

TRAFFIC IMPACT ANALYSIS
FOR
NID COMBIE RESERVOIR SEDIMENT AND MERCURY REMOVAL PROJECT
Nevada County, California

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NID Mercury.rpt

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Transportation Engineers

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Nevada County, CA

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June 3, 2009

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Nevada County, CA**

INTRODUCTION

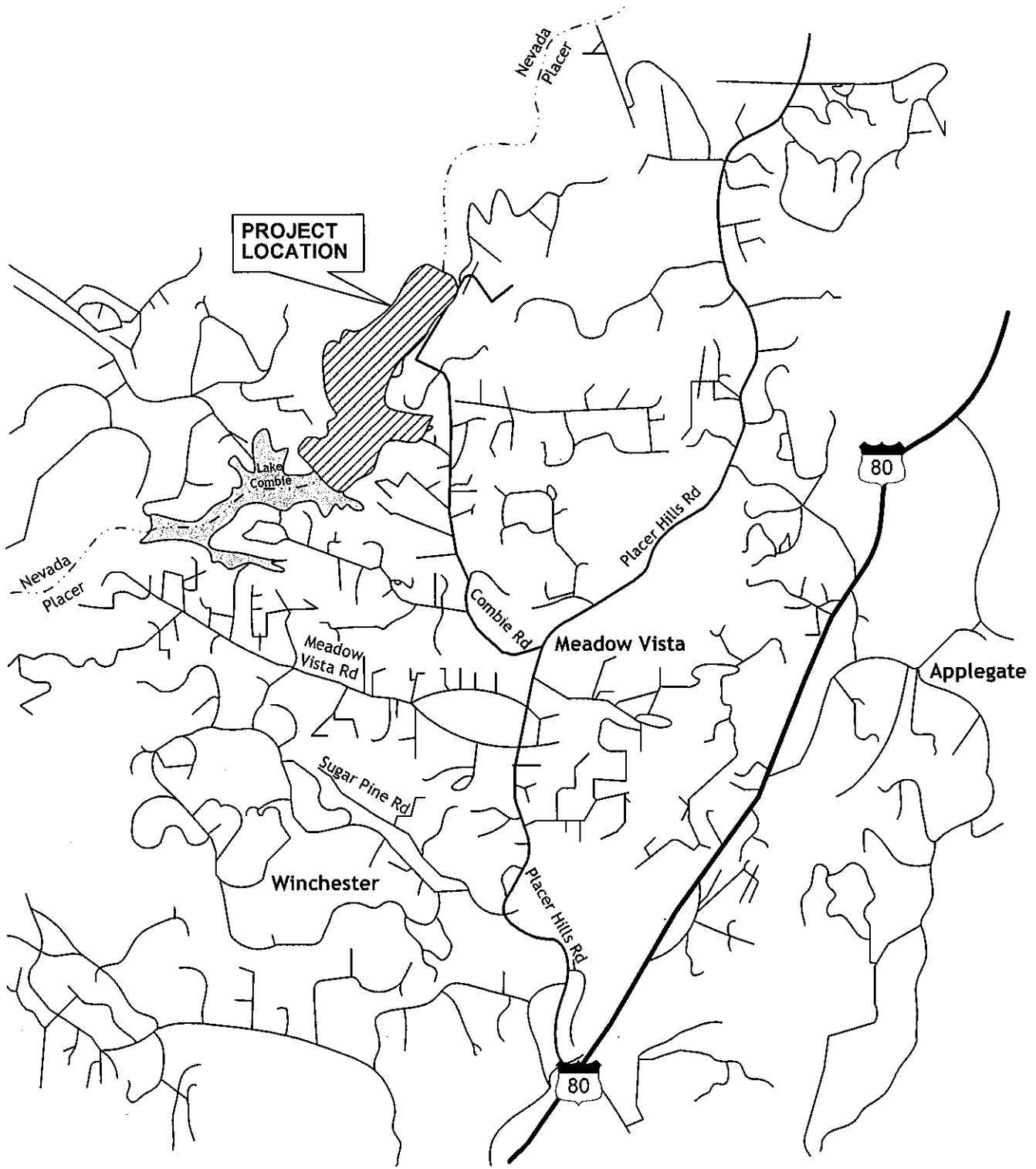
This report documents **KD Anderson & Associates, Inc.**'s assessment of the potential traffic impacts associated with implementation of the **Nevada Irrigation District's (NID) Combie Reservoir Sediment and Mercury Removal Project** in the Combie Lake area of Nevada County. The proposed project is intended to treat approximately 150,000 to 200,000 tons of silt, sand and aggregates that have accumulated in the northeast end of Combie Lake. The project site adjoins the Chevreux plant that today processes similar materials for shipment to locations throughout northern California. Primary access to the project is via Combie Road and Placer Hills Drive, two Placer county roads that link the Meadow Vista area with Interstate 80 as shown in Figure 1. Secondary access also occurs into Nevada County to State Route 49 via Wild Iris Lane, Retherford Road, Magnolia Road and Combie Road.

The analysis is intended to describe the traffic impacts of the project and address both short term and long term circulation issues in the vicinity of the site. Existing traffic conditions have been identified based on recent traffic counts on local streets and at key intersections, and a "worst case" background condition has been created that reflects a reasonable maximum operation at Chevreux facilities. Project trip generation has been estimated based on the amount of available material and the typical seasonal pattern of sales from Chevreux. The distribution of project trips was developed through review of current travel patterns on areas based on turning movement counts conducted at study intersections and through discussion of typical activity with Chevreux operators. Utilizing the expected distribution, project trips were assigned to the study area street system to identify projected intersection operations with development of the site.

Project impacts have been identified under long term cumulative background (i.e., 20 years in the future) conditions. Long term cumulative conditions reflect the eventual occupancy of vacant parcels that may use Combie Road for access, as well as continuing growth in the Meadow Vista area based on Placer County Department of Public Works projections.

EXECUTIVE SUMMARY

The **Nevada Irrigation District's (NID) Combie Reservoir Sediment and Mercury Removal Project** is intended to treat approximately 150,000 to 200,000 tons of silt, sand and aggregates that have accumulated in the northeast end of Combie Reservoir. The project has an expected life of three to five years. The project site adjoins the Chevreux plant that processes similar materials for shipment to locations throughout northern California. Primary access to the project is via Combie Road and Placer Hills Drive, two Placer county roads that link the Meadow Vista area with Interstate 80. Secondary access also occurs into Nevada County to State Route 49 via Wild Iris Lane, Retherford Road, Magnolia Road and Combie Road.



Existing Conditions. Traffic operations on the roads that provide access to the project site are good. The current Level of Service on roadway segments and at intersections satisfies the minimum standards established by Placer County (i.e., Level of Service C). Combie Road itself is in good condition as Placer County installed a pavement overlay in 2004. Pavement markings and shoulder treatment are consistent with the existing 35 mph speed limit.

Baseline Conditions. Because the market for construction materials has recently fallen off, activity at the Chevreux plant in 2009 is less than that which has occurred in the past. A “baseline” conditions representing year 2003 conditions was identified for this analysis. Baseline conditions also satisfy Placer County minimum standards.

Project Trip Generation. It is expected that materials resulting from the project will be sold to Chevreux who would in turn sort and vend the materials as part of their normal business. However, as a “worst case” alternative, it has been assumed that this material would be in addition to the materials typically shipped by Chevreux. This worst case condition might result if all of the reclaimed materials were sold to a different processor for subsequent sale.

The number of trucks involved in transporting materials varies by the type of material and the nature of the construction project. Under the expected operation, Chevreux trucks would haul materials to a stockpile on their site. Under the “worst case” alternative, a variety of trucks could be used. The 40,000 to 67,000 tons attributable to the project each year could generate 5,000 to 8,375 truck loads annually. The amount of materials shipped from the site under the “worst case” alternative could vary. Spread uniformly over the entire year (250 haul days), this would equate to 20 to 35 truck loads per day and on peak days 40% of these shipments are made during the a.m. peak hour (i.e., 8 to 14 truck loads). It is unlikely that any material would be shipped from the site during the typical weekday p.m. peak hour except under unusual circumstances.

