CEQA TECHNICAL MEMORANDUM ATTACHMENTS

NORTH FORK RANCHERIA OF MONO INDIANS
NORTH FORK CASINO PROJECT OFF-SITE IMPROVEMENTS

JUNE 2021

PREPARED FOR:

City of Madera
205 W 4th Street
Madera, CA 93637

PREPARED BY:

Analytical Environmental Services
1801 7th Street, Suite 100
Sacramento, CA 95811

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ATTACHMENT A

TRAFFIC IMPACT STUDY

Traffic Impact Study

Proposed North Fork Rancheria Casino Project

West Side of Golden State Boulevard North of Avenue 17
Madera County, California

Prepared For:

North Fork Rancheria of Mono Indians of California
P.O. Box 929
North Fork, California 93643

and

Station Casinos, LLC
1505 South Pavilion Center Drive
Las Vegas, Nevada 89135

Date:

February 23, 2021

Job No.:

16-007.04

PETERS ENGINEERING GROUP
A CALIFORNIA CORPORATION

February 23, 2021

Ms. Elaine Fink, Chairperson
North Fork Rancheria of Mono Indians
P.O. Box 929
North Fork, California 93643

and

Mr. Scott Zucker, Vice President/Design & Construction
Station Casinos, LLC
1505 South Pavilion Center Drive
Las Vegas, Nevada 89135

Subject: Traffic Impact Study
Proposed North Fork Rancheria Casino Project
West Side of Golden State Boulevard North of Avenue 7
Madera County, California

Dear Ms. Fink and Mr. Zucker:

1.0 INTRODUCTION AND PURPOSE

This report presents the results of a traffic impact study for a reduced-intensity project (as defined below) of the proposed North Fork Rancheria Casino Project in Madera County, California.

The proposed Project (as defined below) and various alternatives were the subject of an Environmental Impact Statement (EIS), which included a traffic impact study that identified significant impacts and required mitigations.

The purpose of this traffic impact study is to analyze the revised Project (which is smaller than Alternative A analyzed in the EIS) and to identify which of the mitigation measures identified in the EIS, if any, should be constructed by the Project. This is considered necessary for the following reasons:

- The EIS did not include analysis of a project that would be smaller than Alternative A (the Preferred Alternative approved by the Bureau of Indian Affairs in the Record of Decision) but larger than Alternative B, and the mitigation measures required for Alternative A may not be proportional or applicable to the Project;
- A majority of the pending projects in the surrounding area that were considered in the opening-day analyses in the EIS are no longer pending.

2.0 PROJECT DESCRIPTION

The proposed casino and resort project described as Alternative A in the EIS is now contemplated to be smaller than Alternative A. The Project consists of an approximately 233,350-square-foot building that will contain approximately 75,025 square feet of gaming floor, two restaurants, a food court, circulation space, and back of house support functions. Access to the site will be from Golden State Boulevard. Construction is expected to be complete by approximately the end of 2022.

A vicinity map is presented in the attached Figure 1, Site Vicinity Map, following the text of this report. The proposed site plan is presented in Figure 2, Site Plan.

3.0 STUDY AREA AND TIME PERIOD

The EIS identifies locations at which the Project is required to construct mitigation measures for Alternative A. Since the Project is smaller than Alternative A, this traffic impact study re-analyzes the locations where the opening-day mitigation measures are required for Alternative A to determine if the Project causes a significant impact.

This report includes analysis of the intersections listed below, with the agency having current jurisdiction over the intersection also listed.

1. State Route (SR) 99 Southbound (SB) Ramps and Avenue 17 (Caltrans);
2. SR 99 Northbound (NB) Ramps and Avenue 17 (Caltrans);
3. Golden State Boulevard-Airport Drive and Avenue 17 (City of Madera);
4. Road 23 and Avenue 17 (City of Madera and County of Madera);
5. SR 99 SB Ramps-Road 23 and Avenue 18½ (Caltrans);
6. SR 99 NB Ramps and Avenue 18½ (Caltrans);
7. SR 99 SB Off Ramp and Olive Avenue (Caltrans); and
8. SR 99 SB On Ramp-Olive Avenue and SR 145 (Caltrans).

In addition to the analyses described above, a trip trace (estimate of number of Project trips) will be provided for

- SR 99 / Cleveland Avenue interchange
- SR 99 / Avenue 16 interchange

This report includes analysis of the following road segments:

- Avenue 17 between SR 99 and Road 26 (County of Madera)
- Avenue 17 between Road 26 and Road 27 (City of Madera/County of Madera)

The study time periods include the weekday a.m. and p.m. peak hours determined between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m.

The peak hours are analyzed for the following conditions:

- Existing Conditions
- Existing-Plus-Project Conditions
- Near-Term With-Project Conditions (includes pending projects)

Caltrans has indicated that mitigation measures on State highways to be constructed by the Project to accommodate opening-day conditions should have an operational design capacity of 10 years based on reasonable assumptions of growth in the region. Therefore, any improvements that the Project is required to construct to mitigate opening-day impacts on, or adjacent to, State facilities will also be analyzed for the following scenario:

- 2032 With-Project (includes required Project mitigation measures, identified pending and approved projects, and nominal background growth).

In addition, Year 2042 With-Project Conditions will be analyzed at State facilities to identify ultimate improvements and how the near-term improvement can be integrated into the ultimate configuration.

4.0 LEVEL OF SERVICE

The Transportation Research Board *Highway Capacity Manual, 6th Edition*, (HCM) defines level of service (LOS) as, "A quantitative stratification of a performance measure or measures that represent quality of service, measured on an A-F scale, with LOS A representing the best operating conditions from the traveler's perspective and LOS F the worst." Automobile mode LOS characteristics for both unsignalized and signalized intersections are presented in Tables 1 and 2. Automobile mode LOS characteristics for road segments in Madera County are presented in Table 3.

Table 1
Level of Service Characteristics for Unsignalized Intersections

Level of Service	Average Vehicle Delay (seconds)
A	0-10
B	>10-15
C	>15-25
D	>25-35
E	>35-50
F	>50

Reference: *Highway Capacity Manual, 6th Edition*, Transportation Research Board, 2016

Table 2
Level of Service Characteristics for Signalized Intersections

Level of Service	Description	Average Vehicle Delay (seconds)
A	Volume-to-capacity ratio is no greater than 1.0. Progression is exceptionally favorable or the cycle length is very short.	≤10
B	Volume-to-capacity ratio is no greater than 1.0. Progression is highly favorable or the cycle length is very short.	>10-20
C	Volume-to-capacity ratio is no greater than 1.0. Progression is favorable or cycle length is moderate.	>20-35
D	Volume-to-capacity ratio is high but no greater than 1.0. Progression is ineffective or cycle length is long. Many vehicles stop and individual cycle failures are noticeable.	>35-55
E	Volume-to-capacity ratio is high but no greater than 1.0. Progression is unfavorable and cycle length is long. Individual cycle failures are frequent.	>55-80
F	Volume-to-capacity ratio is greater than 1.0. Progression is very poor and cycle length is long. Most cycles fail to clear the queue.	>80

Reference: *Highway Capacity Manual, 6th Edition*, Transportation Research Board, 2016

Table 3
Capacities Per Hour Per Lane for Various Highway Facilities in Madera County

Level of Service	Freeways	Two-Lane Rural Highway	Multi-Lane Rural Highway	Expressway	Arterial	Collector
A	700	120	470	720	450	300
B	1,100	240	945	840	525	350
C	1,550	395	1,285	960	600	400
D	1,850	675	1,585	1,080	675	450
E	2,000	1,145	1,800	1,200	750	500

Reference: Madera County General Plan Policy Document adopted October 24, 1995

5.0 SIGNIFICANCE CRITERIA

5.1 County of Madera Criteria

According to LOS Policy 2.A.8 in the Transportation and Circulation Section of the General Plan Policy Document, the County shall develop and manage its roadway system to maintain a minimum LOS of D on all State and County roadways.

For purposes of this study, a significant traffic impact will be recognized at County locations if:

- The Project will cause the LOS to decrease below D at an intersection or road segment;
- The Project will cause the LOS to drop from E to F at an intersection or road segment;
- The Project will exacerbate the delay at an intersection already operating below the minimum acceptable LOS by increasing the average delay by 5.0 seconds or more;
- The Project will cause the volume-to-capacity (V/C) ratio (on a directional peak hour basis) to increase by more than 0.05 on a roadway that is already operating below the minimum acceptable LOS; or
- The Project will cause the density (on a directional peak hour basis) to increase by more than 2.25 passenger cars per mile per lane (five percent of the density of 45.0 at the LOS E/F transition) on a roadway that is already operating below the minimum acceptable LOS.

5.2 Caltrans Criteria

Caltrans no longer recognizes LOS as a metric for transportation impacts. However, for consistency with the EIS, for purposes of this study a significant traffic impact will be recognized at State locations if:

- The Project will cause the LOS to decrease below C at an intersection or road segment;
- The Project will cause the LOS to drop from D to E, from D to F, or from E to F at an intersection or road segment;
- The Project will exacerbate the delay at an intersection already operating below the minimum acceptable LOS by increasing the average delay by 5.0 seconds or more.

5.3 City of Madera Criteria

Policy CI-22 of the City of Madera General Plan requires that LOS C or better be maintained in the vicinity of the Project site.

