Appendix G

Traffic Impact Analysis for the Carryover Storage and San Vicente Dam Raise EIR/EIS

Prepared by Linscott, Law & Greenspan, Engineers

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TRAFFIC IMPACT ANALYSIS

SAN VICENTE DAM RAISE

San Diego County Water Authority, California
February 16, 2007

LLG Ref. 3-05-1582

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TABLE OF CONTENTS

SECTION	PAGE
1.0 Introduction	**1**
2.0 Project Description	**4**
2.1 Project Location	4
2.2 Project Description	4
3.0 Existing Conditions	**6**
3.1 Existing Street Network	6
3.2 Existing Traffic Volumes	7
3.2.1 Peak Hour Intersection Turning Movement Volumes	7
3.2.2 Daily Segment Volumes	7
4.0 Analysis Scenarios and Methodology	**10**
4.1 Analysis Scenarios	10
4.2 Methodology	10
4.3 Intersections	10
4.4 ILV Operations	11
4.5 Street Segments	11
5.0 Significance Criteria	**12**
6.0 Analysis of Existing Conditions	**13**
6.1 Peak Hour Intersection Levels of Service	13
6.2 Intersection Lane Vehicle (ILV) Analysis	13
6.3 Daily Street Segment Levels of Service	13
7.0 Cumulative Traffic	**16**
8.0 Construction Traffic Trip Generation/Distribution/Assignment	**18**
8.1 Trip Generation	18
8.2 Trip Distribution/Assignment	19

TABLE OF CONTENTS

SECTION	PAGE
9.0 Analysis of Future Scenarios	**27**
9.1 Year 2010 Without Project (Baseline Conditions)	27
9.1.1 Intersection Analysis	27
9.1.2 Intersection Lane Vehicles Analysis	27
9.1.3 Segment Operations	27
9.2 Year 2010 + Project (Offsite Trucked Option)	27
9.2.1 Intersection Analysis	27
9.2.2 Intersection Lane Vehicles Analysis	27
9.2.3 Segment Operations	30
9.3 Year 2010 + Project (Onsite Quarry Option)	30
9.3.1 Intersection Analysis	30
9.3.2 Intersection Lane Vehicles Analysis	30
9.3.3 Segment Operations	30
10.0 Significance of Impacts and Mitigation Measures	**33**
10.1 Significance of Impacts	33
10.2 Mitigation Measures	33
10.2.1 SR-67/Vigilante Road	33
10.2.2 SR-67/Willow Road	34

APPENDICES

APPENDIX	
A.	Existing Traffic Counts – AM/PM Peak Hour and ADT
B.	County of San Diego Proposed Level of Service Standards
C.	Existing Peak Hour Intersection Analysis Worksheets
D.	Existing Intersection ILV Analysis Worksheets
E.	Estimated Construction Equipment/Manpower Table And Schedule
F.	Year 2010 Without Project Peak Hour Intersection Analysis Worksheets
G.	Year 2010 Intersection Lane Volume Analysis Results
H.	Year 2010 + Project (Offsite Trucked Option) Peak Hour Intersection Analysis Worksheets
I.	Year 2010 + Project (Onsite Quarry Option) Peak Hour Intersection Analysis Worksheets

LIST OF FIGURES

SECTION—FIGURE #		PAGE
Figure 1–1	Vicinity Map	2
Figure 1–2	Project Area Map	3
Figure 3–1	Existing Conditions Diagram	8
Figure 3–2	Existing Traffic Volumes (AM/PM & ADT)	9
Figure 7–1	Year 2010 Without Project Traffic Volumes (AM/PM & ADT)	17
Figure 7–1	Year 2010 Without Project Traffic Volumes (AM/PM & ADT)	17
Figure 8–1a	Construction Truck Traffic Distribution (AM/PM & ADT)	20
Figure 8–1b	Construction Manpower Traffic Distribution (AM/PM & ADT)	21
Figure 8–2	Total Construction (Offsite Trucked Option) Traffic Volumes (AM/PM & ADT)	22
Figure 8–3	Total Construction (Onsite Quarry Option) Traffic Volumes (AM/PM & ADT)	23
Figure 8–4	Year 2010 + Construction (Offsite Trucked Option) Traffic Volumes	24
Figure 8–5	Year 2010 + Construction (Onsite Quarry Option) Traffic Volumes	25

LIST OF TABLES

SECTION—TABLE #	PAGE
Table 3–1 Existing Traffic Volumes	7
Table 6–1 Existing Intersection Operations	14
Table 6–2 Caltrans ILV Method Intersection Operations	15
Table 6–3 Existing Street Segment Operations	15
Table 8-1 Construction Traffic Generation	26
Table 9-1 Intersection Operations - Offsite Trucking Option	28
Table 9-2 Street Segment Operations - Offsite Trucking Option	29
Table 9-3 Intersection Operations - Onsite Quarry Option	31
Table 9-4 Street Segment Operations - Onsite Quarry Option	32

TRAFFIC IMPACT ANALYSIS

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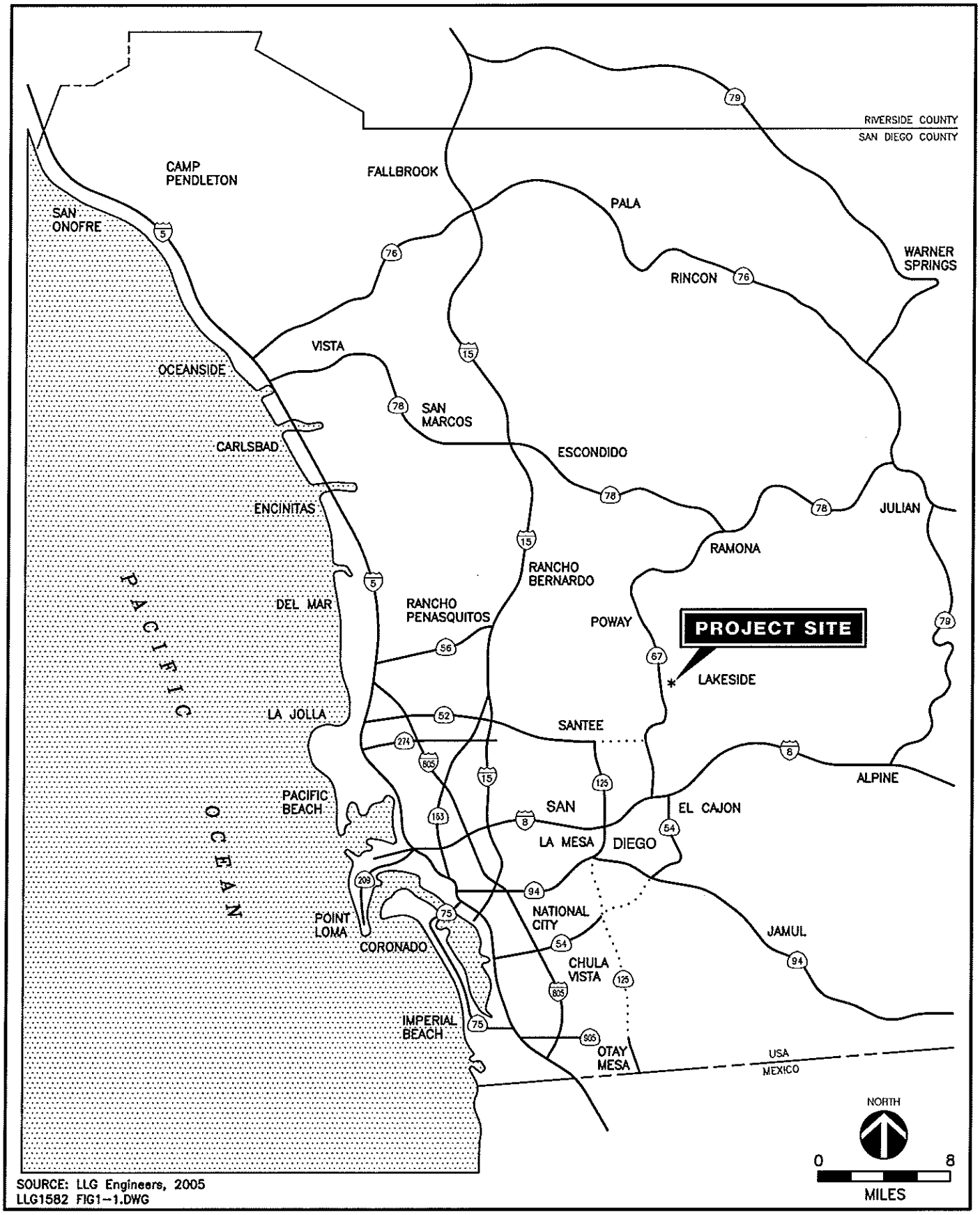
1.0 INTRODUCTION

This traffic study has been prepared to determine and evaluate the potential construction traffic impacts to the local roadway system due to the proposed expansion of San Vicente Reservoir in the County of San Diego. The project site is located in the Lakeside Planning Area, east of SR-67 and northwest of the Vigilante Avenue/ Morena Avenue intersection. *Figure 1-1* shows the general vicinity of the project and *Figure 1-2* shows a more detailed project area map. The traffic generated due to construction of the facility has been added to the existing and cumulative traffic volumes. Based on the total volumes for different scenarios, traffic impacts were analyzed at several key intersections and street segments within the project area.

The following items are included in this report:

- Project Description;
- Existing Conditions Assessment;
- Traffic Analysis Approach & Methodology;
- Significance Criteria;
- Analysis of Existing Conditions;
- Cumulative Traffic Analysis;
- Construction Traffic Generation/Distribution/Assignment;
- Analysis of Future Scenarios;
- Significance of Impacts; and
- Conclusions/Mitigation Measures.



SOURCE: LLG Engineers, 2005
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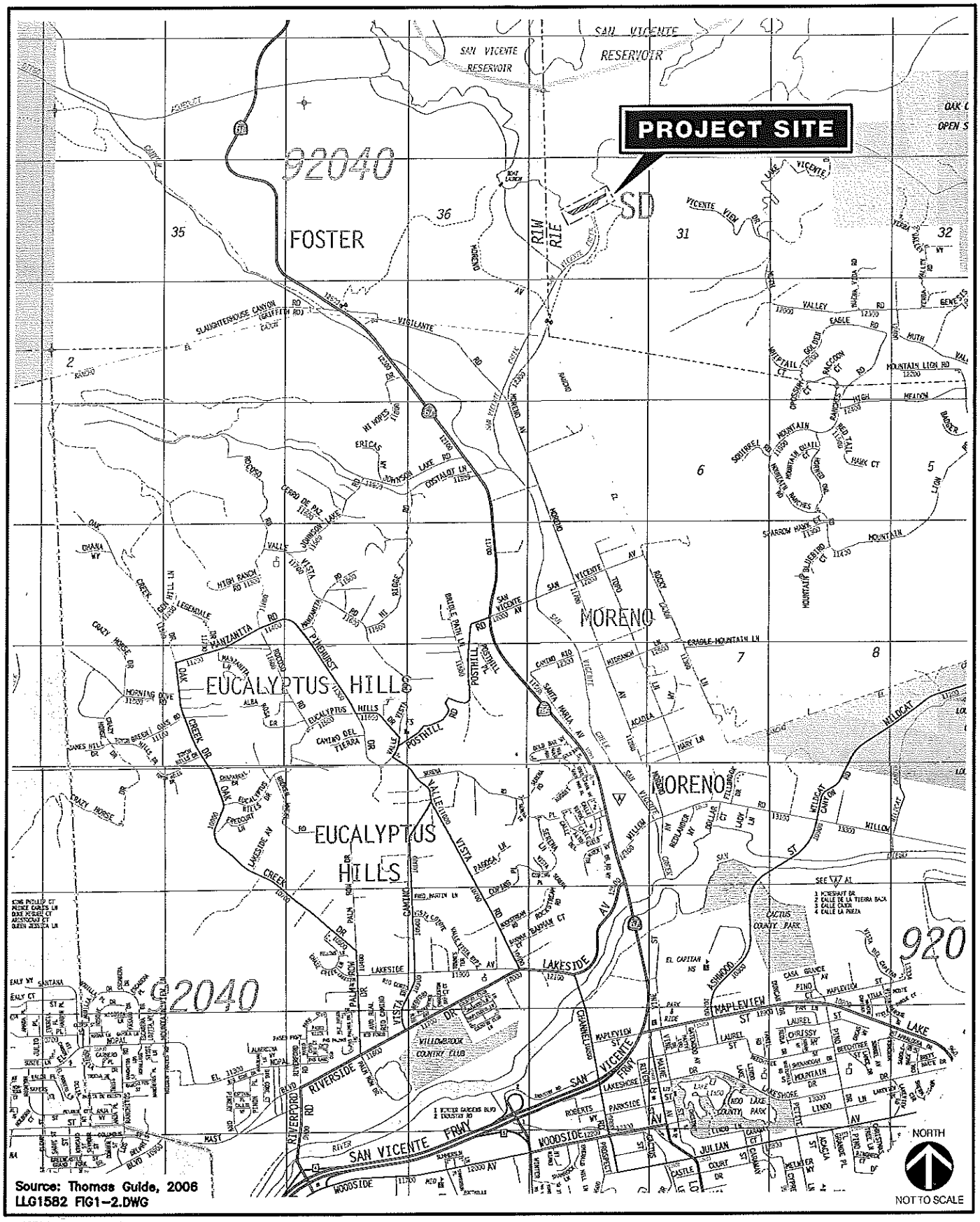
Figure 1-1

Vicinity Map

San Vicente Dam Raise



Source: Thomas Guide, 2006
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Figure 1-2

Project Area Map

2.0 PROJECT DESCRIPTION

2.1 Project Location

The proposed San Vicente Reservoir Expansion project site is located in the County of San Diego, east of SR-67 and northwest of the Vigilante Avenue/ Morena Avenue intersection.

2.2 Project Description

The Proposed Action would be to raise the San Vicente Dam an additional 63 feet beyond the approved ESP dam raise, increasing the capacity of the San Vicente Reservoir by an additional 100,000 AF. The combined Emergency Storage Project (ESP)/ San Vicente Dam Raise Project (CSP) would increase the existing reservoir capacity by approximately 152,100 AF, and increase the overall dam height by up to 117 feet. With implementation of both the ESP and CSP, the total dam height would be 337 feet with a spillway crest of 766 feet AMSL.

No additional conveyance facilities beyond those being constructed for the ESP would be needed for the additional carryover expansion of the San Vicente Reservoir. The dam raise would be accomplished using roller compacted concrete (RCC). The RCC would be placed against the downstream side of the existing dam. It is not technically advisable, nor economically feasible, to raise the dam for ESP purposes, and then raise it again at a later time for carryover storage purposes.

The Proposed Action would require the construction of two saddle dams to the west of the main dam, and relocation of the San Vicente Marina and marina access road. New marina facilities would replace the existing marina that would be inundated by the dam raise and subsequent reservoir inundation. The marina facilities would be shifted west of the existing location as part of the Proposed Action. The Proposed Action would also include construction of a new inlet/outlet facility and installation of a bypass pipeline extending from the easterly saddle dam to the First Aqueduct Diversion Structure north of the proposed marina. During construction, temporary staging areas would be established to accommodate construction equipment, supplies, and materials. The staging areas would be located on City-owned property south or southwest of the existing dam and/or within the marina expansion area.

Four options are being evaluated for the source of aggregate material for RCC production. There are three on-site quarry options and one offsite option. Only one of the on-site quarry alternatives will be selected for aggregate production. The offsite quarry option involves the hauling of aggregate from an existing offsite commercial quarry. The location of the offsite quarry is still to be determined. However, several alternative quarry locations will be identified for analysis.

Construction of the San Vicente Dam raise would require lowering water levels in the reservoir prior to construction. The construction drawdown is expected to take up to one year, depending on local watershed inflows. The construction timeframe for the dam raise is approximately three years. Once construction is complete, refilling of the reservoir is expected to take three to five years, depending on the availability of imported water and local watershed inflows. The total time required to lower the reservoir, construct the dam raise, and refill the reservoir to the new water level would be approximately eight years.

For the Proposed Action, the Corps has determined that the jurisdictional ordinary high water mark (OHWM) for the reservoir is the existing San Vicente Dam spillway at 650 feet AMSL. This is also the baseline for the evaluation of existing environmental resources, and impacts to those resources.

The following two options exist for the production/transport of cement or aggregate material to the site for use in dam construction, and will be evaluated as "project construction component" alternatives throughout the SEIR/EIS:

- *Offsite Trucking Option:* Aggregate, and Cement to produce conventional and RCC concrete would be brought to the site by truck. Conventional and RCC concrete batch plants would be set up near the base of the existing San Vicente Dam.
- *Onsite Quarry Option:* Aggregate would be produced via new on-site quarrying operations.

Access to the site is provided via SR-67 to Vigilante Avenue to Morena Avenue.

3.0 EXISTING CONDITIONS

Based on the anticipated assignment of project construction traffic, the intersections and segments included in the study area are listed below. *Figure 3-1* depicts the study area segments and intersections graphically.

Intersections

1. Pomerado Road/Scripps Poway Parkway
2. SR-67/Poway Road
3. SR-67/Scripps Poway Parkway
4. SR-67/Vigilante Road
5. SR-67/San Vicente Avenue/Posthill Road
6. SR-67/Willow Road
7. Vigilante Road/Morena Avenue

Segments

- **SR-67**
  - Poway Road to Scripps Poway Parkway
  - Scripps Poway Parkway to Vigilante Road
  - Vigilante Road to San Vicente Avenue/Posthill Road
- **Scripps Poway Parkway**
  - West of SR-67
- **Vigilante Road**
  - East of SR-67

3.1 Existing Street Network

The following is a brief description of the existing roadway system in the project area. *Figure 3-1* is the existing conditions diagram.

SR 67 is a north/south Caltrans facility, and is classified as a Major Road (from north of Willow Road to Ramona Street) on the County of San Diego Circulation Element. It is currently a two-lane undivided roadway south of San Vicente Avenue/Posthill Road and generally a four-lane roadway north of Vigilante Avenue. Curbside parking is generally prohibited. The posted speed limit south of Scripps Poway Parkway is 60 MPH and north of Scripps Poway Parkway is 55 MPH.

Scripps Poway Parkway is classified as a Prime Arterial west of SR 67. Currently, it is generally a six-lane divided road from Pomerado Road to SR-67. Curb, gutter, sidewalk and a raised median are provided. Parking is not permitted and the posted speed limit is 55 MPH.

Poway Road is classified as a four-lane Major Road west of SR-67. Curb, gutter, sidewalk and a raised median are provided.

Vigilante Road is classified as a two-lane Light Collector Roadway. Currently, it is a two-lane undivided road east of SR-67. Vigilante Road connects SR-67 to Morena Drive, which is the only access to the project site.

Morena Avenue is classified as a two-lane Light Collector Roadway. Currently, it is a two-lane undivided roadway with truck restrictions. Morena Avenue (north of Vigilante Road) is primary local access to San Vicente Reservoir and project site.

3.2 Existing Traffic Volumes

3.2.1 *Peak Hour Intersection Turning Movement Volumes*

Manual peak hour intersection counts were conducted in October 2005. However, since the original counts were conducted in 2005, a growth factor of 2% was applied to the 2005 counts. The 2% factor is based on general traffic growth along SR-67. Counts were conducted during both AM (7:00-9:00) and PM (4:00-6:00) peak periods. *Appendix A* contains the manual count sheets. *Figure 3-2* depicts the peak hour intersection turning movement volumes at the study area intersections.

3.2.2 *Daily Segment Volumes*

Bi-directional daily traffic counts were conducted in October 2005. However, since the original counts were conducted in 2005, a growth factor of 2% was applied to the 2005 counts. ***Table 3–1*** is a summary of the most recent available average daily traffic volumes (ADTs) from Caltrans Records and the counted ADTs. *Appendix A* contains the manual count sheets. *Figure 3-2* depicts the average 24-hour segment volumes along the study area segments.

TABLE 3–1
EXISTING TRAFFIC VOLUMES

Street Segment	ADT[a]	Source
SR-67		
Poway Rd to Scripps Poway Pkwy	22,240	Caltrans
Scripps Poway Pkwy to Vigilante Rd	27,540	Caltrans
South of Vigilante Rd	24,480	Caltrans
SCRIPPS POWAY PKWY		
West of SR-67	20,380	LLG
VIGILANTE RD		
East of SR-67	2,070	LLG

Footnotes:

a. Average Daily Traffic Volumes with a 2% growth rate.

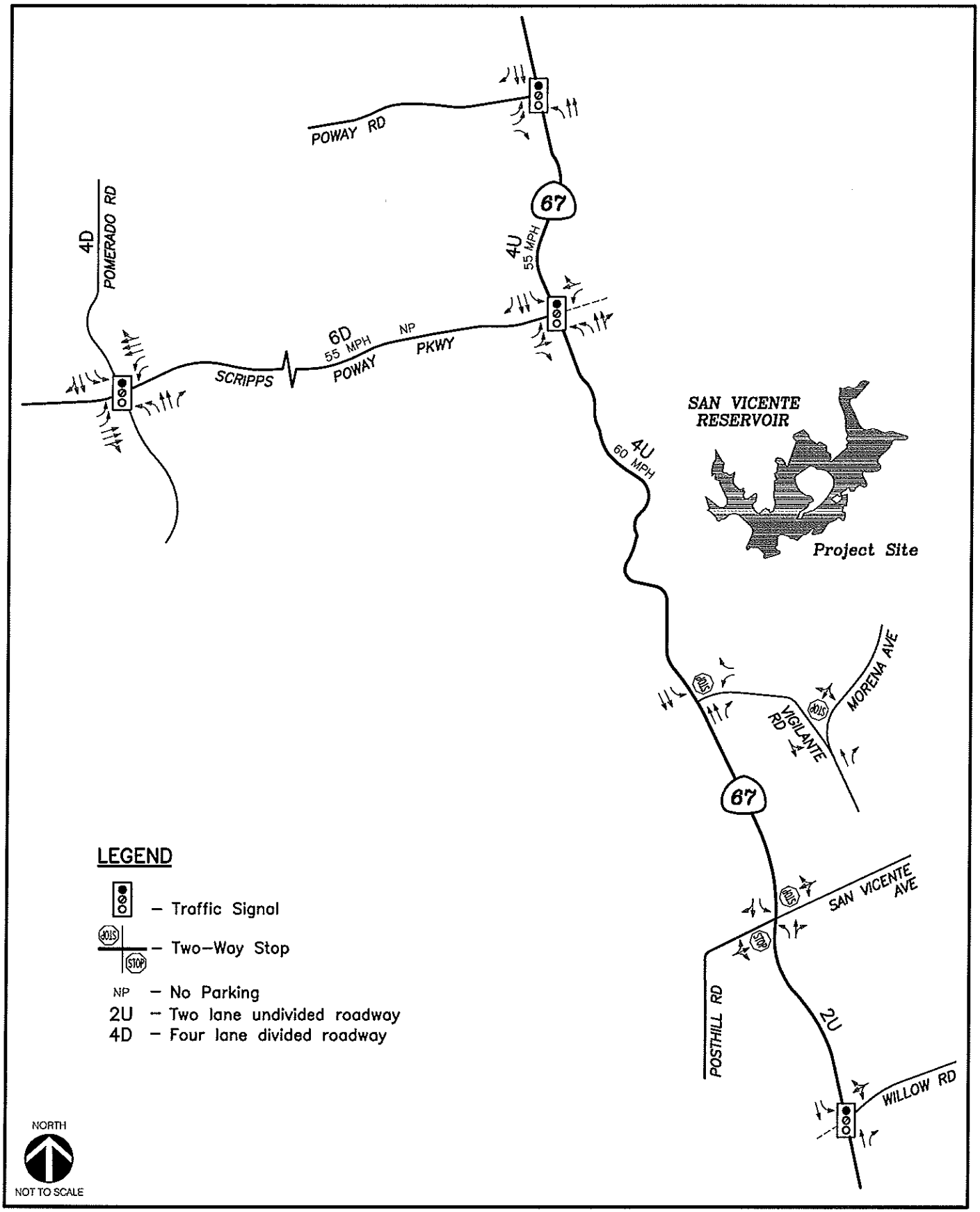

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Figure 3-1

Existing Conditions Diagram

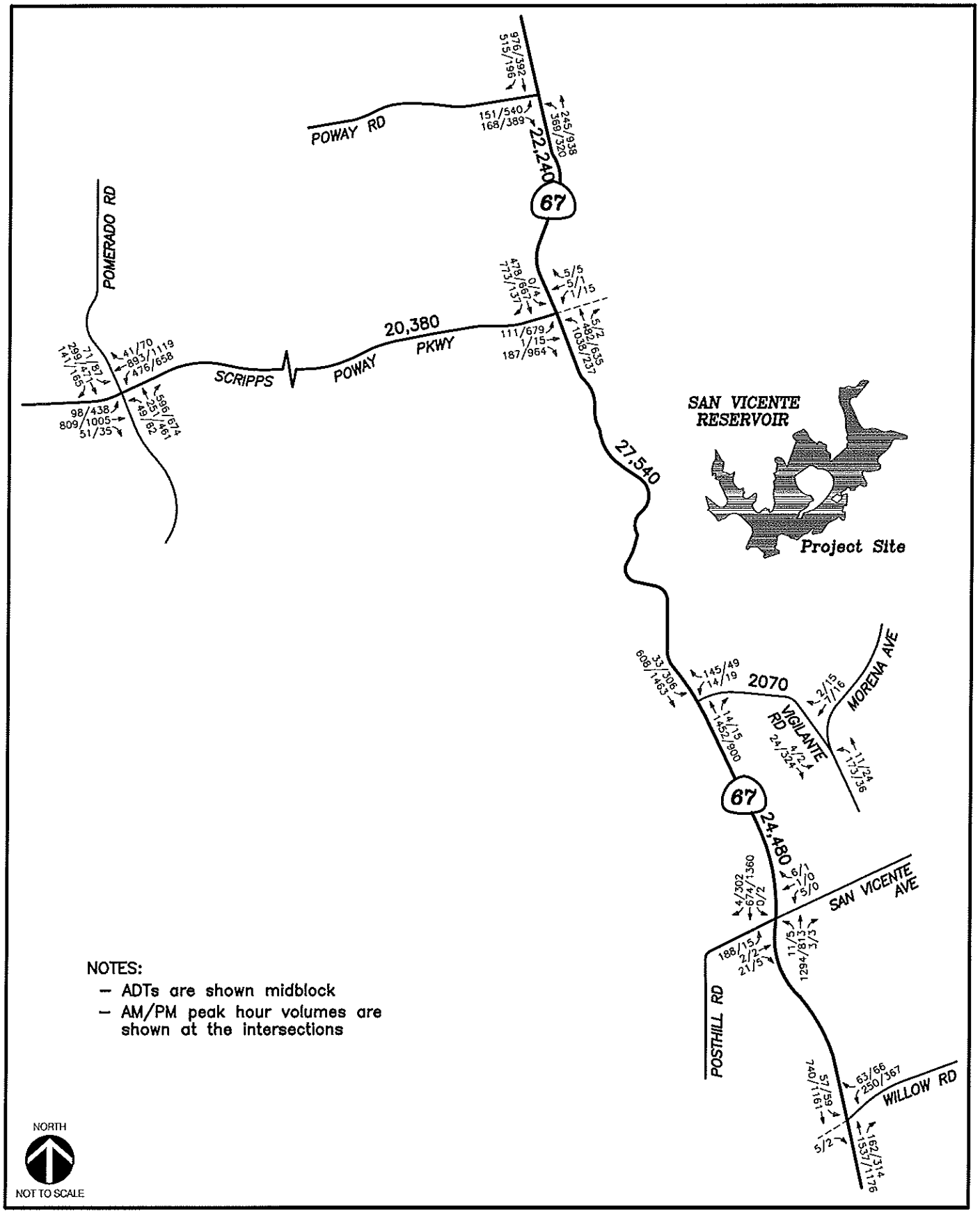

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Figure 3-2

Existing Traffic Volumes AM/PM Peak Hours & ADT

4.0 ANALYSIS SCENARIOS AND METHODOLOGY

4.1 Analysis Scenarios

Peak construction is not anticipated to occur until about Year 2010. Based on the SANDAG North County Model and the historical count data, an average growth rate of 2% per year was determined. Therefore, a growth factor of 8% (2% per year for 4 years) was applied to the existing counts to represent Year 2010 without project conditions. The following scenarios are analyzed in this report.

- Existing
- Year 2010 without project
- Year 2010 + Project Construction Traffic (Offsite Trucking Option)
- Year 2010 + Project Construction Traffic (Onsite Quarry Option)

The study area intersections and segments listed in Section 3.0 are analyzed in this report.

4.2 Methodology

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

4.3 Intersections

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 16 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the [*Traffix* (version 7.5)] computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS). Signalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in ***Appendix B***.

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 17 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the [*Traffix* (version 7.5)] computer software. Unsignalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in ***Appendix B***.

4.4 ILV Operations

Caltrans prefers that State-owned intersections be analyzed using Intersecting Lane Vehicles (ILV) methodology as described in Chapter 400, Topic 406 of the Department Highway Design Manual. The ILV methodology is based on the concept that capacity of intersecting lanes of traffic is 1,500 vehicles per hour. For the typical local street interchange there is usually a critical intersection of a ramp and the crossroads that establishes the capacity of the interchange. Listed below are the values of ILV/hr for various traffic flow conditions.

- *UNDER* - ILV/hr<1200
  Description: Stable flow with slight, but acceptable delay. Occasional signal loading may develop. Free mid-block operations.

- *NEAR* - ILV/hr 1200 – 1500:
  Description: Unstable flow with considerable delays possible. Some vehicles occasionally wait two or more cycles to pass through the intersection. Continuous backup occurs at some approaches.

- *OVER* - ILV/hr >1500:
  Description: Stop and go operation with severe delay and heavy congestion[1]. Traffic volume is limited by maximum discharge rates of each phase. Continuous backup in varying degrees occurs on all approaches. Where downstream capacity is restrictive, mainline congestion can impede orderly discharge through the intersection.

Note: The amount of congestion depends on how much the ILV/hr value exceeds 1500. Observed flow rates will normally not exceed 1500 ILV/hr and the excess will be delayed in a queue.

4.5 Street Segments

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the County of San Diego's *Roadway Classification, Level of Service, and ADT Table*. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. The County of San Diego's *Roadway Classification, Level of Service, and ADT Table* is attached in ***Appendix B***.