Project Impacts. The impacts of project traffic were evaluated by superimposing “worst case” project traffic onto current and Baseline conditions. Minimum Placer County standards for Level of Service will continue to be satisfied. The addition of project truck traffic does not result in any appreciable change to the safety of motorists on Combie Road.

Cumulative Impacts. The cumulative impact of the project was evaluated based on assumed development of other approved projects and background traffic growth. Minimum Placer County Level of Service standards will be satisfied with and without the project.

The project could add truck traffic to Combie Road. However, while the truck loadings associated with the proposed project would make use of the “capacity” of Placer County’s recent overlay project, project truck traffic it would not appreciably change the overall condition of the road nor result in the need for Placer County to change its regular maintenance schedule.

EXISTING SETTING

Regionally, materials shipped from the NID **Combie Reservoir Sediment and Mercury Removal Project** site will primarily be served by Interstate 80, which links the Meadow Vista - Clipper Gap area with Auburn and the Roseville – Sacramento metropolitan area to the west and with Colfax to the east. Placer Hills Road links the Meadow Vista area with Interstate 80. Locally, the site gains access to Placer Hills Road via Combie Road. Secondary access to the site is also available to Nevada County, although the share of Chevreux material shipped out the back route is relatively small (estimated by Chevreux staff at 10% to 15% of annual haul). Wild Iris Lane crosses the Bear River and links the site with the Nevada County circulation system. Northerly truck traffic would continue via Retherford Road to Magnolia Road and Combie Road to State Route 49.

Study Area Circulation System

Placer Hills Road is designated an Arterial Road under the Placer County General Plan and the Meadow Vista Community Plan. Placer Hills Road is a two lane facility that originates at Applegate Road in Clipper Gap. Extending to the north across Interstate 80, Placer Hills Road continues to Meadow Vista before curving eastward to intersect Interstate 80 south of Colfax. This two lane road has shoulders ranging from 4 to 8 feet and separate left turn lanes are provided at major side streets. The speed limit on Placer Hills Road varies from 45 mph between Meadow Vista and Interstate 80, drops to 35 miles per hour near the I-80 interchange and is posted at 25 mph within Meadow Vista. Passing lanes are provided at various locations along the roadway. A daily traffic count made in late 2008 (11/13/08) indicated that Placer Hills Road carried 8,943 vehicles per day at a location just south of the Sugar Pine Road intersection.

Combie Road is designated a collector road in the Meadow Vista Community Plan. This two lane street extends north from Placer Hills Road for about 2½ miles to Meadow Vista to provide access to local residents, to the Placer County's Meadow Vista transfer station and the current operations of Chevreux near the NID project site. Today Combie Road has 11-12 foot paved travel lanes and 1 to 4 foot paved shoulders, but there are no auxiliary lanes outside of the Placer Hills Road intersection. The alignment of the road is "rolling" and striped centerline and edgeline markings are clearly visible. The posted speed limit on Combie Road is 35 mph. New traffic counts made for this study in April 2009 (14th, 15th and 16th) indicated that the daily traffic volume on Combie Road averaged 2,970 vehicles per day in the area between Placer Hills Road and Volley Road. The average volume dropped to 1,620 vehicles per day immediately north of Volley Road. The volume at the upper end of Combie Road east of the Chevreux access averaged 82 vehicles per day, although it is important to note that the Placer County Transfer Station is not open on the Tuesday – Wednesday-Thursday that these counts were made under Placer County traffic study guidelines.

The **Placer Hills Road / Combie Road intersection** is a T intersection. The intersection is controlled by a stop sign on the eastbound Combie Hills Road approach. A separate northbound left turn lane exists on Placer Hills Road for traffic turning onto Combie Road.

Gravel Pit Road is the name of the private road that extends from Combie Road to the existing Chevreux operation and the NID project site. Gravel Pit Road is an eighteen to twenty foot wide two-lane road that originates on the outside of the curve where that road turns towards the Placer

County Transfer Station. Gravel Pit Road is gated and the road is closed from 3:00 p.m. to 7:00 a.m. Traffic is controlled by a stop sign on the Gravel Pit Road approach.

The private road system crosses the eastern end of Combie Lake and provides access to Nevada County for the existing Chevreaux operation. **Wild Iris Lane** is a gated two lane road that links the site with Retherford Road.

Retherford Road is a private local road that is not maintained by Nevada County. This two lane road runs for about ½ mile to its terminus with Magnolia Road.

Magnolia Road is designated a Major Collector in the Nevada County General Plan Circulation Element. This two lane road runs for 2½ miles through the Lake of the Pines area from the intersection with Retherford Road to Nevada County's Combie Road / Magnolia Road intersection.

In Nevada County **Combie Road** is designated a Major Collector. The ¾ mile section of Combie Road from the Magnolia Road intersection to SR 49 has been widened to include auxiliary lanes and is a major transportation corridor.

Level of Service Methodology

To assess the quality of existing traffic conditions, "Levels of Service" were calculated for study area intersections. "Level of Service" (LOS) is a qualitative measure of traffic operating conditions whereby a letter grade, "A" through "F", corresponding to progressively worsening traffic operating conditions, is assigned to an intersection or roadway segment. In general terms, Level of Service is calculated for an hour-long traffic condition at a signalized intersection, unsignalized intersection, or roadway segment. Table 1 presents typical Level of Service characteristics.

**TABLE 1
LEVEL OF SERVICE DEFINITIONS**

Level of Service	Signalized Intersection	Unsignalized Intersection	Roadway (Daily)
"A"	Uncongested operations, all queues clear in a single-signal cycle. Volume / capacity (V/C) < 0.60	Little or no delay. Delay ≤ 10 sec/veh	Completely free flow.
"B"	Uncongested operations, all queues clear in a single cycle. 0.60 ≤ v/c < 0.70	Short traffic delays. Delay > 10 sec/veh and ≤ 15 sec/veh	Free flow, presence of other vehicles noticeable.
"C"	Light congestion, occasional backups on critical approaches. 0.70 ≤ V/C < 0.80	Average traffic delays. Delay > 15 sec/veh and ≤ 25 sec/veh	Ability to maneuver and select operating speed affected.
"D"	Significant congestions of critical approaches but intersection functional. Cars required to wait through more than one cycle during short peaks. No long queues formed.) .80 ≤ V.C < 0.90	Long traffic delays. Delay > 25 sec/veh and ≤ 35 sec/veh	Unstable flow, speeds and ability to maneuver restricted.
"E"	Severe congestion with some long standing queues on critical approaches. Blockage of intersection may occur if traffic signal does not provide for protected turning movements. Traffic queue may block nearby intersection(s) upstream of critical approach(es). 0.90 ≤ V/C < 1.00	Very long traffic delays, failure, extreme congestion. Delay > 35 sec/veh and ≤ 50 sec/veh	At or near capacity, flow quite unstable.
"F"	Total breakdown, stop-and-go operation. V/C > 1.00	Intersection often blocked by external causes. Delay > 50 sec/veh	Forced flow, breakdown.
Sources: 2000 Highway Capacity Manual, Transportation Research Board (TRB) Special Report 209.			

Standards of Significance. Local agencies adopt minimum Level of Service standards as a part of General and Community Plans, and these standards govern the roads under their jurisdiction. Operating standards within this area of Placer County are defined by the Placer County General Plan (PCGP) for roadways under Placer County jurisdiction. Policies contained in the PCGP indicate that the Level of Service minimum standard for intersections shall generally be LOS "C". Land development requirements shall be set to sustain LOS "C" at all intersection locations for as long as possible. The Placer County General Plan also indicates that the LOS standard shall be "D" within ½ mile of state highways.

