biological, or radiological substance or matter that has an adverse effect on air, water, or soil.

Day-night average sound level (L_{dn}). This is equivalent to the 24-hour equivalent sound level (in dBA) with a 10 dBA penalty applied to nighttime sounds occurring between 10:00 p.m. and 7:00 a.m.

Discharge. Flow of dewatering water, hydrostatic test water, fugitive dust control water, and surface water from the construction site(s). Can also apply to the flow of chemical emissions into the air through designated venting mechanisms.

Emission. Unwanted substances released by human activity into air or water.

Environmental Impact Report (EIR). A document required of state and local agencies by the California Environmental Quality Act for public or private projects that have the potential to significantly affect the physical environment.

Environmentally Superior Alternative. Alternative selected by the CEQA lead agency (LADWP) that provides an overall environmental advantage over the other alternatives.

Equivalent sound level (L_{eq}). A single value for any desired duration (usually one hour), which includes all of the time-varying sound energy in the measurement period.

Fine particulate matter ($PM_{2.5}$). Particulate matter less than or equal to 2.5 microns in size.

Fugitive dust. Airborne pulverized soil particles.

Hazardous Air Pollutant (HAP). An air pollutant listed by the EPA in §112(b) of the Federal Clean Air Act, or determined by the Department of Environmental Quality to cause adverse effects to human health or the environment.

Head Losses. The head, pressure or energy (they are the same) lost by water flowing in a pipe as a result of turbulence caused by the velocity (speed) of the flowing water and the roughness of the pipe, or restrictions caused by fittings (valves, etc.).

Hydraulic losses. General term for water flow and pressure losses specifically within a pipeline system.

Lower Reach RSC Pipeline. Water pipeline proposed from west end of the Headworks Spreading Grounds site to the Ivanhoe inlet line located at the intersection of West Silver Lake Drive and Armstrong Avenue. An EIR was completed for this project in December 2005.

Microgram (μg). One millionth of a gram.

Miles per hour (mph). The ratio of the distance traveled (in miles) to the time spent traveling (in hours).

Milligrams (mg). One thousand of a gram.

National Ambient Air Quality Standards (NAAQS). Standards established by USEPA that apply to outdoor air throughout the country.

National Pollutant Discharge Elimination System (NPDES). A provision of the Clean Water Act which prohibits discharge of pollutants into waters of the United States, which includes all surface waters, rivers, lakes, estuaries, coastal waters, and wetlands, including all navigable waters. (e.g., Los Angeles River), unless a special permit is issued by the USEPA, a state, or, where delegated, a tribal government on an Indian reservation. A NPDES hydrostatic test permit would be required to discharge used hydrostatic test water into nearby storm drains, or discharged to sewer drains within the City of Los Angeles.

Nitrogen dioxide (NO_2). A toxic, reddish-brown gas and strong oxidizing agent that is an atmospheric pollutant. It is usually produced by combustion of fossil fuels.

Nonattainment area. Area that does not meet one or more of the National or California Ambient Air Quality Standards for the criteria pollutants designated in the federal Clean Air Act. The proposed project would be in a nonattainment area for the state and federal 1-hour ozone standard, federal 8-hour ozone standard, federal and state PM_{10}, $PM_{2.5}$, and CO standards.

Non-point sources. Diffuse pollution sources (i.e., without a single point of origin or not introduced into a receiving stream from a specific outlet). The pollutants are generally carried off the land by storm water. Common non-point sources are agriculture, forestry, urban, mining, construction, dams, channels, land disposal, saltwater intrusion, and city streets.

Organic. Referring to or derived from living organisms. In chemistry, any compound containing carbon.

Oxides of nitrogen (NO_x). Chemical compounds of nitrogen produced as a byproduct of combustion. These compounds combine with hydrocarbons to produce smog.

Ozone (O_3). A molecule of three oxygen atoms. A principal component of "oxidant" in photochemically polluted atmospheres.

Particulate matter (particulates). Very fine sized solid matter or droplets, typically averaging one micron or smaller in diameter. Also called "aerosol."

Parts per million (ppm). Concentration measure in milligrams or micrograms of a pollutant per cubic meter of air (mg/m^3 or $\mu g/m^3$).

Photochemical activity. Reaction that absorbs energy from the sun and reacts chemically to form ozone (O_3).

Pipe/piping. A long tube generally made of metal or concrete that is used to carry water.

Point source. A stationary location or fixed facility from which pollutants are discharged; any single identifiable source of pollution; e.g., a pipe, ditch, ship, ore pit, factory smokestack.

Prevention of Significant Deterioration (PSD). Rules imposed by the USEPA seeking to create regulatory certainty over what activities fall under the "routine maintenance, repair and replacement" (RMRR) exclusion to the New Source Review (NSR) provision of the Clean Air Act.

Respirable/inhalable particulate matter (PM_{10}). Particulate matter less than or equal to 10 microns in size.