For purposes of this study, a significant traffic impact will be recognized at City locations if:

- The Project will cause the LOS to decrease below C at an intersection or road segment;
- The Project will cause the LOS to drop from D to E, from D to F, or from E to F at an intersection or road segment;
- The Project will exacerbate the delay at an intersection already operating below the minimum acceptable LOS by increasing the average delay by 5.0 seconds or more;
- The Project will cause the volume-to-capacity (V/C) ratio (on a directional peak hour basis) to increase by more than 0.05 on a roadway that is already operating below the minimum acceptable LOS; or
- The Project will cause the density (on a directional peak hour basis) to increase by more than 2.25 passenger cars per mile per lane (five percent of the density of 45.0 at the LOS E/F transition) on a roadway that is already operating below the minimum acceptable LOS.

5.4 Queuing Analyses

Queuing is not included in the significance criteria recognized by the affected agencies; but queuing analyses are typically performed and required to confirm the LOS results and verify that blocking of adjacent lanes and intersections will not occur. A queuing deficiency is identified if the calculated 95th-percentile queue length exceeds the available storage length.

6.0 LANE CONFIGURATIONS AND INTERSECTION CONTROL

The existing lane configurations and intersection control expected to exist at the study locations on opening-day of the Project are presented in Figure 3, Existing Lane Configurations and Intersection Control.

7.0 EXISTING TRAFFIC VOLUMES

Existing peak-hour traffic volumes at the study intersections were determined by performing manual turning-movement counts between 7:00 and 9:00 a.m. and between 4:00 and 6:00 p.m. on a weekday in 2019, prior to the COVID-19 pandemic. The data sheets are attached in Appendix A and indicate the dates the counts were performed. The existing peak-hour turning movement volumes are presented in Figure 4, Existing Peak-Hour Traffic Volumes.

8.0 PROJECT TRIP GENERATION

8.1 Trip Generation

Data provided in the EIS were utilized to estimate the number of trips expected to be generated by the Project. Table 4 presents the trip generation information.

Table 4
Trip Generation Calculations For Proposed Project

Land Use	Size	Daily		A.M. Peak Hour					P.M. Peak Hour				
		Rate	Total	Rate	In:Out	In	Out	Total	Rate	In:Out	In	Out	Total
Casino	233,350	45.30	10,572	2.36	70:30	386	165	551	3.93	53:47	486	431	917

Reference: *Traffic Impact Study, North Fork Casino,* TPG Consulting Incorporated, October 2008
Rates are reported in trips per 1,000 square feet of building area

8.2 Trip Distribution and Assignment

The regional distribution of Project trips is based on the distribution presented in the EIS.

The peak-hour Project traffic volumes presented in Table 4 were generally assigned to the adjacent road network in proportion to the distribution of trips presented in the EIS. The peak-hour Project traffic volumes are presented in Figure 5, Peak Hour Project Traffic Volumes.

8.3 Project Trips at Freeway Interchanges

The estimated number of Project trips expected at the following freeway interchanges is presented in Table 5:

- SR 99 / Cleveland Avenue interchange
- SR 99 / Avenue 16 interchange

Table 5
Phase 1 Trips at Freeway Interchanges

Movement	A.M. Peak Hour	P.M. Peak Hour
NB SR 99 on ramp from Cleveland Avenue	14	22
NB SR 99 off ramp to Cleveland Avenue	0	0
SB SR 99 on ramp from Cleveland Avenue	0	0
SB SR 99 off ramp to Cleveland Avenue	10	27
EB Cleveland Avenue over SR 99	5	6
WB Cleveland Avenue over SR 99	0	0
NB SR 99 on ramp from Gateway Drive	6	1
NB SR 99 off ramp to Avenue 16	0	0
SB SR 99 on ramp from Avenue 16	0	0
SB SR 99 off ramp to Avenue 16	10	27
EB Avenue 16 over SR 99	1	4
WB Avenue 16 over SR 99	0	0
NB SR 99 on ramp from Avenue 16	9	13

9.0 EXISTING PLUS PROJECT TRAFFIC VOLUMES

The existing-plus-Project peak-hour turning movement volumes are presented in Figure 6, Existing-Plus-Project Peak-Hour Traffic Volumes.

10.0 NEAR-TERM AND FUTURE TRAFFIC VOLUMES

The cumulative analyses consider the effects of traffic expected to be generated by other projects in the vicinity of the Project site. The following projects in the vicinity of the Project site are pending, or were pending when the traffic counts were performed, and are considered in the near-term analyses:

- Love’s Travel Center;
- Matilda Torres High School;
- Village D Phase 1;
- Bratton project southwest of the intersection of Avenue 17 and Airport Drive;
- Singh project southeast of the intersection of Avenue 17 and Airport Drive.
- Tentative Parcel Map 4230.

The near-term with-Project traffic volumes are presented in Figure 7, Near-Term With-Project Traffic Volumes.

In addition to the projects listed above, the cumulative year 2032 analyses include the following projects, plus an assumed one percent annual background growth applied to the existing traffic volumes:

- Castellina Development Phases 1 and 2;
- Village D Phase 2;
- Madera Town Center (partial completion: 160,000 square feet of retail);

The year 2032 with-Project traffic volumes are presented in Figure 8, 2032 With-Project Traffic Volumes.

The year 2042 with-Project traffic volumes presented in Figure 9, 2042 Traffic Volumes, were obtained from the traffic study for the Village D project, which utilized the Madera County travel model and assumed City of Madera General Plan buildout, and were increased where necessary to account for the pending projects and to maintain at least the year 2032 traffic volumes on each approach. The volumes were also increased to accommodate the casino Alternative A trips obtained directly from the EIS.

11.0 IMPACT ANALYSES

11.1 Peak Hour Intersection Level of Service

The levels of service at the study intersections were determined using the computer program Synchro 11, which is based on the HCM procedures for calculating levels of service. The intersection analysis sheets are included in the attached Appendix B.

Tables 6 through 8 present the results of the intersection analyses. For the existing conditions, delays and levels of service below the minimum acceptable levels are indicated in bold type and are underlined. For Project scenarios, significant LOS impacts are presented in bold type and are underlined.

Table 6
Intersection LOS Summary – Existing

Intersection	Control Type	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
SR 99 SB-Road 23 / Ave 18½	TWS	**30.1**	**D**	**68.7**	**F**
SR 99 NB / Ave 18½	OWS	**54.1**	**F**	20.3	C
Road 23 / Ave 17	TWS	12.6	B	16.3	C
Golden State-Airport / Ave 17	TWS	16.9	C	24.8	C
SR 99 SB off ramp / Ave 17	OWS	12.4	B	16.2	C
SR 99 NB / Ave 17	OWS	**29.7**	**D**	18.2	C
SR 99 SB off ramp / Olive	Signal	7.4	A	6.7	A
SR 99 SB on ramp-Olive / SR 145	Signal	13.7	B	13.4	B

OWS – One-Way Stop Control TWS – Two-Way Stop Control

Table 7
Intersection LOS Summary - Existing Plus Project

Intersection	Control Type	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
SR 99 SB-Road 23 / Ave 18½	TWS	**49.2**	**E**	**>300**	**F**
SR 99 NB / Ave 18½	OWS	**71.2**	**F**	**26.3**	**D**
Road 23 / Ave 17	TWS	13.3	B	19.5	C
Golden State-Airport / Ave 17	TWS	**37.1**	**E**	**>300**	**F**
SR 99 SB off ramp / Ave 17	OWS	16.7	C	**40.0**	**E**
SR 99 NB / Ave 17	OWS	**140.5**	**F**	**66.8**	**F**
SR 99 SB off ramp / Olive	Signal	7.4	A	6.7	A
SR 99 SB on ramp-Olive / SR 145	Signal	13.9	B	13.7	B

OWS – One-Way Stop Control TWS – Two-Way Stop Control

Table 8
Intersection LOS Summary - Near-Term Plus Project

Intersection	Control Type	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
SR 99 SB-Road 23 / Ave 18½	TWS	**>300**	**F**	**>300**	**F**
SR 99 NB / Ave 18½	OWS	**>300**	**F**	**140.6**	**F**
Road 23 / Ave 17	TWS	14.0	B	22.1	C
Golden State-Airport / Ave 17	TWS	**155.2**	**F**	**>300**	**F**
SR 99 SB off ramp / Ave 17	OWS	**43.4**	**E**	**>300**	**F**
SR 99 NB / Ave 17	OWS	**>300**	**F**	**>300**	**F**
SR 99 SB off ramp / Olive	Signal	7.4	A	6.7	A
SR 99 SB on ramp-Olive / SR 145	Signal	13.9	B	13.7	B

OWS – One-Way Stop Control TWS – Two-Way Stop Control

11.2 Peak-Hour Intersection Queuing

The results of the intersection operational analyses include an estimate of the 95th-percentile queue lengths at the study intersections. The storage capacity and the calculated 95th-percentile queue lengths for the study intersections are presented in Tables 9 and 10. The distances were measured from available aerial photographs. The storage length on off ramps is estimated by measuring from the approximate gore point and subtracting 482 feet to allow for deceleration from 55 miles per hour measured as illustrated in Figure 504.2B of the Caltrans *Highway Design Manual*. Calculated 95th-percentile queues exceeding the available storage length are indicated in bold type and are underlined. Queues exceeding 1,000 feet are also indicated in bold type and are underlined.