The Nevada County General Plan designates LOS C as the minimum standard in rural regions and LOS D in community regions. Caltrans identifies LOS "D" as the acceptable Level of Service along I-80. However, since this primary route used to transport materials from the project site is through Placer County, Nevada County and Caltrans standards are not applicable.

Methodology. Levels of Service at intersections were quantified using methodologies presented in the 2000 edition of the Highway Capacity Manual (HCM). In addition to traffic volumes at signalized intersections, these procedures make use of geometric information and traffic signal timing data.

At unsignalized intersections the number of gaps in through traffic, gap acceptance time and corresponding delays for motorists waiting to turn are used for Level of Service analysis. Procedures used for calculating unsignalized intersection Level of Service are as presented the Highway Capacity Manual, 2000 edition.

The Levels of Service at unsignalized intersections that are controlled by side street stop signs are indicative of the magnitude of the delay incurred by motorists that must yield the right of way at an intersection. Because these calculations exclude the characteristics of through traffic flow (which is assumed to flow freely at a good Level of Service) traffic signal warrant analysis is usually performed to confirm the significance of calculated delays. While the unsignalized Level of Service may indicate long delays (i.e., LOS "E"), traffic conditions are generally not assumed to be unacceptable unless signal warrants are satisfied. Meeting signal warrants signifies that intersection improvements may be warranted, but does not indicate that installation of a signal is the only way to mitigate conditions. It is often possible to improve operations with additional lanes or improved geometrics to reduce delays. The signal warrant criteria employed for this study is as presented in the Manual of Uniform Traffic Control Devices (MUTCD), California Supplement.

Level of Service Based on Daily Volume. The quality of traffic flow on county roads can be determined based on the daily traffic volumes and generalized Level of Service thresholds. The Placer County General Plan EIR identified general “planning level” daily volume thresholds that can be used to identify operating Levels of Service on streets and highways. These thresholds are re-printed in Table 2.

**TABLE 2
EVALUATION CRITERIA FOR ROADWAY SEGMENT LEVEL OF SERVICE**

Roadway Capacity Class	Maximum Daily Traffic Volume Per Lane Level of Service				
	A	B	C	D	E
1. Freeway – Level Terrain	6,300	10,620	13,680	17,740	18,000
2. Freeway – Rolling terrain	5,290	8,920	11,650	14,070	15,120
3. Freeway – Mountainous Terrain	3,400	5,740	7,490	9,040	9,720
4. Arterial – High Access Control	6,000	7,000	8,000	9,000	10,000
5. Arterial – Moderate Access Control	5,400	6,300	7,200	8,100	9,000
6. Arterial – Low Access Control	4,500	5,250	6,000	6,870	7,500
7. Rural 2-lane Highway – Level terrain	1,500	2,950	4,800	7,750	12,500
8. Rural 2-lane highway – Rolling terrain	800	2,100	3,800	5,700	10,500
9. Rural 2-lane highway – Mountainous Terrain	400	1,200	2,100	3,400	7,000

Source: Placer County General Plan FEIR

Minimum Sight Distance. Placer County has established minimum sight distance standards for intersections onto County roads. These standards generally conform to Caltrans requirements for corner sight distance and are summarized in Plate R-17 of the Placer County Design Standards. The minimum sight distance required for a 35 mph design is 385 feet, while the required distance for 45 mph is 495 feet. Development of a new access without adequate sight distance would constitute a potential safety impact.

Existing Traffic Volumes

This analysis addresses traffic conditions occurring during peak weekday hours. Peak hour traffic counts were conducted in April 2009 during the morning (i.e., 7:00 to 9:00 a.m.) and evening (4:00 to 6:00 p.m.) when local schools were in session. The observed 2009 volumes along with daily volumes on Combie Road are presented in Figure 2.

Baseline Traffic Volumes

While the traffic volumes observed in April 2009 are indicative of the conditions occurring as this report is being prepared, it is important to recognize the volume of traffic on Meadow Vista area roads can vary. For example, the operation of the Placer County Transfer station on Friday, Saturday, Sunday and Monday can add traffic that would not normally be considered under typical traffic study guidelines.

In this area the most obvious cause of traffic volume variation would be the operation of the Chevreaux plant. The amount of material transported from the plant typically varies throughout the year in response to the demands of the construction industry. With the recent downturn in development and construction, the amount of material being transported in April 2009 is likely less than that transported in the mid 2000's when construction was more active.

For this analysis a “baseline” condition has created to reflect more typical operation of the Chevreaux plant. To provide a reasonable “worst case” analysis, the baseline was intended to represent conditions occurring during the year of greatest activity at the plant, and to be indicative of the 95th percentile day of truck traffic. The baseline condition was developed with input Chevreaux staff.

Table 3 identifies the amount of materials shipped by Chevreaux over the past few years. The amounts shipped have dropped off substantially since 2006, and the tonnage shipped in 2003 and 2005 were similar.

**TABLE 3
CHEVREAUX AGGREGATES HAULING HISTORY**

	Tons of Material Shipped Annually (1,000 tons)					
	2003	2004	2005	2006	2007	2008
Aggregate, Etc	322	312	323	301	163	68

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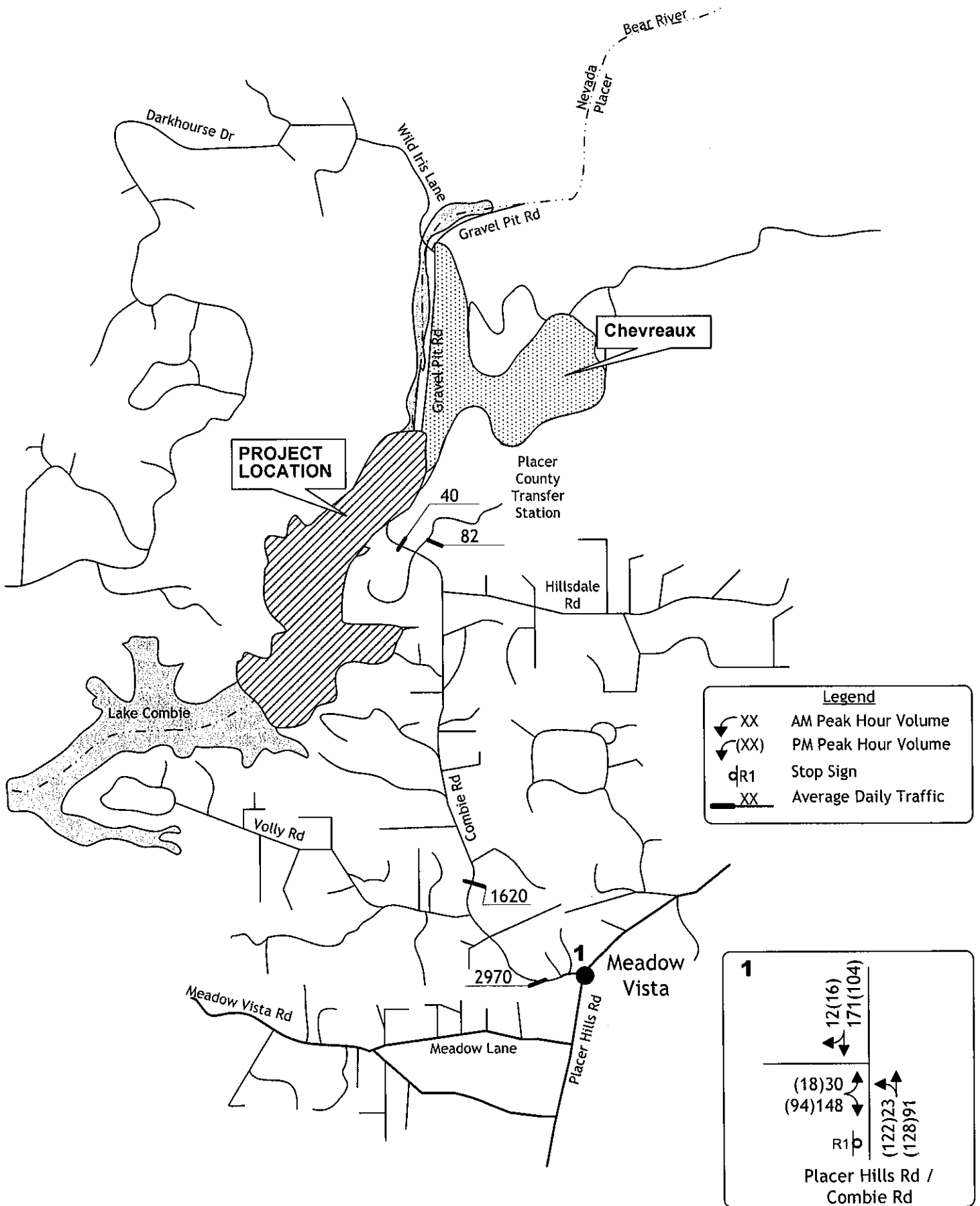
Chevreaux haul records for the year 2003 were reviewed. The plant was open for 246 days that year, and the 95th percentile haul day would be the 13th highest day. On that day a total of 113 loading tickets were issued, and each ticket represented a truck of some size traveling into and out of the site at some point during the day.