5.0 SIGNIFICANCE CRITERIA

Thresholds used to evaluate potential traffic/circulation impacts are based on applicable criteria in the State CEQA Guidelines (CCR §§15000-15387), the San Diego Traffic Engineers' Council (SANTEC) Guidelines. A significant traffic/circulation impact would occur if the proposed action would:

1. Significantly worsen congestion at any intersection that is currently operating, or is projected to operate at LOS E or F, by adding two seconds or more to the delays experienced by motorists at intersections. However for unsignalized intersections, if no additional traffic is added to the critical movement, the impact is not significant.

2. Cause any roadway segment to be reduced to LOS E or F, or increase the volume to capacity ratio by 0.02 or more at any roadway segment currently operating or projected to operate at LOS E or F.

6.0 ANALYSIS OF EXISTING CONDITIONS

6.1 Peak Hour Intersection Levels of Service

Table 6-1 summarizes the existing intersections level of service. As seen in *Table 6-1*, all intersections are calculated to currently operate at LOS D or better during both the AM and PM peak hours except for the following.

- SR-67/Vigilante Road (westbound left operates at LOS F during both AM and PM peak hour)
- SR-67/San Vicente Avenue (eastbound movement operates at LOS F during the AM peak hour and LOS E during the PM peak hour)
- SR-67/Willow Road (LOS E during the AM peak hour)

Appendix C contains the existing intersection analysis worksheets.

6.2 Intersection Lane Vehicle (ILV) Analysis

Table 6-2 summarizes the ILV analysis results for the signalized intersections on SR-67. As seen in *Table 6-2*, all intersections are calculated to currently operate "at Capacity" or better during both the AM and PM peak hours except the SR-67/Willow Road intersection, which currently operates over capacity. *Appendix D* contains the existing intersection ILV analysis worksheets.

6.3 Daily Street Segment Levels of Service

Table 6-3 shows a summary of the existing street segment operations in the project area. As seen in *Table 6-3*, all study area street segments are calculated to currently operate at LOS C or better.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
Pomerado Rd./Scripps Poway Pkwy	Signal	AM	24.5	C
		PM	29.5	C
SR-67/Poway Rd.	Signal	AM	17.8	B
		PM	18.0	B
SR-67/Scripps Poway Pkwy.	Signal	AM	24.6	C
		PM	27.3	C
SR-67/Vigilante Rd.	TWSC (WBL)	AM	93.0	F
		PM	>100	F
SR-67/San Vicente Ave.	TWSC (EB/WB)	AM	>100/28.0	F/D
		PM	40.5/15.0	E/C
SR-67/Willow Rd	Signal	AM	70.2	E
		PM	50.6	D
Vigilante Rd./Morena Ave.	TWSC (SB)	AM	9.8	A
		PM	10.1	B

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
d. WBL=Westbound Left-turn; EB=Eastbound; WB=Westbound; SB=Southbound.

SIGNALIZED DELAY/LOS THRESHOLDS		UNSIGNALIZED DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

TABLE 6–2
CALTRANS ILV METHOD INTERSECTION OPERATIONS

Intersection	AM		PM	
	ILV[1]	Capacity[2]	ILV	Capacity
SR-67/Poway Rd	1052	Under	1178	Under
SR-67/Scripps Poway Pkwy	1489	At	1431	At
SR-67/Willow Rd	1907	Over	1668	Over

Footnotes:

1. ILV = Intersecting Lane Vehicles.
2. CAPACITY is shown as *UNDER* capacity, *AT* capacity or *OVER* capacity;

Under Capacity = <1200 ILV/Hour

At Capacity = >1200 but < 1500 ILV/Hour

Over Capacity = >1500 ILV/Hour

TABLE 6–3
EXISTING STREET SEGMENT OPERATIONS

Street Segment	Capacity (LOS E) [a]	ADT [b]	LOS	V/C
SR-67				
Poway Rd to Scripps Poway Pkwy	37,000	22,000	0.59	B
Scripps Poway Pkwy to Vigilante Rd	37,000	27,500	0.74	C
South of Vigilante Rd	37,000	24,300	0.66	B
SCRIPPS POWAY PKWY				
West of SR-67	37,000	19,980	0.54	A
VIGILANTE RD				
East of SR-67	16,200	2,030	0.13	B

Footnotes:

a. Capacities based on County of San Diego Roadway Classification Table.

b. Average Daily Traffic Volumes.

7.0 CUMULATIVE TRAFFIC

To account for the growth in area traffic between Year 2006 and Year 2010, the anticipated peak construction year, a growth rate of 8% (growth for 4 years) was added to the existing traffic. *Figure 7-1* depicts the Year 2010 without Project Volumes for AM/PM Peak Hours.

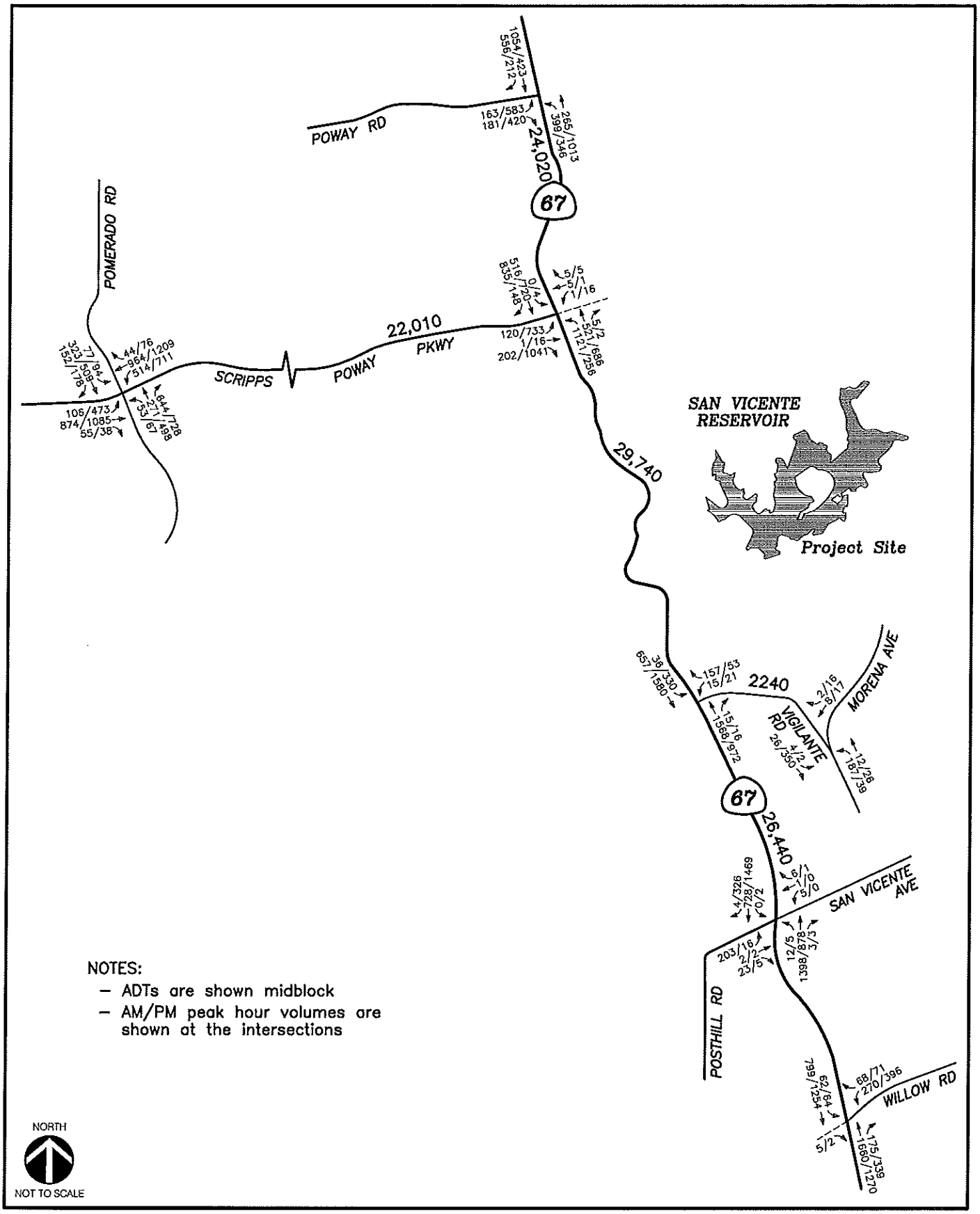

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Figure 7-1

Year 2010 Without Project Traffic Volumes AM/PM Peak Hours & ADT

8.0 CONSTRUCTION TRAFFIC TRIP GENERATION/DISTRIBUTION/ASSIGNMENT

8.1 Trip Generation

Table 7-1 summarizes the Project Construction Traffic trip generation for trucks bringing equipment (i.e. bulldozers, cranes etc.), cement, fly ash, aggregate etc to the site, and crewmember traffic. The trip generations for the following two (2) scenarios, which were also discussed in Section 2.2 were calculated separately:

1. Offsite Trucking Option
2. Onsite Quarry Option

The trip generation for the trucks was based on the estimated construction equipment schedule prepared for the project (see Appendix E). The trip generation for the crewmembers was based on the estimated manpower prepared for the project (see Appendix E). There were several construction phases identified for the project and trip generation values for each construction phase were calculated. Simultaneous construction phase's traffic volume was combined. In order to identify the peak construction scenario and evaluate the maximum impact of construction traffic, the construction phase with the highest total traffic was analyzed.

In the offsite Trucking Option, the construction phase with trucks bringing the aggregate was considered. However, since Onsite Quarry Option does not require trucks to haul aggregate, the construction phase with trucks bringing the equipment was utilized. Table 7-1 summarizes the trip generation for the peak construction phase for each scenario.

A Passenger Car Equivalent (PCE) factor was applied to the generated truck trips. PCE is defined as the number of passenger cars that are displaced by a single heavy vehicle of a particular type under the prevailing traffic conditions. Heavy vehicles have a greater traffic impact than passenger cars since: (1) they are larger than passenger cars, and therefore, occupy more roadway space; and (2) their performance characteristics are generally inferior to passenger cars, leading to the formation of downstream gaps in the traffic stream (especially on upgrades) which cannot always be effectively filled by normal passing maneuvers. Based on the elevation changes in the vicinity of the project site a PCE of 2.0 was applied to each truck trip.

8.2 Trip Distribution/Assignment

The project-generated traffic was distributed to the street system based on several factors such as potential truck routes, population centers (for crew member trips) and the proximity of the material providers. Based on the probable sites were the cement and fly ash will be hauled, 100% of the cement and fly ash was assumed to be hauled from the north side of the San Vicente Reservoir via SR-67. Similarly, based on the probable sites were the aggregate will be hauled, 100% of the aggregate was assumed to be hauled from the south side of the San Vicente Reservoir via SR-67. *Figure 8-1a* depicts the assumed regional project traffic distribution percentages for the equipment and miscellaneous (other than aggregate, cement and fly ash) truck traffic. *Figure 8-1b* depicts the assumed regional project traffic distribution percentages for the crewmembers.

Based on the above traffic distribution, *Figure 8-2* depicts the total project traffic assignment for the Offsite Trucking Option and *Figure 8-3* depicts the total project traffic assignment for the Onsite Quarry Option. Appendix E contains the individual traffic assignment for cement and fly ash, aggregate, equipment and miscellaneous truck traffic and the crew traffic. *Figure 8-3* depicts the total traffic volumes for the Year 2010 + construction traffic (Offsite Trucking Option). *Figure 8-4* depicts the total traffic volumes for the Year 2010 + construction traffic (Onsite Quarry).

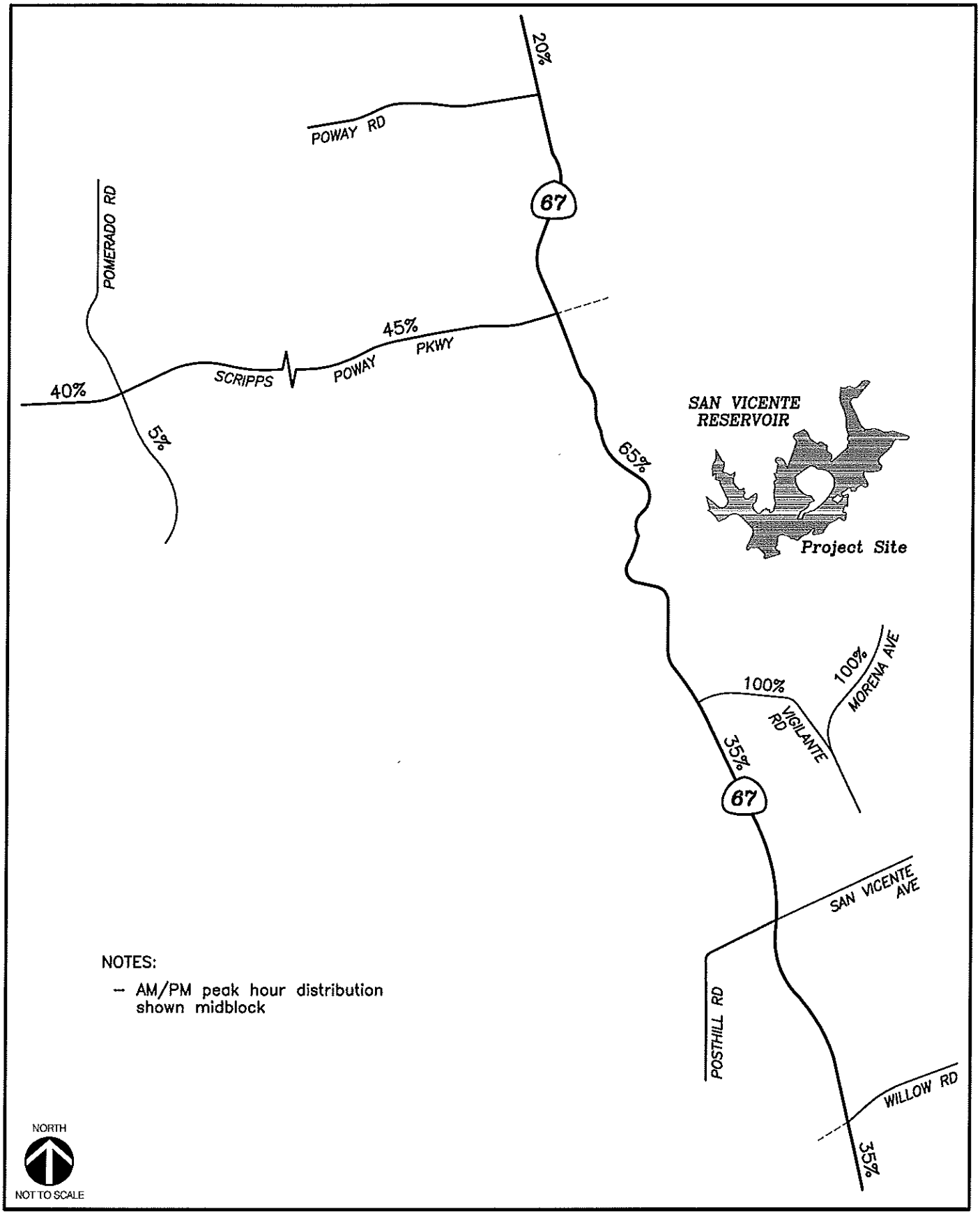

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Figure 8-1a

Construction Truck Traffic Distribution AM/PM & ADT

San Vicente Dam Raise

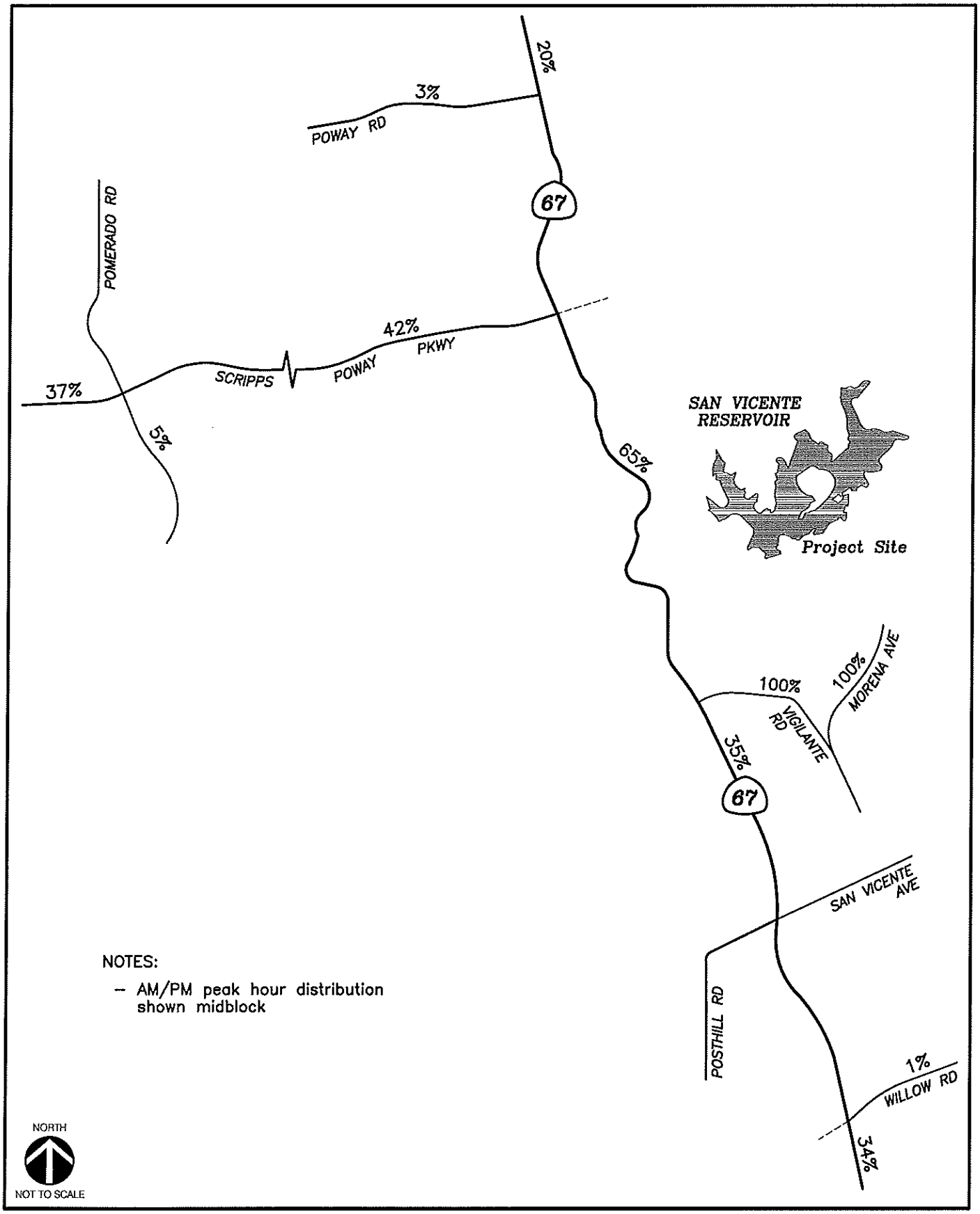

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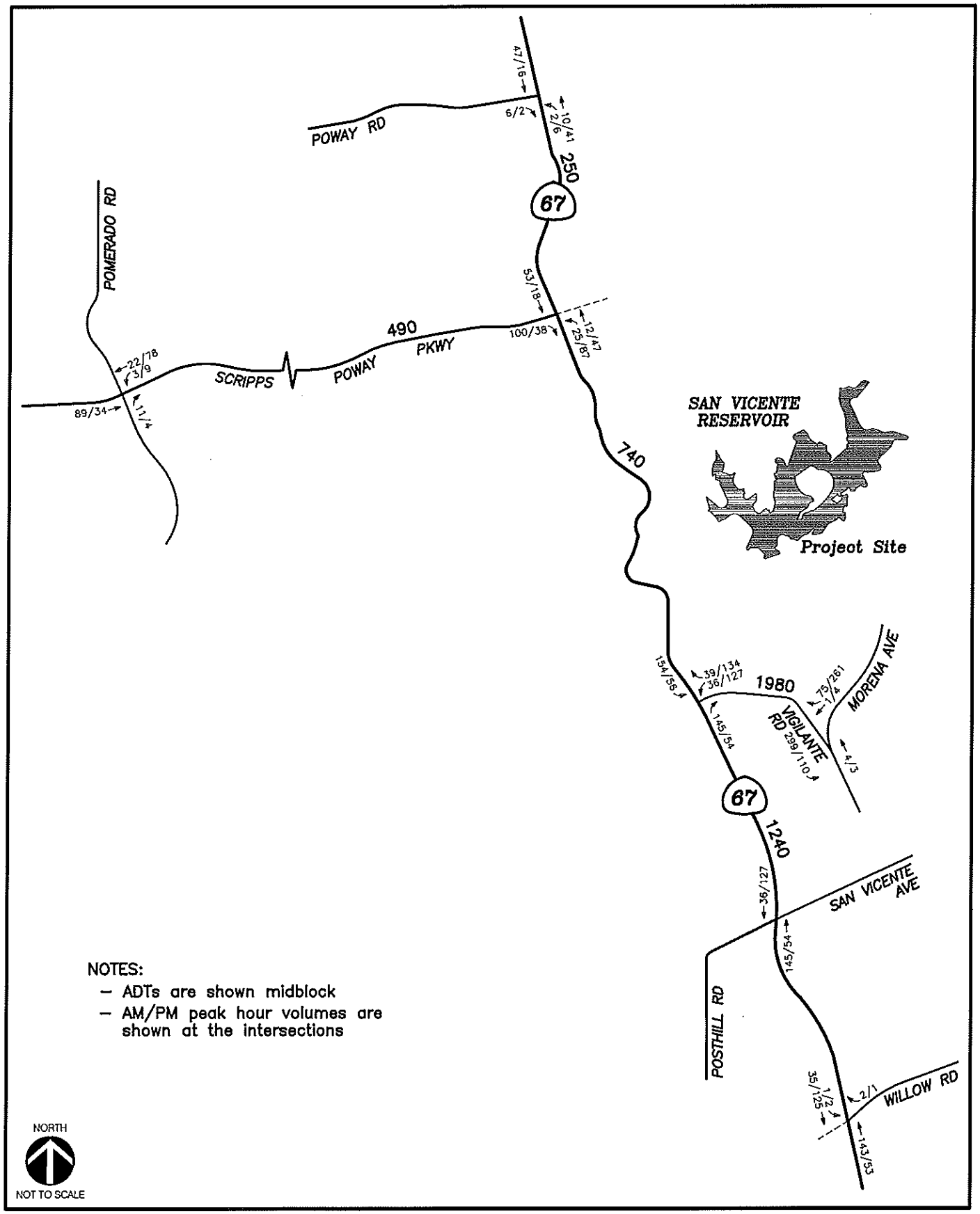
Figure 8-1b