Notes and abbreviations for Tables 9 and 10:

L: Left-turn lane T: Through lane R: Right-turn lane

TR: Through lane with a shared right turn

* Storage length greater than 1,000 feet.

\+ Connects to a two-way left-turn lane that provides additional capacity.

All distances reported in feet.

Storage length for through lane is the distance to the next freeway ramp or major intersection.

Reported storage lengths exclude deceleration distance of 482 feet on freeway off ramps measured as illustrated in Figure 504.2B of the Caltrans Highway Design Manual.

Table 9
Intersection Queuing Summary - Existing and Existing Plus Project

Intersection / Approach	Storage Capacity (feet)	95th-Percentile Queue Length (feet) Existing A.M.	Existing P.M.	Existing Plus Project A.M.	Existing Plus Project P.M.
SR 99 SB Ramp – Rd 23 / Ave 18½					
Eastbound	*	DNS	DNS	DNS	DNS
Westbound	*	3	8	5	10
Northbound L	*	58	48	95	235
Northbound R	25	15	13	18	18
Southbound	765	55	235	90	410
SR 99 NB Ramps / Ave 18½					
Eastbound L	145	18	10	18	13
Eastbound T	740	DNS	DNS	DNS	DNS
Westbound	*	DNS	DNS	DNS	DNS
Northbound	600	205	70	240	93
Rd 23 / Ave 17					
Eastbound	*	5	10	8	23
Westbound	*	15	15	18	18
Northbound	*	0	0	0	0
Southbound	*	0	5	0	5
Golden St-Airport / Ave 17					
Eastbound L	120	0	0	0	3
Eastbound T	*	DNS	DNS	DNS	DNS
Eastbound R	130	DNS	DNS	DNS	DNS
Westbound L	75	8	5	8	5
Westbound T	365	DNS	DNS	DNS	DNS
Westbound R	120	DNS	DNS	DNS	DNS
Northbound L	60+	0	3	0	5
Northbound TR	*	15	30	43	113
Southbound	*	28	60	125	**>1,000**
SR 99 SB Off Ramp / Ave 17					
Eastbound T	390	DNS	DNS	DNS	DNS
Westbound T	770	DNS	DNS	DNS	DNS
Southbound L	600	8	28	13	73
Southbound R	600	5	5	5	5
SR 99 NB Ramps / Ave 17					
Eastbound L	115	5	5	5	5
Eastbound T	840	DNS	DNS	DNS	DNS
Westbound T	*	DNS	DNS	DNS	DNS
Westbound R	50	DNS	DNS	DNS	DNS
Northbound L	550	48	20	270	183
Northbound R	550	23	73	25	93
SR 99 SB Off Ramp / Olive					
Eastbound T (1 lane)	85	46	46	47	46
Eastbound T (2 lanes)	630	46	46	47	46
Westbound T (2 lanes)	108	57	53	58	53
Southbound L	25	**100**	**87**	**102**	**90**
Southbound R	690	46	19	46	21
SR 99 SB On Ramp-Olive / SR 145					
Eastbound L	125	**157**	**143**	**164**	**148**
Eastbound LT	125	**162**	**145**	**167**	**149**
Eastbound R	125	47	54	48	56
Northbound L (2 lanes)	125	49	48	50	50
Northbound TR (2 lanes)	*	182	158	192	170
Southbound L	100	68	**110**	69	**113**
Southbound TR (2 lanes)	325	114	104	116	106

Table 10
Intersection Queuing Summary - Existing and Near-Term Plus Project

Intersection / Approach	Storage Capacity (feet)	95th-Percentile Queue Length (feet)			
		Existing		Near Term Plus Project	
		A.M.	P.M.	A.M.	P.M.
SR 99 SB Ramp – Rd 23 / Ave 18½					
Eastbound	*	DNS	DNS	DNS	DNS
Westbound	*	3	8	5	10
Northbound L	*	58	48	100	248
Northbound R	25	15	13	20	18
Southbound	765	55	235	598	593
SR 99 NB Ramps / Ave 18½					
Eastbound L	145	18	10	20	18
Eastbound T	740	DNS	DNS	DNS	DNS
Westbound	*	DNS	DNS	DNS	DNS
Northbound	600	205	70	**>1,000**	338
Rd 23 / Ave 17					
Eastbound	*	5	10	13	35
Westbound	*	15	15	20	28
Northbound	*	0	0	0	0
Southbound	*	0	5	0	5
Golden St-Airport / Ave 17					
Eastbound L	120	0	0	0	3
Eastbound T	*	DNS	DNS	DNS	DNS
Eastbound R	130	DNS	DNS	DNS	DNS
Westbound L	75	8	5	10	13
Westbound T	365	DNS	DNS	DNS	DNS
Westbound R	120	DNS	DNS	DNS	DNS
Northbound L	60+	0	3	3	13
Northbound TR	*	15	30	75	255
Southbound	*	28	60	285	**>1,000**
SR 99 SB Off Ramp / Ave 17					
Eastbound T	390	DNS	DNS	DNS	DNS
Westbound T	770	DNS	DNS	DNS	DNS
Southbound L	600	8	28	125	525
Southbound R	600	5	5	8	8
SR 99 NB Ramps / Ave 17					
Eastbound L	115	5	5	10	8
Eastbound T	840	DNS	DNS	DNS	DNS
Westbound T	*	DNS	DNS	DNS	DNS
Westbound R	50	DNS	DNS	DNS	DNS
Northbound L	550	48	20	**643**	**590**
Northbound R	550	23	73	78	413
SR 99 SB Off Ramp / Olive					
Eastbound T (1 lane)	85	46	46	47	46
Eastbound T (2 lanes)	630	46	46	47	46
Westbound T (2 lanes)	108	57	53	58	53
Southbound L	25	**100**	**87**	**102**	**90**
Southbound R	690	46	19	46	21
SR 99 SB On Ramp-Olive / SR 145					
Eastbound L	125	**157**	**143**	**164**	**148**
Eastbound LT	125	**162**	**145**	**167**	**149**
Eastbound R	125	47	54	48	56
Northbound L (2 lanes)	125	49	48	50	50
Northbound TR (2 lanes)	*	182	158	192	170
Southbound L	100	68	**110**	69	**113**
Southbound TR (2 lanes)	325	114	104	116	106

11.3 Peak Hour Road Segment Level of Service

The results of the road segment analyses are presented in Table 11 and 12. The Avenue 17 road segment volumes are based on intersection volumes at Road 26. The Love's Truck Stop is located on Avenue 17 between SR 99 and Road 26, and the Environmental Impact Report (EIR) for the Love's project included analysis of Avenue 17 and identified significant impacts to Avenue 17 adjacent to the Love's site. The roadway has been improved. Therefore, since the Love's EIR considered a cumulative scenario, for purposes of these analyses it is assumed that cumulative impacts to Avenue 17 between SR 99 and Walden Drive have been addressed by the Love's project. LOS impacts are presented in bold type and are underlined.

Table 11
Avenue 17 Road Segment LOS Summary – A.M. Peak Hour

Scenario	Eastbound				Westbound			
	West of Road 26		Road 26 to Road 27		Road 27 to Road 26		West of Road 26	
	Volume Per Lane	LOS	Volume Per Lane	LOS	Volume Per Lane	LOS	Volume Per Lane	LOS
Existing	190	A	245	A	232	A	236	A
Existing Plus Project	208	A	280	A	300	A	270	A
Near Term Plus Project	300	A	464	B	443	A	342	A

Note: All scenarios assume Avenue 17 is a four-lane arterial west of Road 26 and a two-lane arterial east of Road 26.

Table 12
Avenue 17 Road Segment LOS Summary – P.M. Peak Hour

Scenario	Eastbound				Westbound			
	West of Road 26		Road 26 to Road 27		Road 27 to Road 26		West of Road 26	
	Volume Per Lane	LOS	Volume Per Lane	LOS	Volume Per Lane	LOS	Volume Per Lane	LOS
Existing	247	A	286	A	193	A	131	A
Existing Plus Project	292	A	376	A	282	A	175	A
Near Term Plus Project	487	A	**<u>766</u>**	**<u>F</u>**	579	C	324	A

Note: All scenarios assume Avenue 17 is a four-lane arterial west of Road 26 and a two-lane arterial east of Road 26.

12.0 DISCUSSION OF IMPACT ANALYSES

12.1 Existing Conditions

The results of the intersection analyses indicate that the following study intersections are currently operating at levels of service below the target LOS:

- SR 99 Southbound Ramps-Road 23 / Avenue 18½ (a.m. and p.m. peak hours);
- SR 99 Northbound Ramps / Avenue 18½ (a.m. peak hour); and
- SR 99 Northbound Ramps / Avenue 17 (a.m. peak hour).

The other study intersections are operating at acceptable levels of service.

The results of the queuing analyses indicate that the calculated 95th-percentile queues exceed the storage capacity at the following locations:

- SR 99 Southbound Off Ramp / Olive Avenue (calculated queue length exceeds storage length in the short, striped storage lanes on the southbound approach, but total calculated queues do not exceed available storage capacity);
- SR 99 Southbound On Ramp-Olive Avenue / SR 145 (queue length exceeds storage length in the eastbound left-turn and eastbound left/through lanes during both the a.m. and p.m. peak hours, and in the southbound left-turn lane during the p.m. peak hour).