April is typically a month with less than average activity. As a comparison, a total of 29 shipments were made from Chevreaux over April 14, 15 and 16, 2009 or an average of 10 shipments per day. Thus, the baseline day would handle 103 more loads per day.

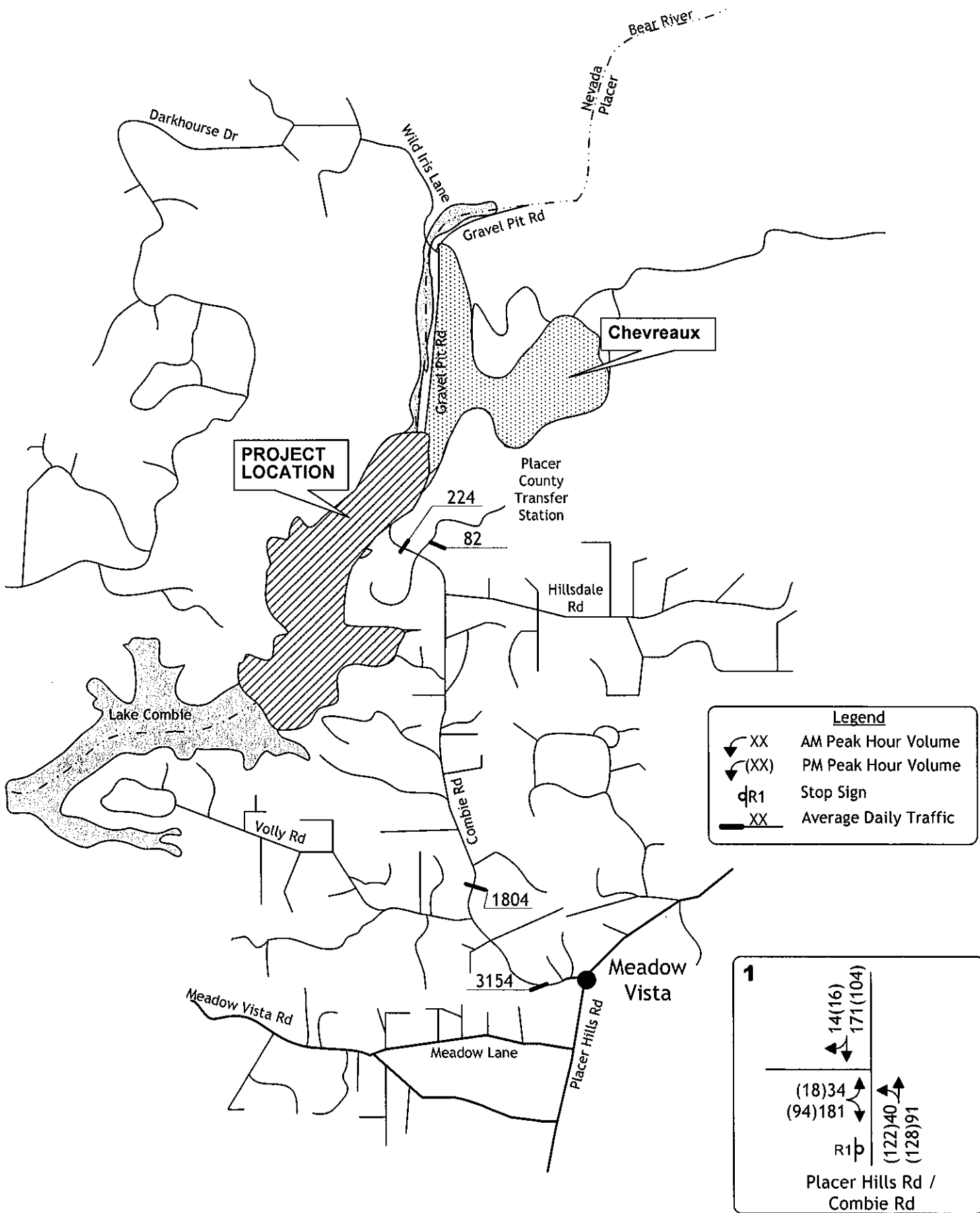
The distribution of materials from Chevreaux reflects the presence of the secondary access to Nevada County. Chevreaux staff suggest that 10% to 15% of the annual shipment uses the secondary access. To develop the baseline condition it has been assumed that 90% of the 103 additional shipments, or 93 loads used the Combie Road route through Meadow Vista. This would equate to roughly 186 additional vehicle trip ends on Combie Road that day.

The distribution of this additional truck traffic through the day reflects the need for construction materials early in the day. Chevreaux staff acknowledges that on heavy days many trucks arrive earlier in the morning in order to be loaded when the plant begins operation. It was suggested that 40% of the daily shipments may be made during the a.m. peak hour, although a portion of the inbound truck traffic is likely to have arrived before the a.m. peak commute hour. For this analysis it has been assumed that 19 inbound and 38 outbound vehicles would be added to Combie Road during the a.m. peak hour. If the plant was to continue its current hours of operation, no additional traffic would be generated during the typical weekday commute hour.

While the directionality of this traffic at the Placer Hills Road / Combie Road intersection would vary from day to day, it is reasonable to expect that most of the truck traffic on a peak day would be headed to the west via Interstate 80. Figure 3 identifies resulting Baseline traffic under these assumptions.



EXISTING TRAFFIC VOLUMES
 AND LANE CONFIGURATIONS



Existing Levels of Service

Intersection Level of Service. Table 4 summarizes current Levels of Service at the Placer Hills Road / Combie Road intersection during the a.m. and p.m. peak hours. As shown, the each approach to the intersection operated at LOS “B” or better conditions when observed in April 2009.

For Baseline conditions, Level of Service calculations assume truck adjustment to reflect *Passenger Car Equivalents (PCE)*. Because large trucks accelerate and decelerate more slowly than regular passenger cars, the Highway Capacity Manual (HCM) suggests that for the purpose of Level of Service analysis each truck is assumed to be the equivalent of 2 to 4 passenger cars. For this study each truck added under baseline conditions was assumed to generate 4 PCE.

**TABLE 4
PLACER HILLS DRIVE / COMBIE ROAD INTERSECTION LEVEL OF SERVICE**

Intersection	Control	Weekday				Traffic Signal Warrants Met? Delay/Volume	
		AM Peak Hour (7:00 to 9:00 a.m.)		PM Peak Hour (4:00 p.m. to 6:00 p.m.)		AM Peak Hour	PM Peak Hour
		LOS	Average Delay (sec's per vehicle)	LOS	Average Delay (sec's per vehicle)		
<i>Observed</i>							
Placer Hills Rd / Combie Rd NB left turn EB approach	EB Stop	A	8	A	8	No/No	No/No
		B	11	B	10		
<i>Baseline</i>							
Placer Hills Rd / Combie Rd NB left turn EB left+right turn	EB Stop	A	8	A	8	No/No	No/No
		B	14	B	10		
LOS = Level of Service							

Level of Service on Roadways. Table 5 presents the volume of traffic on study roadway segments and the resulting Level of Services based on Placer General Plan thresholds. The volume observed on Combie Road in this area is indicative of LOS “B” and “C” on a 2 lane rural road in rolling terrain. While baseline daily traffic volumes would be higher, the operating Level of Service would remain the same.