Construction Manpower Traffic Distribution AM/PM & ADT



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LLG1582 FIG8-2.DWG

Figure 8-2

Total Construction (Offsite Trucked Option) Traffic Volumes AM/PM & ADT

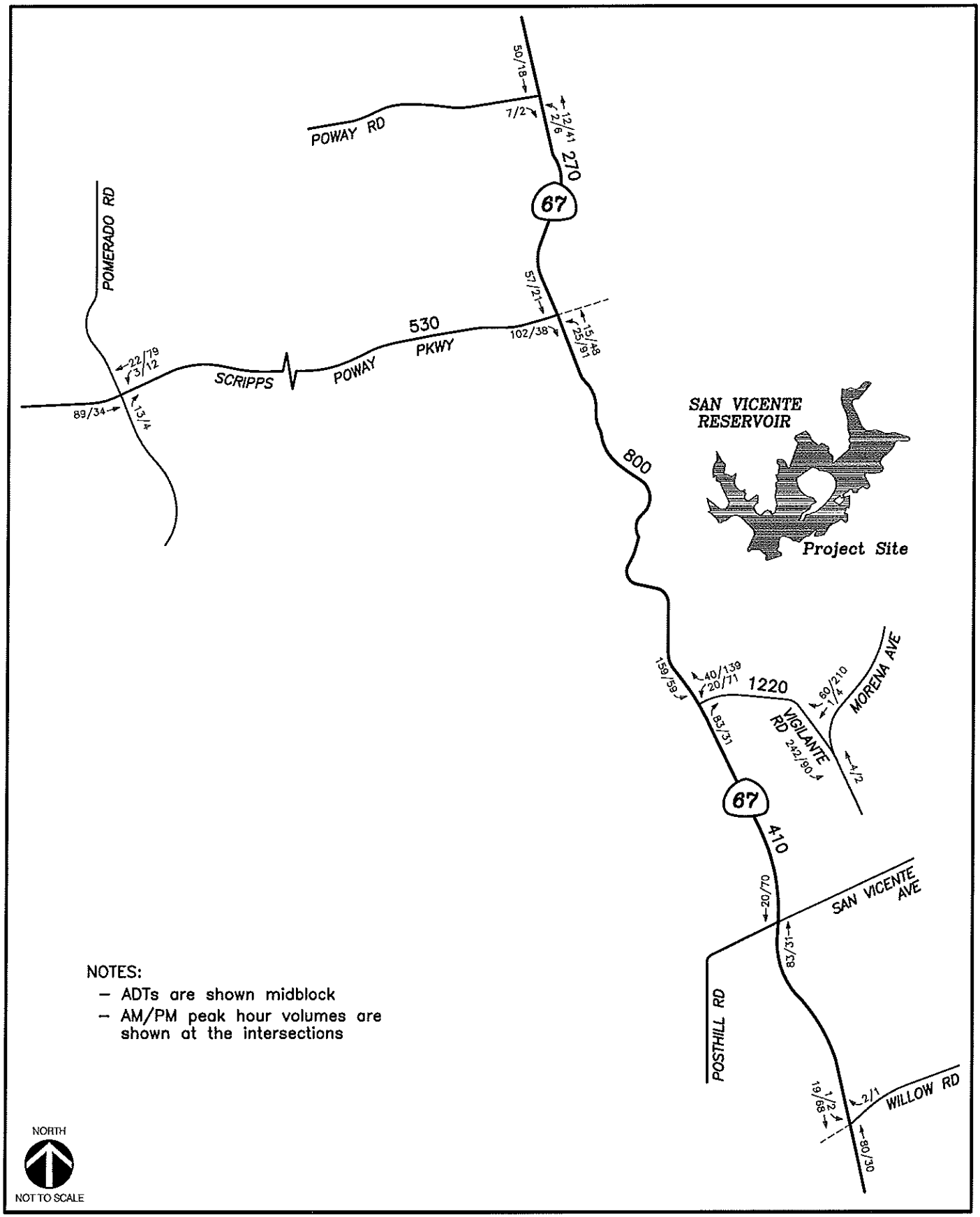

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Figure 8-3

Total Construction (On-site Quarry Option) Traffic Volumes AM/PM & ADT

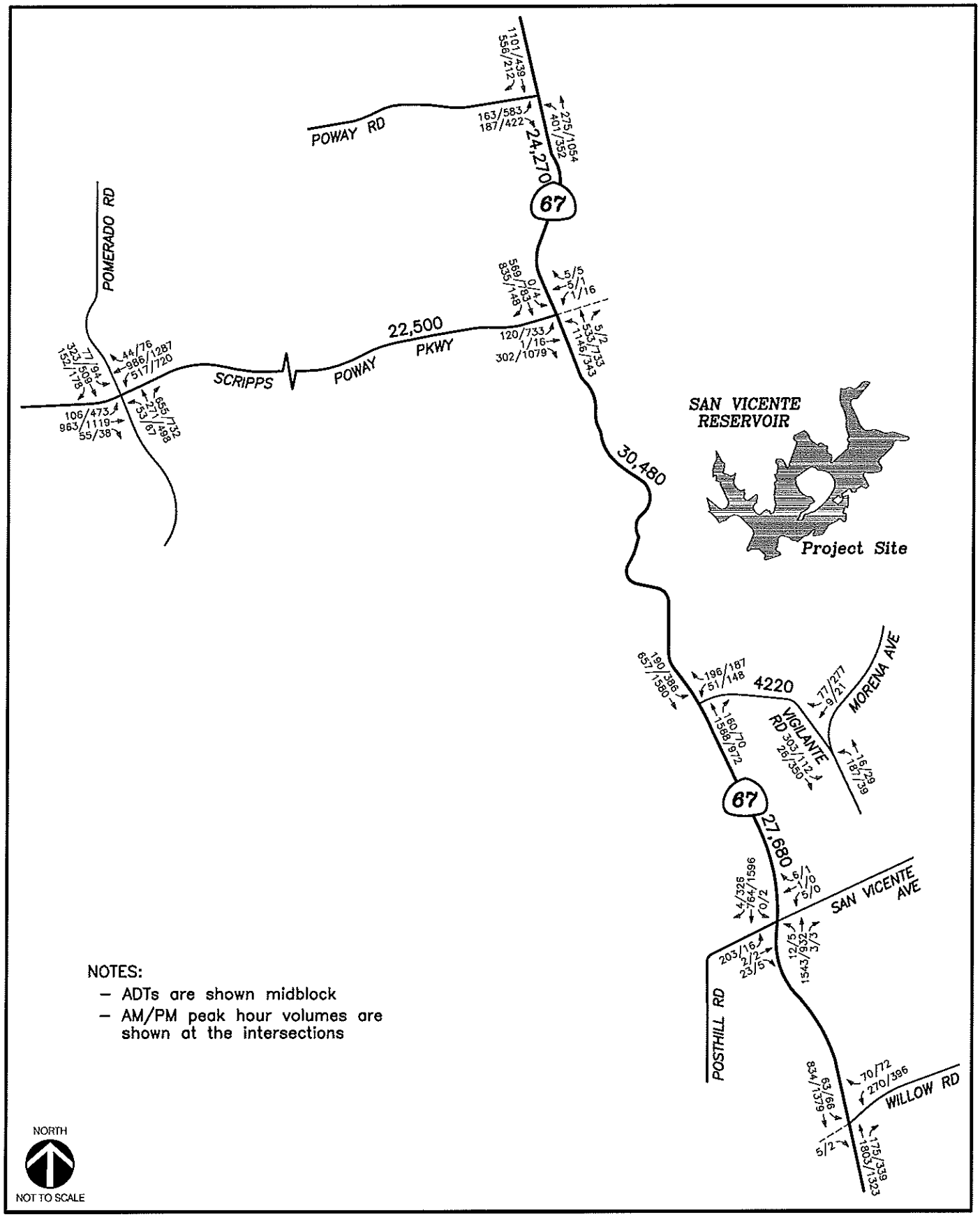

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Figure 8-4

Year 2010 + Construction (Off-site Trucked Option) Traffic Volumes AM/PM & ADT

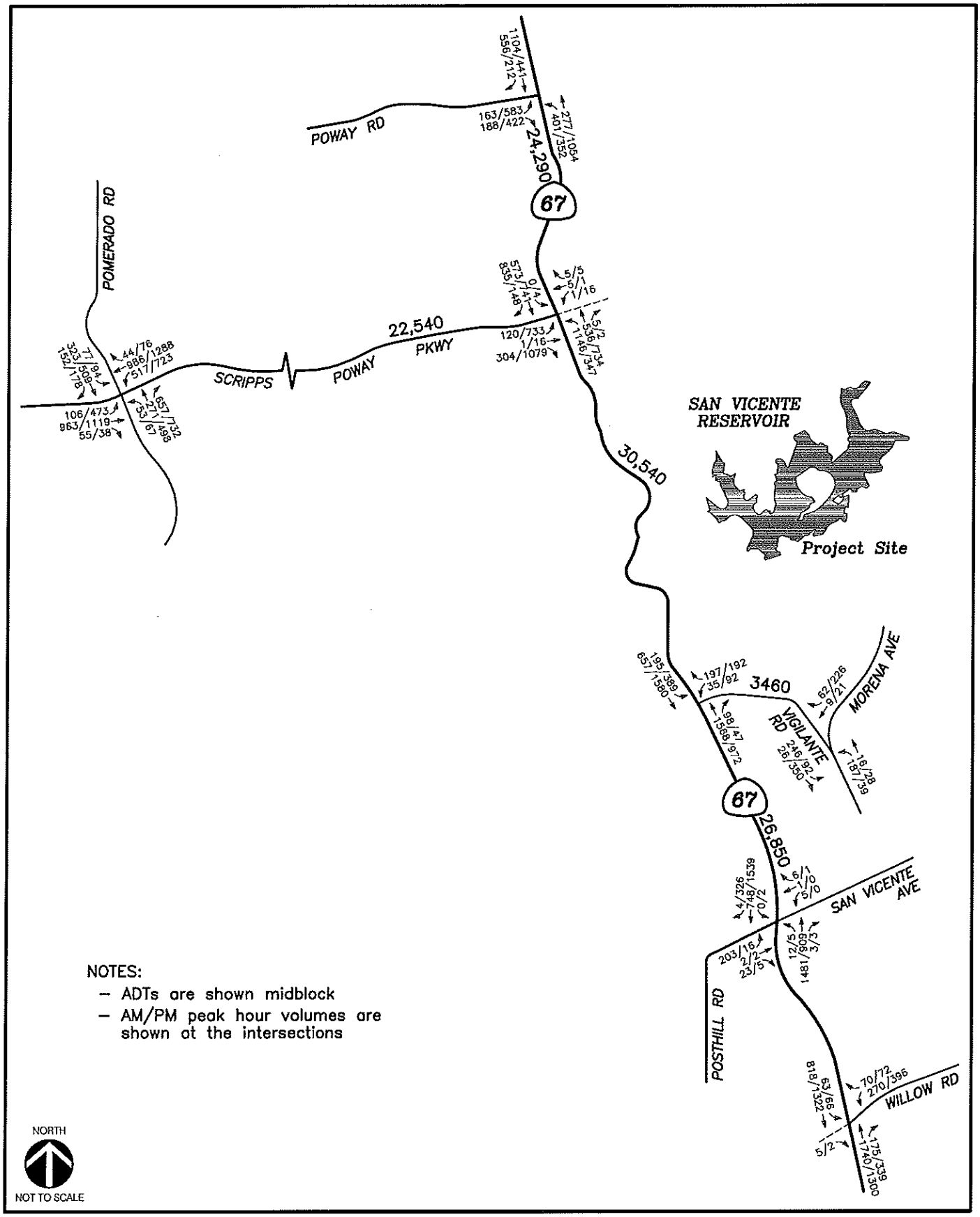

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Figure 8-5

Year 2010 + Construction (On-site Quarry Option) Traffic Volumes AM/PM & ADT

TABLE 8-1
CONSTRUCTION TRAFFIC GENERATION

Trip Generation Summary (Trucks only)												
Use	Trucks Trips	Total ADT in PCE	AM Peak Hour					PM Peak Hour				
			% Of ADT	In:Out Split		Volume		% OF ADT	In:Out Split		Volume	
						In	Out				In	Out
Offsite Trucked Option	551	1102	10%	80%	20%	88	22	10%	30%	70%	33	77
Onsite Quarry Option	160	320	10%	80%	20%	26	6	10%	30%	70%	10	22
Trip Generation Summary (Crew Vehicles Only)												
Use	Crew Vehicle Trips	Total ADT in PCE	AM Peak Hour					PM Peak Hour				
			% Of ADT	In:Out Split		Volume		% OF ADT	In:Out Split		Volume	
						In	Out				In	Out
Offsite Trucked Option	894	894	30%	80%	20%	215	54	30%	30%	70%	80	188
Onsite Quarry Option	916	916	30%	80%	20%	220	55	30%	30%	70%	82	192
Trip Generation Summary (Total)												
Use	Total Vehicle Trips	Total ADT in PCE	AM Peak Hour					PM Peak Hour				
						Volume					Volume	
						In	Out				In	Out
Offsite Trucked Option	1445	1996				303	76				113	265
Onsite Quarry Option	1076	1236				246	61				92	214

Footnotes:

1. PCE = Passenger Car Equivalence.

9.0 ANALYSIS OF FUTURE SCENARIOS

9.1 Year 2010 Without Project (Baseline Conditions)

9.1.1 *Intersection Analysis*

Table 9-1 summarizes the Year 2010 without project intersections level of service. As seen in *Table 6-1*, all intersections are calculated to operate at LOS D or better during both the AM and PM peak hours with the addition of cumulative traffic except the following intersection:

- SR-67/Vigilante Road (westbound left-turn movement operates at LOS F during both AM and PM peak hour)
- SR-67/San Vicente Avenue (eastbound movement operates at LOS F during the AM peak hour and LOS E during the PM peak hour)
- SR-67/Willow Road (LOS F during the AM peak hour and LOS E during PM peak hour)

Appendix F contains the intersection analysis worksheets.

9.1.2 *Intersection Lane Vehicles Analysis*

Appendix G summarizes the ILV analysis results for the signalized intersections on SR-67.

9.1.3 *Segment Operations*

Table 9-2 shows a summary of the Year 2010 without project segment operations in the project area. As seen in *Table 9-2*, all study area street segments are calculated to operate at LOS D or better.

9.2 Year 2010 + Project (Offsite Trucked Option)

9.2.1 *Intersection Analysis*

Table 9-1 summarizes the Year 2010 with project (offsite trucked option) intersections level of service. As seen in *Table 6-1*, all intersections are calculated to operate at LOS D or better during both the AM and PM peak hours except the following intersection:

- SR-67/Vigilante Road (westbound left-turn movement operates at LOS F during both AM and PM peak hour)
- SR-67/San Vicente Avenue (eastbound movement operates at LOS F during both AM and PM peak hour, and westbound movement operates at LOS E during the AM Peak Hour)
- SR-67/Willow Road (LOS F during both AM and PM peak hour)

Appendix H contains the intersection analysis worksheets.

9.2.2 *Intersection Lane Vehicles Analysis*

Appendix G summarizes the ILV analysis results for the signalized intersections on SR-67.

TABLE 9-1
INTERSECTION OPERATIONS - OFFSITE TRUCKING OPTION

Intersection	Peak Period	Existing		Year 2010 Without Project		Year 2010 + Construction Project				Significant Impact
		Delay[a]	LOS[b]	Delay	LOS	Delay	LOS	Delay Δ[c]	Critical Move Trips	
Pomerado Rd./Scripps Poway Pkwy	AM	24.5	C	25.4	C	25.9	C	0.5	N/A	No
[Signalized]	PM	29.5	C	31.4	C	31.8	C	0.4		No
SR-67/Poway Rd.	AM	17.8	B	18.7	B	18.8	B	0.1	N/A	No
[Signalized]	PM	18.0	B	18.5	B	18.5	B	0.0		No
SR-67/Scripps Poway Pkwy	AM	24.6	C	30.1	C	30.5	C	0.4	N/A	No
[Signalized]	PM	27.3	C	33.3	C	37.8	D	4.5		No
SR-67/Vigilante Rd.	AM	93.0	F	>100	F	>100	F	>10	36	Yes
[TWSC-WBL]	PM	>100	F	>100	F	>100	F	>10	127	Yes
SR-67/San Vicente Ave.	AM	>100/28.0	F/D	>100/31.9	F/D	>100/38.4	F/E	>10	0	No
[TWSC-EB/WB]	PM	40.5/15.0	E/C	49.1/16.0	E/C	60.2/16.9	F/C	9.7	0	No
SR-67/Willow Rd	AM	70.2	E	96.4	F	>100	F	>10	N/A	Yes
[Signalized]	PM	50.6	D	74.6	E	93.8	F	19.2		Yes
Vigilante Rd./Morena Ave.	AM	9.8	A	9.9	A	11.8	B	1.9	N/A	No
[TWSC-SB]	PM	10.1	B	10.3	B	11.4	B	1.1		No

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported. WBL=Westbound Left-turn; EB=Eastbound; WB=Westbound; SB=Southbound.

TABLE 9-2
STREET SEGMENT OPERATIONS - OFFSITE TRUCKING OPTION

Segment	Capacity LOS E	Existing			Year 2010 Without Project			Year 2010 + Construction Project Traffic		
		ADT	V/C	LOS	ADT	V/C	LOS	ADT	V/C	LOS
SR-67										
Poway Rd to Scripps Poway Pkwy	37,000	22,240	0.60	B	24,020	0.65	B	24,270	0.66	B
Scripps Poway Pkwy to Vigilante Rd	37,000	27,540	0.74	C	29,740	0.80	D	30,480	0.82	D
South of Vigilante Rd	37,000	24,480	0.66	B	26,440	0.71	C	27,680	0.75	C
SCRIPPS POWAY PKWY										
West of SR-67	37,000	20,380	0.55	A	22,010	0.59	A	22,500	0.61	B
VIGILANTE RD										
East of SR-67	16,200	2,070	0.13	B	2,240	0.14	B	4,220	0.26	C

Footnotes:

a. Capacities based on County of San Diego Roadway Classification Table.

b. Average Daily Traffic Volumes.

9.2.3 *Segment Operations*

Table 9-2 shows a summary of the Year 2010 with project (offsite trucked option) intersections street segment operations in the project area. As seen in *Table 9-2*, all study area street segments are calculated to currently operate at LOS D or better.

9.3 Year 2010 + Project (Onsite Quarry Option)

9.3.1 *Intersection Analysis*

Table 9-3 summarizes the Year 2010 with project (onsite quarry option) intersections level of service. As seen in *Table 9-3*, all intersections are calculated to operate at LOS D or better during both the AM and PM peak hours except the following intersection:

- SR-67/Vigilante Road (westbound left-turn movement operates at LOS F during both AM and PM peak hour)
- SR-67/San Vicente Avenue (eastbound movement operates at LOS F during both AM and PM peak hour, and westbound movement operates at LOS E during the AM Peak Hour)
- SR-67/Willow Road (LOS F during both AM and PM peak hour)

Appendix I contains the intersection analysis worksheets.

9.3.2 *Intersection Lane Vehicles Analysis*

Appendix G summarizes the ILV analysis results for the signalized intersections on SR-67.

9.3.3 *Segment Operations*

Table 9-4 shows a summary of the Year 2010 with project (onsite quarry option) intersections street segment operations in the project area. As seen in *Table 9-4*, all study area street segments are calculated to operate at LOS D or better.

TABLE 9-3
INTERSECTION OPERATIONS - ONSITE QUARRY OPTION

Intersection	Peak Period	Existing		Year 2010 Without Project		Year 2010 + Construction Project				Significant Impact
		Delay[a]	LOS[b]	Delay	LOS	Delay	LOS	Delay Δ[c]	Critical Move Trips	
Pomerado Rd./Scripps Poway Pkwy	AM	24.5	C	25.4	C	25.9	C	0.5	N/A	No
[Signalized]	PM	29.5	C	31.4	C	31.9	C	0.5		No
SR-67/Poway Rd.	AM	17.8	B	18.7	B	18.8	B	0.1	N/A	No
[Signalized]	PM	18.0	B	18.5	B	18.5	B	0.0		No
SR-67/Scripps Poway Pkwy	AM	24.6	C	30.1	C	30.5	C	0.4	N/A	No
[Signalized]	PM	27.3	C	33.3	C	37.9	D	4.6		No
SR-67/Vigilante Rd.	AM	93.0	F	>100	F	>100	F	>10	20	Yes
[TWSC-WBL]	PM	>100	F	>100	F	>100	F	>10	71	Yes
SR-67/San Vicente Ave.	AM	>100/28.0	F/D	>100/31.9	F/D	>100/35.4	F/E	>10	0	No
[TWSC-EB/WB]	PM	40.5/15.0	E/C	49.1/16.0	E/C	54.9/16.5	F/C	5.8	0	No
SR-67/Willow Rd	AM	70.2	E	96.4	F	>100	F	>10	N/A	Yes
[Signalized]	PM	50.6	D	74.6	E	84.9	F	10.3		Yes
Vigilante Rd./Morena Ave.	AM	9.8	A	9.9	A	11.3	B	1.4	N/A	No
[TWSC-SB]	PM	10.1	B	10.3	B	10.8	B	0.5		No

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.
c. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported. WBL=Westbound Left-turn; EB=Eastbound; WB=Westbound; SB=Southbound.

TABLE 9-4
STREET SEGMENT OPERATIONS - ONSITE QUARRY OPTION

Segment	Capacity LOS E	Existing			Year 2010 Without Project			Year 2010 + Construction Project Traffic		
		ADT	V/C	LOS	ADT	V/C	LOS	ADT	V/C	LOS
SR-67										
Poway Rd to Scripps Poway Pkwy	37,000	22,240	0.60	B	24,020	0.65	B	24,290	0.66	B
Scripps Poway Pkwy to Vigilante Rd	37,000	27,540	0.74	C	29,740	0.80	D	30,540	0.83	D
South of Vigilante Rd	37,000	24,480	0.66	B	26,440	0.71	C	26,850	0.73	C
SCRIPPS POWAY PKWY										
West of SR-67	37,000	20,380	0.55	A	22,010	0.59	A	22,540	0.61	B
VIGILANTE RD										
East of SR-67	16,200	2,070	0.13	B	2,240	0.14	B	3,460	0.21	B

Footnotes:

a. Capacities based on County of San Diego Roadway Classification Table.

b. Average Daily Traffic Volumes.

10.0 SIGNIFICANCE OF IMPACTS AND MITIGATION MEASURES

10.1 Significance of Impacts

Based on the analyses of intersections and segments in the study area (*Tables 9-1* thru *9-5*), and the established significance criteria, the following significant impacts were determined for both options. Section 10.2 – 10.3 recommends corresponding mitigation measures for the two (2) options.

1. SR-67/Vigilante Road Intersection
2. SR-67/Willow Road Intersection

10.2 Mitigation Measures

The significant construction-related traffic congestion impacts at the SR-67/Vigilante Road intersection (***Impact 1***) and at the SR-67/Willow Road intersection (***Impact 2***) due to the Proposed Action, under both the off-site trucking option and the on-site quarry options, would be avoided by prohibiting haul trucks and crew vehicles from accessing the construction site during both AM and PM peak hours (7:00-8:00 a.m. and 4:00-6:00 p.m.). This is not a feasible mitigation measure because hauling, materials deliveries and crew access must occur on a continuous basis to support the 24/7 operations associated with RCC dam construction. Several additional mitigation scenarios were examined specific to each intersection; however, none were determined to be readily feasible or practicable, as explained below.

10.2.1 *SR-67/Vigilante Road*

Under both the off-site trucking option and the on-site quarry options, the significant construction-related traffic congestion impact at the SR-67/Vigilante Road intersection could be mitigated by installing a traffic signal and extending the southbound left turn pocket on SR-67 by 150 feet. However, Caltrans has indicated they would not support the installation of a traffic signal at this intersection. Therefore, this measure is not considered feasible. Additional mitigation scenarios for this intersection are discussed below.

For the off-site trucking option, there are no other feasible measures to mitigate the significant construction-related traffic congestion impact at the SR-67/Vigilante Road intersection due to the high volume of daily haul trucks estimated throughout the construction period. Therefore, the construction-related traffic congestion impacts at this intersection under the off-site trucking option would be significant and unmitigated.

For the on-site quarry options, the significant construction-related traffic congestion impact at the SR-67/Vigilante Road intersection could be mitigated through temporary removal of the existing truck restrictions on the Moreno Avenue and Willow Road segments during the SV 100K construction period, and by rerouting truck and crew traffic to the SR-67/Willow Road intersection. Although the Proposed Action would also result in significant construction-related traffic congestion at the SR-67/Willow Road intersection, turning movements are easier at this controlled intersection than at the uncontrolled SR-67/Vigilante Road intersection. Therefore, less delay would be experienced at SR-67/Willow Road, as compared to SR-67/Vigilante Road, although significant traffic congestion would still occur at this intersection. However, temporary removal of the existing truck restrictions on the Moreno Avenue and Willow Road segments is a measure that is beyond the control of the Water Authority. The following outlines the necessary steps for this approach:

- A request letter should be submitted to the San Diego County Traffic Advisory Committee (TAC).
- The following information should be provided with the letter: project description, reason for requesting removal of truck restrictions on Moreno Avenue and Willow Road segments, and trip generation and analysis results and calculations.
- TAC meets approximately every six weeks to review the requests.
- After reviewing the request, TAC will submit their recommendations to the San Diego County Board of Supervisors for their final recommendation.

The Water Authority shall initiate this process by submitting the request letter to the TAC, but there is no guarantee that the TAC will approve the request. Therefore, although this mitigation scenario is considered feasible, if the TAC does not approve the request for temporary removal of existing truck restrictions on the Moreno Avenue and Willow Road segments, then the construction-related traffic congestion impacts at the SR-67/Vigilante Road intersection under the on-site quarry options would be significant and unmitigated.

10.2.2 *SR-67/Willow Road*

Under both the off-site trucking option and the on-site quarry options, the significant construction-related traffic congestion impact at the SR-67/Willow Road intersection could be mitigated via signal re-timing, lane reconfigurations/additions or "fair-share" funding of unidentified improvements. Re-timing the signals at this intersection is not a viable mitigation scenario because substantial delays already exist for all movements, and it is important to minimize congestion on the SR-67 through movements.

Lane reconfigurations, additions and widening were considered for the SR-67 southbound approach to increase capacity and "green" signal time for trucks making left turns. However, the narrow right-of-way in this area precludes such improvements; a cut slope exists on the west side and a convenience store is located on the east side of SR-67 at this intersection. Another mitigation scenario involves the addition of a Left Turn Only lane on the westbound Willow Road approach. There appears to be sufficient right-of-way on the south side of Willow Road to accommodate an additional left-turn lane. A dedicated left-turn lane on the westbound Willow Road approach would decrease the overall "green" signal time needed to serve Willow Road, which in turn would allow for an increase in "green" signal time for southbound SR-67 movements. Although this mitigation scenario was identified as the most feasible to implement at this intersection, it is not considered practicable given that this significant traffic impact from the Proposed Action would only occur during the construction period, and the Proposed Action would not have any impact at this intersection after completion of construction.

Contributing a "fair share" payment to Caltrans towards the future improvement at this intersection was also considered as a possible mitigation scenario. However, Caltrans does not have a mechanism to accept a "fair-share" contribution, and therefore, this scenario was also rejected.

Therefore, the construction-related traffic congestion impacts at the SR-67/Willow Road intersection, under both the off-site trucking option and the on-site quarry options, would be significant and unmitigated.

The potential for increased risk of motor vehicle accidents and pedestrian injuries on SR-67 due to the addition of construction-related traffic from the Proposed Action, under both the off-site trucking option and the on-site quarry options, could be mitigated by installing a traffic signal at SR-67/Vigilante Road intersection and extending the southbound left turn pocket on SR-67 by 150 feet. However, as stated above, Caltrans has indicated they would not support the installation of a traffic signal at this intersection. Therefore, there are no other feasible measures to mitigate this impact, and the construction-related traffic safety impacts of the Proposed Action would be significant and unmitigated, under both the off-site trucking option and the on-site quarry options.

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engineers

TRAFFIC IMPACT ANALYSIS

CARRYOVER STORAGE AND SAN VICENTE DAM RAISE

San Diego County Water Authority, California
February 19, 2007

LLG Ref. 3-05-1582

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TABLE OF CONTENTS

SECTION	PAGE
1.0 Introduction	**1**
2.0 Project Description	**5**
2.1 Alternative 2: Moosa 100,000 AF (Moosa 100K)	5
2.2 Alternative 3: San Vicente 50,000 AF (San Vicente 50K) + Moosa 50,000 AF (Moosa 50K)	6
3.0 Existing Conditions	**8**
3.1 Existing Street Network	9
3.1.1 Moosa Valley Site	9
3.1.2 San Vicente Site	10
3.2 Existing Traffic Volumes	11
4.0 Analysis Scenarios and Methodology	**16**
4.1 Analysis Scenarios	16
4.2 Methodology	16
4.3 Intersections	16
4.4 Street Segments	17
5.0 Significance Criteria	**18**
6.0 Analysis of Existing Conditions	**19**
6.1 Peak Hour Intersection Levels of Service	19
6.2 Daily Street Segment Levels of Service	19
7.0 Alternative 2: Moosa 100K	**24**
7.1 Year 2010 Without Project	24
7.2 Year 2010 Without Project (Baseline Conditions) Analysis	24
7.2.1 Intersection Analysis	24
7.2.2 Segment Operations	24
7.3 Construction Traffic Trip Generation/Distribution/Assignment	24
7.3.1 Trip Generation	24
7.3.2 Trip Distribution/Assignment	25
7.4 Year 2010 + Project (Offsite Trucked Option)	25
7.4.1 Intersection Analysis	25
7.4.2 Segment Operations	25
7.5 Significance of Impacts and Mitigation Measures	26
7.5.1 Significance of Impacts	26
7.5.2 Mitigation Measures	26

TABLE OF CONTENTS

SECTION	PAGE
8.0 Alternative 3a: San Vicente 50K	**35**
8.1 Year 2010 Without Project	35
8.2 Year 2010 Without Project (Baseline Conditions) Analysis	35
8.2.1 Intersection Analysis	35
8.2.2 Segment Operations	35
8.3 Construction Traffic Trip Generation/Distribution/Assignment	35
8.3.1 Trip Generation	35
8.3.2 Trip Distribution/Assignment	36
8.4 Year 2010 + Project (Offsite Trucked Option)	36
8.4.1 Intersection Analysis	36
8.4.2 Segment Operations	37
8.5 Year 2010 + Project (Onsite Quarry Option)	37
8.5.1 Intersection Analysis	37
8.5.2 Segment Operations	37
8.6 Significance of Impacts and Mitigation Measures	37
8.6.1 Significance of Impacts	37
8.6.2 Offsite Trucked Option Mitigation Measures	39
8.6.3 Onsite Quarry Option Mitigation Measures	39
9.0 Alternative 3b: Moosa 50K	**52**
9.1 Year 2010 Without Project	52
9.2 Year 2010 Without Project (Baseline Conditions) Analysis	52
9.2.1 Intersection Analysis	52
9.2.2 Segment Operations	52
9.3 Construction Traffic Trip Generation/Distribution/Assignment	52
9.3.1 Trip Generation	52
9.3.2 Trip Distribution/Assignment	53
9.4 Year 2010 + Project	53
9.4.1 Intersection Analysis	53
9.4.2 Segment Operations	53
9.5 Significance of Impacts and Mitigation Measures	54
9.5.1 Significance of Impacts	54
9.5.2 Mitigation Measures	54

TABLE OF CONTENTS

SECTION	PAGE
10.0 Conclusion	**60**
10.1 Alternative 2: Moosa 100K	60
10.1.1 Significance of Impacts	60
10.1.2 Mitigation Measures	60
10.2 Alternative 3a: San Vicente 50K	61
10.2.1 Significance of Impacts	61
10.2.2 Offsite Trucked Option Mitigation Measures	63
10.2.3 Onsite Quarry Option Mitigation Measures	63
10.3 Alternative 3b: Moosa 50K	63

APPENDICES

APPENDIX	
A.	Existing Traffic Counts – AM/PM Peak Hour and ADT
B.	County of San Diego Proposed Level of Service Standards
C.	Existing Peak Hour Intersection Analysis Worksheets
D.	Moosa Valley Site - Year 2010 Without Project Peak Hour Intersection Analysis Worksheets
E.	Moosa 100K - Estimated Construction Equipment/Manpower Table And Schedule
F.	Moosa 100K - Year 2010 With Project Peak Hour Intersection Analysis Worksheets
G.	San Vicente Site - Year 2010 Without Project Peak Hour Intersection Analysis Worksheets
H.	San Vicente 50K - Estimated Construction Equipment/Manpower Table And Schedule
I.	San Vicente 50K - Year 2010 + Project (Offsite Trucked Option) Peak Hour Intersection Analysis Worksheets
J.	San Vicente 50K - Year 2010 + Project (Onsite Quarry Option) Peak Hour Intersection Analysis Worksheets
K.	Moosa 50K - Estimated Construction Equipment/Manpower Table And Schedule
L.	Moosa 50K - Year 2010 With Project Peak Hour Intersection Analysis Worksheets

LIST OF FIGURES

SECTION—FIGURE #		PAGE
Figure 1–1	Vicinity Map	2
Figure 1–2	Project Area Map – Moosa Valley Site	3
Figure 1–3	Project Area Map – San Vicente Site	4
Figure 3–1	Existing Conditions Diagram – Moosa Valley Site	12
Figure 3–2	Existing Conditions Diagram – San Vicente Site	13
Figure 3–3	Existing Traffic Volumes - Moosa Valley Site (AM/PM & ADT)	14
Figure 3–4	Existing Traffic Volumes - San Vicente Site (AM/PM & ADT)	15
Figure 7–1	Year 2010 Without Project Traffic Volumes (Moosa Valley Site)	30
Figure 7–2a	Construction Truck Traffic Distribution (AM/PM & ADT)	31
Figure 7–2b	Construction Crew Traffic Distribution (AM/PM & ADT)	32
Figure 7-3	Total Construction (Moosa 100K) Traffic Volumes (AM/PM & ADT)	33
Figure 7–4	Year 2010 + Construction (Moosa 100K) Traffic Volumes	34
Figure 8–1	Year 2010 Without Project Traffic Volumes (San Vicente Site)	45
Figure 8–2a	Construction Truck Traffic Distribution (AM/PM & ADT)	46
Figure 8–2b	Construction Crew Traffic Distribution (AM/PM & ADT)	47
Figure 8-3	Total Construction (San Vicente 50K) – Offsite Trucking Option Traffic Volumes (AM/PM & ADT)	48
Figure 8-4	Total Construction (San Vicente 50K) – Onsite Quarry Option Traffic Volumes (AM/PM & ADT)	49
Figure 8-5	Year 2010 + Construction (San Vicente 50K) – Offsite Trucking Option Traffic Volumes	50
Figure 8-6	Year 2010 + Construction (San Vicente 50K) – Onsite Quarry Option Traffic Volumes	51
Figure 9-1	Total Construction (Moosa 50K) Traffic Volumes (AM/PM & ADT)	58
Figure 9-2	Year 2010 + Construction (Moosa 50K) Traffic Volumes	59

LIST OF TABLES

SECTION—TABLE #	PAGE
Table 6–1 Existing Intersection Operations – Moosa Valley Site	20
Table 6–2 Existing Intersection Operations – San Vicente Site	21
Table 6–3 Existing Street Segment Operations – Moosa Valley Site	22
Table 6–4 Existing Street Segment Operations – San Vicente Site	23
Table 7-1 Intersection Operations – Moosa 100K	27
Table 7-2 Street Segment Operations – Moosa 100K	28
Table 7-3 Construction Traffic Generation – Moosa 100K	29
Table 8-1 Intersection Operations - Offsite Trucking Option (San Vicente 50K)	40
Table 8-2 Street Segment Operations - Offsite Trucking Option (San Vicente 50K)	41
Table 8-3 Intersection Operations - Onsite Quarry Option (San Vicente 50K)	42
Table 8-4 Street Segment Operations - Onsite Quarry Option (San Vicente 50K)	43
Table 8-5 Construction Traffic Generation (San Vicente 50K)	44
Table 9-1 Intersection Operations – Moosa 50K	55
Table 9-2 Street Segment Operations – Moosa 50K	56
Table 9-3 Construction Traffic Generation – Moosa 50K	57

TRAFFIC IMPACT ANALYSIS

CARRYOVER STORAGE AND SAN VICENTE DAM RAISE

San Diego County Water Authority, California
February 19, 2007

1.0 INTRODUCTION

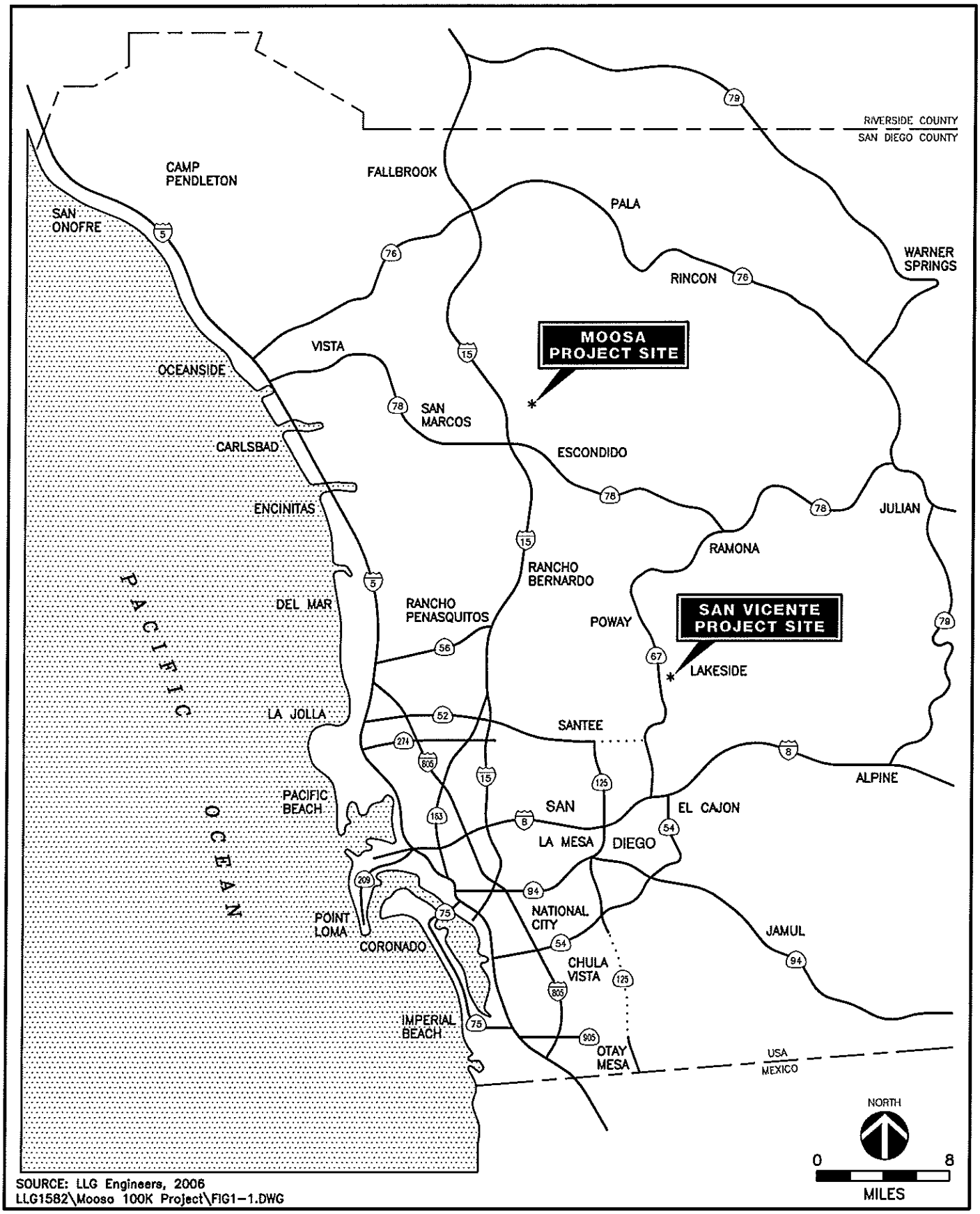
This traffic study has been prepared to determine and evaluate the potential construction traffic impacts to the local roadway system due to the proposed expansion of either the Moosa Valley Reservoir or the San Vicente Reservoir in the County of San Diego. A traffic study for San Vicente 100,000 Acre-Feet (Alternative 1) was prepared separately. Following the Traffic Report for the San Vicente 100,000 Acre-Feet (Alternative 1), this Traffic Report evaluates Moosa 100,000 Acre-Feet (Alternative 2) and San Vicente 50,000 Acre-Feet + Moosa 50,000 Acre-Feet (Alternative 3) project alternatives.