The results of the road segment analyses indicate that the study road segments are currently operating at acceptable levels of service.

12.2 Existing Plus Project Conditions

The existing-plus-Project conditions analyses represent conditions that would occur after construction of the Project in the absence of other pending projects and regional growth. This scenario isolates the specific impacts of the Project.

The analyses indicate that the Project is expected to cause significant traffic impacts at the following locations:

- SR 99 Southbound Off Ramp-Road 23 / Avenue 18½ (causes the LOS to drop from D to E during the a.m. peak hour and causes the delay associated with the existing LOS F to increase substantially during the p.m. peak hour);
- SR 99 Northbound Ramps / Avenue 18½ (causes the delay associated with the existing LOS F to increase substantially during the a.m. peak hour and causes the LOS to drop from C to D during the p.m. peak hour);
- Golden State Boulevard-Airport Drive / Avenue 17 (causes the LOS to drop from C to E during the a.m. peak hour and from C to F during the p.m. peak hour);
- SR 99 Southbound Off Ramp / Avenue 17 (causes the LOS to drop from C to E during the p.m. peak hour); and
- SR 99 Northbound Ramps / Avenue 17 (causes the LOS to drop from D to F during the a.m. peak hour and from C to F during the p.m. peak hour).

The other study locations are either expected to continue to operate at acceptable levels of service.

The Project does not significantly increase calculated queues at the study intersections, except on the southbound approach to the intersection of Golden State Boulevard-Airport Drive / Avenue 17.

The study road segments are expected to continue to operate acceptable levels of service.

Mitigation of the significant traffic impacts caused by the Project will be required to accommodate the pending projects and an additional 10 years of growth. Therefore, mitigation measures will be discussed in a following section of this report.

12.3 Near-Term Plus Project Conditions

The near-term analyses represent conditions that would occur after construction of the Project and the cumulative projects described above. This scenario isolates the cumulative near-term impacts of the Project and the pending/approved projects.

The analyses indicate that the cumulative near-term projects are expected to cause significant traffic impacts with potentially excessive queues at the following locations:

- SR 99 Southbound Off Ramp-Road 23 / Avenue 18½ (cause the LOS to drop from D to F during the a.m. peak hour and causes the delay associated with the existing LOS F to increase substantially during the p.m. peak hour);
- SR 99 Northbound Ramps / Avenue 18½ (cause the delay associated with the existing LOS F to increase substantially during the a.m. peak hour and causes the LOS to drop from C to F during the p.m. peak hour);
- Golden State Boulevard-Airport Drive / Avenue 17 (cause the LOS to drop from C to F during both the a.m. and p.m. peak hours);
- SR 99 Southbound Off Ramp / Avenue 17 (cause the LOS to drop from B to E during the a.m. peak hour and from C to F during the p.m. peak hour); and
- SR 99 Northbound Ramps / Avenue 17 (causes the LOS to drop from D to F during the a.m. peak hour and from C to F during the p.m. peak hour).

The following study intersections are not expected to be significantly impacted based on LOS or queuing:

- Road 23 and Avenue 17;
- SR 99 SB Off Ramp and Olive Avenue; and
- SR 99 SB On Ramp-Olive Avenue and SR 145.

The cumulative near-term projects are expected to cause the eastbound direction of Avenue 17 between Road 26 and Road 27 to operate at LOS F during the p.m. peak hour.

12.4 Impacts and Mitigation Measures

The significant impacts and discussions of the recommended improvements to mitigate the impacts are summarized and discussed in the following sections. Caltrans has indicated that mitigation measures on State highways to be constructed by the Project to accommodate opening-day conditions should have an operational design capacity of 10 years based on reasonable assumptions of growth in the region. Therefore, the recommended mitigation measures on, or adjacent to, interchanges are based on the year 2032 traffic volumes. The mitigated intersection analysis sheets are presented in Appendix C. For roundabouts, Sidra Intersection 9.0 Plus software was utilized using the Sidra Standard model with an environmental factor of 1.1.

Impact 1

At the intersection of the SR 99 Southbound Off Ramp-Road 23 and Avenue 18½, which is already operating at LOS D during the a.m. peak hour and LOS F during the p.m. peak hour, the Project contributes to increased delays associated with LOS F during both peak hours.

Recommended Improvement 1

The intersection of the SR 99 Southbound Off Ramp-Road 23 and Avenue 18½ should be signalized with protected left-turn phasing in the westbound direction and split phasing in the north-south direction. The intersection will require associated geometry/striping modifications to achieve the following lane configurations:

Eastbound: one through lane with a shared right turn;

Westbound: one left-turn lane and one through lane (the loop on ramp may remain in its existing location);

Northbound: one left-turn lane and one right-turn lane

Southbound: one left-turn lane, one through lane, and one right-turn lane.

As an alternative to signalization, a single-lane roundabout with dedicated right-turn bypass lanes on the eastbound, northbound, and southbound approaches is expected to operate at acceptable LOS. The southbound on ramp from westbound Avenue 18½ would be incorporated into the roundabout. Two exiting lanes are recommended on the eastbound and westbound exits. The eastbound exit may include a trap lane directed to the existing southbound on ramp south of Avenue 18½.

With implementation of one of these improvements the intersection would operate at acceptable LOS as presented in Table 13 with queues as presented in Tables 14 and 15. It is expected that an ICE report in accordance with Caltrans criteria will be required to determine the exact intersection control and lane configurations prior to obtaining an encroachment permit, and it is expected that the year 2042 configuration will be considered to avoid constructing throwaway improvements and to facilitate future expansion.

Impact 2

At the intersection of the SR 99 Northbound Ramps and Avenue 18½, which is operating at LOS F during the a.m. peak hour and LOS C during the p.m. peak hour, the Project contributes to increased delays associated with LOS F during both peak hours.

Recommended Improvement 2

The intersection of the SR 99 Northbound Ramps and Avenue 18½ should be signalized with protected left-turn phasing in the eastbound direction. The intersection will require associated geometry/striping modifications to achieve the following lane configurations:

Eastbound: one left-turn lane and one through lane (already existing);

Westbound: one through lane with a shared right turn (already existing);

Northbound: one left-turn lane and one right-turn lane (requires widening of ramp)

As an alternative to signalization, a single-lane roundabout with a dedicated right-turn lane on the northbound approach is expected to operate at acceptable LOS.

With implementation of one of these improvements the intersection would operate at acceptable LOS as presented in Table 13 with queues as presented in Tables 14 and 15. It is expected that an ICE report in accordance with Caltrans criteria will be required to determine the exact intersection control and lane configurations prior to obtaining an encroachment permit, and it is expected that the year 2042 configuration will be considered to avoid constructing throwaway improvements and to facilitate future expansion.

Impact 3

At the intersection of Golden State Boulevard-Airport Drive and Avenue 17, the Project contributes to a drop from LOS C to LOS F during both the a.m. and p.m. peak hours.

Recommended Improvement 3

The intersection of Golden State Boulevard-Airport Drive and Avenue 17 should be should be signalized with eight-phase protected left-turn phasing. The intersection will require associated geometry/striping modifications to achieve the following lane configurations:

Eastbound: one left-turn lane, one through lane, and one right-turn lane (already existing);

Westbound: one left-turn lane, one through lane, and one right-turn lane (already existing);

Northbound: one left-turn lane, one through lane, and one right-turn lane (requires striping/installation of right-turn lane);

Southbound: one left-turn lane and one through lane with a shared right turn (requires widening).

As an alternative to signalization, a single-lane roundabout is expected to operate at acceptable LOS.

With implementation of one of these improvements the intersection would operate at acceptable LOS as presented in Table 13 with queues as presented in Tables 14 and 15. Due to the proximity of the intersection to the SR 99 interchange, the intersection should be considered in the ICE report for the interchange.

Impact 4

At the intersection of the SR 99 Southbound Off Ramp and Avenue 17, the Project contributes to a drop from LOS B to LOS E during the a.m. peak hour and from LOS C to LOS F during the p.m. peak hour.

Recommended Improvement 4

The intersection of the SR 99 Southbound Off Ramp and Avenue 17 should be signalized with the existing lane configurations.

As an alternative to signalization, a two-lane roundabout is expected to operate at acceptable LOS. A single circulating lane may be installed adjacent to the east and west legs. The southbound approach may consist of one dedicated left-turn lane and one dedicated right-turn lane. The southbound on ramp from westbound Avenue 17 would be incorporated into the roundabout. Two exiting lanes are recommended on the eastbound and westbound exits. The eastbound exit may include a trap lane directed to the existing southbound on ramp south of Avenue 17.

With implementation of one of these improvements the intersection would operate at acceptable LOS as presented in Table 13 with queues as presented in Tables 14 and 15. It is expected that an ICE report in accordance with Caltrans criteria will be required to determine the exact intersection control and lane configurations prior to obtaining an encroachment permit, and it is expected that the year 2042 configuration will be considered to avoid constructing throwaway improvements and to facilitate future expansion.

Impact 5

At the intersection of the SR 99 Northbound Ramps and Avenue 17, the Project contributes to a drop from LOS D to LOS F during the a.m. peak hour and from LOS C to LOS F during the p.m. peak hour.