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**TABLE 5
ROADWAY SEGMENT LEVEL OF SERVICE**

Roadway	Location	Classification	LOS C threshold	Existing		Baseline	
				Daily Traffic	LOS	Daily Traffic	LOS
Combie Road	Placer Hill Road to Volley Road	2 lane rural road in rolling terrain	3,800	2,970	C	3,200	C
Combie Road	Volley Road to Chevreaux access	2 lane rural road in rolling terrain	3,800	1,620	B	1,950	B

Pavement Condition

Visual inspection of Combie Road suggests that this Placer County Road is in “good” condition. While the road is used by Chevreaux trucks and by trucks traveling to the Placer County Transfer Station, there are no locations with major cracking or potholes. A 3” A.C. overlay was installed on the road by Placer County in 2004. Striping and other pavement markings are in good shape.

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PROJECT IMPACTS

Project Description

Combie Reservoir Sediment and Mercury Removal Project will treat silt, sand and aggregates that have accumulated at the reservoir but have previously been un-useable. By extracting mercury, 150,000 to 200,000 tons of materials will now be available. The project is expected to operate nine months per year for a three-year to five year period. The materials resulting from the project will be trucked to the Chevreux plant for processing, clarifying, and eventual shipment. The project could employ 3 to 5 persons.

Project Characteristics

Trip Generation. As with all aggregates sources, the amount of traffic associated with implementing the proposed project on any particular day will be dependent on the pace of regional construction. If all of the material created by the project was sold during each of 3 to 5 years, then 40,000 to 67,000 tons might be shipped annually.

It is expected that this materials will be sold to Chevreux who would in turn sort and vend the materials as part of their normal business. Approximately 70% of the reclaimed materials are expected to be directed to the construction industry and approximately 30 percent of the material to be excavated through dredging is a waste product such that there may be no market for. However, as a "worst case" alternative, it has been assumed that 100% of this material would be in addition to the materials typically shipped by Chevreux. This worst case condition might result if the reclaimed materials were sold to a different processor for subsequent sale.

The number of trucks involved in transporting materials varies by the type of material and the nature of the construction project. Under the expected operation, Chevreux trucks would haul materials to a stockpile on their site. Under the "worst case" alternative, a variety of trucks could be used. Large 5 axle truck trailer combinations typically transport 25 tons per load. Two axle "bobtail" trucks haul roughly 8 tons per load. Pick up trucks with small trailers used by small contractors can haul roughly 3-4 tons. To identify a "worst case" truck volume, it has been assumed that the average load is 8 tons per shipment. Assuming that this ratio held, the 40,000 to 67,000 tons attributable to the project each year could generate 5,000 to 8,375 truck loads annually.

The amount of materials shipped from the site under the "worst case" alternative could vary. Because the materials would first have to be sorted before retail sale, it is likely that shipment would not have the peaks / valleys associated with direct retail sale to the construction industry. Spread uniformly over the entire year (250 haul days), this would equate to 20 to 35 truck loads per day. As a "worst case", it is assumed that on peak days 40% of these shipments are made during the a.m. peak hour (i.e., 8 to 14 truck loads) It is unlikely that any material would be shipped from the site during the typical weekday p.m. peak hour except under unusual circumstances.

The extent to which project traffic actually increases the overall volume of traffic on Combie Road needs to be considered. In 2009 the amount of materials shipped from the Chevreux site

is low compared to other years. Assuming there is a normal market for the materials, shipping the materials generated by the project would result in additional traffic as compared to the volumes observed on Combie Road in April 2009. However, if conditions were ever again to reach the baseline volumes estimated for 2003, it is reasonable to conclude that the project's materials would satisfy part of that demand but would not itself result in additional demand from the construction industry.

The project could generate a small amount of traffic by employees. A conservative assumption would be that each of the 3-5 employees arrives during the a.m. peak hour and departs during the p.m. peak hour.

Assuming that the materials generated by this project is vended by Chevreaux with no increase in construction industry demands, then employee traffic would be the only additional traffic on area streets. 10 daily trips would occur, with 5 inbound trips in the a.m. peak hour and 5 outbound trips in the p.m. peak hour. For this analysis, it has been assumed that under "worst case" conditions the project will generate 80 vehicle trips per day (i.e., 70 by trucks and 10 by employees). During the a.m. peak hour there would be 13 inbound trips and 14 outbound trips. Five outbound employee trips could occur during the p.m. peak hour.

Trip Distribution. Having determined the number of trips that are expected to be generated by the project, it is necessary to identify the directional distribution of project-generated traffic. It is reasonable to expect that the traffic associated with the project would follow the distribution patterns assumed for baseline traffic (i.e., 80% west on I-80, 10% east to Colfax and 10% north to Nevada County).

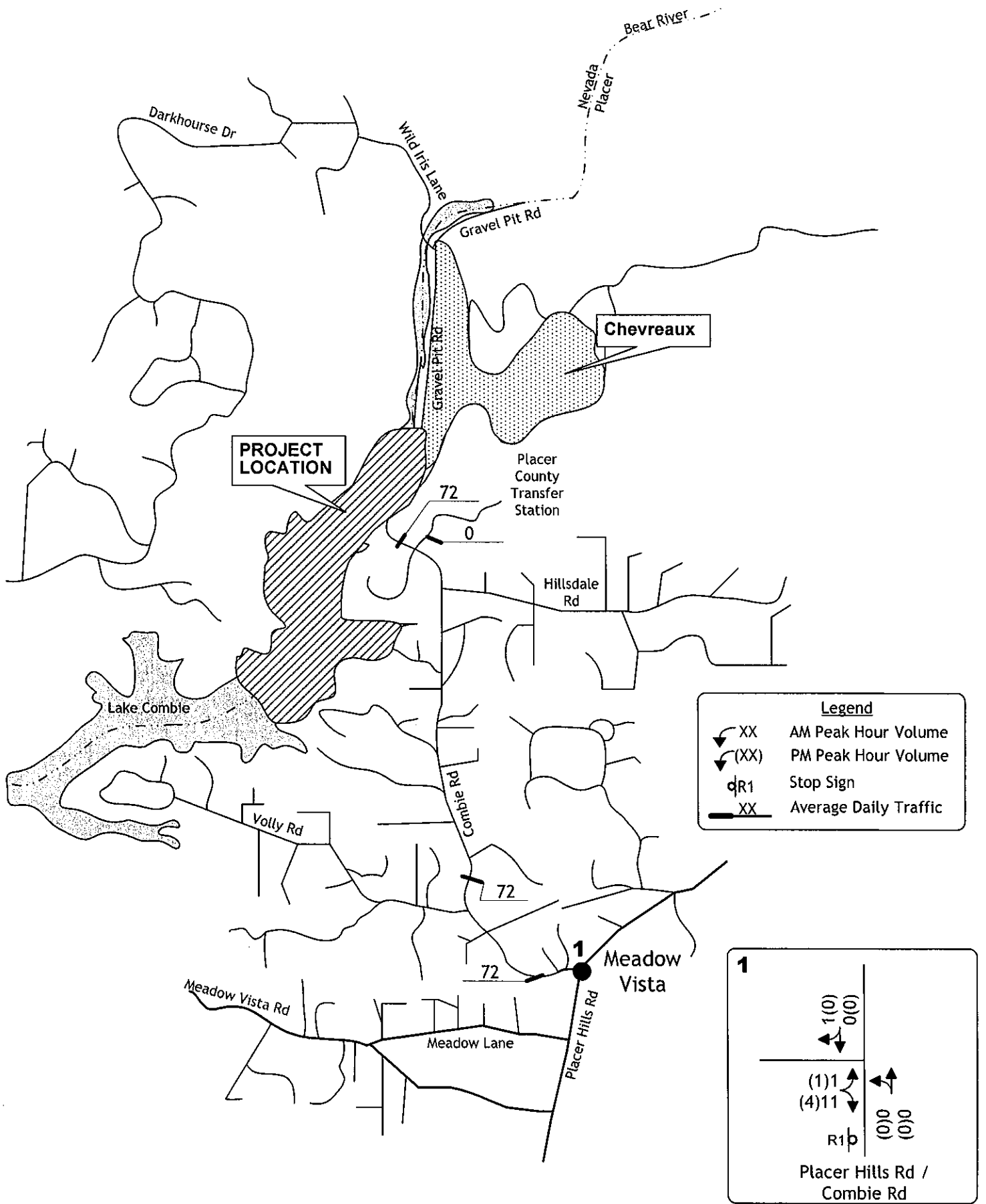
Existing Plus Project Traffic Volumes and Levels of Service