Moosa Valley project site is located in a relatively unpopulated area 3.5 miles northwest of Valley Center in San Diego County. The site is approximately 15 miles north of the City of Escondido and four miles east of Interstate 15. *Figure 1-1* shows the general vicinity of the project, and *Figure 1-2* shows a more detailed project area map.

San Vicente project site is located in the Lakeside Planning Area, east of SR-67 and northwest of the Vigilante Avenue/ Morena Avenue intersection. *Figure 1-1* shows the general vicinity of the project and Figure 1-3 shows a more detailed project area map. The traffic generated due to construction of the facility has been added to the existing and cumulative traffic volumes. Based on the total volumes for different scenarios, traffic impacts were analyzed at several key intersections and street segments within the project area for both the alternatives.

The following items are included in this report:

- Project Description;
- Existing Conditions Assessment;
- Traffic Analysis Approach & Methodology;
- Significance Criteria;
- Analysis of Existing Conditions;
- Year 2010 Traffic Analysis;
- Construction Traffic Generation/Distribution/Assignment for alternatives;
- Analysis of Future Scenarios;
- Significance of Impacts; and
- Conclusions/Mitigation Measures.



SOURCE: LLG Engineers, 2006
LLG1582\Moosa 100K Project\FIG1-1.DWG

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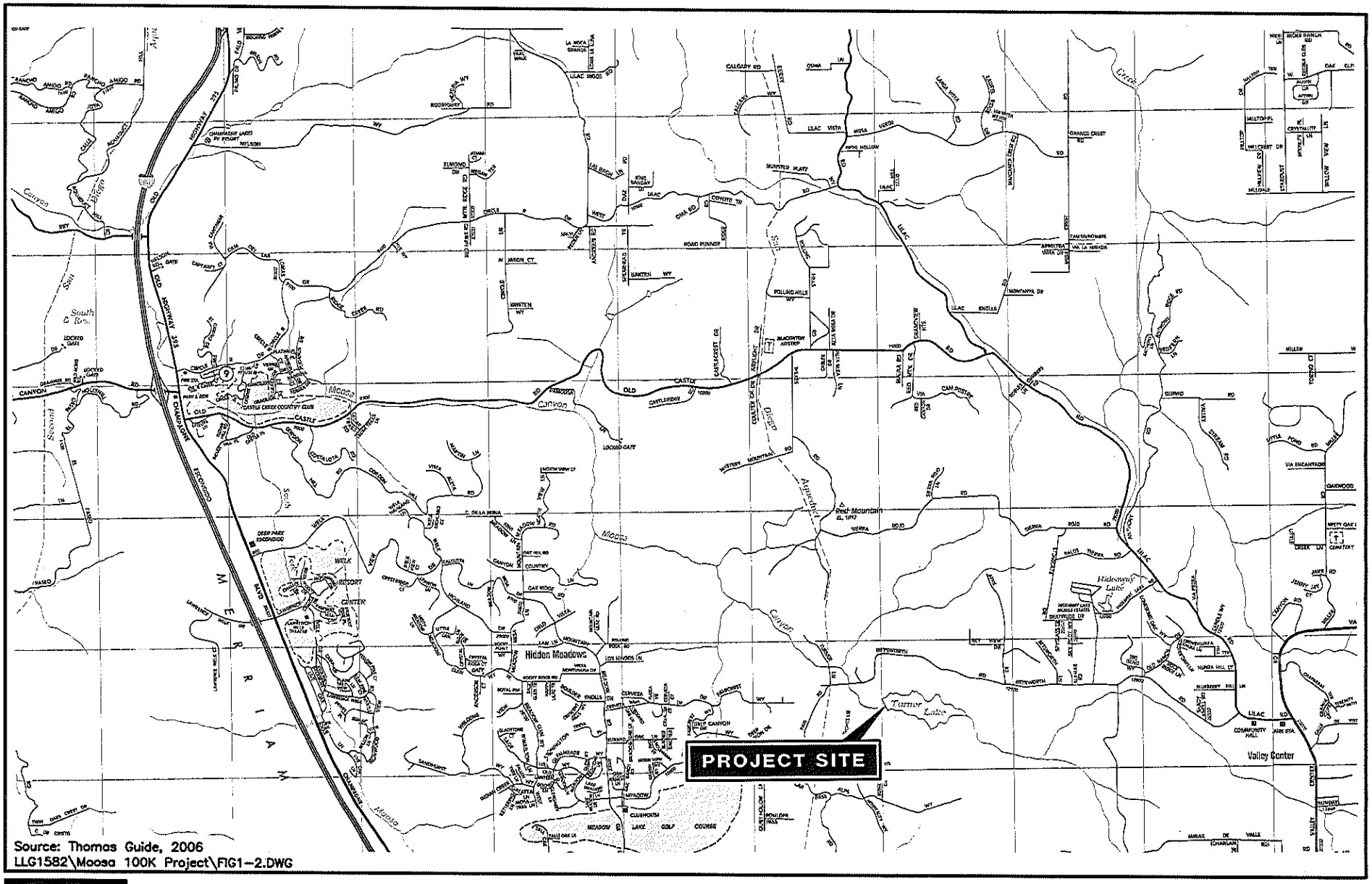
Figure 1-1

Vicinity Map



LINSCOTT LAW & GREENSPAN engineers

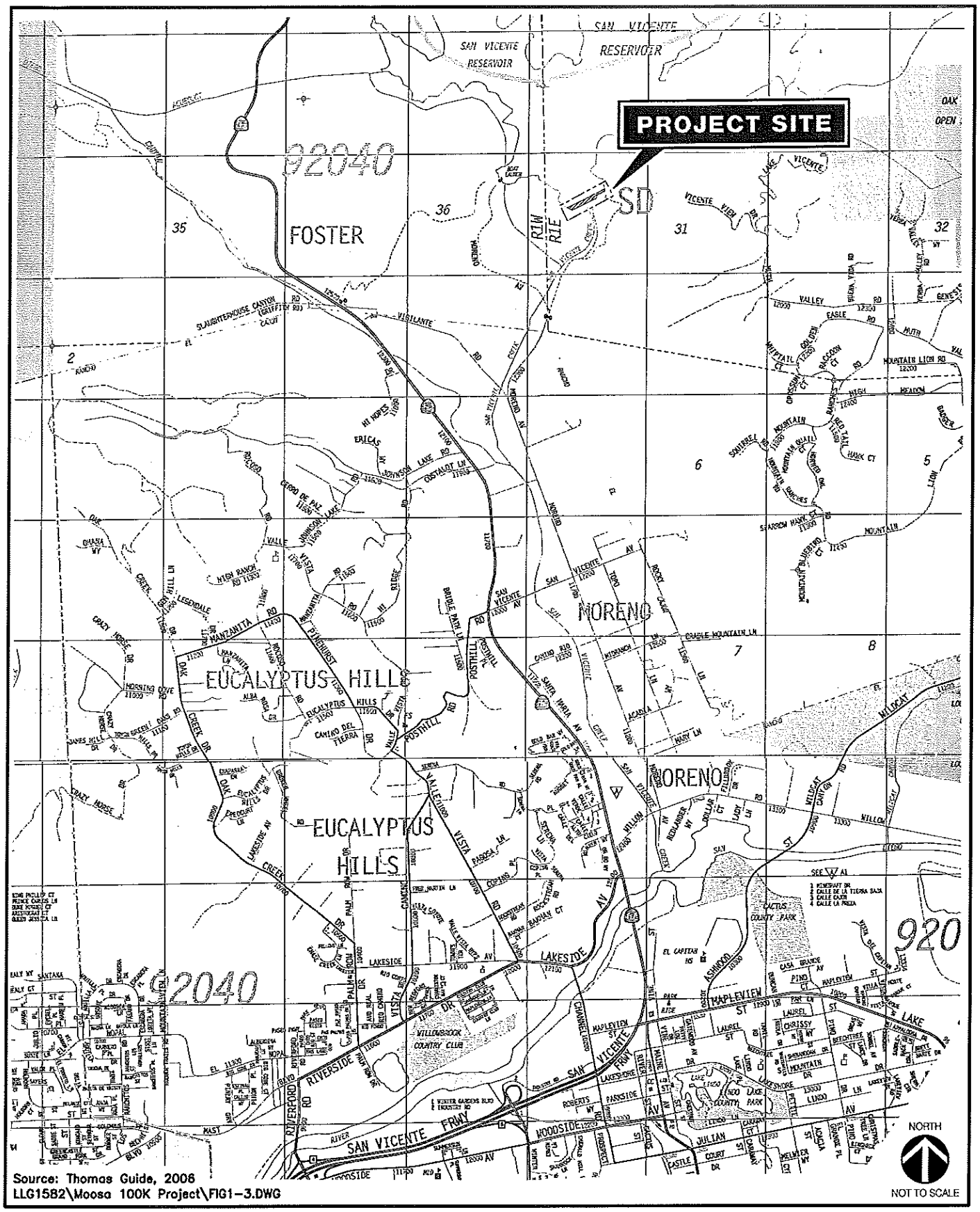
NORTH

NOT TO SCALE

Figure 1-2

Project Area Map - Moosa Site

CARRYOVER STORAGE & SAN VICENTE DAM RAISE PROJECT



Source: Thomas Guide, 2006
LLG1582\Moosa 100K Project\FIG1-3.DWG

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Figure 1-3

Project Area Map - San Vicente Site

2.0 PROJECT DESCRIPTION

The overall purpose of the Carryover Storage and San Vicente Dam Raise Project (CSP) is to substantially increase the reliability and flexibility of the regional water supply by providing the San Diego County Water Authority (Water Authority) with facilities to accumulate and store approximately 100,000 acre feet (AF) of water. Through the use of carryover storage, water can be accumulated during wetter years/seasons, when supplies are available, and used in drier years/seasons or during droughts, when supplies are in higher demand. Carryover storage would provide approximately 100,000 AF of local storage and facilitate the reliable and efficient delivery of water to residents of the Water Authority service area through the year 2030. The project description for Alternative 2 and Alternative 3 are as follows.

2.1 Alternative 2: Moosa 100,000 AF (Moosa 100K)

Moosa Valley is located in a relatively unpopulated area 3.5 miles northwest of Valley Center in San Diego County. The site is approximately 15 miles north of the City of Escondido and four miles east of Interstate 15 (I-15). Existing uses within Moosa Valley include Turner Lake, scattered residences, agricultural lands and undeveloped areas. The site is within the USGS 7.5' Quadrangle, Township South, Range West, Sections; and Township South, Range East, Sections. Access to the site is via Old Castle Road, Lilac Road and Betsworth Road.

This alternative would provide for approximately 100,000 AF of carryover storage at Moosa Valley through construction of a new dam and inundation of a natural canyon. A new 384-foot high dam would be constructed. The dam crest elevation would be 1,258 feet AMSL. A saddle dam with spillway would be constructed approximately 1,000 feet to the northeast of the main dam; the spillway elevation would be 1,246 feet AMSL. The saddle dam/spillway would be approximately 84 feet high and 1,090 feet long. Both the main dam and saddle dam would be concrete-face rockfill dams. Dam construction is estimated to take about four years.

The following new conveyance facilities would be required to connect the reservoir to the Water Authority's aqueduct system: three pump stations, flow regulatory storage tank, pipeline, and appurtenant facilities. The Moosa Creek pump station would lift water from the Moosa Reservoir to a flow regulatory storage tank. Water would be conveyed by gravity from the tank to the Second Aqueduct via a 6.4-mile-long, 90-inch-diameter steel pipeline. The pipeline alignment would follow Moosa Creek to Old Castle Road and continue west to the Second Aqueduct on the west side of I-15. The pipeline would be installed within an open-cut trench, except for the portion crossing I-15, which would be in a tunnel. Additional facilities would include a marina, new access roads, and new electrical supply to the pump station and other facilities. A portion of the First Aqueduct located below the reservoir inundation area would require reconstruction.

Access to the site would be provided via Betsworth Road only.

2.2 Alternative 3: San Vicente 50,000 AF (San Vicente 50K) + Moosa 50,000 AF (Moosa 50K)

The proposed San Vicente Reservoir Expansion project site is located in the County of San Diego, east of SR-67 and northwest of the Vigilante Avenue/ Morena Avenue intersection and the location of Moosa Valley is described in the previous section.

This alternative involves a reduced raise of San Vicente Dam, which would provide approximately 50,000 AF of carryover storage at San Vicente Reservoir, and construction of a new dam at Moosa Valley to create a new reservoir that would provide another 50,000 AF of carry storage capacity. The two projects taken together would provide a combined 100,000 AF of carryover storage. It is assumed that both projects would be constructed concurrently.

San Vicente Dam would be raised an additional 32 feet beyond the approved 54-foot dam raise for the ESP, increasing the overall height of the dam by 86 feet (or a total dam height of up 306 feet). The dam raise would increase the usable volume of San Vicente Reservoir by approximately 102,100 AF. The elevation of the spillway crest would be raised from 650 to 735 feet AMSL. The San Vicente Dam raise associated with Alternative 3 would be accomplished using the same methods and techniques described for the Proposed Action; namely continuous (20 to 24 hours per day) RCC placement on the downstream face of the dam. The same options for the provision of aggregate for RCC production that are under consideration for the Proposed Action are also being evaluated for this alternative. Reservoir water level lowering would be the same as described for the Proposed Action. The reduced increase in reservoir capacity and elevation, as compared to the Proposed Action, would not require the construction of saddle dams. As with the Proposed Action, additional facilities associated with this alternative would include a downstream control facility, outlet pipeline, relocated Bypass Pipeline, relocated marina facilities, and new access roads to the dam crest, relocated marina, and Diversion Structure.

In addition to an approximate 50,000-acre-foot increase in the capacity of San Vicente Reservoir, a new 300-foot high dam would be constructed at Moosa Valley to create a reservoir with 50,000 AF of carryover storage. The dam crest elevation would be 1,185 feet AMSL. A spillway would be constructed approximately 1,500 feet to the northeast of the main dam; the spillway crest elevation would be 1,170 feet AMSL. As described in Alternative 2, the main dam would be a concrete-face rockfill dam. This alternative would involve the same conveyance facilities as Alternative 2. The pipeline would follow the same alignment described in Alternative 2. Additional facilities would include a marina, new access roads, and new electrical supply to the pump station and other facilities. A portion of the First Aqueduct located below the reservoir inundation area would require reconstruction.

The following two options exist for the production/transport of cement or aggregate material to the site for use in the San Vicente Dam construction only:

- *Offsite Trucking Option:* Aggregate, and Cement to produce conventional and RCC concrete would be brought to the site by truck. Conventional and RCC concrete batch plants would be set up near the base of the existing San Vicente Dam.
- *Onsite Quarry Option:* Aggregate would be produced via new on-site quarrying operations.

Access to the Moosa 50K site would be provided via Betsworth Road. Access to the San Vicente 50K site would be provided via SR-67 to Vigilante Avenue to Morena Avenue.

3.0 EXISTING CONDITIONS

Based on the anticipated assignment of project construction traffic, the intersections and segments listed below were chosen for analysis, since this will carry the majority of project traffic. *Figure 3-1* depicts the study area segments and intersections graphically for Moosa Valley site and Figure 3-2 depicts the study area segments and intersections graphically for San Vicente site.

Intersections: Moosa Valley Site

1. Valley Center Road/Lilac Road
2. Lilac Road/Betsworth Road
3. Old Castle Road/Lilac Road
4. Champagne Boulevard/Old castle Road
5. Old Hwy 395/Gopher Canyon Road
6. I-15 Northbound Ramps/Gopher Canyon Road
7. I-15 Southbound Ramps/Gopher Canyon Road
8. Old Hwy 395/Circle R Drive

Segments: Moosa Valley Site

- **Valley Center Road**
  - South of Lilac Road
- **Old Castle Road**
  - East of Champagne Boulevard
  - West of Lilac Road
- **Betsworth Road**
  - South of Lilac Road
- **Champagne Blvd**
  - Between Old Castle Road and Gopher Canyon Road

Intersections: San Vicente Site

1. Pomerado Road/Scripps Poway Parkway
2. SR-67/Poway Road
3. SR-67/Scripps Poway Parkway
4. SR-67/Vigilante Road
5. SR-67/San Vicente Avenue/Posthill Road
6. SR-67/Willow Road
7. Vigilante Road/Morena Avenue

Segments: San Vicente Site

- **SR-67**
  - Poway Road to Scripps Poway Parkway
  - Scripps Poway Parkway to Vigilante Road
  - Vigilante Road to San Vicente Avenue/Posthill Road
- **Scripps Poway Parkway**
  - West of SR-67
- **Vigilante Road**
  - East of SR-67

3.1 Existing Street Network

3.1.1 *Moosa Valley Site*

The following is a brief description of the existing roadway system in the Moosa Valley project area. *Figure 3-1* is the existing conditions diagram.

Valley Center Road is classified as a Prime Arterial on the County of San Diego Circulation Element within the project vicinity. Valley Center Road is currently constructed as a two-lane undivided north-south roadway, providing one lane of travel per direction. No bus stops or bike lanes are provided and curbside parking is prohibited along both sides of the roadway. Valley Center Road is part of the County's bicycle network system.

It should be noted that Phase I of the Valley Center Road Capital Improvement Project (CIP) has been completed. This consisted of widening and reconstructing 2.0 miles of Valley Center Road from approximately 2700 feet (0.5 miles) south of Escondido City limit to 1 mile south of Banbury Drive in Valley Center. This portion of Valley Center Road was reconstructed to modify major road standards (4-lane divided road with bike lanes). Phase 2 is currently under construction and will reconstruct Valley Center Road to four lanes from Banbury Drive northward to Cole Grade Road. Phase 2 is estimated to be completed in 2008.

Lilac Road is classified as a Rural Light Collector on the County of San Diego Circulation Element within the project vicinity. Currently, Lilac Road is constructed as a two-lane undivided north-south roadway. No bus stops or bike lanes are provided and curbside parking is prohibited along both sides of the roadway. Lilac Road is part of the County's bicycle network system.

Betsworth Road is an unclassified two-lane undivided street that travels west from Lilac Road and would terminate at the project site.

Old Castle Road is classified as a Collector Road on the County of San Diego Circulation Element within the project vicinity. Old Castle Road is currently constructed as a two-lane undivided east-west facility with a general curb-to-curb width ranging from 30-40 feet and shoulders ranging from 0-6 feet. Bike lanes are provided and curbside parking is prohibited along both sides of the roadway. Old Castle Road is part of the County's bicycle network system. Certain traffic calming measures are also in place on Old Castle Road.

Old Highway 395 is classified as a Collector Road on the County of San Diego Circulation Element within the project vicinity. Old Highway 395 is currently constructed as a two-lane undivided north-south facility, providing one lane of travel per direction. No bus stops are provided and bike lanes are striped along both sides of the road with curbside parking prohibited. Old Highway 395 is part of the County's bicycle network system.

Champagne Boulevard is classified as a Collector Road on the County of San Diego Circulation Element within the project vicinity. Champagne Boulevard is currently constructed as a two-lane undivided north-south facility with a curb-to-curb width of 45-feet with 2-foot shoulders. No bus stops are provided and bike lanes are striped along both sides of the road with curbside parking prohibited. Champagne Boulevard is part of the County's bicycle network system.

Gopher Canyon Road is classified as a Collector Road on the County of San Diego Circulation Element within the project vicinity. Gopher Canyon Road is currently constructed as a two-lane undivided east-west facility with a curb-to-curb width of 24-feet with 6-foot shoulders. Bike lanes are provided and curbside parking is prohibited along both sides of the roadway. The posted speed limit is 55 mph. Gopher Canyon Road is part of the County's bicycle network system.

3.1.2 *San Vicente Site*

The following is a brief description of the existing roadway system in the San Vicente project area. *Figure 3-2* is the existing conditions diagram.

SR 67 is a north/south Caltrans facility, and is classified as a Major Road (from north of Willow Road to Ramona Street) on the County of San Diego Circulation Element. It is currently a two-lane undivided roadway south of San Vicente Avenue/Posthill Road and generally a four-lane roadway north of Vigilante Avenue. Curbside parking is generally prohibited. The posted speed limit south of Scripps Poway Parkway is 60 MPH and north of Scripps Poway Parkway is 55 MPH.

Scripps Poway Parkway is classified as a Prime Arterial west of SR 67. Currently, it is generally a six-lane divided road from Pomerado Road to SR-67. Curb, gutter, sidewalk and a raised median are provided. Parking is not permitted and the posted speed limit is 55 MPH.

Poway Road is classified as a four-lane Major Road west of SR-67. Curb, gutter, sidewalk and a raised median are provided.

Vigilante Road is classified as a two-lane Light Collector Roadway. Currently, it is a two-lane undivided road east of SR-67. Vigilante Road connects SR-67 to Morena Drive, which is the only access to the project site.

Morena Avenue is classified as a two-lane Light Collector Roadway. Currently, it is a two-lane undivided roadway with truck restrictions. Morena Avenue (north of Vigilante Road) is primary local access to San Vicente Reservoir and project site.

3.2 Existing Traffic Volumes

Manual peak hour intersection counts and the bi-directional daily traffic counts for the Moosa Valley project area were conducted in June, August and November 2006. Intersection counts were conducted during both AM (7:00-9:00) and PM (4:00-6:00) peak periods. *Appendix A* contains the manual count sheets. *Figure 3-3* depicts the peak hour intersection turning movement volumes at the Moosa Valley site.

Manual peak hour intersection counts and the bi-directional daily traffic counts for San Vicente project area were conducted in October 2005. Since the original counts were conducted in 2005, a growth factor of 2% was applied to represent 2006the 2005 counts. The 2% factor is based on historical traffic growth along SR-67. Intersection counts were conducted during both AM (7:00-9:00) and PM (4:00-6:00) peak periods. *Appendix A* contains the manual count sheets. *Figure 3-4* depicts the peak hour intersection turning movement volumes at the San Vicente site.

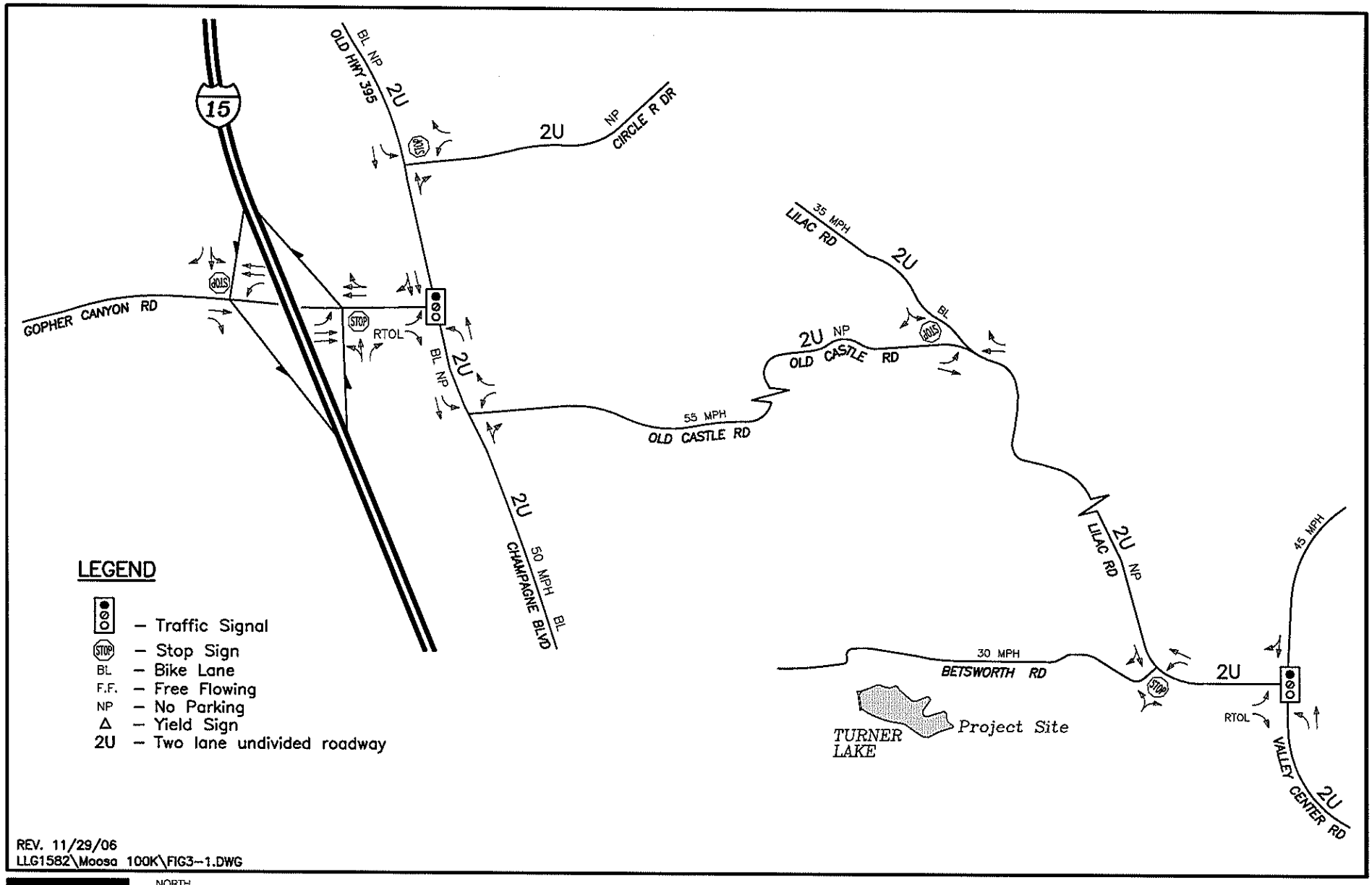

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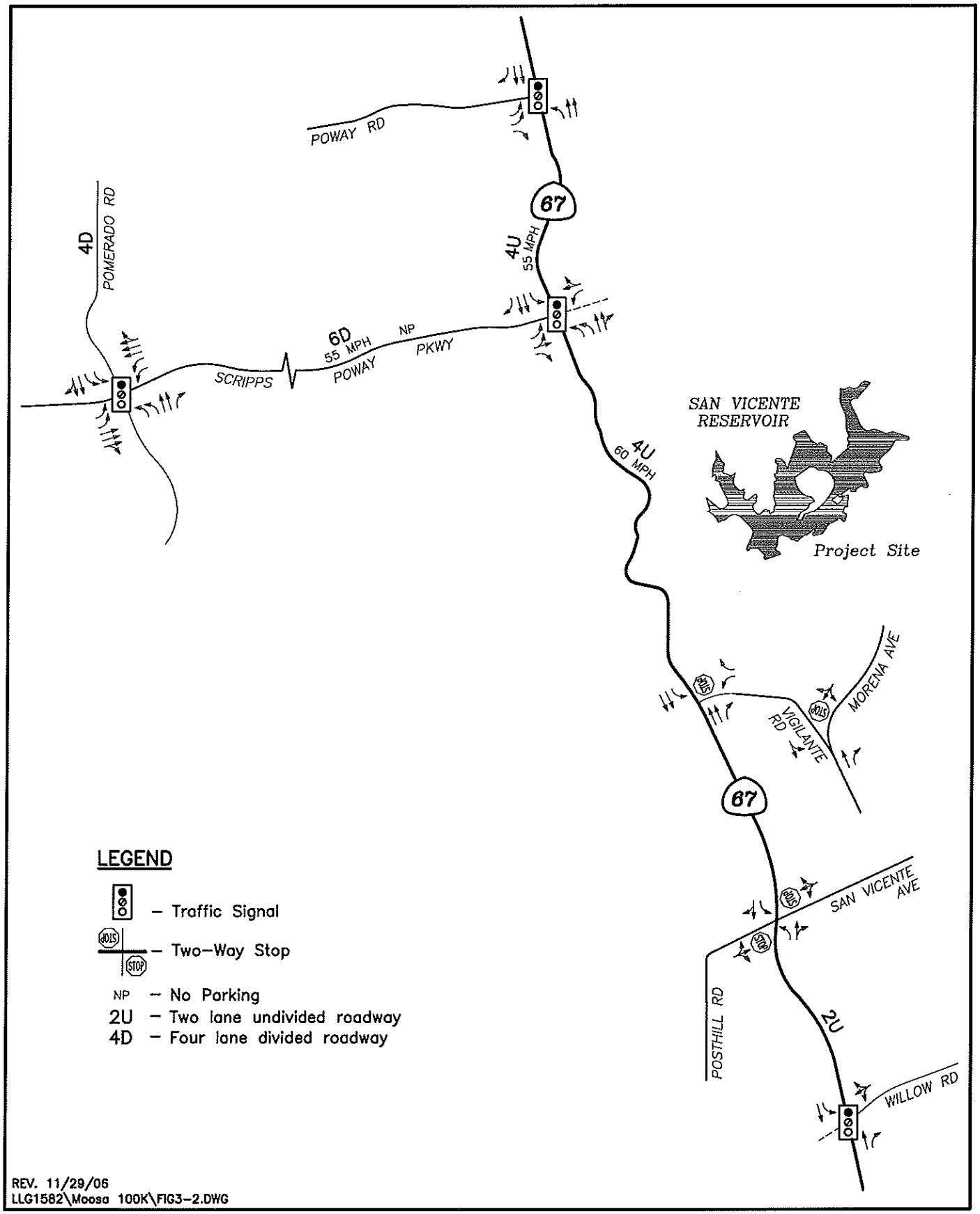
Figure 3-1