Recommended Improvement 5

The intersection of the SR 99 Northbound Ramps and Avenue 17 should be signalized with protected left-turn phasing. The intersection will require associated geometry/striping modifications to achieve the following lane configurations:

Eastbound: one left-turn lane and one through lane (already existing);

Westbound: one through lane and one right-turn lane (requires striping/installation of right-turn lane);

Northbound: one left-turn lane and one right-turn lane (already existing).

As an alternative to signalization, a roundabout is expected to operate at acceptable LOS. The roundabout would require two entry lanes from the westbound approach, two entry lanes (including a dedicated right-turn lane) from the northbound approach, and one entry lane from the eastbound approach. Two circulating lanes would be installed adjacent to the north leg, while one circulating lane would be required adjacent to the south and east legs.

With implementation of one of these improvements the intersection would operate at acceptable LOS as presented in Table 13 with queues as presented in Tables 14 and 15. It is expected that an ICE report in accordance with Caltrans criteria will be required to determine the exact intersection control and lane configurations prior to obtaining an encroachment permit, and it is expected that the year 2042 configuration will be considered to avoid constructing throwaway improvements and to facilitate future expansion.

Impact 6

On the Avenue 17 eastbound lane between Road 26 and Road 27, the cumulative projects contribute to a drop from LOS A to LOS F.

Recommended Improvement 6

It is noted that the impact only occurs in the near-term condition, while the road segment is expected to continue to operate at LOS A in the existing-plus-Project condition. Therefore, it is suggested that the improvements may be deferred to Phase 2 of the Project or to other pending projects, such as Castellina.

Table 13 presents calculated delays and levels of service for the mitigated year 2032 conditions. Tables 14 and 15 present the calculated 95th-percentile queues for the mitigated conditions. Mitigated intersection analysis sheets are presented in the attached Appendix C.

Table 13
Mitigated Intersection LOS Summary – Year 2032 Conditions

Intersection	Control Type	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
SR 99 SB-Road 23 / Ave 18½	Signals	15.0	B	24.7	C
	Roundabout	7.1	A	8.0	A
SR 99 NB / Ave 18½	Signals	45.8	D	25.3	C
	Roundabout	14.2	B	18.9	C
Golden State-Airport / Ave 17	Signals	15.1	B	29.8	C
	Roundabout	8.5	A	17.2	C
SR 99 SB / Ave 17	Signals	7.5	A	16.2	B
	Roundabout	6.1	A	7.6	A
SR 99 NB / Ave 17	Signals	40.4	D	35.7	D
	Roundabout	10.0	A	14.2	B

Table 14
Mitigated Intersection Queuing Summary – Year 2032 Conditions (Signalized)

Intersection	95th-Percentile Queue Length (feet)	
Approach	A.M.	P.M.
SR 99 SB-Road 23 / Ave 18½		
Eastbound TR (1 lane)	583	750
Westbound L (1 lane)	88	190
Westbound T (1 lane)	173	148
Northbound L (1 lane)	111	96
Northbound R (1 lane)	193	106
Southbound L (1 lane)	175	69
Southbound T (1 lane)	200	469
Southbound R (1 lane)	51	52
SR 99 NB / Ave 18½		
Eastbound L (1 lane)	428	346
Eastbound T (1 lane)	94	49
Westbound TR (1 lane)	273	571
Northbound LT (1 lane)	291	273
Northbound R (1 lane)	58	44
Golden State-Airport / Ave 17		
Eastbound L (1 lane)	25	41
Eastbound T (1 lane)	145	303
Eastbound R (1 lane)	0	0
Westbound L (1 lane)	168	206
Westbound T (1 lane)	103	134
Westbound R (1 lane)	52	37
Northbound L (1 lane)	22	48
Northbound T (1 lane)	65	144
Northbound R (1 lane)	35	54
Southbound L (1 lane)	163	565
Southbound TR (1 lane)	43	100
SR 99 SB Ramps / Avenue 17		
Eastbound T (1 lane)	178	897
Westbound T (1 lane)	220	396
Southbound L (1 lane)	117	421
Southbound R (1 lane)	22	35
SR 99 NB Ramps / Avenue 17		
Eastbound L (1 lane)	124	138
Eastbound T (1 lane)	157	653
Westbound T (1 lane)	1,090	817
Westbound R (1 lane)	78	140
Northbound LT (1 lane)	370	253
Northbound R (1 lane)	92	477

Table 15
Mitigated Intersection Queuing Summary – Year 2032 Conditions (Roundabouts)

Intersection	95th-Percentile Queue Length (feet)	
Approach	A.M.	P.M.
SR 99 SB-Road 23 / Ave 18½		
Eastbound LT (1 lane)	136	171
Eastbound R (1 lane)	0	0
Westbound LTR (1 lane)	104	164
Northbound LTR (1 lane)	46	27
Northbound R (1 lane)	0	0
Southbound LTR (1 lane)	87	124
Southbound R (1 lane)	0	0
SR 99 NB / Ave 18½		
Eastbound LT (1 lane)	0	0
Westbound TR (1 lane)	159	507
Northbound LT (1 lane)	134	40
Northbound R (1 lane)	163	19
Golden State-Airport / Ave 17		
Eastbound LTR (1 lane)	37	180
Westbound LTR (1 lane)	126	216
Northbound LTR (1 lane)	50	253
Southbound LTR (1 lane)	50	225
SR 99 SB Ramps / Avenue 17		
Eastbound LT (1 lane)	34	103
Eastbound T (1 lane)	35	99
Westbound T (1 lane)	80	76
Westbound TR (1 lane)	105	78
Southbound L (1 lane)	35	60
Southbound R (1 lane)	13	13
SR 99 NB Ramps / Avenue 17		
Eastbound LT (1 lane)	0	0
Westbound T (1 lane)	233	130
Westbound TR (1 lane)	233	125
Northbound LT (1 lane)	50	102
Northbound R (1 lane)	64	438

12.5 Comparison of Mitigation Measures

Table 16 presents a comparison of the mitigation measures identified in the EIS and those that are required for the Project.

Table 16
Comparison of Mitigation Measures

Location	EIS 2010 Mitigation Measure	Recommended Project Mitigation Measure
SR 99 SB-Road 23 / Ave 18½	Traffic signals*	Traffic signals with geometry modifications or roundabout
SR 99 NB / Ave 18½	Traffic signals	Traffic signals with geometry modifications or roundabout
Road 23 / Ave 17	Traffic signals	None required
Golden State-Airport / Ave 17	Traffic signals and intersection widening	Traffic signals with geometry modifications or roundabout
SR 99 SB / Ave 17	Traffic signals and intersection widening	Traffic signals or roundabout
SR 99 NB / Ave 17	Traffic signals and intersection widening	Traffic signals with geometry modifications or roundabout
SR 99 SB off ramp / Olive	Widen north leg	None required
SR 99 SB on ramp-Olive / SR 145	Widen west leg	None required
Avenue 17 – SR 99 to Road 26	Widen to four lanes	None required
Avenue 17 – Road 26 to Road 27	Widen to four lanes	Defer widening of eastbound.

* The EIS indicates that one-year traffic monitoring is required and the signals may be turned off if signal warrants are not met within one year. Signal turn-off is at the discretion of Caltrans.

It is important to note that these analyses are not intended to relieve the casino project of its obligation to complete the mitigation measures outlined in the EIS. Rather, these analyses identify which of the significant impacts already identified in the EIS will be triggered by the Project, and which mitigation measures identified in the EIS should be constructed to mitigate the significant impacts caused by the Project.

13.0 YEAR 2042 ANALYSES

The purpose of the year 2042 analyses is to identify the intersection configurations expected to be required by 2042 to potentially coordinate the Project's year 2032 mitigation measures with the year 2042 configuration. A description of the recommended configurations is presented below. The actual improvements required are expected to be more specifically determined after completion of the ICE reports. The intersection analysis sheets are presented in Appendix D. For roundabouts in the year 2042, Sidra Intersection 9.0 Plus software was utilized using the Sidra Standard model with an environmental factor of 1.05.

Year 2042 Improvement 1 - SR 99 Southbound Off Ramp-Road 23 and Avenue 18½

The intersection of the SR 99 Southbound Off Ramp-Road 23 and Avenue 18½ should be signalized with protected left-turn phasing in the westbound direction and split phasing in the north-south direction. The intersection will require associated geometry/striping modifications to achieve the following lane configurations:

Eastbound: one through lane and one right-turn lane;

Westbound: one left-turn lane and one through lane (the loop on ramp may remain in its existing location, this is the same configuration as that recommended for 2032);

Northbound: one left-turn lane and one right-turn lane (this is the same configuration as that recommended for 2032);

Southbound: one left-turn lane, one through lane, and one right-turn lane (this is the same configuration as that recommended for 2032).

As an alternative to signalization, a roundabout with two entry lanes on the eastbound, northbound, and southbound approaches and one entry lane on the westbound approach is expected to operate at acceptable LOS. It is recommended that the northbound approach include a dedicated right-turn lane. The southbound on ramp from westbound Avenue 18½ would be incorporated into the roundabout. Two exiting lanes are recommended on the eastbound, westbound, and southbound exits. The eastbound exit may include a trap lane directed to the existing southbound on ramp south of Avenue 18½.

With implementation of one of these improvements the intersection would operate at acceptable LOS as presented in Table 17 with queues as presented in Tables 18 and 19.