Sensitive receptor (or receivers). A segment of a population that is more susceptible to the effects of air pollution, noise, and other environmental concerns, due to age or weak health. Sensitive receptors include residences, schools, hospitals, etc.

Shoring. A term used in construction meaning the act of bracing to provide temporary support. Typically trench walls are supported with hydraulic jacks or trench boxes. Steel or wood sheeting between H-beams (e.g., beam and plate) may also be used to support jacking and receiving pits. Shoring would be used in the construction of the pipeline in all open trenches, and jacking and receiving pits to allow for safe access.

Slurry. A mixture of a liquid (water) and fine particles of a solid substance such as clay or cement. Slurry will be used during pipeline installation as backfill material.

State Implementation Plans (SIPs). Air quality plans developed to meet federal requirements.

Sulfur dioxide (SO_2). A heavy pungent toxic gas that is used especially in making sulfuric acid, in bleaching, as a preservative, and as a refrigerant. It easily condensed to a colorless liquid, and is a major air pollutant, especially in industrial areas.

Tons per year (tpy). Measure of the annual quantity of a pollutant.

Proposed Upper Reach Pipeline. Proposed water pipeline from the North Hollywood Pumping Station to the west end of the Headworks Spreading Grounds site**.**

Volatile organic compounds (VOCs). A group of organic compounds characterized by their tendency to evaporate easily at room temperature.

8.2 Acronyms

AAQS
Ambient Air Quality Standards

ADT

Average Daily Traffic

BDPR
City of Burbank Department of Parks and Recreation

BMPs
Best Management Practices

CAA
Clean Air Act (federal)

CAAQS
California Ambient Air Quality Standards

Caltrans
California Department of Transportation

CARB
California Air Resources Board

CBC

California Building Code

CCAA
California Clean Air Act

CCR
California Code of Regulations

CDFG
California Department of Fish and Game

CEIDARS

California Emission Inventory Development and Reporting System

CEQA
California Environmental Quality Act

CGS

California Geological Survey
(formerly DMG)

CMP
Congestion Management Program

CNEL
Community Noise Equivalent Level

CO
Carbon monoxide

DMG
Department of Mines and Geology

DOC
Department of Conservation
(now CGS)

dBA
A-weighted decibel scale (noise)

DTSC

California Department of Toxic Substances Control

EIR
Environmental Impact Report

GHG
Greenhouse Gas

GPM
Gallons per minute

ft
Foot

HDPE
High-density polyethylene

IS
Initial Study

LADOT
Los Angeles Department of Transportation

LADPW
City of Los Angeles Department of Public Works

LADRP
City of Los Angeles Department of Recreation and Parks

LADWP
Los Angeles Department of Water and Power

LAWSDAC
Los Angeles Water System Data Acquisition and Control

LST
Localized Significance Threshold

L_{dn}
Day-night average sound level.

L_{eq}
Equivalent sound level

L_{max}
Maximum sound level

L_{min}
Minimum sound level

M
Moment Magnitude Scale (earthquakes)

MCL
Maximum Contaminant Level

MTA
Metropolitan Transportation Authority

MTBE
Methyl tertiary butyl ether

MTU
Mine and Tunnel Unit of Cal/OSHA

NAAQS

National Ambient Air Quality Standards

NHPS
North Hollywood Pumping Station

NOP
Notice of Preparation

NO_x / NO_2
Oxides of Nitrogen / Nitrogen dioxide

NPDES
National Pollution Discharge Elimination System

NPL
National Priorities List

NSR
New Source Review

OPR
California Office of Planning and Research

OSHA
Occupational Safety and Health Administration

O_3
Ozone

PCE
Perchloroethylene

PM_{10} / $PM_{2.5}$
Fine particulate matter

PSA
Peak Ground Acceleration

PSD
Prevention of Significant Deterioration

RMRR
routine maintenance, repair and replacement

ROCs
Reactive Organic Compounds

ROGs
Reactive Organic Gases

ROW
Right-of-way

RSC
River Supply Conduit

RWQCB
Regional Water Quality Control Board

SCAB
South Coast Air Basin

SCAQMD
South Coast Air Quality Management District

SIP
State Implementation Plan

SO_x / SO_2
Oxides of Sulfur / Sulfur dioxide

SRA
Sensitive Receptor Area

TAC
Toxic Air Contaminant

TCE
Trichloroethylene

TIA
Transportation Impact Assessment

TBM
Tunnel Boring Machine

TSO
Tunnel Safety Order

USEPA
United States Environmental Protection Agency

UBC
Uniform Building Code

VdB
Velocity decibels (vibration)

VOC
Volatile organic compound

WATCH
Work Area Traffic Control Handbook

9. Report Preparation Team

In accordance with CEQA Guidelines §15063(d)(6), Table 9-1 lists the persons that prepared, or participated in the preparation of, this Draft EIR.

Table 9-1. List of Preparers and Reviewers

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