Under expected conditions, the limited amount of traffic accompanying the regular operation of the project would be too small to have an appreciable impact on operating Levels of Service (i.e., 10 trips per day). To provide an assessment of project impacts under the "worst case" alternative, it has been assumed that the shipments resulting from implementation of the project are in addition to the Baseline condition. Figure 4 identifies "project only" traffic under the "worst case" scenario, while Figure 5 superimposes project trips onto the background traffic volumes to create the "Baseline Plus Project Worst Case" condition.

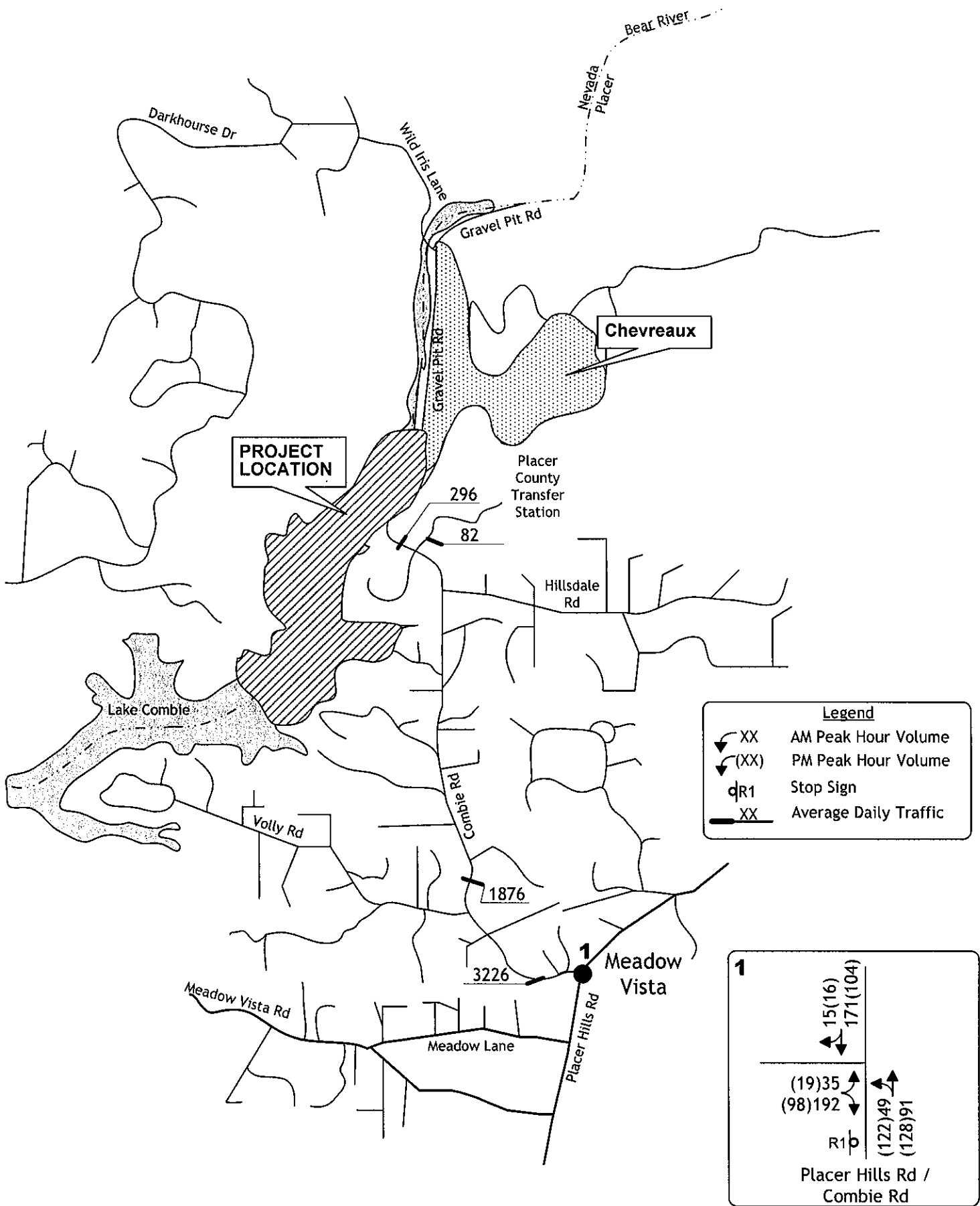
Intersection Levels of Service. Table 6 identifies the Level of Service projected at the Placer Hill Road / Combie Road intersection under worst case "plus project" conditions. Expected operation of the project would be the same as the No Project condition. As shown, the addition of traffic resulting from the project under the "worst case" scenario will not appreciably change existing Levels of Service.

Roadway Levels of Service. Table 7 presents the daily roadway volumes and corresponding levels of service. As shown, even under the "worst case" scenario the addition of the small amount of project generated traffic does not change existing Level of Service at any location.

Based on these criteria, the project does not have any impacts to the regional circulation system.



KD Anderson & Associates, Inc. PROJECT ONLY WORST CASE TRAFFIC VOLUMES AND LANE CONFIGURATIONS
 Transportation Engineers



**TABLE 6
EXISTING PLUS PROJECT AND BASELINE PLUS PROJECT INTERSECTION LEVEL OF SERVICE**

Intersection	Control	Weekday										Traffic Signal Warrants Met? Delay/Volume	
		AM Peak Hour (7:00 to 9:00 a.m.)					PM Peak Hour (4:00 p.m. to 6:00 p.m.)					AM Peak Hour	PM Peak Hour
		No Project		Plus Project (worst case)		No Project		Plus Project (worst case)		LOS	Average Delay (spv)		
		LOS	Average Delay (spv)	LOS	Average Delay (spv)	LOS	Average Delay (spv)	LOS	Average Delay (spv)				
Placer Hills Rd / Combie Rd NB left turn EB approach	EB Stop	A	8	A	8	A	8	A	8	A	8	No/No	No/No
		B	11	B	12	B	10	B	10	B	10		
Observed													
Placer Hills Rd / Combie Rd NB left turn EB left-right turn	EB Stop	A	8	A	8	A	8	A	8	A	8	No/No	No/No
		B	14	B	16	B	10	B	10	B	10		
Baseline													
LOS is Level of Service spv is Seconds per Vehicle													

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**TABLE 7
EXISTING PLUS PROJECT AND BASELINE PLUS PROJECT ROADWAY SEGMENT LEVEL OF SERVICE**

Roadway	Location	Classification	LOS C Threshold	Existing				Baseline					
				No Project		Plus Project (worst case)		No Project		Plus Project (worst case)			
				Daily Traffic	LOS	Daily Project Only	Total Traffic	Daily Traffic	LOS	Daily Project Only	Total Traffic		
Combie Road	Placer Hill Road to Volley Road	2 lane rural road in rolling terrain	3,800	C	2,970	C	72	3,042	3,200	C	72	3,272	C
Combie Road	Volley Road to Chevreux access	2 lane rural road in rolling terrain	3,800	B	1,620	B	72	1,692	1,804	B	72	1,876	B

KDA

CUMULATIVE TRAFFIC IMPACTS

The impacts of implementing the **Nevada Irrigation District's (NID) Combie Reservoir Sediment and Mercury Removal Project** have also been considered within the context of long-term future (i.e., 20 year) traffic conditions in this area of Placer County. Cumulative analysis accounts for future regional traffic growth and other development as projected by historical traffic volume increases on roads in the area as directed by Placer County staff, as well as the trip generation potential of other approved / pending projects.