Year 2042 Improvement 2 - SR 99 Northbound Ramps and Avenue 18½

The intersection of the SR 99 Northbound Ramps and Avenue 18½ should be signalized with protected left-turn phasing in the eastbound direction. The intersection will require associated geometry/striping modifications to achieve the following lane configurations:

Eastbound: two left-turn lanes and one through lane;

Westbound: one through lane with a shared right turn (same as existing);

Northbound: one left-turn lane and one right-turn lane (this is the same configuration as that recommended for 2032).

As an alternative to signalization, a roundabout with two entry lanes on each approach, including a dedicated right-turn lane on the northbound approach, is expected to operate at acceptable LOS. The eastbound and westbound exits would require only one lane, while the roundabout should include two lanes to accommodate the eastbound-to-northbound left turn, including two northbound exit lanes.

With implementation of one of these improvements the intersection would operate at acceptable LOS as presented in Table 17 with queues as presented in Tables 18 and 19.

Year 2042 Improvement 3 - Golden State Boulevard-Airport Drive and Avenue 17

The intersection of Golden State Boulevard-Airport Drive and Avenue 17 should be should be signalized with eight-phase protected left-turn phasing. The intersection will require associated geometry/striping modifications to achieve the following lane configurations:

Eastbound: one left-turn lane, two through lanes, and one right-turn lane;

Westbound: one left-turn lane, two through lanes, and one right-turn lane;

Northbound: one left-turn lane, one through lane, and one right-turn lane (this is the same configuration as that recommended for 2032);

Southbound: two left-turn lanes and one through lane with a shared right turn.

As an alternative to signalization, a two-lane roundabout with three westbound lanes entering and exiting is expected to operate at acceptable LOS.

With implementation of one of these improvements the intersection would operate at acceptable LOS as presented in Table 17 with queues as presented in Tables 18 and 19.

Year 2042 Improvement 4 - SR 99 Southbound Off Ramp and Avenue 17

The intersection of the SR 99 Southbound Off Ramp and Avenue 17 should be signalized with associated geometry/striping modifications to achieve the following lane configurations:

Eastbound: two through lanes;

Westbound: two through lanes;

Southbound: one left-turn lane and one right-turn lane (already exists).

As an alternative to signalization, a two-lane roundabout with three eastbound lanes is expected to operate at acceptable LOS. A single circulating lane may be installed adjacent to the east and west legs. The southbound approach may consist of one dedicated left-turn lane and one dedicated right-turn lane. The southbound on ramp from westbound Avenue 17 would be incorporated into the roundabout. Three exiting lanes are recommended on the eastbound exit and two exiting lanes are recommended on the westbound exit.

With implementation of one of these improvements the intersection would operate at acceptable LOS as presented in Table 17 with queues as presented in Tables 18 and 19.

Year 2042 Improvement 5 - SR 99 Northbound Ramps and Avenue 17

The intersection of the SR 99 Northbound Ramps and Avenue 17 should be signalized with protected left-turn phasing. The intersection will require associated geometry/striping modifications to achieve the following lane configurations:

Eastbound: one left-turn lane and two through lanes;

Westbound: two through lanes and one right-turn lane;

Northbound: two left-turn lanes and one right-turn lane.

As an alternative to signalization, a roundabout is expected to operate at acceptable LOS. The roundabout would require three entry lanes from the westbound approach, three entry lanes from the northbound approach (including a dedicated left-turn lane, a left/through/right lane, and a dedicated right-turn lane), and two entry lanes from the eastbound approach. Three circulating lanes would be installed adjacent to the north leg, while two circulating lanes would be required adjacent to the south and east legs.

With implementation of one of these improvements the intersection would operate at acceptable LOS as presented in Table 17 with queues as presented in Tables 18 and 19.

Table 17 presents calculated delays and levels of service for the intersection configurations estimated to be required in the year 2042 conditions. Tables 18 and 19 present the calculated 95^{th}-percentile queues for the year 2042 conditions. The year 2042 intersection analysis sheets are presented in the attached Appendix D.

Table 17
Mitigated Intersection LOS Summary – Year 2042 Conditions

Intersection	Control Type	A.M. Peak Hour		P.M. Peak Hour	
		Delay (sec)	LOS	Delay (sec)	LOS
SR 99 SB-Road 23 / Ave 18½	Signals	14.9	B	41.3	D
	Roundabout	13.4	B	16.4	C
SR 99 NB / Ave 18½	Signals	21.0	C	31.5	C
	Roundabout	11.0	B	11.0	B
Golden State-Airport / Ave 17	Signals	34.6	C	38.2	D
	Roundabout	19.4	C	20.1	C
SR 99 SB / Ave 17	Signals	10.7	B	24.4	C
	Roundabout	8.8	A	16.8	C
SR 99 NB / Ave 17	Signals	17.4	B	41.2	D
	Roundabout	14.1	B	7.4	A

Table 18
Mitigated Intersection Queuing Summary – Year 2042 Conditions (Signalized)

Intersection	95th-Percentile Queue Length (feet)	
Approach	A.M.	P.M.
SR 99 SB-Road 23 / Ave 18½		
Eastbound T (1 lane)	607	595
Eastbound R (1 lane)	42	164
Westbound L (1 lane)	112	216
Westbound T (1 lane)	287	247
Northbound L (1 lane)	169	202
Northbound R (1 lane)	854	166
Southbound L (1 lane)	215	67
Southbound T (1 lane)	474	891
Southbound R (1 lane)	58	66
SR 99 NB / Ave 18½		
Eastbound L (2 lanes)	345	262
Eastbound T (1 lane)	98	80
Westbound TR (1 lane)	246	736
Northbound LT (1 lane)	264	269
Northbound R (1 lane)	78	45
Golden State-Airport / Ave 17		
Eastbound L (1 lane)	47	80
Eastbound T (2 lanes)	614	455
Eastbound R (1 lane)	124	70
Westbound L (1 lane)	406	329
Westbound T (2 lanes)	143	526
Westbound R (1 lane)	41	169
Northbound L (1 lane)	183	327
Northbound T (1 lane)	138	128
Northbound R (1 lane)	63	221
Southbound L (2 lanes)	146	250
Southbound TR (1 lane)	83	145
SR 99 SB Ramps / Avenue 17		
Eastbound T (2 lanes)	548	734
Westbound T (2 lanes)	242	668
Southbound L (1 lane)	287	510
Southbound R (1 lane)	68	99
SR 99 NB Ramps / Avenue 17		
Eastbound L (1 lane)	192	282
Eastbound T (2 lanes)	246	354
Westbound T (2 lanes)	499	758
Westbound R (1 lane)	150	205
Northbound LT (2 lanes)	232	380
Northbound R (1 lane)	314	543

Table 19
Mitigated Intersection Queuing Summary – Year 2042 Conditions (Roundabouts)

Intersection	95th-Percentile Queue Length (feet)	
Approach	A.M.	P.M.
SR 99 SB-Road 23 / Ave 18½		
Eastbound LT (1 lane)	52	181
Eastbound TR (1 lane)	52	199
Westbound LTR (1 lane)	114	223
Northbound LTR (1 lane)	200	70
Northbound R (1 lane)	210	71
Southbound LT (1 lane)	81	206
Southbound TR (1 lane)	83	223
SR 99 NB / Ave 18½		
Eastbound L (1 lane)	0	0
Eastbound LT (1 lane)	0	0
Westbound T (1 lane)	59	209
Westbound R (1 lane)	19	44
Northbound LT (1 lane)	92	39
Northbound R (1 lane)	114	20
Golden State-Airport / Ave 17		
Eastbound LT (1 lane)	487	253
Eastbound TR (1 lane)	523	274
Westbound LT (1 lane)	48	135
Westbound T (1 lane)	48	135
Westbound TR (1 lane)	51	132
Northbound LT (1 lane)	102	180
Northbound TR (1 lane)	117	208
Southbound LT (1 lane)	31	257
Southbound TR (1 lane)	14	49
SR 99 SB Ramps / Avenue 17		
Eastbound LT (1 lane)	105	273
Eastbound T (2 lanes)	110	291
Westbound T (1 lane)	161	420
Westbound TR (1 lane)	161	441
Southbound L (1 lane)	55	253
Southbound R (1 lane)	29	37
SR 99 NB Ramps / Avenue 17		
Eastbound LT (1 lane)	0	0
Eastbound T (1 lane)	0	0
Westbound T (2 lanes)	248	89
Westbound TR (1 lane)	289	93
Northbound L (1 lane)	93	34
Northbound LTR (1 lane)	93	34
Northbound R (1 lane)	109	36

14.0 EQUITABLE SHARE RESPONSIBILITY

Where required improvements are not included in a traffic impact fee, the Project's financial responsibility for the improvements can be determined based on equitable share calculations as presented in the Caltrans *Guide for the Preparation of Traffic Impact Studies* dated December 2002.

Caltrans has typically utilized the following equation to determine a project's equitable share of the cost of improvements:

$$P = \frac{T}{T_B - T_E}$$

where:

P = The equitable share of the project's traffic impact;
T = The project trips generated during the peak hour of the adjacent facility;
T_B = The forecasted (future with project) traffic volume on the impacted facility;
T_E = The existing traffic on the facility plus approved projects traffic (cumulative).

Table 20 presents equitable share responsibility calculations for the Project based on the 2042 p.m. peak hour traffic volumes.