Existing Conditions Diagram - Moosa Site

CARRYOVER STORAGE & SAN VICENTE DAM RAISE PROJECT



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LLG1582\Moosa 100K\FIG3-2.DWG

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NORTH
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Figure 3-2

Existing Conditions Diagram - San Vicente Site

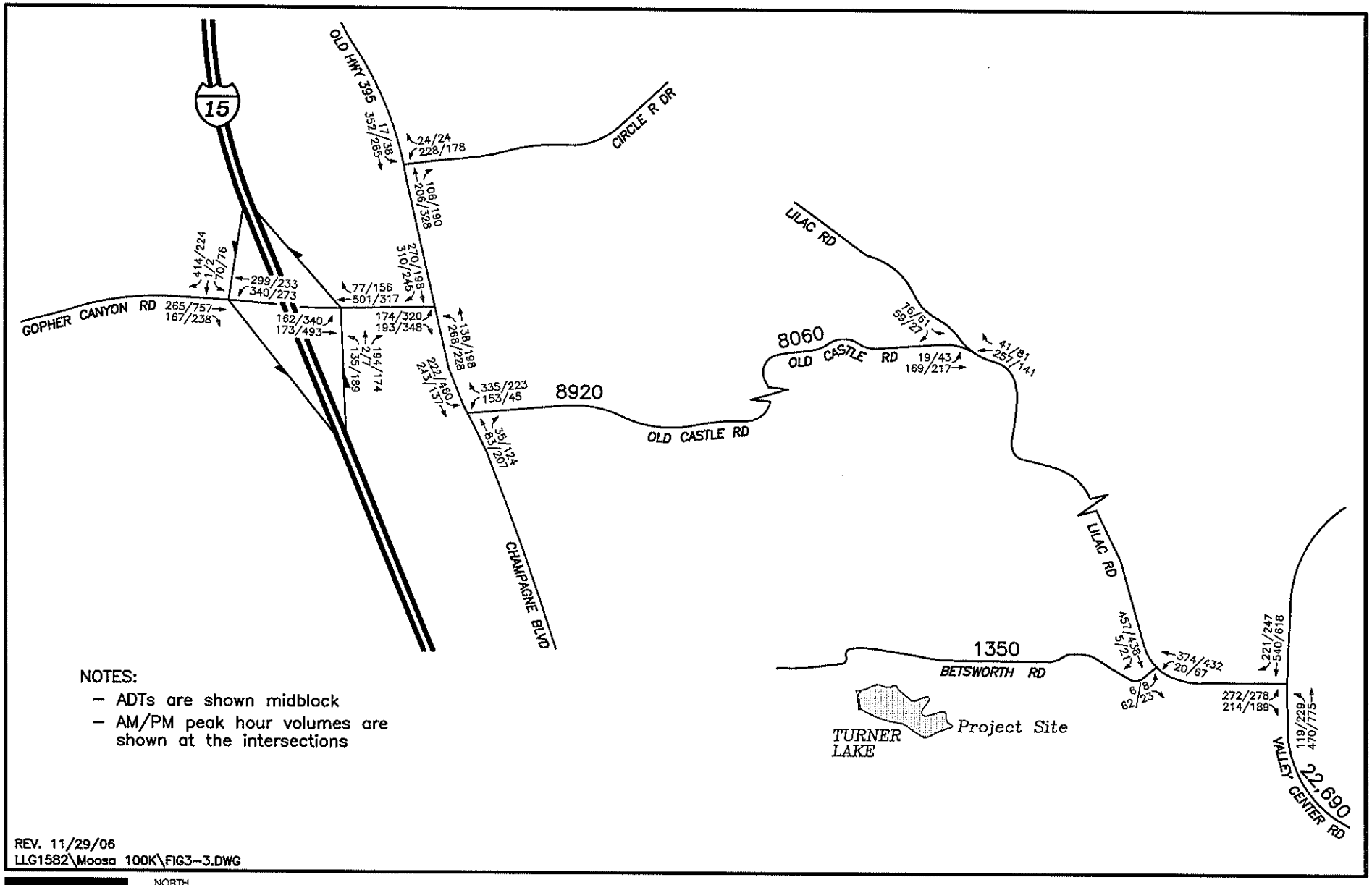

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Figure 3-3

Existing Traffic Volumes - Moosa Site AM/PM Peak Hours & ADT

CARRYOVER STORAGE & SAN VICENTE DAM RAISE PROJECT

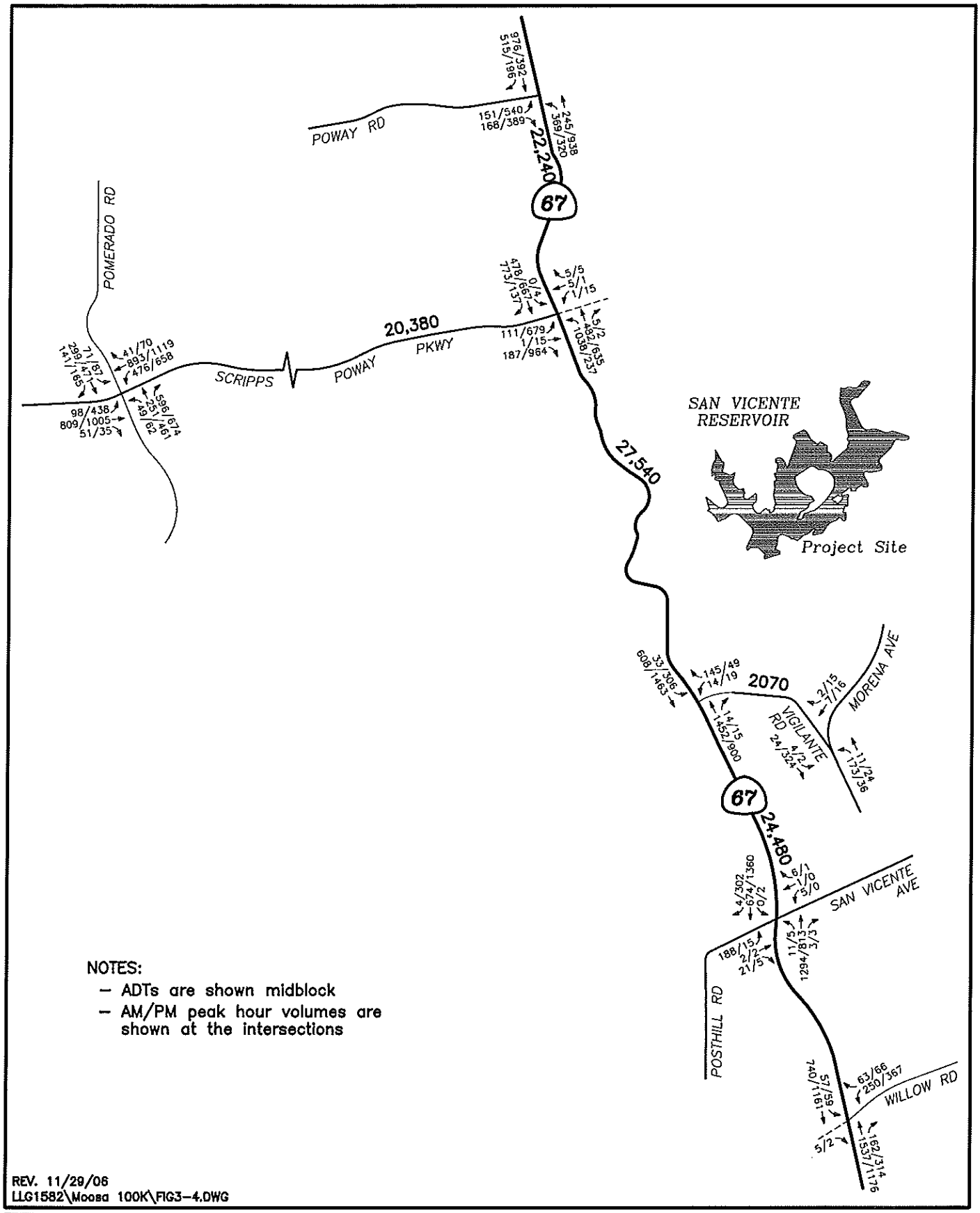

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Figure 3-4

Existing Traffic Volumes - San Vicente Site AM/PM Peak Hours & ADT

4.0 ANALYSIS SCENARIOS AND METHODOLOGY

4.1 Analysis Scenarios

Peak construction is not anticipated to occur until about Year 2010. Based on the SANDAG North County Model and the historical count data, an average growth rate of 2% per year was determined. Therefore, a growth factor of 8% (2% per year for 4 years) was applied to the existing counts to represent Year 2010 without project conditions. The following scenarios are analyzed for each alternative in this report.

- Existing
- Year 2010 without project
- Year 2010 + Project Construction Traffic

The study area intersections and segments listed in Section 3.0 are analyzed in this report.

4.2 Methodology

Level of service (LOS) is the term used to denote the different operating conditions which occur on a given roadway segment under various traffic volume loads. It is a qualitative measure used to describe a quantitative analysis taking into account factors such as roadway geometries, signal phasing, speed, travel delay, freedom to maneuver, and safety. Level of service provides an index to the operational qualities of a roadway segment or an intersection. Level of service designations range from A to F, with LOS A representing the best operating conditions and LOS F representing the worst operating conditions. Level of service designation is reported differently for signalized and unsignalized intersections, as well as for roadway segments.

4.3 Intersections

Signalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay was determined utilizing the methodology found in Chapter 16 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the [*Traffix* (version 7.5)] computer software. The delay values (represented in seconds) were qualified with a corresponding intersection Level of Service (LOS). Signalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in ***Appendix B***.

Unsignalized intersections were analyzed under AM and PM peak hour conditions. Average vehicle delay and Levels of Service (LOS) was determined based upon the procedures found in Chapter 17 of the *2000 Highway Capacity Manual (HCM),* with the assistance of the [*Traffix* (version 7.5)] computer software. Unsignalized intersection calculation worksheets and a more detailed explanation of the methodology are attached in ***Appendix B***.

4.4 Street Segments

Street segment analysis is based upon the comparison of daily traffic volumes (ADTs) to the County of San Diego's *Roadway Classification, Level of Service, and ADT Table*. This table provides segment capacities for different street classifications, based on traffic volumes and roadway characteristics. The County of San Diego's *Roadway Classification, Level of Service, and ADT Table* is attached in ***Appendix B***.

5.0 SIGNIFICANCE CRITERIA

Thresholds used to evaluate potential traffic/circulation impacts are based on applicable criteria in the State CEQA Guidelines (CCR §§15000-15387), the San Diego Traffic Engineers' Council (SANTEC) Guidelines. A significant traffic/circulation impact would occur if the proposed action would:

1. Significantly worsen congestion at any intersection that is currently operating, or is projected to operate at LOS E or F, by adding two seconds or more to the delays experienced by motorists at intersections. For unsignalized intersections, if no additional traffic (or less than 20 peak hour trips when the intersection operates at LOS E and less than 5 peak hour trips when the intersection operates at LOS F) is added to the critical movement, the impact is considered not significant regardless of the increased delay for any one particular movement.

2. Cause any roadway segment to be reduced to LOS E or F, or increase the volume to capacity ratio by 0.02 or more at any roadway segment currently operating or projected to operate at LOS E or F.

6.0 ANALYSIS OF EXISTING CONDITIONS

6.1 Peak Hour Intersection Levels of Service

Tables 6-1 and 6-2 summarize the existing intersections level of service for the Moosa Valley and San Vicente project area's respectively. As seen in *Tables 6-1 and 6-2*, all intersections are calculated to currently operate at LOS C or better during both the AM and PM peak hours except for the following:

- Champagne Boulevard/Old Castle Road (westbound left movement operates at LOS E in the AM Peak Hour and LOS F during the PM peak hour)
- I-15 Northbound Ramps/Gopher Cyn Rd (northbound left-thru movement operates at LOS E during the AM peak hour and LOS F during the PM peak hour)
- I-15 Southbound Ramps/Gopher Cyn Rd (southbound left-thru movement operates at LOS F during both AM and PM peak hour)
- SR-67/Vigilante Road (westbound left movement operates at LOS F during both AM and PM peak hour)
- SR-67/San Vicente Avenue (eastbound movement operates at LOS F during the AM peak hour and LOS E during the PM peak hour)
- SR-67/Willow Road (LOS E during the AM peak hour)

Appendix C contains the existing intersection analysis worksheets.

6.2 Daily Street Segment Levels of Service

Tables 6-3 and 6-4 summarizes the existing street segment operations level of service for the Moosa Valley and San Vicente project area's respectively. As seen in *Tables 6-3 and 6-4*, all segments are calculated to currently operate at LOS D or better except the 2-lane Valley Center Road (south of Lilac Road) segment.

TABLE 6–1
EXISTING INTERSECTION OPERATIONS – MOOSA VALLEY SITE

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
Valley Center Rd/Lilac Rd	Signal	AM PM	24.5 32.8	C C
Lilac Rd/Betsworth Rd	TWSC (NB)	AM PM	9.6 8.5	A A
Old Castle Rd/Lilac Rd	TWSC (SB)	AM PM	7.3 6.9	A A
Champagne Blvd/Old Castle Rd	TWSC (WBL)	AM PM	35.7 80.1	E F
Old Hwy 395/Gopher Cyn Rd	Signal	AM PM	23.3 23.3	C C
I-15 NB Ramps/Gopher Cyn Rd	TWSC (NBTL)	AM PM	35.7 >100	E F
I-15 SB Ramps/Gopher Cyn Rd	TWSC (SBTL)	AM PM	>100 >100	F F
Old Hwy 395/Circle R Dr	TWSC (WB)	AM PM	8.2 8.2	A A

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.

General Notes:
1. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
2. WBL=Westbound Left-turn; EB=Eastbound; WB=Westbound; SB=Southbound.

SIGNALIZED		UNSIGNALIZED	
DELAY/LOS THRESHOLDS		DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

TABLE 6–2
EXISTING INTERSECTION OPERATIONS – SAN VICENTE SITE

Intersection	Control Type	Peak Hour	Existing	
			Delay[a]	LOS[b]
Pomerado Rd./Scripps Poway Pkwy	Signal	AM PM	24.5 29.5	C C
SR-67/Poway Rd.	Signal	AM PM	17.8 18.0	B B
SR-67/Scripps Poway Pkwy.	Signal	AM PM	24.6 27.3	C C
SR-67/Vigilante Rd.	TWSC (WBL)	AM PM	93.0 >100	F F
SR-67/San Vicente Ave.	TWSC (EB/WB)	AM PM	>100/28.0 40.5/15.0	F/D E/C
SR-67/Willow Rd	Signal	AM PM	70.2 50.6	E D
Vigilante Rd./Morena Ave.	TWSC (SB)	AM PM	9.8 10.1	A B

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.

General Notes:
1. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported.
2. WBL=Westbound Left-turn; EB=Eastbound; WB=Westbound; SB=Southbound.

SIGNALIZED DELAY/LOS THRESHOLDS		UNSIGNALIZED DELAY/LOS THRESHOLDS	
Delay	LOS	Delay	LOS
0.0 < 10.0	A	0.0 < 10.0	A
10.1 to 20.0	B	10.1 to 15.0	B
20.1 to 35.0	C	15.1 to 25.0	C
35.1 to 55.0	D	25.1 to 35.0	D
55.1 to 80.0	E	35.1 to 50.0	E
> 80.1	F	> 50.1	F

TABLE 6–3
EXISTING STREET SEGMENT OPERATIONS – MOOSA VALLEY SITE

Street Segment	Capacity (LOS E) [a]	ADT [b]	V/C	LOS[c]
Valley Center Rd				
South of Lilac Rd	16,200	22,690[d]	1.40	F
Old Castle Road				
East of Champagne Blvd	16,200	8,920 [d]	0.55	D
West of Lilac Rd	16,200	8,060 [d]	0.50	D
Betsworth Rd				
South of Lilac Rd	16,200	1,350 [d]	0.08	A

Footnotes:
a. Capacities based on County of San Diego Roadway Classification Table.
b. Average Daily Traffic Volumes.
c. Level of service.
d. Source: Counts commissioned by LLG in 2006.

TABLE 6–4
EXISTING STREET SEGMENT OPERATIONS – SAN VICENTE SITE

Street Segment	Capacity (LOS E) [a]	ADT [b]	V/C	LOS[c]
SR-67				
Poway Rd to Scripps Poway Pkwy	37,000	22,000 [e]	0.59	B
Scripps Poway Pkwy to Vigilante Rd	37,000	27,500 [e]	0.74	C
South of Vigilante Rd	37,000	24,300 [e]	0.66	B
SCRIPPS POWAY PKWY				
West of SR-67	37,000	19,980 [d]	0.54	A
VIGILANTE RD				
East of SR-67	16,200	2,030 [d]	0.13	B

Footnotes:

a. Capacities based on County of San Diego Roadway Classification Table.

b. Average Daily Traffic Volumes.

c. Level of service.

d. Source: Counts commissioned by LLG in 2005 (a growth factor of 2% was also applied).

e. Source: Caltrans Counts.

7.0 ALTERNATIVE 2: MOOSA 100K

7.1 Year 2010 Without Project

To account for the growth in area traffic between Year 2006 and Year 2010, the anticipated peak construction year, a growth rate of 8% (growth for 4 years) was added to the existing traffic. *Figure 7-1* depicts the Year 2010 without Project Volumes for AM/PM Peak Hours.

7.2 Year 2010 Without Project (Baseline Conditions) Analysis

7.2.1 *Intersection Analysis*

Table 7-1 summarizes the Year 2010 without project intersections level of service. As seen in *Table 7-1*, all intersections are calculated to operate at LOS D or better during both the AM and PM peak hours:

- Champagne Boulevard/Old Castle Road (westbound left movement operates at LOS F during both AM and PM peak hour)
- I-15 Northbound Ramps/Gopher Cyn Rd (northbound left-thru movement operates at LOS F during both AM and PM peak hour)
- I-15 Southbound Ramps/Gopher Cyn Rd (southbound left-thru movement operates at LOS F during both AM and PM peak hour)

Appendix D contains the intersection analysis worksheets.

7.2.2 *Segment Operations*

Table 7-2 summarizes the Year 2010 without project street segment operations level of service. As seen in *Table 7-2*, all segments are calculated to currently operate at LOS D or better except the Valley Center Road (south of Lilac Road) segment.

7.3 Construction Traffic Trip Generation/Distribution/Assignment

7.3.1 *Trip Generation*

Table 7-3 summarizes the Project Construction Traffic trip generation for trucks bringing equipment (i.e. bulldozers, cranes etc.), cement, fly ash, aggregate etc to the site, and crewmember traffic.

The trip generation for the trucks was based on the estimated construction equipment schedule prepared for the project (see Appendix E). The trip generation for the crewmembers was based on the estimated manpower prepared for the project (see Appendix E). There were several construction phases identified for the project and trip generation values for each construction phase were calculated. Simultaneous construction phase's traffic volume was combined. In order to identify the peak construction scenario and evaluate the maximum impact of construction traffic, the construction phase with the highest total traffic was determined and analyzed.

A Passenger Car Equivalent (PCE) factor was applied to the generated truck trips. PCE is defined as the number of passenger cars that are displaced by a single heavy vehicle of a particular type under the prevailing traffic conditions. Heavy vehicles have a greater traffic impact than passenger cars since: (1) they are larger than passenger cars, and therefore, occupy more roadway space; and (2) their performance characteristics are generally inferior to passenger cars, leading to the formation of downstream gaps in the traffic stream (especially on upgrades) which cannot always be effectively filled by normal passing maneuvers. Based on the elevation changes in the vicinity of the project site a PCE of 2.0 was applied to each truck trip.

7.3.2 *Trip Distribution/Assignment*

The project-generated traffic was distributed to the street system based on several factors such as potential truck routes, the location of population centers (for crew member trips) and the proximity of the material providers. *Figure 7-2a* depicts the assumed regional project traffic distribution percentages for the equipment and miscellaneous (other than aggregate, cement and fly ash) truck traffic. *Figure 7-2b* depicts the assumed regional project traffic distribution percentages for the crewmembers.

Based on the above traffic distribution, *Figure 7-3* depicts the total project traffic assignment for the Moosa 100K. Appendix E contains the individual traffic assignment for equipment and miscellaneous truck traffic and the crew traffic. *Figure 7-4* depicts the total traffic volumes for the Year 2010 + Construction traffic (Moosa 100K).

7.4 Year 2010 + Project (Offsite Trucked Option)

7.4.1 *Intersection Analysis*

Table 7-1 summarizes the Year 2010 with project intersections level of service. As seen in *Table 7-1*, all intersections are calculated to operate at LOS D or better during both the AM and PM peak hours with the addition of cumulative traffic except the following intersection:

- Lilac Road/Betsworth Road (northbound movement operates at LOS F during the PM peak hour)
- Champagne Boulevard/Old Castle Road (westbound left movement operates at LOS F during both AM and PM peak hour)
- I-15 Northbound Ramps/Gopher Cyn Rd (northbound left-thru movement operates at LOS F during both AM and PM peak hour)
- I-15 Southbound Ramps/Gopher Cyn Rd (southbound left-thru movement operates at LOS F during both AM and PM peak hour)

Appendix F contains the existing intersection analysis worksheets.

7.4.2 *Segment Operations*

Table 7-2 summarizes the Year 2010 without project street segment operations level of service. As seen in *Table 7-2*, all segments are calculated to currently operate at LOS D or better, except the Valley Center Road (south of Lilac Road) and Old Castle Road (East of Champagne Boulevard) segments.

7.5 Significance of Impacts and Mitigation Measures

7.5.1 *Significance of Impacts*

Based on the analyses of intersections and segments in the study area (*Tables 7-1 and 7-2*), and the established significance criteria, the following significant impacts were determined for the Moosa 100K alternative. Section 7.6.2 recommends corresponding mitigation measures for the following four locations:

1. Lilac Road/Betsworth Road Intersection
2. I-15 Southbound Ramps/Gopher Cyn Rd
3. Valley Center Road (south of Lilac Road)
4. Old Castle Road (East of Champagne Boulevard)

7.5.2 *Mitigation Measures*

The following is a list of measures recommended to mitigate the project construction traffic impacts.

1. **Lilac Road/Betsworth Road** – the intersection impact can be mitigated by providing either one of the following alternative mitigation measures:

   Alternate 1: The intersection impact can be mitigated by installing a traffic signal at the subject intersection. This mitigation measure would mitigate the intersection significance impact to below a level of significance.

   Alternate 2: Prohibit the truck and crew traffic from exiting the project site during the PM peak period (4:00 – 6:00 PM). This alternate would mitigate the significant intersection impact to below a level of significance.

2. **I-15 Southbound Ramps/Gopher Canyon Road** – the intersection impact can be mitigated by providing either one of the following alternative mitigation measure:

   Alternate 1: The intersection impact can be mitigated by installing a traffic signal at the subject intersection. This mitigation measure would mitigate the intersection significance impact to below a level of significance.

   Alternate 2: Prohibit the truck and crew traffic accessing the project site during both AM and PM peak hours (7:00 – 8:00 AM and 4:00 – 6:00 PM). This alternate would mitigate the significant intersection impact to below a level of significance.

3. **Valley Center Road (south of Lilac Road)** – The planned widening of Valley Center Road to 4 lanes would mitigate the significant impact.

4. **Old Castle Road (East of Champagne Boulevard):** Signalizing the Champagne Blvd/Old castle Rd intersection would mitigate the segment impact by providing additional capacity at this key intersection along Old Castle Road.

TABLE 7-1
INTERSECTION OPERATIONS – MOOSA 100K

Intersection	Peak Period	Existing		Year 2010 Without Project		Year 2010 + Construction Project				Significant Impact
		Delay[a]	LOS[b]	Delay	LOS	Delay	LOS	Delay Δ[c]	Critical Move Trips	
Valley Center Rd/Lilac Rd	AM	24.5	C	27.8	C	43.2	D	15.4	N/A	No
[Signalized]	PM	32.8	C	43.0	D	55.0	D	12.0		No
Lilac Rd/Betsworth Rd	AM	9.6	A	9.8	A	17.5	C	7.7		No
[TWSC-NB]	PM	8.5	A	8.6	A	>100	F	>10	228	Yes
Old Castle Rd/Lilac Rd	AM	7.3	A	7.4	A	9.3	A	1.9	N/A	No
[TWSC-SB]	PM	6.9	A	6.9	A	7.3	A	0.4		No
Champagne Blvd/Old Castle Rd	AM	35.7	E	50.0	F	>100	F	>10	1	No
[TWSC-WBL]	PM	80.1	F	>100	F	>100	F	>10	3	No
Old Hwy 395/Gopher Cyn Rd	AM	23.3	C	24.0	C	24.4	C	0.4	N/A	No
[Signalized]	PM	23.3	C	24.1	C	27.0	C	2.9		No
I-15 NB Ramps/Gopher Cyn Rd	AM	35.7	E	50.1	F	66	F	15.9	0	No
[TWSC-NBTL]	PM	>100	F	>100	F	>100	F	>10	0	No
I-15 SB Ramps/Gopher Cyn Rd	AM	>100	F	>100	F	>100	F	>10	25	Yes
[TWSC-SBTL]	PM	>100	F	>100	F	>100	F	>10	10	Yes
Old Hwy 395/Circle R Dr	AM	8.2	A	8.3	A	8.4	A	0.1	N/A	No
[TWSC-WB]	PM	8.2	A	8.4	A	8.4	A	0.0		No

Footnotes:

a. Average delay expressed in seconds per vehicle.

b. Level of Service.

General Notes:

1. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported. WBL=Westbound Left-turn; EB=Eastbound; WB=Westbound; SB=Southbound.

TABLE 7-2
STREET SEGMENT OPERATIONS – MOOSA 100K

Segment	Capacity LOS E	Existing			Year 2010 Without Project			Year 2010 + Construction Project Traffic		
		ADT	V/C	LOS	ADT	V/C	LOS	ADT	V/C	LOS
Valley Center Rd										
South of Lilac Rd	16,200	22,690	1.40	F	24,510	1.51	F	25,207	1.56	F
Old Castle Road										
East of Champagne Blvd	16,200	8,920	0.55	D	9,630	0.59	D	11,148	0.69	E
West of Lilac Rd	16,200	8,060	0.50	D	8,700	0.54	D	10,260	0.63	D
Betsworth Rd										
South of Lilac Rd	16,200	1,350	0.08	A	1,460	0.09	A	3,968	0.24	B

Footnotes:

a. Capacities based on County of San Diego Roadway Classification Table.

b. Average Daily Traffic Volumes.

c. Level of service.

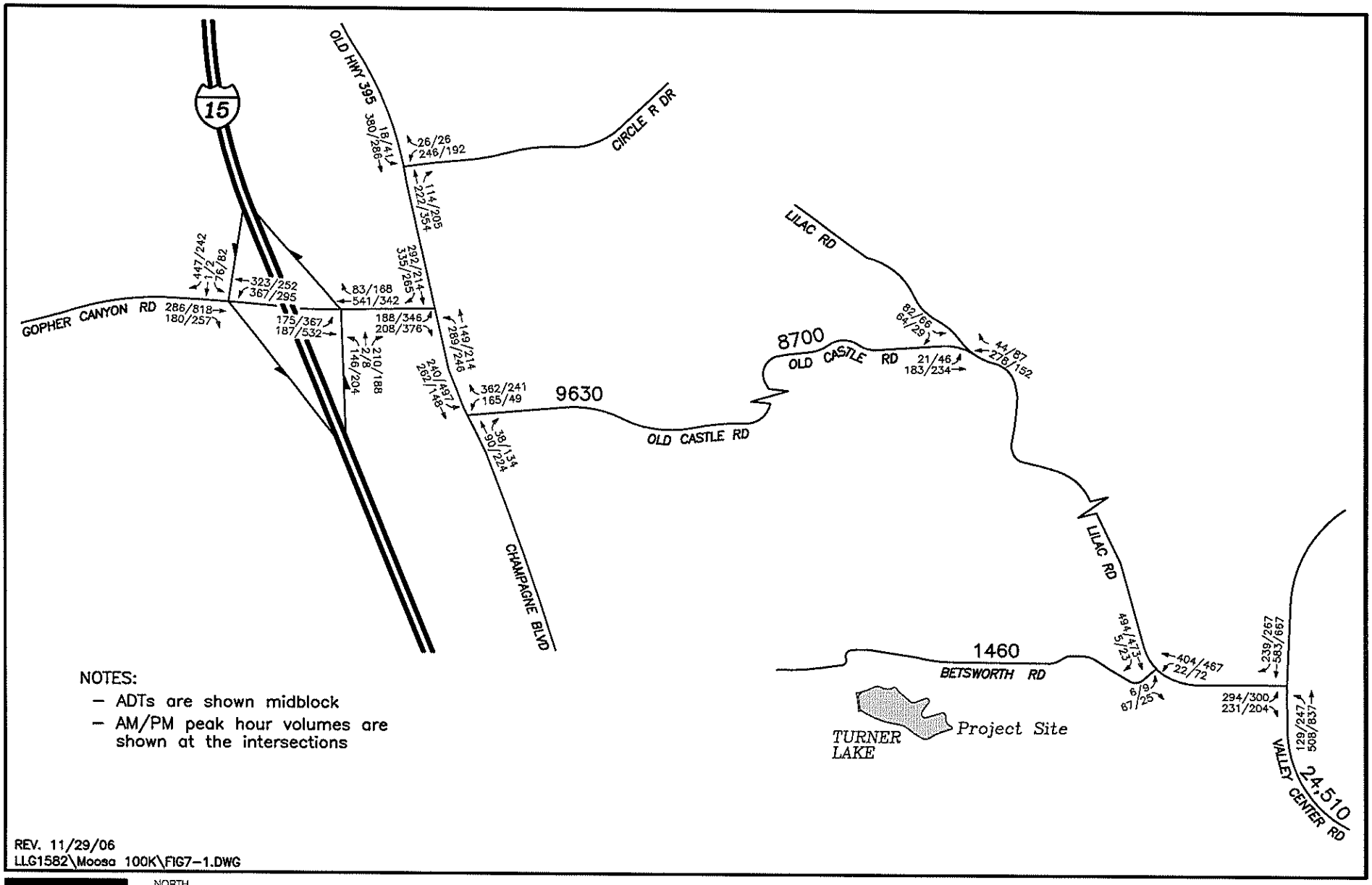
d. Shading indicates significance impacts.