Long Term Prognosis for Project

The project itself has a limited life. Recovery of mercury from materials currently in Lake Combie is expected to take 3 to 5 years. It is possible that additional contaminated material will accumulate after that time, and if the project proves successful NID will be able to pursue a proactive mercury removal program as part of consistent and ongoing maintenance dredging at Combie Reservoir. However, it is also expected that return maintenance dredging could occur on approximately 10 year cycles. However, to provide a "worst case" assessment, the addition of "worst case" project traffic under cumulative conditions has been investigated.

Other Development

Approved - Pending Projects. Much of the Meadow Vista area of Placer County is built out, particularly properties along the local roads that are tributary to Combie Road. Regionally, there are three approved / pending projects that should be acknowledged in the cumulative analysis. The *Winchester Golf* Community is a 409 unit residential community that opened in 2002. Since that time roughly 100 home sites have been developed leaving approximately 310 dwellings to be developed, although immediate occupancy of the project is unlikely given the current overall climate for residential development and the well documented problems at Winchester. Roughly 3,000 new daily trips could accompany full occupancy of Winchester.

Winchester has access to Placer Hills Road via Sugar Pine Road, but the community also has access to the west to Christian Valley Road via Winchester Way. Given the travel time along each route, roughly 2/3 of the new trips generated by Winchester would use the Sugar Pine Road access onto Placer Hills Road.

Another known project is the Sugar Pine Estates subdivision. This 52 unit residential development lies on the east side of Placer Hills Road opposite the Sugar Pine Road intersection. According to the 2006 traffic study prepared for this project*, Sugar Pine Estates would generate 498 new daily trips. While one of the access points to Sugar Pine Estates is at the Placer Hills Road / Sugar Pine Road intersection, this development also has access to Lake Arthur Road, an Interstate 80 frontage road that intersects Placer Hills Road near the freeway. The project traffic study indicates that about 40% of the Sugar Pine Estates traffic is expected to gain access via the Placer Hills Road / Sugar Pine Road intersection.

The final known project is Meadow Vista Woods. This 14 unit subdivision is located off of

* Sugar Pine Ridge, KD Anderson & Associates, December 8, 2006

Sugar Pine Road near Placer Hills Road, and is not approved. This project could generate 134 daily trips, nearly all of which would use Placer Hills Road.

Locally, most of the properties in the area of the project are occupied, and there are only a few undeveloped parcels along the roads that are tributary to Combie Road. Review of current real estate listings identified only one parcel that was for sale. During conversation with Placer County Planning Department staff it was concluded that no projects that would appreciably increase the yield of properties in this area is permitted under the current Community / General Plan.

Background Traffic Volume Growth. The Meadow Vista Area is included at the northern end of the Placer County's regional travel demand forecasting model. That tool suggested varying growth rates for traffic on Placer Hills Road, with locations nearer to Interstate 80 carrying higher volumes and experiencing greater growth than that at locations farther from the freeway. As part of the Sugar Pine Estates traffic study Placer County staff reviewed model results and estimated that traffic on Placer Hills Road would increase by 22% over the next 20 years.

This growth rate was applied to current through traffic volumes on Placer Hills Road to yield cumulative background condition. Trips from the three identified projects were added, as well as the peak traffic assumed for the Chevreaux operation under the Baseline analysis, and resulting "Year 2029 Worst Case" traffic volumes are noted in Figure 6.

Cumulative Circulation System Improvements

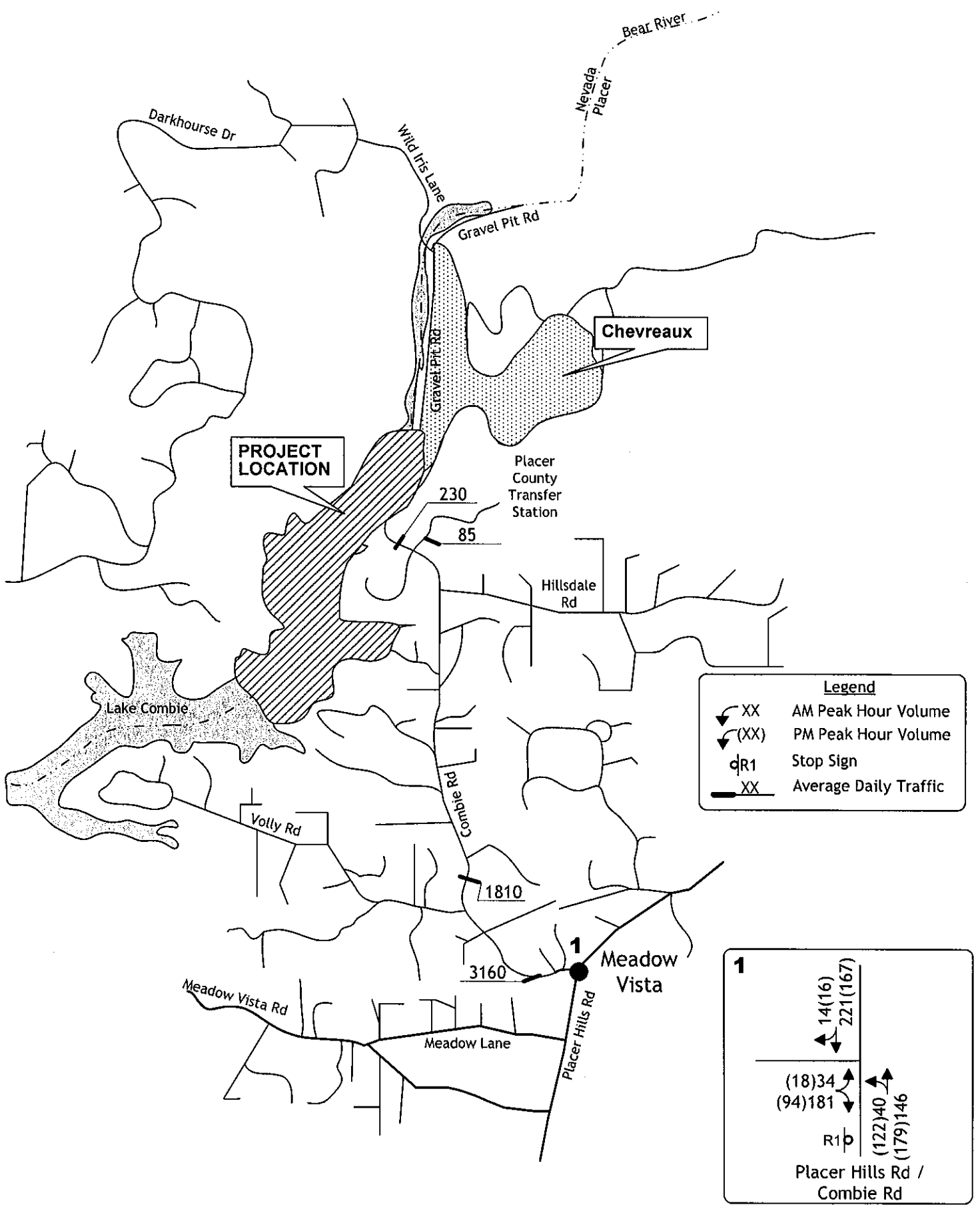
A traffic signal planned for the Placer Hills Road / Sugar Pine Road / Sugar Pine Road Access intersection.