Table 20
Equitable Share Responsibility Calculations – P.M. Peak Hour

Location	Project Trips	Existing Traffic	2042 Traffic	Equitable Share
SR 99 SB-Road 23 / Ave 18½	132	1,185	2,574	9.50%
SR 99 NB / Ave 18½	66	553	1,725	5.63%
Road 23 / Ave 17	106	525	4,414	2.73%
Golden State-Airport / Ave 17	600	697	4,152	17.37%
SR 99 SB off ramp / Ave 17	469	728	3,848	15.03%
SR 99 NB / Ave 17	324	1,100	4,751	8.87%
SR 99 SB off ramp / Olive	25	1,077	2,530	1.72%
SR 99 SB on ramp-Olive / SR 145	51	1,925	4,233	2.21%
Avenue 17 west of Road 26	179	754	2,921	8.26%
Avenue 17 between Roads 26 and 27	179	479	2,292	9.87%

15.0 CONCLUSIONS AND RECOMMENDATIONS

Generally-accepted traffic engineering principles and methods were employed to estimate the amount of traffic expected to be generated by the Project, to analyze the existing traffic conditions, and to analyze the traffic conditions projected to occur in the future.

The traffic impact study found that the Project will cause certain near-term significant impacts that were previously identified in the EIS, while other near-term significant impacts identified in the EIS will not occur with the Project. The near-term significant impacts that will be caused by the Project can be mitigated to acceptable levels with an expected operational design life of 10 years as requested by Caltrans.

The improvements to be constructed and operational prior to opening the Project are generally summarized as:

- Signalization or installation of roundabouts at the two intersections at the SR 99 interchange at Avenue 18½;
- Signalization or installation of roundabouts at the two intersections at the SR 99 interchange at Avenue 17;
- Signalization or construction of a single-lane roundabout at the intersection of Golden State Boulevard, Airport Drive, and Avenue 17.

The Project will be responsible for a proportionate share responsibility for mitigation costs as described in the EIS. Improvements constructed by the Project should be credited against the proportionate share if those improvements can be incorporated into the ultimate improvement.

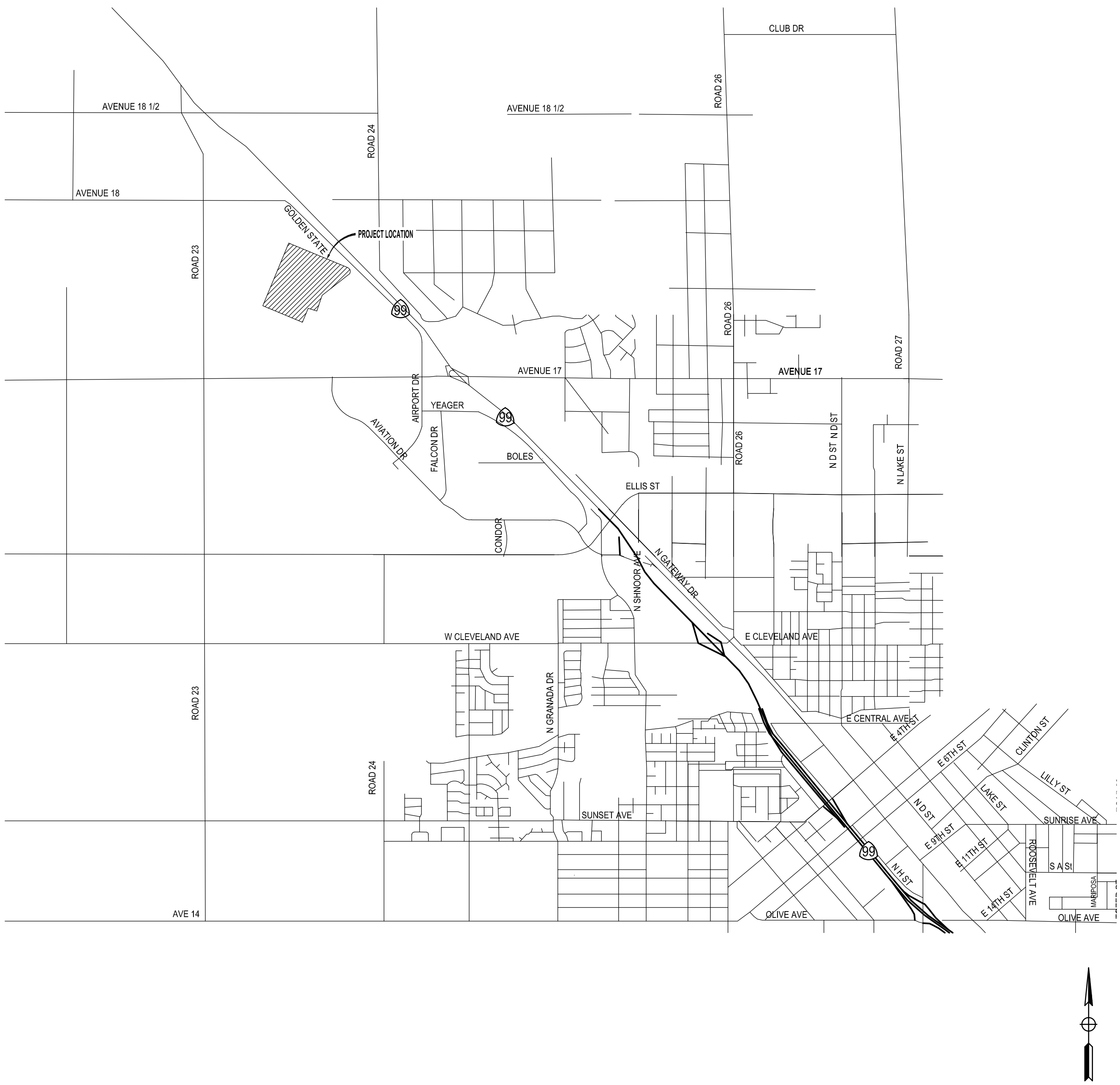
Thank you for the opportunity to perform this traffic impact study. Please feel free to contact our office if you have any questions.

PETERS ENGINEERING GROUP

John Rowland, PE, TE

Attachments: Figures 1 through 9
Appendix A - Traffic Count Data Sheets
Appendix B - Intersection Analysis Sheets
Appendix C - Mitigated Intersection Analysis Sheets
Appendix D – Year 2042 Intersection Analysis Sheets

FIGURES



Not to Scale

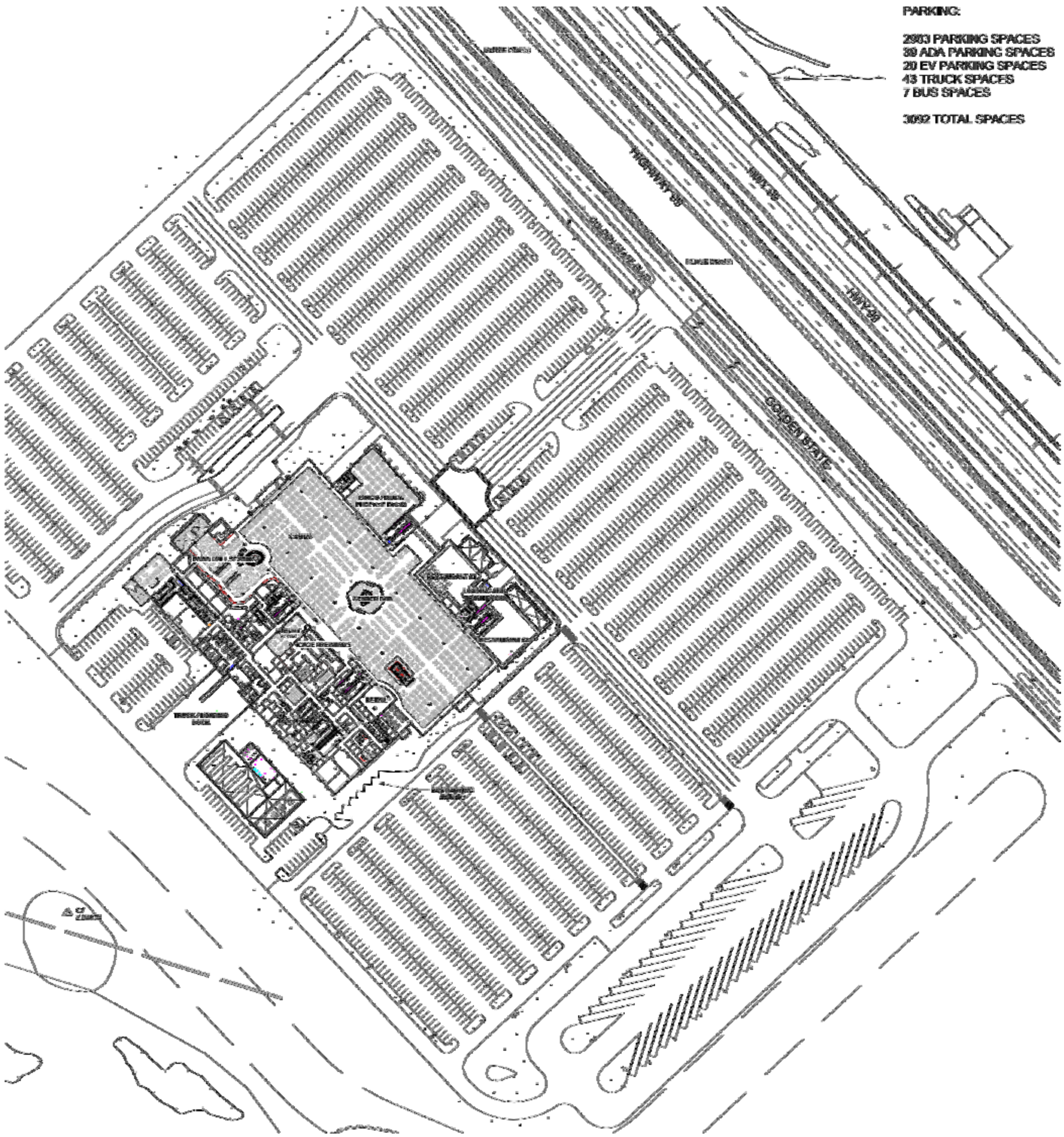
Proposed North Fork Rancheria Casino Project