TABLE 7-3
CONSTRUCTION TRAFFIC GENERATION – MOOSA 100K

Use	Trucks Trips	Total ADT in PCE	AM Peak Hour					PM Peak Hour				
			% Of ADT	In:Out Split		Volume		% OF ADT	In:Out Split		Volume	
						In	Out				In	Out
Trucks/Equipment Only	552	1104	10%	80%	20%	88	22	10%	30%	70%	33	77
Crew Traffic Only	1404	1404	30%	80%	20%	337	84	30%	30%	70%	126	295
Total	1,956	2,508				425	106				159	372

Footnotes:

1. PCE = Passenger Car Equivalent.



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NORTH

NOT TO SCALE

Figure 7-1

Year 2010 Without Project Traffic Volumes AM/PM Peak Hours & ADT

CARRYOVER STORAGE & SAN VICENTE DAM RAISE PROJECT

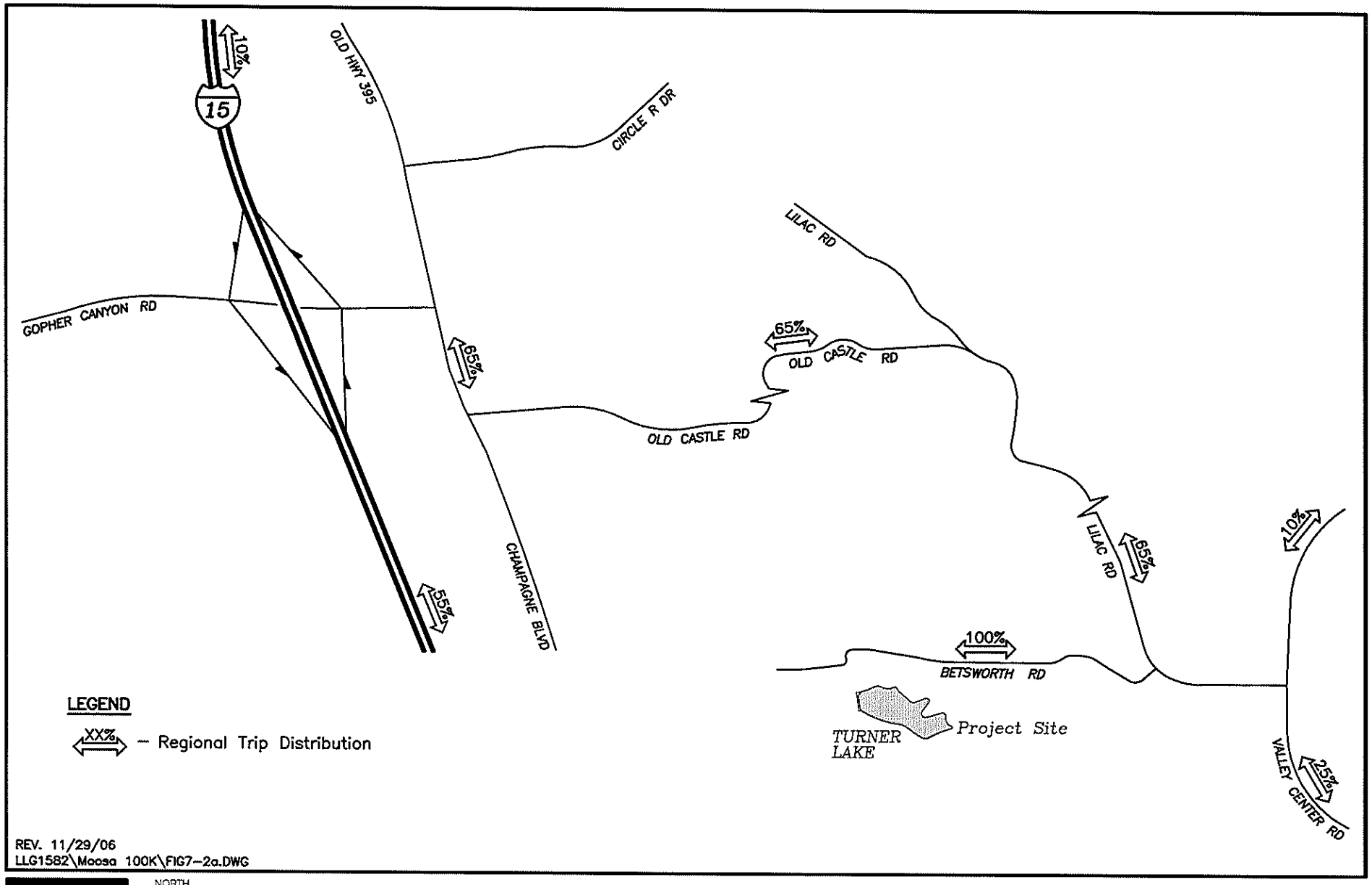

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Figure 7-2a

Construction Truck Traffic Distribution (Moosa Valley Site) AM/PM Peak Hours & ADT

CARRYOVER STORAGE & SAN VICENTE DAM RAISE PROJECT

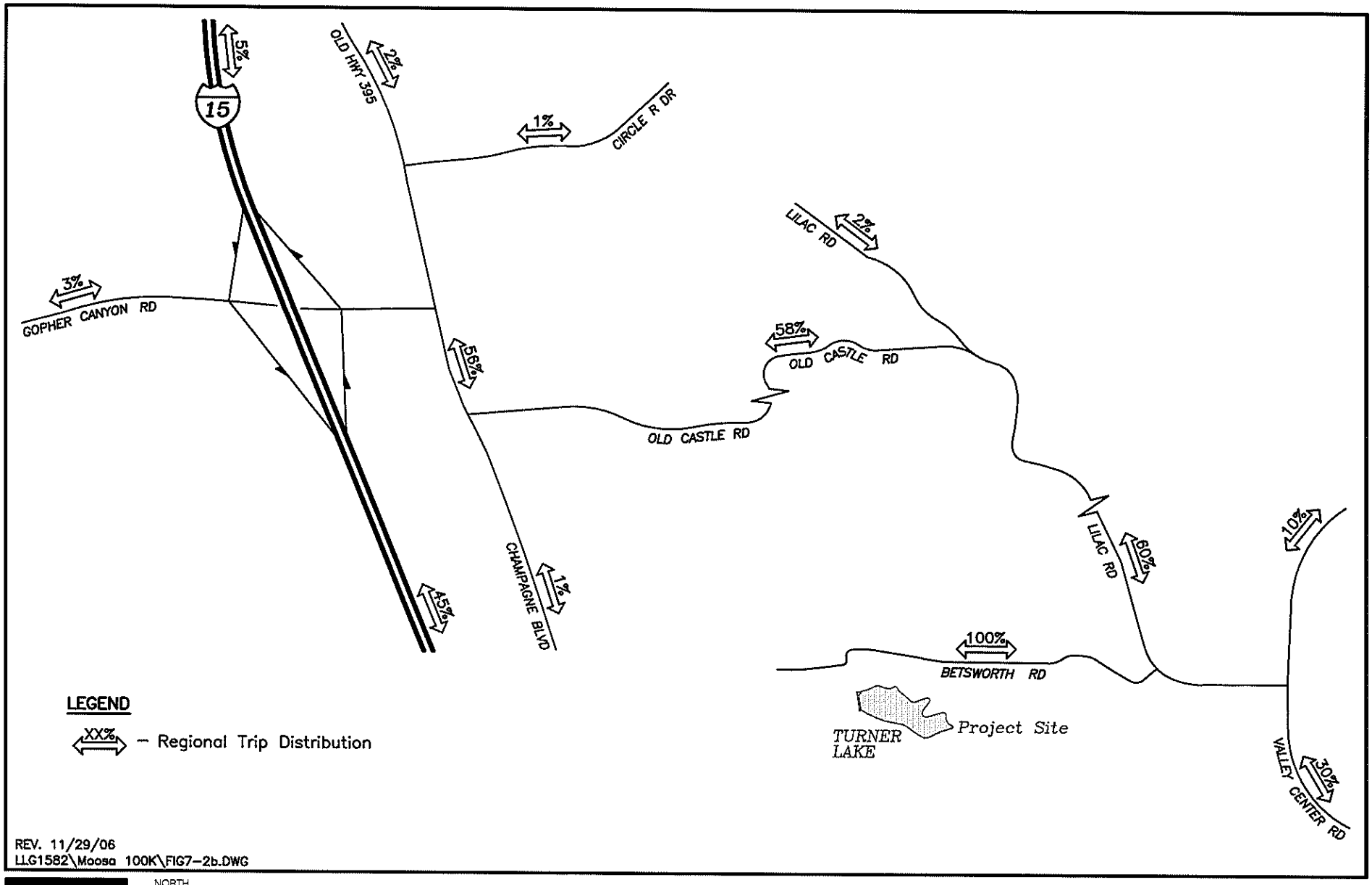

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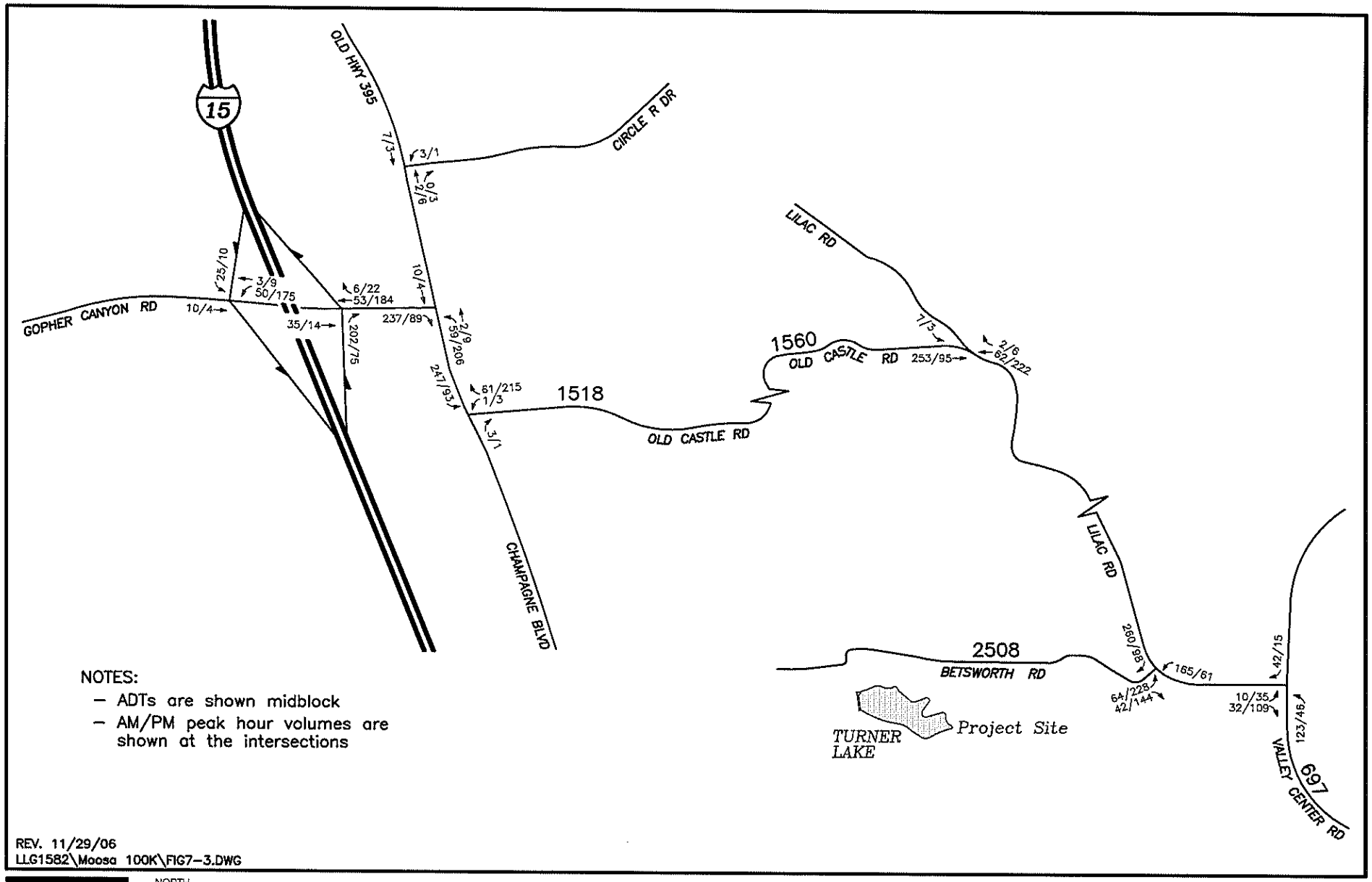
Figure 7-2b

Construction Crew Traffic Distribution (Moosa Valley Site) AM/PM Peak Hours & ADT

CARRYOVER STORAGE & SAN VICENTE DAM RAISE PROJECT



NOTES:
- ADTs are shown midblock
- AM/PM peak hour volumes are shown at the intersections

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LLG1582\Moosa 100K\FIG7-3.DWG

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Figure 7-3

Total Construction (MOOSA 100,000 AF) Traffic Volumes AM/PM Peak Hours & ADT

CARRYOVER STORAGE & SAN VICENTE DAM RAISE PROJECT

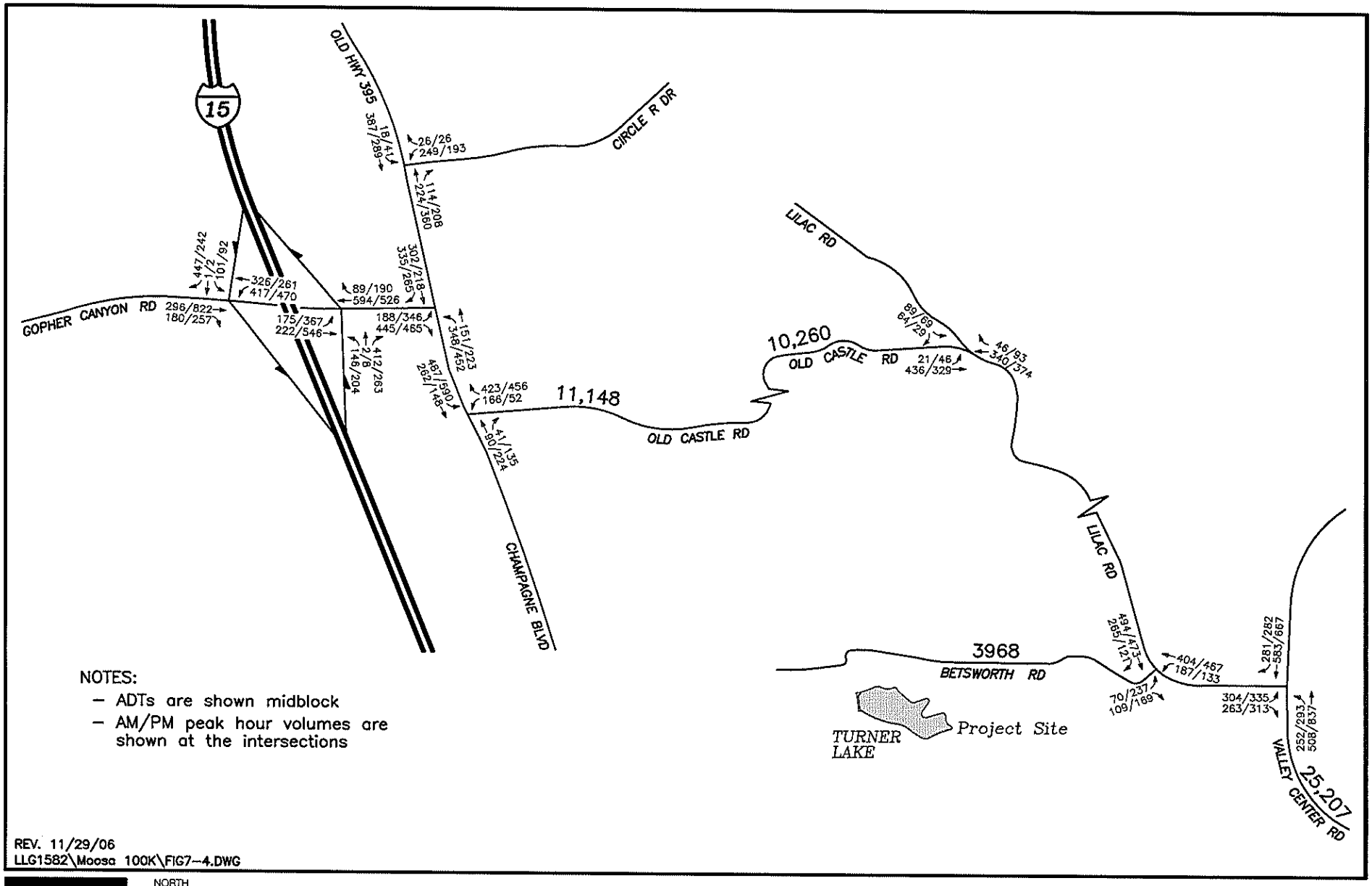

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Figure 7-4

Year 2010 + Construction (MOOSA 100,000 AF) Traffic Volumes AM/PM Peak Hours & ADT

CARRYOVER STORAGE & SAN VICENTE DAM RAISE PROJECT

8.0 ALTERNATIVE 3A: SAN VICENTE 50K

8.1 Year 2010 Without Project

To account for the growth in area traffic between Year 2006 and Year 2010, the anticipated peak construction year, a growth rate of 8% (growth for 4 years) was added to the existing traffic. *Figure 8-1* depicts the Year 2010 without Project Volumes for AM/PM Peak Hours.

8.2 Year 2010 Without Project (Baseline Conditions) Analysis

8.2.1 *Intersection Analysis*

Table 8-1 summarizes the Year 2010 without project intersections level of service. As seen in *Table 8-1*, all intersections are calculated to operate at LOS D or better during both the AM and PM peak hours:

- SR-67/Vigilante Road (westbound left movement operates at LOS F during both AM and PM peak hour)
- SR-67/San Vicente Avenue (eastbound movement operates at LOS F during the AM peak hour and LOS E during the AM peak hour)
- SR-67/Willow Road (LOS F during the AM peak hour and LOS E during PM peak hour)

Appendix G contains the intersection analysis worksheets.

8.2.2 *Segment Operations*

Table 8-2 summarizes the Year 2010 without project street segment operations level of service. As seen in *Table 8-2*, all segments are calculated to currently operate at LOS D or better.

8.3 Construction Traffic Trip Generation/Distribution/Assignment

8.3.1 *Trip Generation*

Table 8-5 summarizes the Project Construction Traffic trip generation for trucks bringing equipment (i.e. bulldozers, cranes etc.), cement, fly ash, aggregate etc to the site, and crewmember traffic. The trip generations for the following two (2) scenarios, which were also discussed in Section 2.3, were calculated separately:

1. Offsite Trucking Option
2. Onsite Quarry Option

The trip generation for the trucks was based on the estimated construction equipment schedule prepared for the project (see Appendix H). The trip generation for the crewmembers was based on the estimated manpower prepared for the project (see Appendix H). There were several construction phases identified for the project and trip generation values for each construction phase were calculated. Simultaneous construction phase's traffic volume was combined. In order to identify the peak construction scenario and evaluate the maximum impact of construction traffic, the construction phase with the highest total traffic was analyzed. Table 8-5 summarizes the trip generation for the peak construction phase for each scenario.

A Passenger Car Equivalent (PCE) factor was applied to the generated truck trips. PCE is defined as the number of passenger cars that are displaced by a single heavy vehicle of a particular type under the prevailing traffic conditions. Heavy vehicles have a greater traffic impact than passenger cars since: (1) they are larger than passenger cars, and therefore, occupy more roadway space; and (2) their performance characteristics are generally inferior to passenger cars, leading to the formation of downstream gaps in the traffic stream (especially on upgrades) which cannot always be effectively filled by normal passing maneuvers. Based on the elevation changes in the vicinity of the project site a PCE of 2.0 was applied to each truck trip.

8.3.2 *Trip Distribution/Assignment*

The project-generated traffic was distributed to the street system based on several factors such as potential truck routes, population centers (for crew member trips) and the proximity of the material providers. Based on the probable sites were the cement and fly ash will be hauled, 100% of the cement and fly ash was assumed to be hauled from the north side of the San Vicente Reservoir via SR-67. Similarly, based on the probable sites were the aggregate will be hauled, 100% of the aggregate was assumed to be hauled from the south side of the San Vicente Reservoir via SR-67. *Figure 8-2a* depicts the assumed regional project traffic distribution percentages for the equipment and miscellaneous (other than aggregate, cement and fly ash) truck traffic. *Figure 8-2b* depicts the assumed regional project traffic distribution percentages for the crewmembers.

Based on the above traffic distribution, *Figure 8-3* depicts the total project traffic assignment for the Offsite Trucking Option and *Figure 8-4* depicts the total project traffic assignment for the Onsite Quarry Option. Appendix H contains the individual traffic assignment for cement and fly ash, aggregate, equipment and miscellaneous truck traffic and the crew traffic. *Figure 8-5* depicts the total traffic volumes for the Year 2010 + construction traffic (Offsite Trucking Option). *Figure 8-6* depicts the total traffic volumes for the Year 2010 + construction traffic (Onsite Quarry).

8.4 Year 2010 + Project (Offsite Trucked Option)

8.4.1 *Intersection Analysis*

Table 8-1 summarizes the Year 2010 with project intersections level of service. As seen in *Table 8-1*, all intersections are calculated to operate at LOS D or better during both the AM and PM peak hours:

- SR-67/Vigilante Road (westbound left movement operates at LOS F during both AM and PM peak hour)
- SR-67/San Vicente Avenue (eastbound movement operates at LOS F during both AM and PM peak hour, and westbound movement operates at LOS E in the AM peak hour)
- SR-67/Willow Road (LOS F during both AM and PM peak hour)

Appendix I contains the Year 2010 + Project (Offsite Trucked Option) intersection analysis worksheets.

8.4.2 *Segment Operations*

Table 8-2 summarizes the Year 2010 without project street segment operations level of service. As seen in *Table 8-2*, all segments are calculated to currently operate at LOS D or better.

8.5 Year 2010 + Project (Onsite Quarry Option)

8.5.1 *Intersection Analysis*

Table 8-3 summarizes the Year 2010 with project intersections level of service. As seen in *Table 8-3*, all intersections are calculated to operate at LOS D or better during both the AM and PM peak hours with the addition of cumulative traffic except the following intersection:

- SR-67/Vigilante Road (westbound left movement operates at LOS F during both AM and PM peak hour)
- SR-67/San Vicente Avenue (eastbound movement operates at LOS F during both AM and PM peak hour)
- SR-67/Willow Road (LOS F during both AM and PM peak hour)

Appendix J contains the Year 2010 + Project (Onsite Quarry Option) intersection analysis worksheets.

8.5.2 *Segment Operations*

Table 8-4 summarizes the Year 2010 without project street segment operations level of service. As seen in *Table 8-4*, all segments are calculated to currently operate at LOS D.

8.6 Significance of Impacts and Mitigation Measures

8.6.1 *Significance of Impacts*

Based on the analyses of intersections and segments in the study area (*Tables 8-1* thru 8-*4*), and the established significance criteria, the following significant impacts were determined for both options. Section 8.2 – 8.3 recommends corresponding mitigation measures for the two (2) options.

1. SR-67/Vigilante Road Intersection
2. SR-67/Willow Road Intersection

8.6.2 *Mitigation Measures*

The significant construction-related traffic congestion impacts at the SR-67/Vigilante Road intersection (***Impact 1***) and at the SR-67/Willow Road intersection (***Impact 2***) due to the Proposed Action, under both the off-site trucking option and the on-site quarry options, would be avoided by prohibiting haul trucks and crew vehicles from accessing the construction site during both AM and PM peak hours (7:00-8:00 a.m. and 4:00-6:00 p.m.). This is not a feasible mitigation measure because hauling, materials deliveries and crew access must occur on a continuous basis to support the 24/7 operations associated with RCC dam construction. Several additional mitigation scenarios were examined specific to each intersection; however, none were determined to be readily feasible or practicable, as explained below.

SR-67/Vigilante Road

Under both the off-site trucking option and the on-site quarry options, the significant construction-related traffic congestion impact at the SR-67/Vigilante Road intersection could be mitigated by installing a traffic signal and extending the southbound left turn pocket on SR-67 by 150 feet. However, Caltrans has indicated they would not support the installation of a traffic signal at this intersection. Therefore, this measure is not considered feasible. Additional mitigation scenarios for this intersection are discussed below.

For the off-site trucking option, there are no other feasible measures to mitigate the significant construction-related traffic congestion impact at the SR-67/Vigilante Road intersection due to the high volume of daily haul trucks estimated throughout the construction period. Therefore, the construction-related traffic congestion impacts at this intersection under the off-site trucking option would be significant and unmitigated.

For the on-site quarry options, the significant construction-related traffic congestion impact at the SR-67/Vigilante Road intersection could be mitigated through temporary removal of the existing truck restrictions on the Moreno Avenue and Willow Road segments during the SV 100K construction period, and by rerouting truck and crew traffic to the SR-67/Willow Road intersection. Although the Proposed Action would also result in significant construction-related traffic congestion at the SR-67/Willow Road intersection, turning movements are easier at this controlled intersection than at the uncontrolled SR-67/Vigilante Road intersection. Therefore, less delay would be experienced at SR-67/Willow Road, as compared to SR-67/Vigilante Road, although significant traffic congestion would still occur at this intersection. However, temporary removal of the existing truck restrictions on the Moreno Avenue and Willow Road segments is a measure that is beyond the control of the Water Authority. The following outlines the necessary steps for this approach:

- A request letter should be submitted to the San Diego County Traffic Advisory Committee (TAC).
- The following information should be provided with the letter: project description, reason for requesting removal of truck restrictions on Moreno Avenue and Willow Road segments, and trip generation and analysis results and calculations.
- TAC meets approximately every six weeks to review the requests.
- After reviewing the request, TAC will submit their recommendations to the San Diego County Board of Supervisors for their final recommendation.

The Water Authority shall initiate this process by submitting the request letter to the TAC, but there is no guarantee that the TAC will approve the request. Therefore, although this mitigation scenario is considered feasible, if the TAC does not approve the request for temporary removal of existing truck restrictions on the Moreno Avenue and Willow Road segments, then the construction-related traffic congestion impacts at the SR-67/Vigilante Road intersection under the on-site quarry options would be significant and unmitigated.

SR-67/Willow Road

Under both the off-site trucking option and the on-site quarry options, the significant construction-related traffic congestion impact at the SR-67/Willow Road intersection could be mitigated via signal re-timing, lane reconfigurations/additions or "fair-share" funding of unidentified improvements. Re-timing the signals at this intersection is not a viable mitigation scenario because substantial delays already exist for all movements, and it is important to minimize congestion on the SR-67 through movements.

Lane reconfigurations, additions and widening were considered for the SR-67 southbound approach to increase capacity and "green" signal time for trucks making left turns. However, the narrow right-of-way in this area precludes such improvements; a cut slope exists on the west side and a convenience store is located on the east side of SR-67 at this intersection. Another mitigation scenario involves the addition of a Left Turn Only lane on the westbound Willow Road approach. There appears to be sufficient right-of-way on the south side of Willow Road to accommodate an additional left-turn lane. A dedicated left-turn lane on the westbound Willow Road approach would decrease the overall "green" signal time needed to serve Willow Road, which in turn would allow for an increase in "green" signal time for southbound SR-67 movements. Although this mitigation scenario was identified as the most feasible to implement at this intersection, it is not considered practicable given that this significant traffic impact from the Proposed Action would only occur during the construction period, and the Proposed Action would not have any impact at this intersection after completion of construction.

Contributing a "fair share" payment to Caltrans towards the future improvement at this intersection was also considered as a possible mitigation scenario. However, Caltrans does not have a mechanism to accept a "fair-share" contribution, and therefore, this scenario was also rejected.

Therefore, the construction-related traffic congestion impacts at the SR-67/Willow Road intersection, under both the off-site trucking option and the on-site quarry options, would be significant and unmitigated.

The potential for increased risk of motor vehicle accidents and pedestrian injuries on SR-67 due to the addition of construction-related traffic from the Proposed Action, under both the off-site trucking option and the on-site quarry options, could be mitigated by installing a traffic signal at SR-67/Vigilante Road intersection and extending the southbound left turn pocket on SR-67 by 150 feet. However, as stated above, Caltrans has indicated they would not support the installation of a traffic signal at this intersection. Therefore, there are no other feasible measures to mitigate this impact, and the construction-related traffic safety impacts of the Proposed Action would be significant and unmitigated, under both the off-site trucking option and the on-site quarry options.