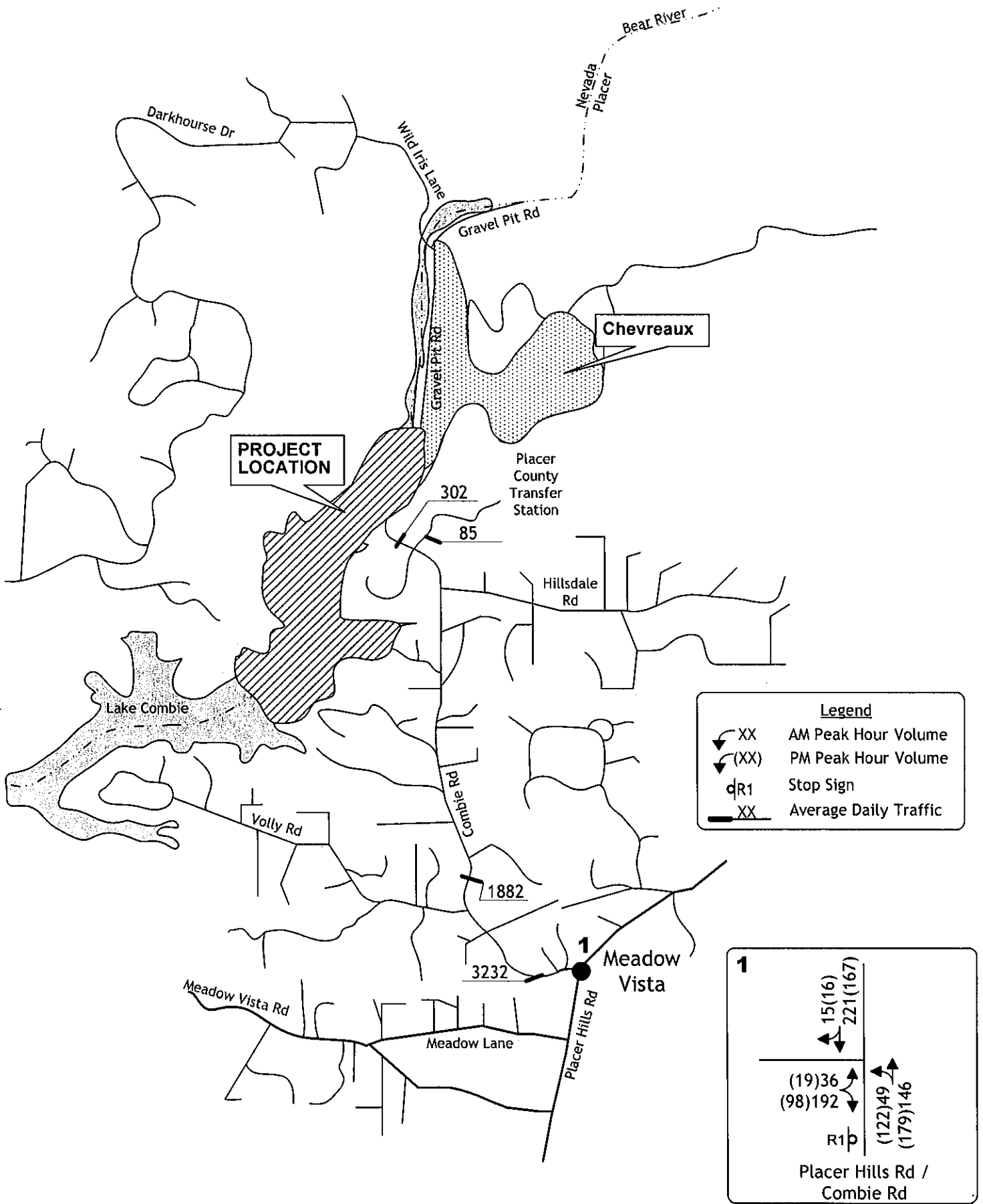
Cumulative Levels of Service

Figure 7 presents "Cumulative Plus Project Worst Case" traffic volumes that were developed based on assumed background growth and the development of identified projects, along with the "worst case" assumption that project traffic is additive to the base condition.

Intersection Levels of Service. Table 8 presents peak hour Levels of Service at the study intersection. As shown, without the Placer Hills Road / Combie Road intersection will continue to operate acceptably. Peak hour warrants for signalization based on volume would be not be met.

Roadway Levels of Service. Because the area that is tributary to Combie Road is built out, there would not be an appreciable difference between long term traffic volumes on Combie Road and the forecasts developed for the Baseline condition.





**TABLE 8
CUMULATIVE (20 YEAR) BASE AND PLUS PROJECT
INTERSECTION LEVELS OF SERVICE**

Intersection	Control	Weekday										Traffic Signal Warrants Met? Delay/Volume	
		AM Peak Hour (7:00 to 9:00 a.m.)					PM Peak Hour (4:00 p.m. to 6:00 p.m.)					AM Peak Hour	PM Peak Hour
		No Project		Plus Project (worst case)		No Project		Plus Project (worst case)		LOS	Average Delay (spv)		
		LOS	Average Delay (spv)	LOS	Average Delay (spv)	LOS	Average Delay (spv)	LOS	Average Delay (spv)				
Placer Hills Rd / Combie Rd NB left turn EB left-right turn	EB Stop	A	8	A	8	A	8	A	8	A	8	No/No	No/No
		B	14	B	16	B	11	B	11	B	11		

LOS is Level of Service spv is Seconds per Vehicle

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Truck Loading on Combie Road. Combie Road is in good condition today, the relative impact of materials transported due to the proposed project should be considered based on the procedures contained in Chapter 6 of the Caltrans Highway Design Manual. These procedures equate truck loadings over a 20 year period to *Equivalent Single Axle Loads (ESAL's)* and identify relative impact in terms of resulting *Traffic Index (TI)*.

The proposed project will haul up to 200,000 tons of material, and for the purpose of pavement analysis this load is spread over the pavement's twenty year useful life. Assuming 250 haul days annually, then the twenty year average would be 40 tons per day. This load could be accommodated in a variety of ways, using 25 ton 5-axle truck and trailer combinations, 8 ton two axle trucks or 3-4 tons private pick up. As the worst case loading results from 5 axle trucks, it has been assumed that the average is 1.6 large truck trailers. It is important to note that this average utilization is not the same as the number of trucks on the road during the period when the plant is actually in operation.

The number of ESAL's associated with this level of truck activity can be identified based on Table 603.3A of the HDM. Each daily 5-axle truck creates 13,780 ESAL's over a twenty year period. Thus, the project's contribution to loadings on Combie Road could be 22,040 ESAL's. If the project is repeated in the future, then additional trucks could be added to Combie Road. A "worst case" assumption would assume that another 200,000 tons of material was shipped in ten years. This future haul would add another 22,040 ESAL's to Combie Road.

As a comparison, if the reported activity for the Chevreux plant in 2003 or 2005 (325,000 tons \pm) continued for 20 years with 50% carried in bobtails and 50% carried in 5-axle trucks, this level of activity would create 472,000 ESAL's.

The roadway needed to accommodate this loading over a 20 year period is expressed in terms of the section's **Traffic Index (T.I)**. A T.I. of 8.0 is needed to accommodate 288,000 to 487,000 ESAL's. Placer County staff reported that the last overlay project was intended to result in a facility with a TI of 9.0. Thus, while the loadings associated with the proposed project would make use of the "capacity" of the recent project, it would not appreciably change the overall condition of the road nor result in the need for Placer County to change its regular maintenance schedule.

APPENDIX

The Technical Appendix containing the traffic counts and Level of Service calculations is available in the NID offices at 1036 W. Main Street, Grass Valley, CA., on the NID website at www.nidwater.com [click on “Planning and Development” and then select “Project Documents” and then scroll down to “Combie Reservoir”].) and is available on disk.