TABLE 8-1
INTERSECTION OPERATIONS - OFFSITE TRUCKING OPTION (SAN VICENTE 50K)

Intersection	Peak Period	Existing		Year 2010 Without Project		Year 2010 + Construction Project				Significant Impact
		Delay[a]	LOS[b]	Delay	LOS	Delay	LOS	Delay Δ	Critical Move Trips	
Pomerado Rd./Scripps Poway Pkwy	AM	24.5	C	25.4	C	25.8	C	0.4	N/A	No
[Signalized]	PM	29.5	C	31.4	C	31.7	C	0.3		No
SR-67/Poway Rd.	AM	17.8	B	18.7	B	18.8	B	0.1	N/A	No
[Signalized]	PM	18.0	B	18.5	B	18.5	B	0.0		No
SR-67/Scripps Poway Pkwy	AM	24.6	C	30.1	C	30.4	C	0.3	N/A	No
[Signalized]	PM	27.3	C	33.3	C	36.9	D	3.6		No
SR-67/Vigilante Rd.	AM	93.0	F	>100	F	**>100**	**F**	**>10**	**30**	**Yes**
[TWSC-WBL]	PM	>100	F	>100	F	**>100**	**F**	**>10**	**111**	**Yes**
SR-67/San Vicente Ave.	AM	>100/28.0	F/D	>100/31.9	F/D	>100/37.5	F/E	>10	0	No
[TWSC-EB/WB]	PM	40.5/15.0	E/C	49.1/16.0	E/C	58.6/16.7	F/C	9.5	0	No
SR-67/Willow Rd	AM	70.2	E	96.4	F	**>100**	**F**	**>10**	**N/A**	**Yes**
[Signalized]	PM	50.6	D	74.6	E	**91.2**	**F**	**16.6**		**Yes**
Vigilante Rd./Morena Ave.	AM	9.8	A	9.9	A	11.5	B	1.6	N/A	No
[TWSC-SB]	PM	10.1	B	10.3	B	10.9	B	0.6		No

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.

General Notes:
1. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported. WBL=Westbound Left-turn; EB=Eastbound; WB=Westbound; SB=Southbound.

TABLE 8-2
STREET SEGMENT OPERATIONS - OFFSITE TRUCKING OPTION (SAN VICENTE 50K)

Segment	Capacity LOS E	Existing			Year 2010 Without Project			Year 2010 + Construction Project Traffic		
		ADT	V/C	LOS	ADT	V/C	LOS	ADT	V/C	LOS
SR-67										
Poway Rd to Scripps Poway Pkwy	37,000	22,240	0.60	B	24,020	0.65	B	24,230	0.65	B
Scripps Poway Pkwy to Vigilante Rd	37,000	27,540	0.74	C	29,740	0.80	D	30,360	0.82	D
South of Vigilante Rd	37,000	24,480	0.66	B	26,440	0.71	C	27,560	0.74	C
SCRIPPS POWAY PKWY										
West of SR-67	37,000	20,380	0.55	A	22,010	0.59	A	22,420	0.61	B
VIGILANTE RD										
East of SR-67	16,200	2,070	0.13	B	2,240	0.14	B	3,980	0.25	B

Footnotes:

a. Capacities based on County of San Diego Roadway Classification Table.

b. Average Daily Traffic Volumes.

TABLE 8-3
INTERSECTION OPERATIONS - ONSITE QUARRY OPTION (SAN VICENTE 50K)

Intersection	Peak Period	Existing		Year 2010 Without Project		Year 2010 + Construction Project				Significant Impact
		Delay[a]	LOS[b]	Delay	LOS	Delay	LOS	Delay Δ	Critical Move Trips	
Pomerado Rd./Scripps Poway Pkwy	AM	24.5	C	25.4	C	25.8	C	0.4	N/A	No
[Signalized]	PM	29.5	C	31.4	C	31.7	C	0.3		No
SR-67/Poway Rd.	AM	17.8	B	18.7	B	18.7	B	0.0	N/A	No
[Signalized]	PM	18.0	B	18.5	B	18.5	B	0.0		No
SR-67/Scripps Poway Pkwy	AM	24.6	C	30.1	C	30.4	C	0.3	N/A	No
[Signalized]	PM	27.3	C	33.3	C	37.0	D	3.7		No
SR-67/Vigilante Rd.	AM	93.0	F	>100	F	>100	F	>10	16	Yes
[TWSC-WBL]	PM	>100	F	>100	F	>100	F	>10	56	Yes
SR-67/San Vicente Ave.	AM	>100/28.0	F/D	>100/31.9	F/D	>100/34.9	F/D	>10	0	No
[TWSC-EB/WB]	PM	40.5/15.0	E/C	49.1/16.0	E/C	53.7/16.4	F/C	4.6	0	No
SR-67/Willow Rd	AM	70.2	E	96.4	F	>100	F	>10	N/A	Yes
[Signalized]	PM	50.6	D	74.6	E	82.9	F	8.3		Yes
Vigilante Rd./Morena Ave.	AM	9.8	A	9.9	A	10.9	B	1.0	N/A	No
[TWSC-SB]	PM	10.1	B	10.3	B	10.4	B	0.1		No

Footnotes:
a. Average delay expressed in seconds per vehicle.
b. Level of Service.
Footnotes:
1. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported. WBL=Westbound Left-turn; EB=Eastbound; WB=Westbound; SB=Southbound.
2. N/A: Not Applicable

TABLE 8-4
STREET SEGMENT OPERATIONS - ONSITE QUARRY OPTION (SAN VICENTE 50K)

Segment	Capacity LOS E	Existing			Year 2010 Without Project			Year 2010 + Construction Project Traffic		
		ADT	V/C	LOS	ADT	V/C	LOS	ADT	V/C	LOS
SR-67										
Poway Rd to Scripps Poway Pkwy	37,000	22,240	0.60	B	24,020	0.65	B	24,250	0.66	B
Scripps Poway Pkwy to Vigilante Rd	37,000	27,540	0.74	C	29,740	0.80	D	30,400	0.82	D
South of Vigilante Rd	37,000	24,480	0.66	B	26,440	0.71	C	26,780	0.72	C
SCRIPPS POWAY PKWY										
West of SR-67	37,000	20,380	0.55	A	22,010	0.59	A	22,450	0.61	B
VIGILANTE RD										
East of SR-67	16,200	2,070	0.13	B	2,240	0.14	B	3,250	0.20	B

Footnotes:

a. Capacities based on County of San Diego Roadway Classification Table.

b. Average Daily Traffic Volumes.

TABLE 8-5
CONSTRUCTION TRAFFIC GENERATION (SAN VICENTE 50K)

Trip Generation Summary (Trucks only)												
Use	Trucks Trips	Total ADT in PCE	AM Peak Hour					PM Peak Hour				
			% Of ADT	In:Out Split		Volume		% OF ADT	In:Out Split		Volume	
						In	Out				In	Out
Offsite Trucked Option	520	1040	10%	80%	20%	83	21	10%	30%	70%	31	73
Onsite Quarry Option	154	308	10%	80%	20%	25	6	10%	30%	70%	9	22

Trip Generation Summary (Crew Vehicles Only)												
Use	Crew Vehicle Trips	Total ADT in PCE	AM Peak Hour					PM Peak Hour				
			% Of ADT	In:Out Split		Volume		% OF ADT	In:Out Split		Volume	
						In	Out				In	Out
Offsite Trucked Option	712	712	30%	80%	20%	171	43	30%	30%	70%	64	150
Onsite Quarry Option	712	712	30%	80%	20%	171	43	30%	30%	70%	64	150

Trip Generation Summary (Total)												
Use	Total Vehicle Trips	Total ADT in PCE	AM Peak Hour					PM Peak Hour				
						Volume					Volume	
						In	Out				In	Out
Offsite Trucked Option	1232	1752				254	64				95	223
Onsite Quarry Option	866	1020				196	49				73	172

Footnotes:

1. PCE = Passenger Car Equivalent.

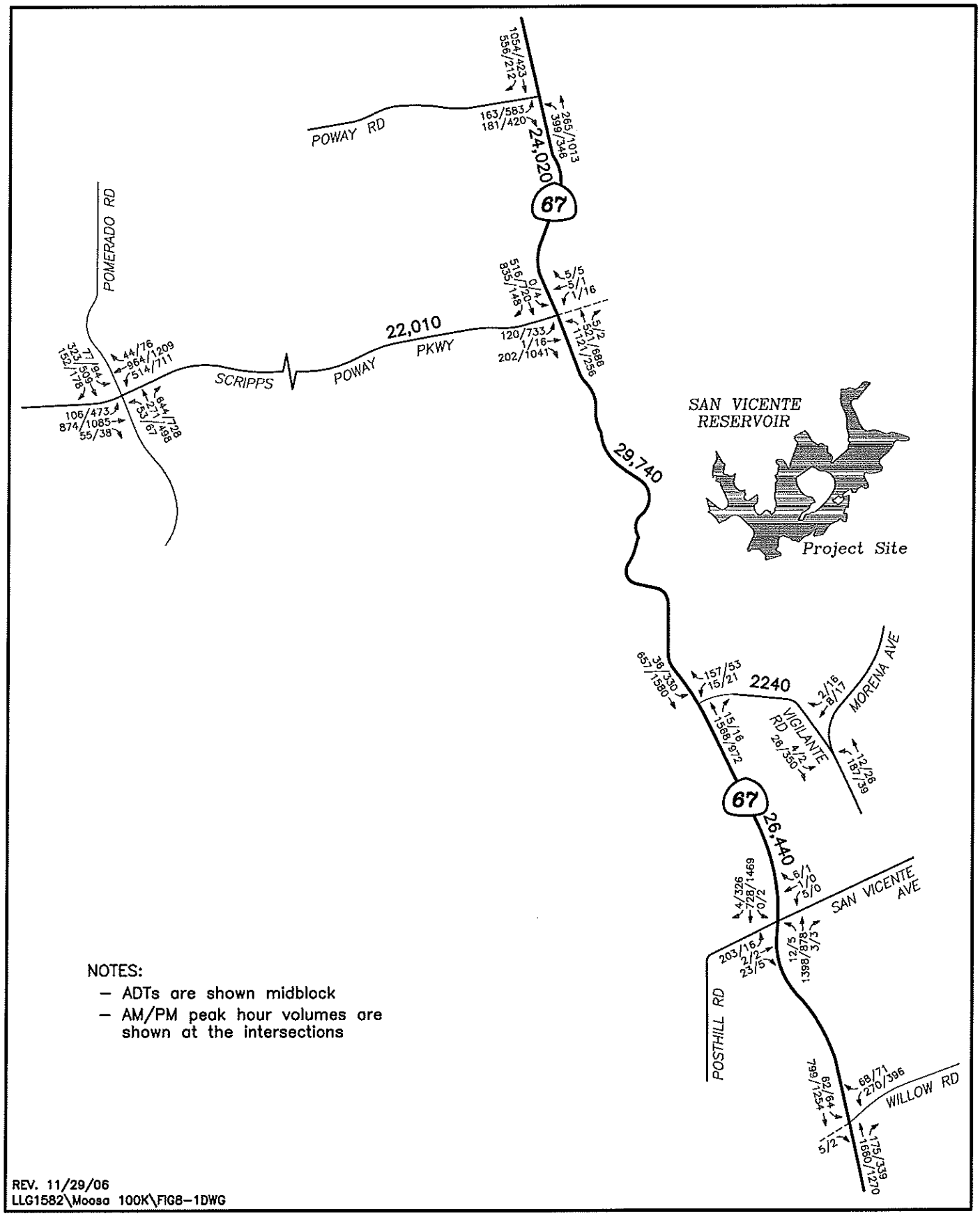

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Figure 8-1

Year 2010 Without Project Traffic Volumes AM/PM Peak Hours & ADT

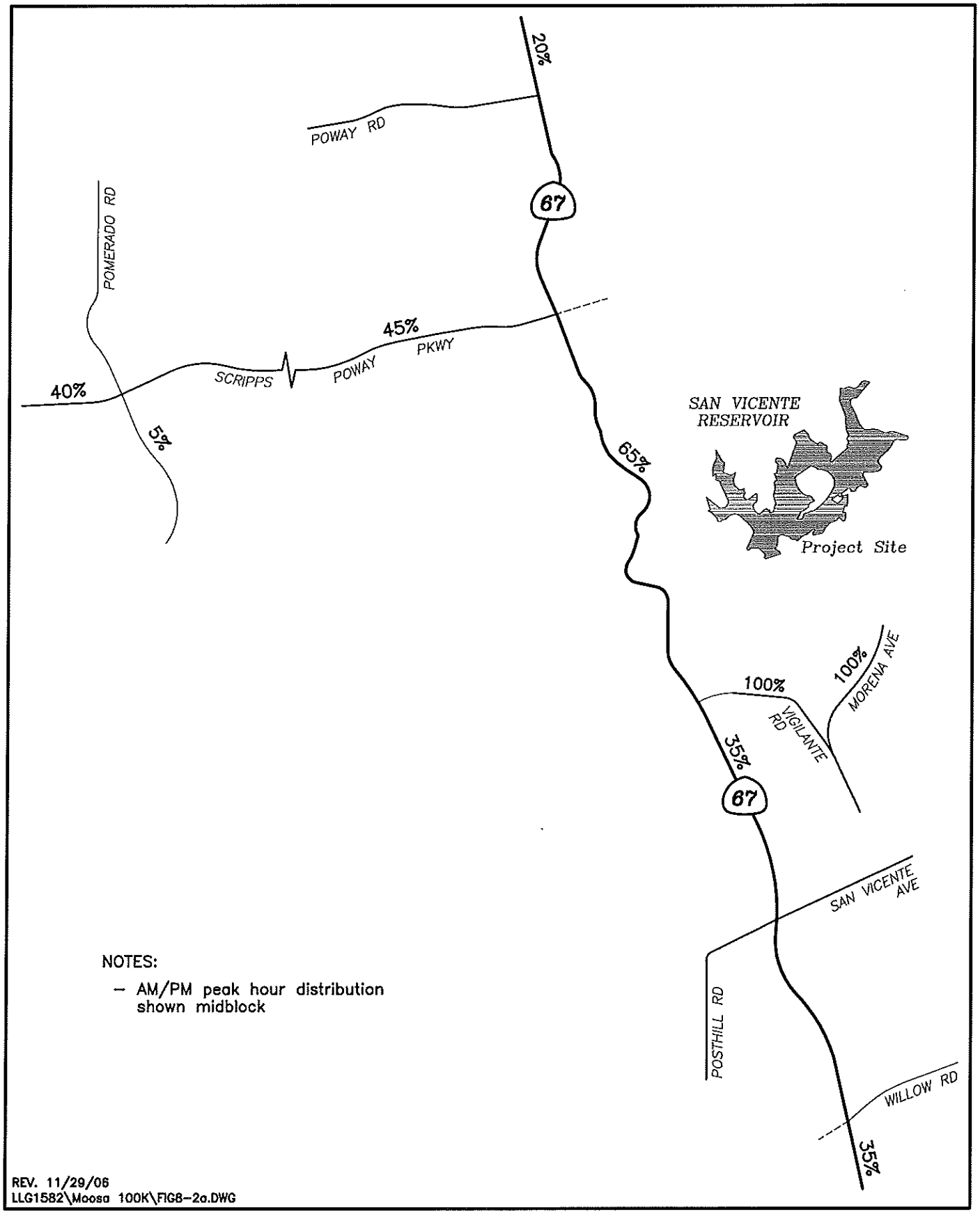

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Figure 8-2a

Construction Truck Traffic Distribution (San Vicente Site) AM/PM Peak Hours & ADT

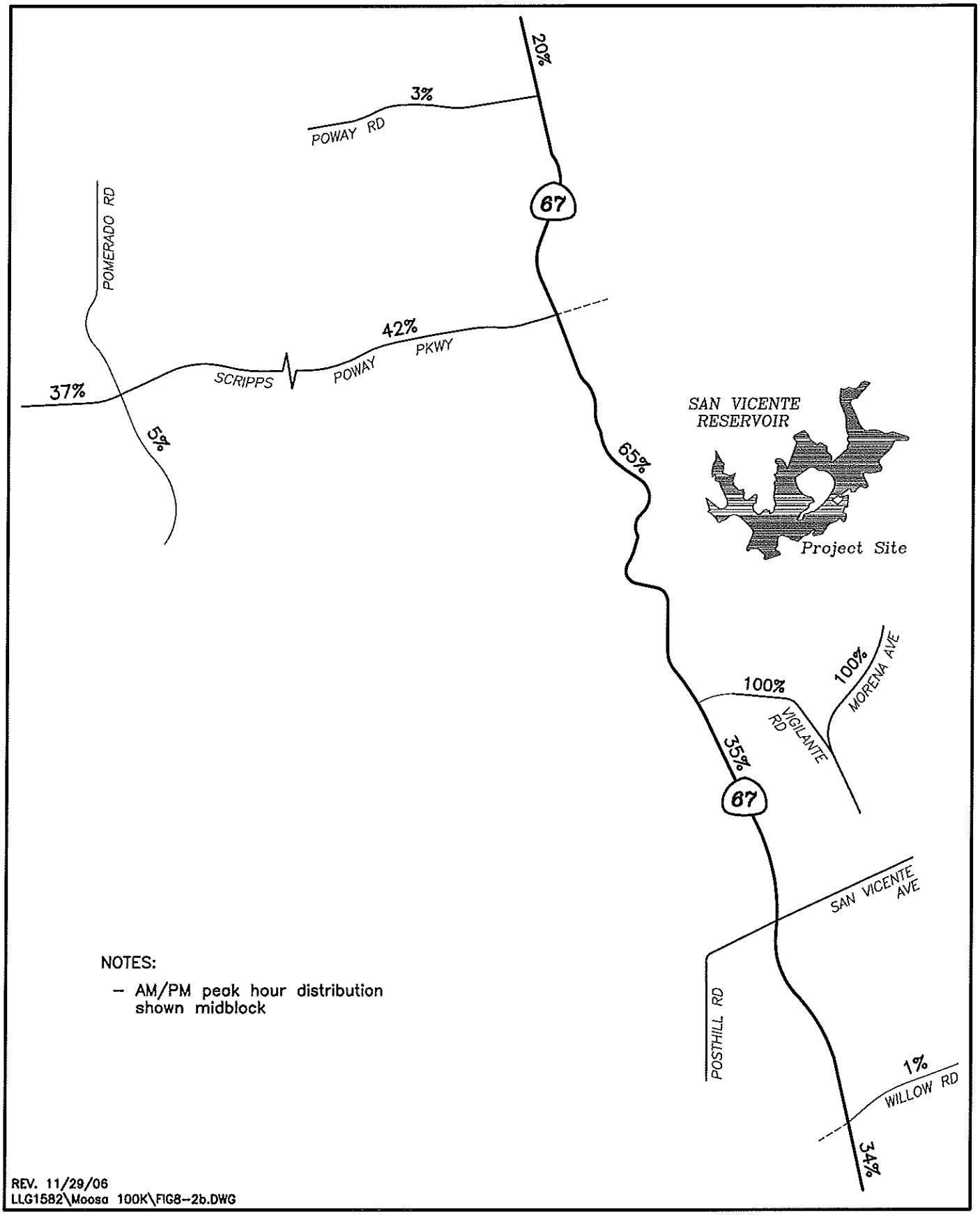

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Figure 8-2b
Construction Crew Traffic Distribution (San Vicente Site) AM/PM Peak Hours & ADT

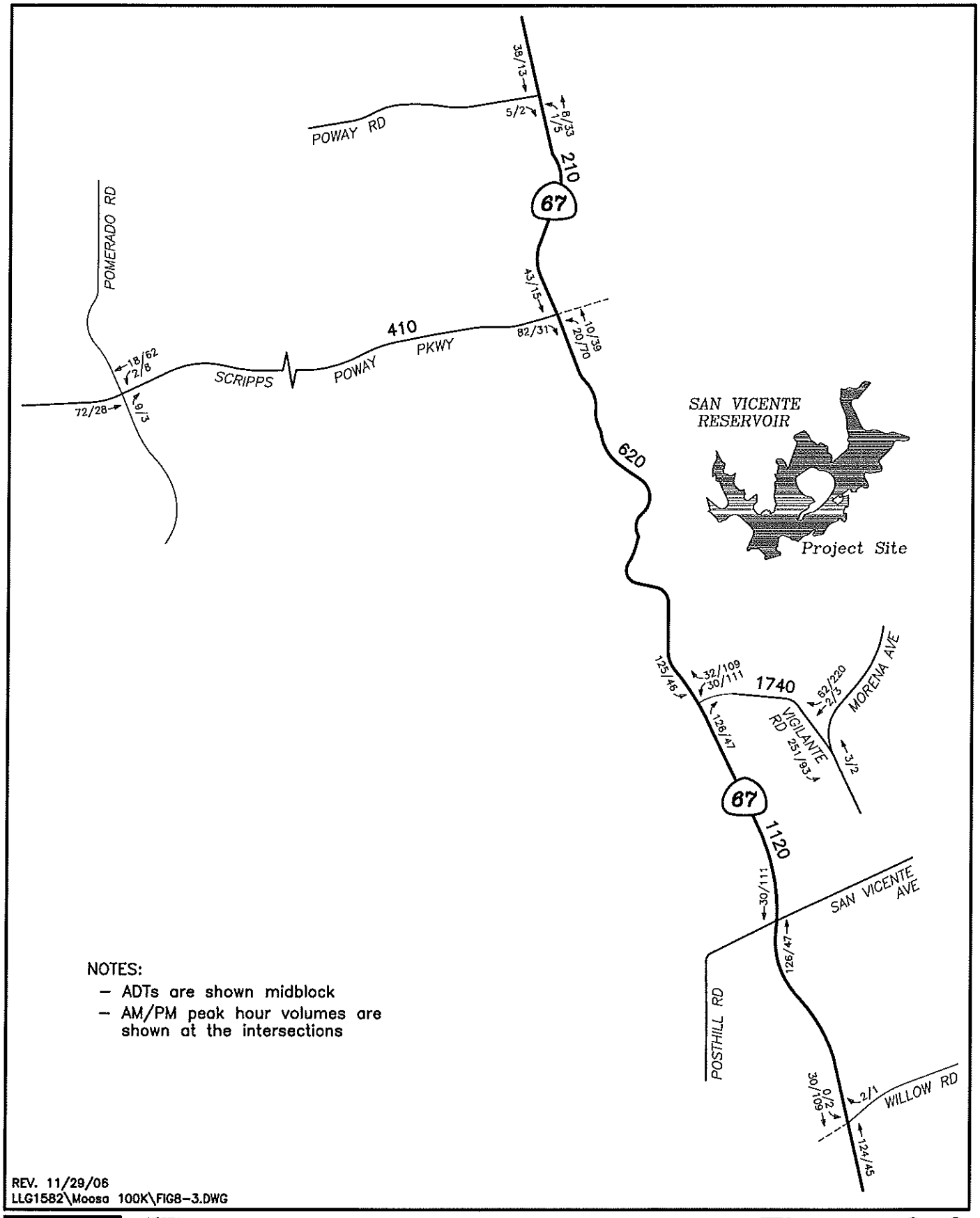

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Figure 8-3

Total Construction (SAN VICENTE 50,000 AF) Off-site Trucking Option Traffic Volumes AM/PM Peak Hours & ADT

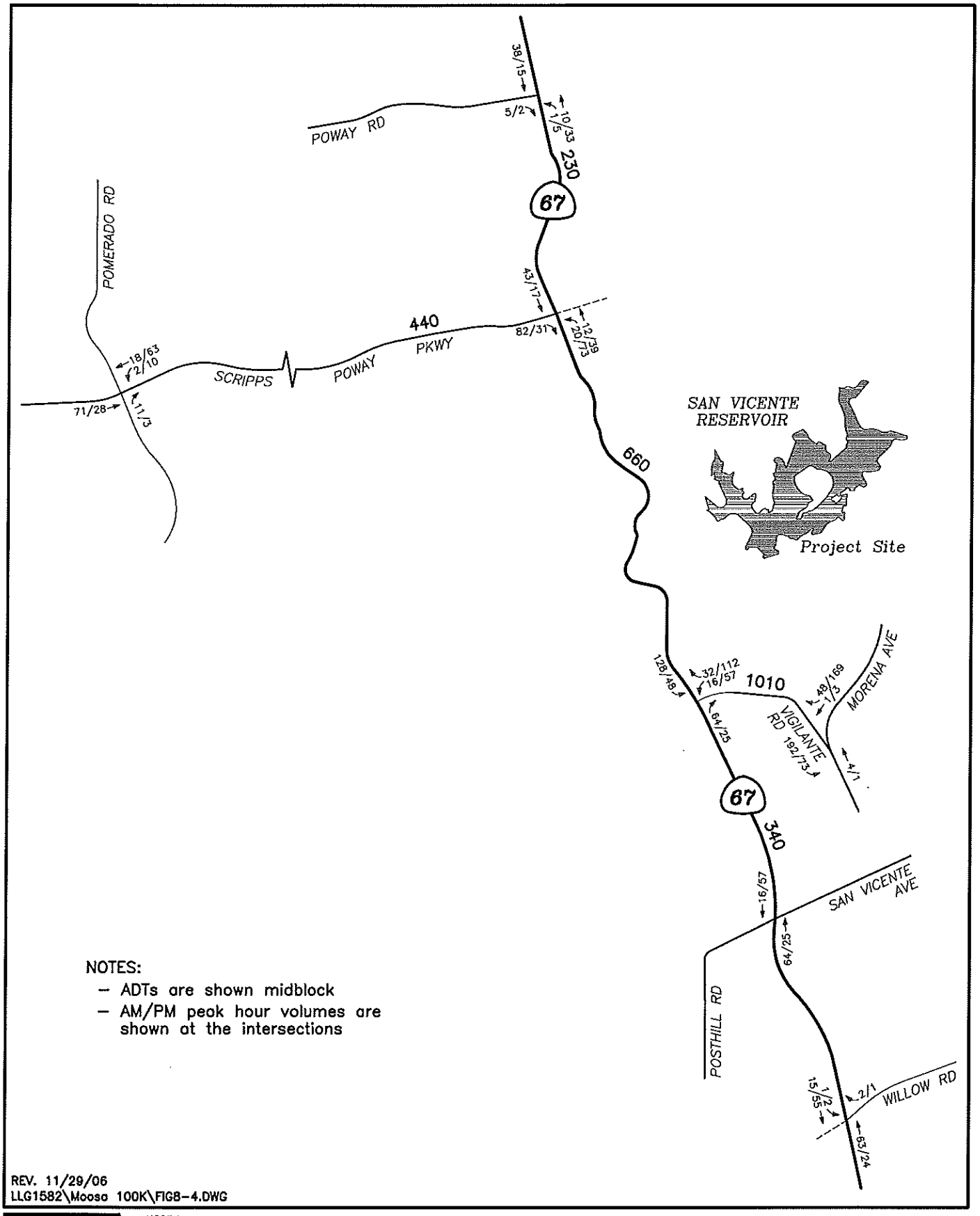

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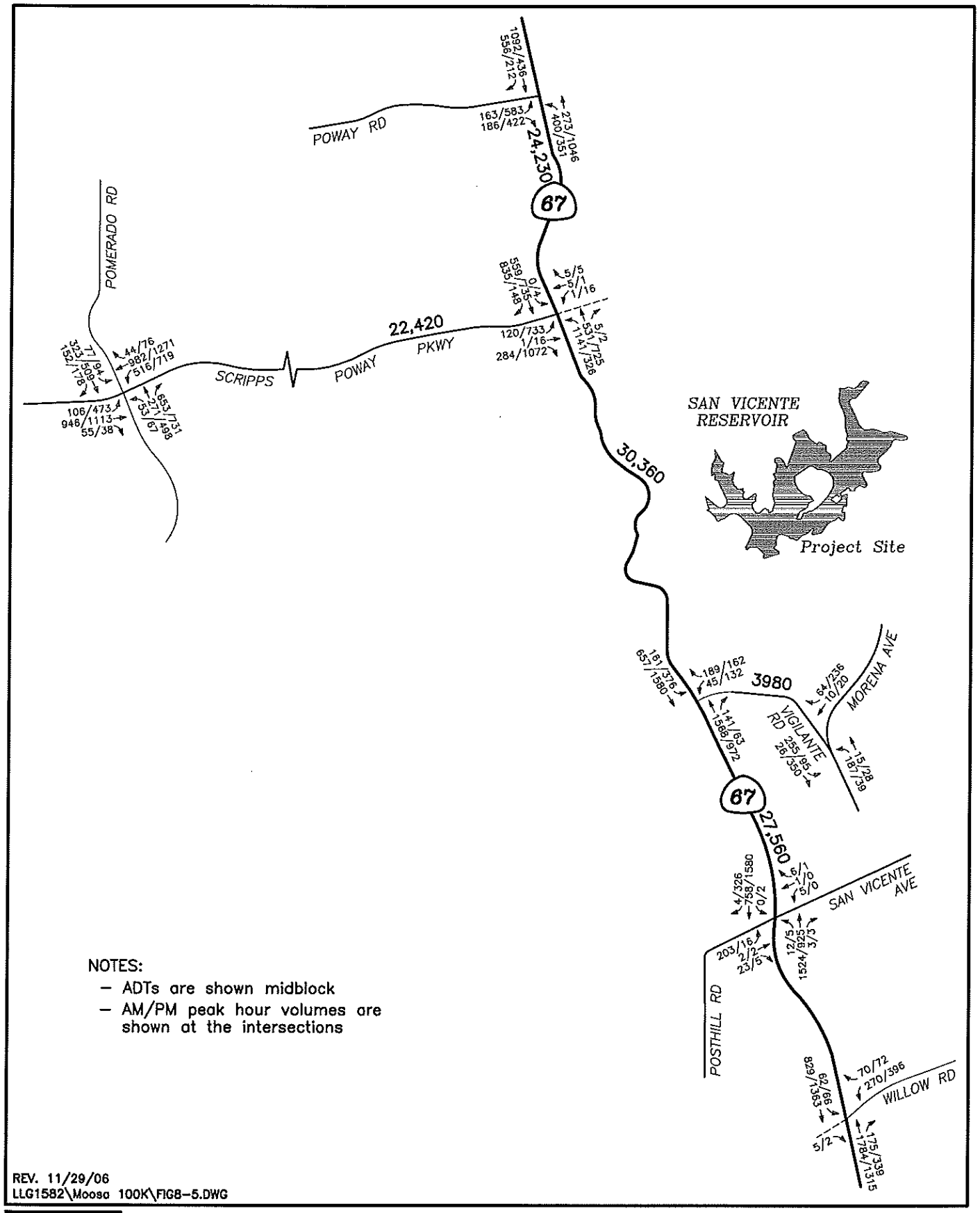
Figure 8-4

Total Construction (SAN VICENTE 50,000 AF) Onsite Quarry Option Traffic Volumes



NOTES:
- ADTs are shown midblock
- AM/PM peak hour volumes are shown at the intersections

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LLG1582\Moosa 100K\FIG8-5.DWG

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Figure 8-5

Year 2010 + Construction (Off-site Trucked Option) Traffic Volumes AM/PM Peak Hours & ADT

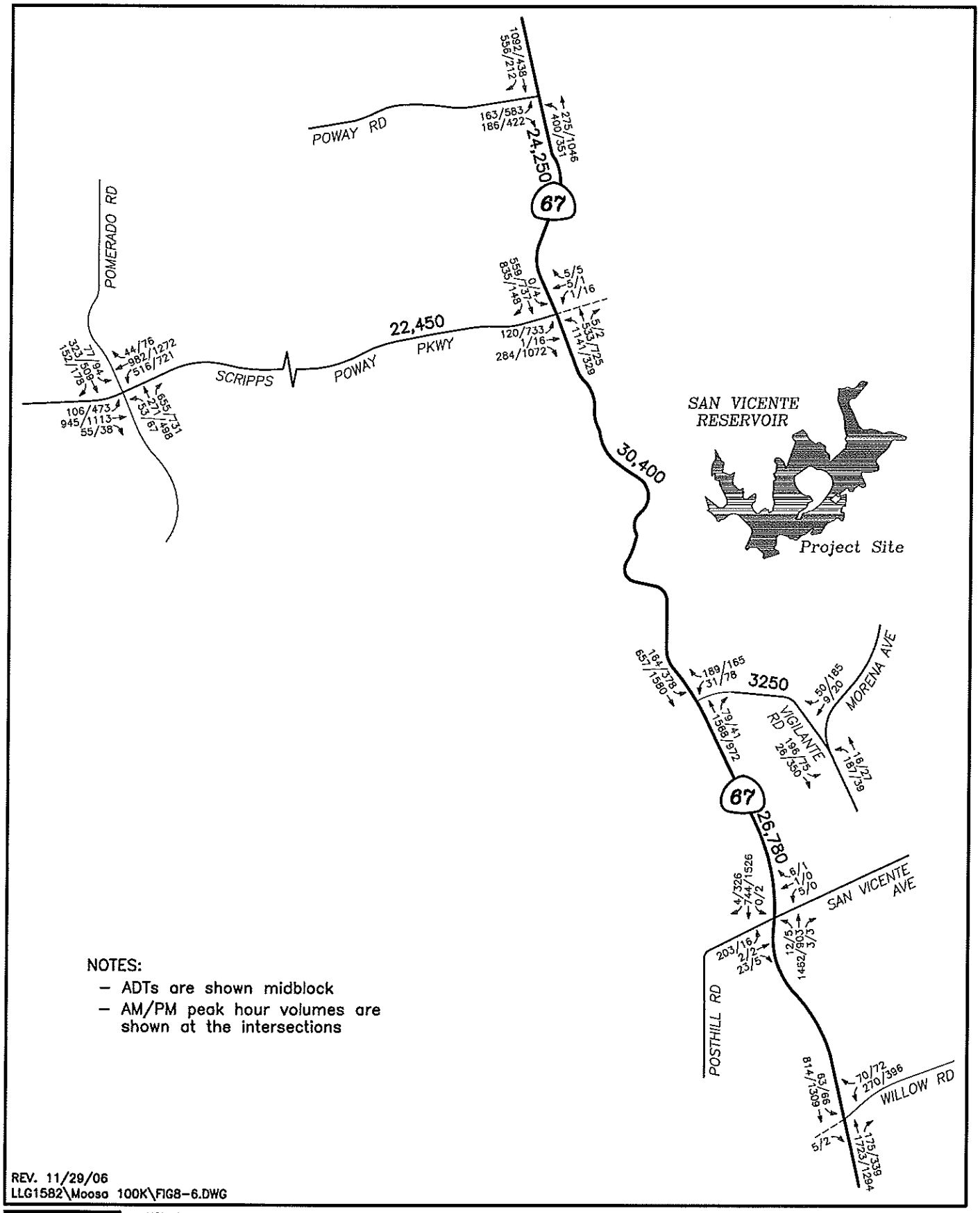

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Figure 8-6

Year 2010 + Construction (On-site Quarry Option) Traffic Volumes AM/PM Peak Hours & ADT

9.0 ALTERNATIVE 3B: MOOSA 50K

9.1 Year 2010 Without Project

To account for the growth in area traffic between Year 2006 and Year 2010, the anticipated peak construction year, a growth rate of 8% (growth for 4 years) was added to the existing traffic. *Figure 7-1* depicts the Year 2010 without Project Volumes for AM/PM Peak Hours.

9.2 Year 2010 Without Project (Baseline Conditions) Analysis

9.2.1 *Intersection Analysis*

Table 9-1 summarizes the Year 2010 without project intersections level of service. As seen in *Table 9-1*, all intersections are calculated to operate at LOS D or better during both the AM and PM peak hours:

- Champagne Boulevard/Old Castle Road (westbound left movement operates at LOS F during both AM and PM peak hour)
- I-15 Northbound Ramps/Gopher Cyn Rd (northbound left-thru movement operates at LOS F during both AM and PM peak hour)
- I-15 Southbound Ramps/Gopher Cyn Rd (southbound left-thru movement operates at LOS F during both AM and PM peak hour)

Appendix F contains the intersection analysis worksheets.

9.2.2 *Segment Operations*

Table 9-2 summarizes the Year 2010 without project street segment operations level of service. As seen in *Table 9-2*, all segments are calculated to currently operate at LOS D or better except the Valley Center Road (south of Lilac Road) segment.

9.3 Construction Traffic Trip Generation/Distribution/Assignment

9.3.1 *Trip Generation*

Table 9-3 summarizes the Project Construction Traffic trip generation for trucks bringing equipment (i.e. bulldozers, cranes etc.), cement, fly ash, aggregate etc to the site, and crewmember traffic.

The trip generation for the trucks was based on the estimated construction equipment schedule prepared for the project (see Appendix K). The trip generation for the crewmembers was based on the estimated manpower prepared for the project (see Appendix K). There were several construction phases identified for the project and trip generation values for each construction phase were calculated. Simultaneous construction phase's traffic volume was combined. In order to identify the peak construction scenario and evaluate the maximum impact of construction traffic, the construction phase with the highest total traffic was analyzed.

A Passenger Car Equivalent (PCE) factor was applied to the generated truck trips. PCE is defined as the number of passenger cars that are displaced by a single heavy vehicle of a particular type under the prevailing traffic conditions. Heavy vehicles have a greater traffic impact than passenger cars since: (1) they are larger than passenger cars, and therefore, occupy more roadway space; and (2) their performance characteristics are generally inferior to passenger cars, leading to the formation of downstream gaps in the traffic stream (especially on upgrades) which cannot always be effectively filled by normal passing maneuvers. Based on the elevation changes in the vicinity of the project site a PCE of 2.0 was applied to each truck trip.

9.3.2 *Trip Distribution/Assignment*

The project-generated traffic was distributed to the street system based on several factors such as potential truck routes, population centers (for crew member trips) and the proximity of the material providers. *Figure 7-2a* depicts the assumed regional project traffic distribution percentages for the equipment and miscellaneous (other than aggregate, cement and fly ash) truck traffic. *Figure 7-2b* depicts the assumed regional project traffic distribution percentages for the crewmembers.

Based on the above traffic distribution, *Figure 9-1* depicts the total project traffic assignment for the Moosa 50K. Appendix K contains the individual traffic assignment for equipment and miscellaneous truck traffic and the crew traffic. *Figure 9-2* depicts the total traffic volumes for the Year 2010 + construction traffic (Moosa 50K).

9.4 Year 2010 + Project

9.4.1 *Intersection Analysis*

Table 9-1 summarizes the Year 2010 with project intersections level of service. As seen in *Table 9-1*, all intersections are calculated to operate at LOS D or better during both the AM and PM peak hours with the addition of cumulative traffic except the following intersection:

- Lilac Road/Betsworth Road (northbound movement operates at LOS F during the PM peak hour)
- Champagne Boulevard/Old Castle Road (westbound left movement operates at LOS F during both AM and PM peak hour)
- I-15 Northbound Ramps/Gopher Cyn Rd (northbound left-thru movement operates at LOS F during both AM and PM peak hour)
- I-15 Southbound Ramps/Gopher Cyn Rd (southbound left-thru movement operates at LOS F during both AM and PM peak hour)

Appendix L contains the Year 2010 + Project intersection analysis worksheets.

9.4.2 *Segment Operations*

Table 9-2 summarizes the Year 2010 without project street segment operations level of service. As seen in *Table 9-2*, all segments are calculated to currently operate at LOS D or better during except the Valley Center Road (south of Lilac Road) segment.

9.5 Significance of Impacts and Mitigation Measures

9.5.1 *Significance of Impacts*

Based on the analyses of intersections and segments in the study area (*Tables 9-1 and 9-2*), and the established significance criteria, the following significant impacts were determined for the Moosa 100K alternative. Section 9.6.2 recommends corresponding mitigation measures for the following four locations:

1. Lilac Road/Betsworth Road Intersection
2. I-15 Southbound Ramps/Gopher Cyn Rd
3. Valley Center Road (south of Lilac Road)

9.5.2 *Mitigation Measures*

The following is a list of measures recommended to mitigate the projects construction traffic impacts.

1. **Lilac Road/Betsworth Road** – the intersection impact can be mitigated by providing either one of the following alternative mitigation measure:

   Alternate 1: The intersection impact can be mitigated by installing a traffic signal at the subject intersection. This mitigation measure would mitigate the intersection significance impact to below a level of significance.

   Alternate 2: Prohibit the truck and crew traffic from exiting the project site during the PM peak period (4:00 – 6:00 PM). This alternate would mitigate the significant intersection impact to below a level of significance.

2. **I-15 Southbound Ramps/Gopher Canyon Road** – the intersection impact can be mitigated by providing either one of the following alternative mitigation measure:

   Alternate 1: The intersection impact can be mitigated by installing a traffic signal at the subject intersection. This mitigation measure would mitigate the intersection significance impact to below a level of significance.

   Alternate 2: Prohibit the truck and crew traffic accessing the project site during both AM and PM peak hours (7:00 – 8:00 AM and 4:00 – 6:00 PM). This alternate would mitigate the significant intersection impact to below a level of significance.

3. **Valley Center Road (south of Lilac Road)** – The planned widening of Valley Center Road to 4 lanes would mitigate the significant impact.

TABLE 9-1
INTERSECTION OPERATIONS – MOOSA 50K

Intersection	Peak Period	Existing		Year 2010 Without Project		Year 2010 + Construction Project				Significant Impact
		Delay[a]	LOS[b]	Delay	LOS	Delay	LOS	Delay Δ[c]	Critical Move Trips	
Valley Center Rd/Lilac Rd	AM	24.5	C	27.8	C	39.8	D	12.0	N/A	No
[Signalized]	PM	32.8	C	43.0	D	52.5	D	9.5		No
Lilac Rd/Betsworth Rd	AM	9.6	A	9.8	A	12.7	B	2.9		No
[TWSC-NB]	PM	8.5	A	8.6	A	>100	F	>10	186	Yes
Old Castle Rd/Lilac Rd	AM	7.3	A	7.4	A	9.2	A	1.8	N/A	No
[TWSC-SB]	PM	6.9	A	6.9	A	7.3	A	0.4		No
Champagne Blvd/Old castle Rd	AM	35.7	E	50.0	F	>100	F	>10	1	Yes
[TWSC-WBL]	PM	80.1	F	>100	F	>100	F	>10	3	Yes
Old Hwy 395/Gopher Cyn Rd	AM	23.3	C	24.0	C	24.2	C	0.2	N/A	No
[Signalized]	PM	23.3	C	24.1	C	26.3	C	2.2		No
I-15 NB Ramps/Gopher Cyn Rd	AM	35.7	E	50.1	F	62.3	F	12.2	0	Yes
[TWSC-NBTL]	PM	>100	F	>100	F	>100	F	>10	0	Yes
I-15 SB Ramps/Gopher Cyn Rd	AM	>100	F	>100	F	>100	F	>10	19	Yes
[TWSC-SBTL]	PM	>100	F	>100	F	>100	F	>10	8	Yes
Old Hwy 395/Circle R Dr	AM	8.2	A	8.3	A	8.4	A	0.1	N/A	No
[TWSC-WBL]	PM	8.2	A	8.4	A	8.4	A	0.0		No

Footnotes:

a. Average delay expressed in seconds per vehicle.
b. Level of Service.

General Notes:

1. TWSC – Two-Way Stop Controlled intersection. Minor street left turn delay is reported. WBL=Westbound Left-turn; EB=Eastbound; WB=Westbound; SB=Southbound.

TABLE 9-2
STREET SEGMENT OPERATIONS – MOOSA 50K

Segment	Capacity LOS E	Existing			Year 2010 Without Project			Year 2010 + Construction Project Traffic		
		ADT	V/C	LOS	ADT	V/C	LOS	ADT	V/C	LOS
Valley Center Rd										
South of Lilac Rd	16,200	22,690	1.40	F	24,510	1.51	F	25,035	1.55	F
Old Castle Road										
East of Champagne Blvd	16,200	8,920	0.55	D	9,630	0.59	D	10,730	0.66	D
West of Lilac Rd	16,200	8,060	0.50	D	8,700	0.54	D	9,838	0.61	D
Betsworth Rd										
South of Lilac Rd	16,200	1,350	0.08	A	1,460	0.09	A	3,308	0.20	B

Footnotes:
a. Capacities based on County of San Diego Roadway Classification Table.
b. Average Daily Traffic Volumes.
c. Level of service.
d. Source: Counts commissioned by LLG in 2005 (a growth factor of 2% was also applied).

TABLE 9-3
CONSTRUCTION TRAFFIC GENERATION – MOOSA 50K

Use	Trucks Trips	Total ADT in PCE	AM Peak Hour					PM Peak Hour				
			% Of ADT	In:Out Split		Volume		% OF ADT	In:Out Split		Volume	
						In	Out				In	Out
Trucks/Equipment Only	292	584	10%	80%	20%	47	12	10%	30%	70%	18	41
Crew Traffic Only	1264	1264	30%	80%	20%	303	76	30%	30%	70%	114	265
Total	1,556	1,848				350	88				132	306

Footnotes:

1. PCE = Passenger Car Equivalent.

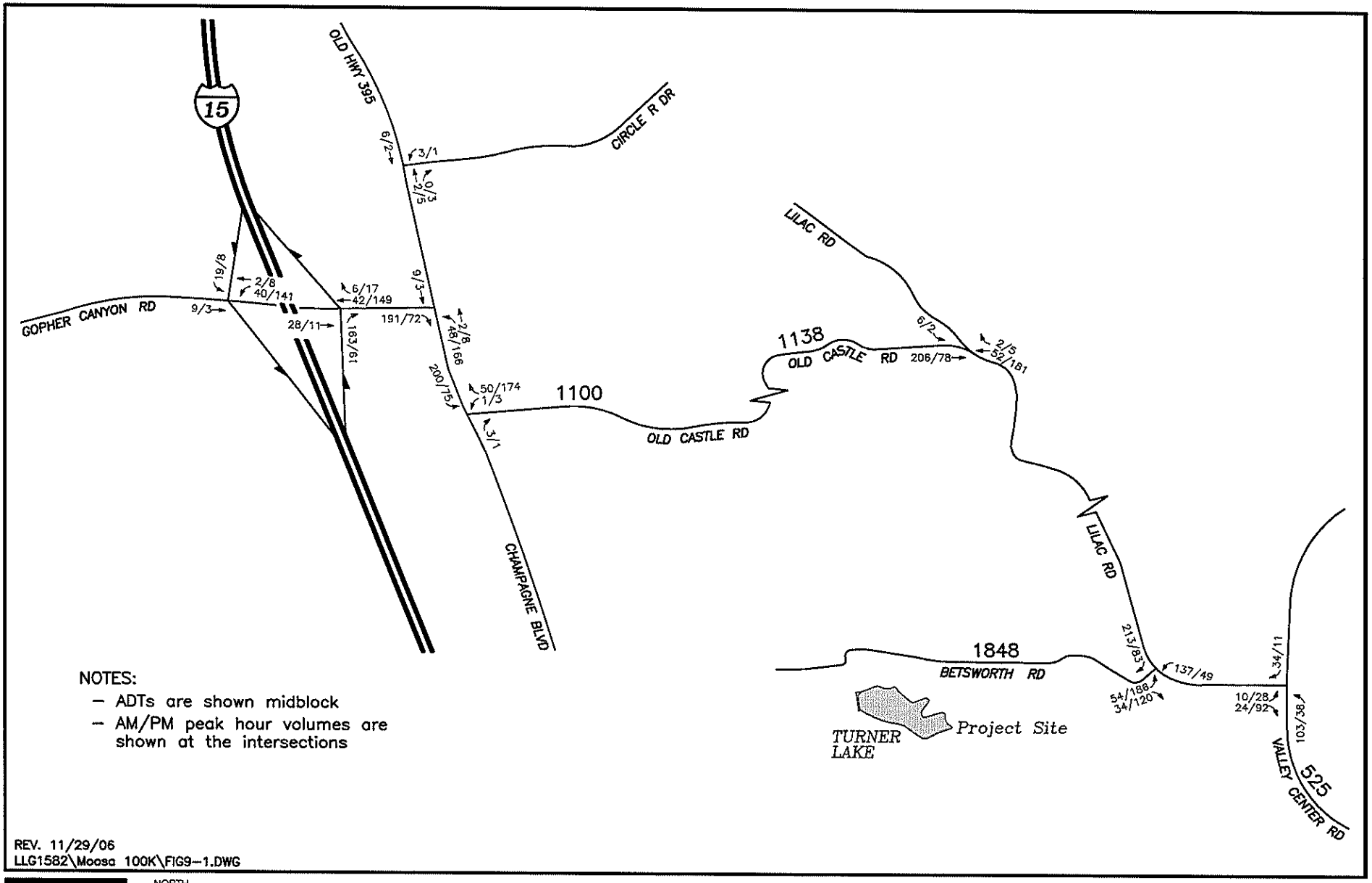

Figure 9-1

Total Construction (MOOSA 50,000 AF) Traffic Volumes AM/PM Peak Hours & ADT

CARRYOVER STORAGE & SAN VICENTE DAM RAISE PROJECT

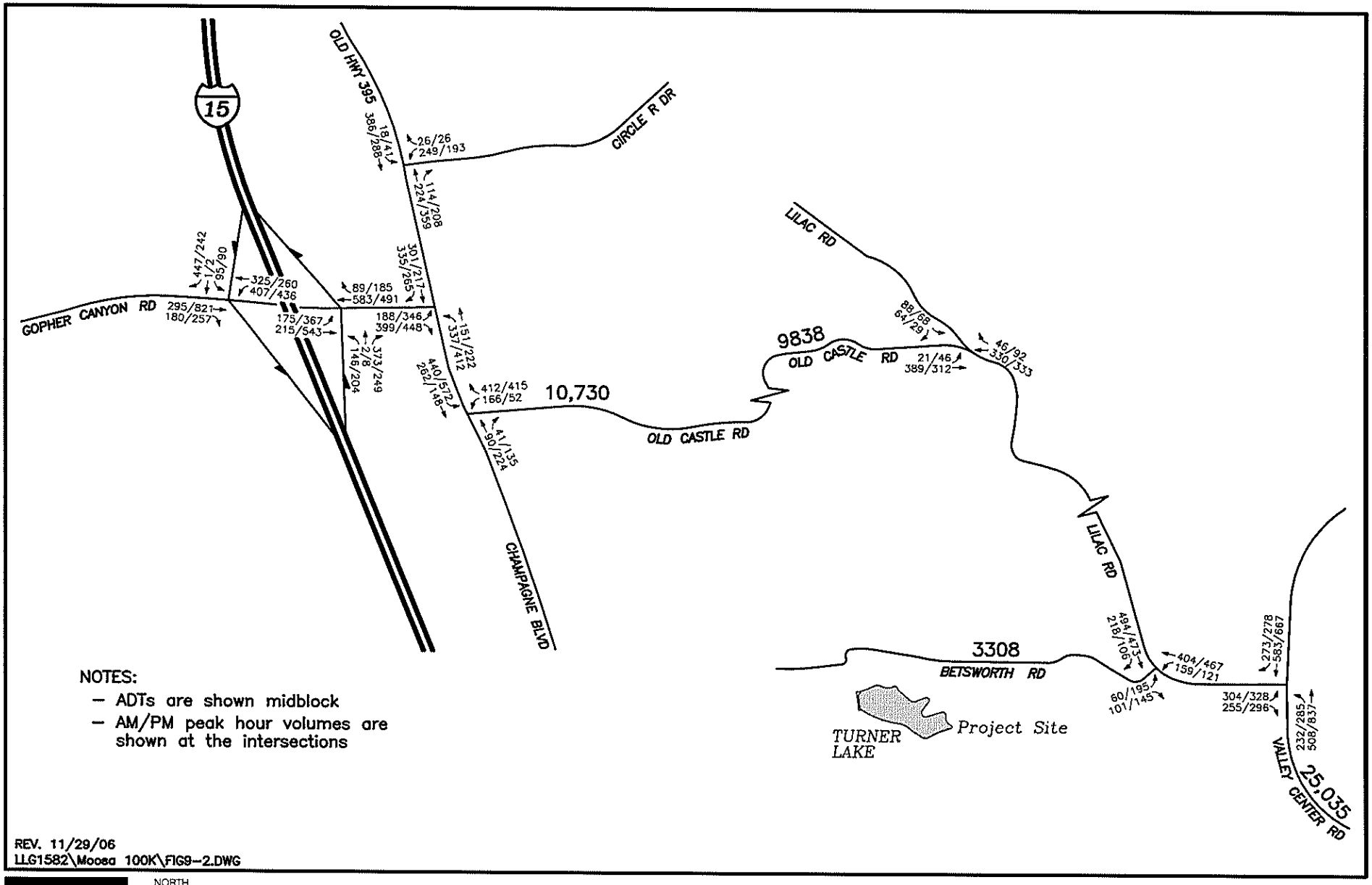

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Figure 9-2

Year 2010 + Construction (MOOSA 50,000 AF) Traffic Volumes

CARRYOVER STORAGE & SAN VICENTE DAM RAISE PROJECT

10.0 CONCLUSION

As mentioned earlier, a traffic study for San Vicente 100,000 Acre-Feet (Alternative 1) was prepared separately. Therefore, the following sections discuss the significance of impacts and the mitigation measures, for the Moosa 100,000 Acre-Feet (Alternative 2) and the San Vicente 50,000 Acre-Feet + Moosa 50,000 Acre-Feet (Alternative 3) project alternatives.

10.1 Alternative 2: Moosa 100K

10.1.1 *Significance of Impacts*

Based on the analyses of intersections and segments in the study area (*Tables 7-1 and 7-2*), and the established significance criteria, the following significant impacts were determined for the Moosa 100K alternative. Section 10.1.2 recommends corresponding mitigation measures for the following four locations:

1. Lilac Road/Betsworth Road Intersection
2. I-15 Southbound Ramps/Gopher Cyn Rd
3. Valley Center Road (south of Lilac Road)
4. Old Castle Road (East of Champagne Boulevard)

10.1.2 *Mitigation Measures*

The following is a list of measures recommended to mitigate the projects construction traffic impacts.

1. **Lilac Road/Betsworth Road** – the intersection impact can be mitigated by providing either one of the following alternative mitigation measures:

   Alternate 1: The intersection impact can be mitigated by installing a traffic signal at the subject intersection. This mitigation measure would mitigate the intersection significance impact to below a level of significance.

   Alternate 2: Prohibit the truck and crew traffic from exiting the project site during the PM peak period (4:00 – 6:00 PM). This alternate would mitigate the significant intersection impact to below a level of significance.

2. **I-15 Southbound Ramps/Gopher Canyon Road** – the intersection impact can be mitigated by providing either one of the following alternative mitigation measure:

   Alternate 1: The intersection impact can be mitigated by installing a traffic signal at the subject intersection. This mitigation measure would mitigate the intersection significance impact to below a level of significance.

   Alternate 2: Prohibit the truck and crew traffic accessing the project site during both AM and PM peak hours (7:00 – 8:00 AM and 4:00 – 6:00 PM). This alternate would mitigate the significant intersection impact to below a level of significance.

3. **Valley Center Road (south of Lilac Road)** – The planned widening of Valley Center Road to 4 lanes would mitigate the significant impact.

4. **Old Castle Road (East of Champagne Boulevard):** Signalizing the Champagne Blvd/Old castle Rd intersection would mitigate the segment impact by providing additional capacity at this key intersection along Old Castle Road.

10.2 Alternative 3a: San Vicente 50K

10.2.1 *Significance of Impacts*

Based on the analyses of intersections and segments in the study area (*Tables 8-1* thru *8-5*), and the established significance criteria, the following significant impacts were determined for both options. Section 10.2.2 – 10.2.3 recommends corresponding mitigation measures for the two (2) options.

1. SR-67/Vigilante Road Intersection
2. SR-67/Willow Road Intersection

10.2.2 *Mitigation Measures*

The significant construction-related traffic congestion impacts at the SR-67/Vigilante Road intersection (***Impact 1***) and at the SR-67/Willow Road intersection (***Impact 2***) due to the Proposed Action, under both the off-site trucking option and the on-site quarry options, would be avoided by prohibiting haul trucks and crew vehicles from accessing the construction site during both AM and PM peak hours (7:00-8:00 a.m. and 4:00-6:00 p.m.). This is not a feasible mitigation measure because hauling, materials deliveries and crew access must occur on a continuous basis to support the 24/7 operations associated with RCC dam construction. Several additional mitigation scenarios were examined specific to each intersection; however, none were determined to be readily feasible or practicable, as explained below.

SR-67/Vigilante Road

Under both the off-site trucking option and the on-site quarry options, the significant construction-related traffic congestion impact at the SR-67/Vigilante Road intersection could be mitigated by installing a traffic signal and extending the southbound left turn pocket on SR-67 by 150 feet. However, Caltrans has indicated they would not support the installation of a traffic signal at this intersection. Therefore, this measure is not considered feasible. Additional mitigation scenarios for this intersection are discussed below.

For the off-site trucking option, there are no other feasible measures to mitigate the significant construction-related traffic congestion impact at the SR-67/Vigilante Road intersection due to the high volume of daily haul trucks estimated throughout the construction period. Therefore, the construction-related traffic congestion impacts at this intersection under the off-site trucking option would be significant and unmitigated.

For the on-site quarry options, the significant construction-related traffic congestion impact at the SR-67/Vigilante Road intersection could be mitigated through temporary removal of the existing truck restrictions on the Moreno Avenue and Willow Road segments during the SV 100K construction period, and by rerouting truck and crew traffic to the SR-67/Willow Road intersection. Although the Proposed Action would also result in significant construction-related traffic congestion at the SR-67/Willow Road intersection, turning movements are easier at this controlled intersection than at the uncontrolled SR-67/Vigilante Road intersection. Therefore, less delay would be experienced at SR-67/Willow Road, as compared to SR-67/Vigilante Road, although significant traffic congestion would still occur at this intersection. However, temporary removal of the existing truck restrictions on the Moreno Avenue and Willow Road segments is a measure that is beyond the control of the Water Authority. The following outlines the necessary steps for this approach:

- A request letter should be submitted to the San Diego County Traffic Advisory Committee (TAC).
- The following information should be provided with the letter: project description, reason for requesting removal of truck restrictions on Moreno Avenue and Willow Road segments, and trip generation and analysis results and calculations.
- TAC meets approximately every six weeks to review the requests.
- After reviewing the request, TAC will submit their recommendations to the San Diego County Board of Supervisors for their final recommendation.

The Water Authority shall initiate this process by submitting the request letter to the TAC, but there is no guarantee that the TAC will approve the request. Therefore, although this mitigation scenario is considered feasible, if the TAC does not approve the request for temporary removal of existing truck restrictions on the Moreno Avenue and Willow Road segments, then the construction-related traffic congestion impacts at the SR-67/Vigilante Road intersection under the on-site quarry options would be significant and unmitigated.

SR-67/Willow Road

Under both the off-site trucking option and the on-site quarry options, the significant construction-related traffic congestion impact at the SR-67/Willow Road intersection could be mitigated via signal re-timing, lane reconfigurations/additions or "fair-share" funding of unidentified improvements. Re-timing the signals at this intersection is not a viable mitigation scenario because substantial delays already exist for all movements, and it is important to minimize congestion on the SR-67 through movements.

Lane reconfigurations, additions and widening were considered for the SR-67 southbound approach to increase capacity and "green" signal time for trucks making left turns. However, the narrow right-of-way in this area precludes such improvements; a cut slope exists on the west side and a convenience store is located on the east side of SR-67 at this intersection. Another mitigation scenario involves the addition of a Left Turn Only lane on the westbound Willow Road approach. There appears to be sufficient right-of-way on the south side of Willow Road to accommodate an additional left-turn lane. A dedicated left-turn lane on the westbound Willow Road approach would decrease the overall "green" signal time needed to serve Willow Road, which in turn would allow for an increase in "green" signal time for southbound SR-67 movements. Although this mitigation scenario was identified as the most feasible to implement at this intersection, it is not considered practicable given that this significant traffic impact from the Proposed Action would only occur during the construction period, and the Proposed Action would not have any impact at this intersection after completion of construction.

Contributing a "fair share" payment to Caltrans towards the future improvement at this intersection was also considered as a possible mitigation scenario. However, Caltrans does not have a mechanism to accept a "fair-share" contribution, and therefore, this scenario was also rejected.

Therefore, the construction-related traffic congestion impacts at the SR-67/Willow Road intersection, under both the off-site trucking option and the on-site quarry options, would be significant and unmitigated.

The potential for increased risk of motor vehicle accidents and pedestrian injuries on SR-67 due to the addition of construction-related traffic from the Proposed Action, under both the off-site trucking option and the on-site quarry options, could be mitigated by installing a traffic signal at SR-67/Vigilante Road intersection and extending the southbound left turn pocket on SR-67 by 150 feet. However, as stated above, Caltrans has indicated they would not support the installation of a traffic signal at this intersection. Therefore, there are no other feasible measures to mitigate this impact, and the construction-related traffic safety impacts of the Proposed Action would be significant and unmitigated, under both the off-site trucking option and the on-site quarry options.

10.3 Alternative 3b: Moosa 50K

Based on the analyses of intersections and segments in the study area (*Tables 9-1 and 9-2*), and the established significance criteria, the following significant impacts were determined for the Moosa 100K alternative. Section 10.1.2 recommends corresponding mitigation measures for the following three locations:

1. Lilac Road/Betsworth Road Intersection
2. I-15 Southbound Ramps/Gopher Cyn Rd
3. Valley Center Road (south of Lilac Road)