Madera County, California

SITE VICINITY MAP

PETERS ENGINEERING GROUP

Figure 1



Proposed North Fork Rancheria Casino Project

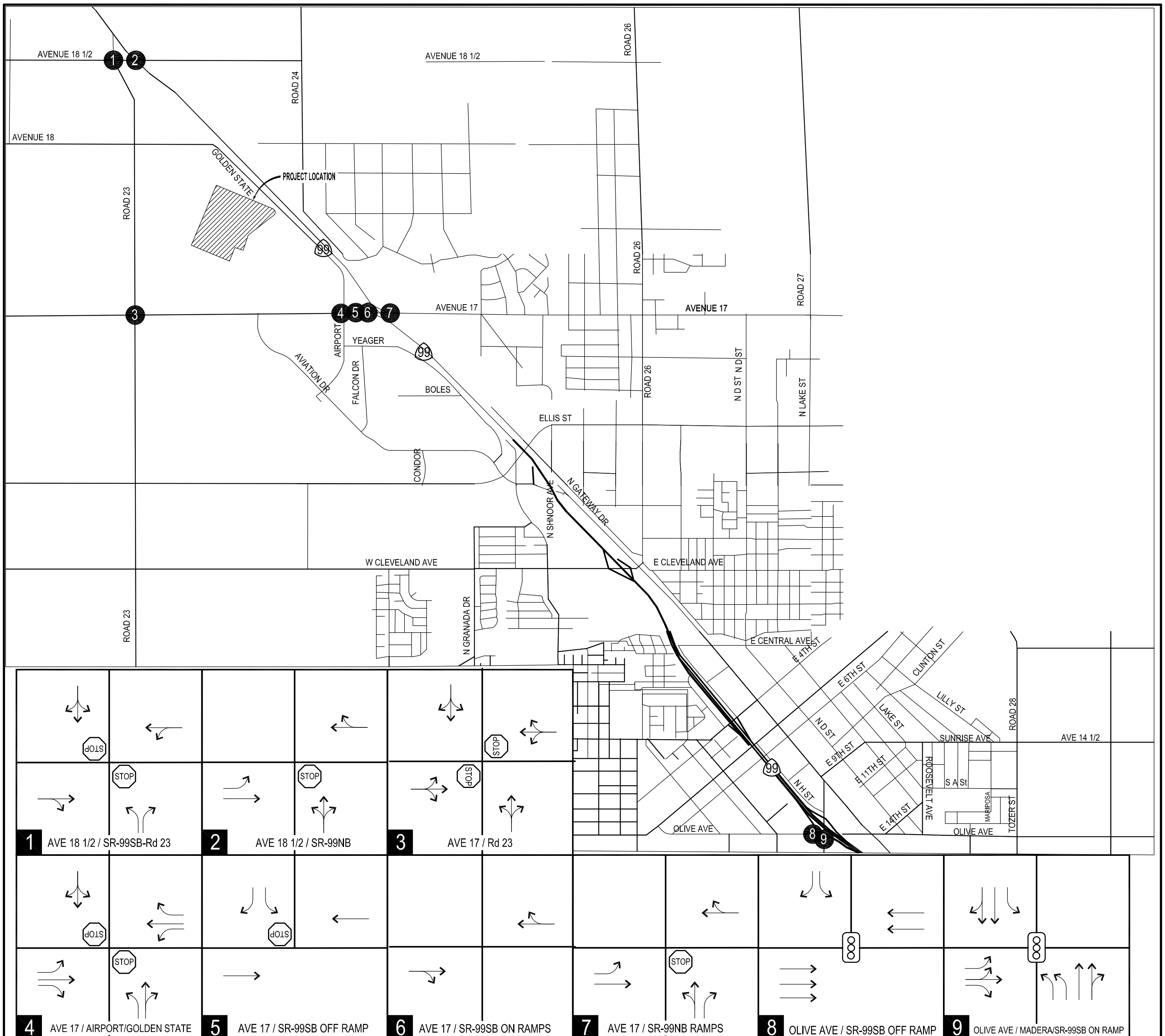
Madera County, California

SITE PLAN

Not to Scale

Peters Engineering Group

Figure 2



LEGEND

- XX STUDY AREA INTERSECTIONS
- PROJECT SITE
- SIGNALIZED INTERSECTION
- STOP STOP SIGN
- DIRECTION OF TRAVEL

Proposed North Fork Rancheria Casino Project

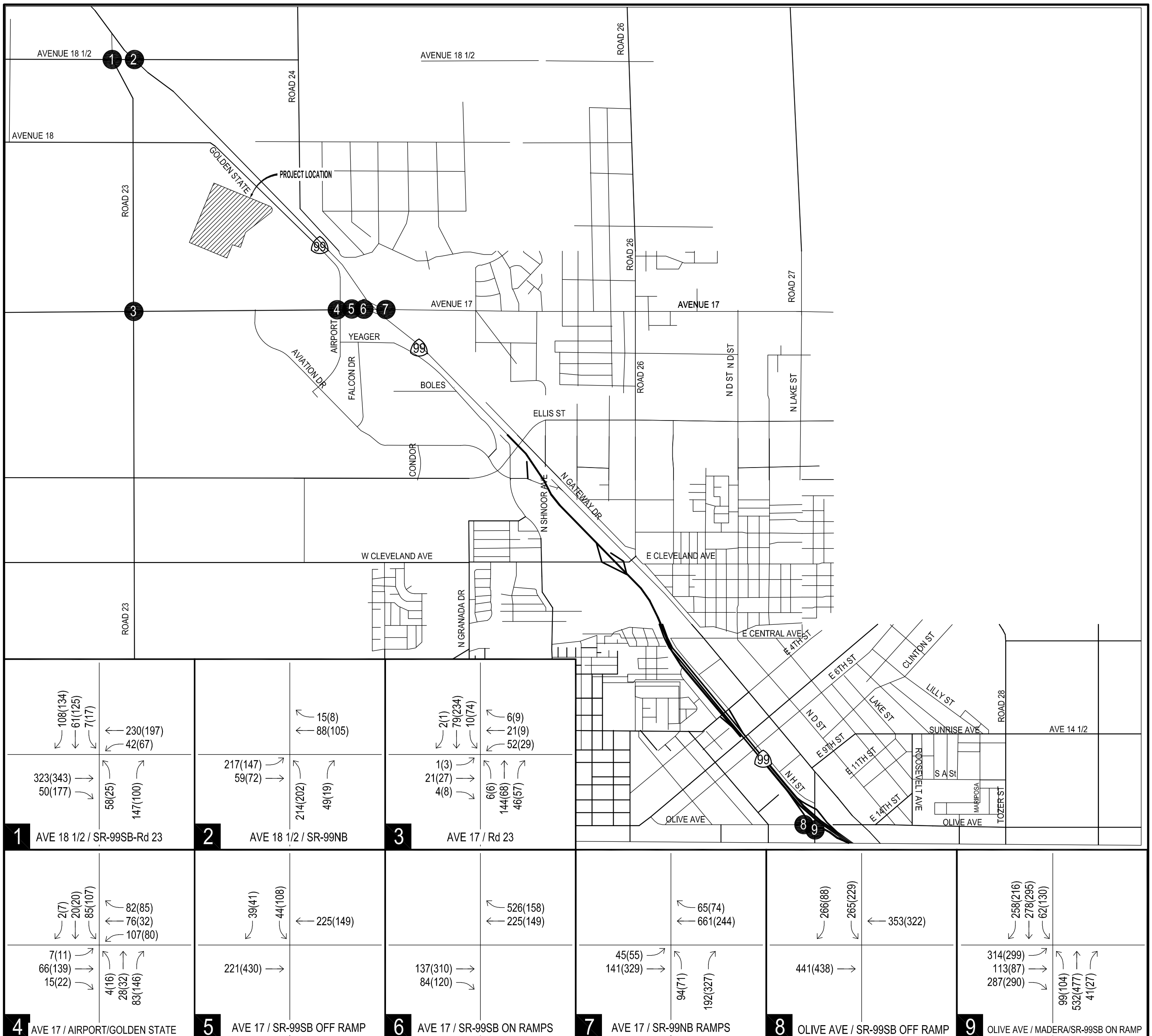
Madera County, California

EXISTING LANE CONFIGURATIONS AND INTERSECTION CONTROL

Not to Scale

PETERS ENGINEERING GROUP

Figure 3



LEGEND

XX STUDY AREA INTERSECTIONS

PROJECT SITE

XX (YY) AM (PM) VOLUMES

Proposed North Fork Rancheria Casino Project

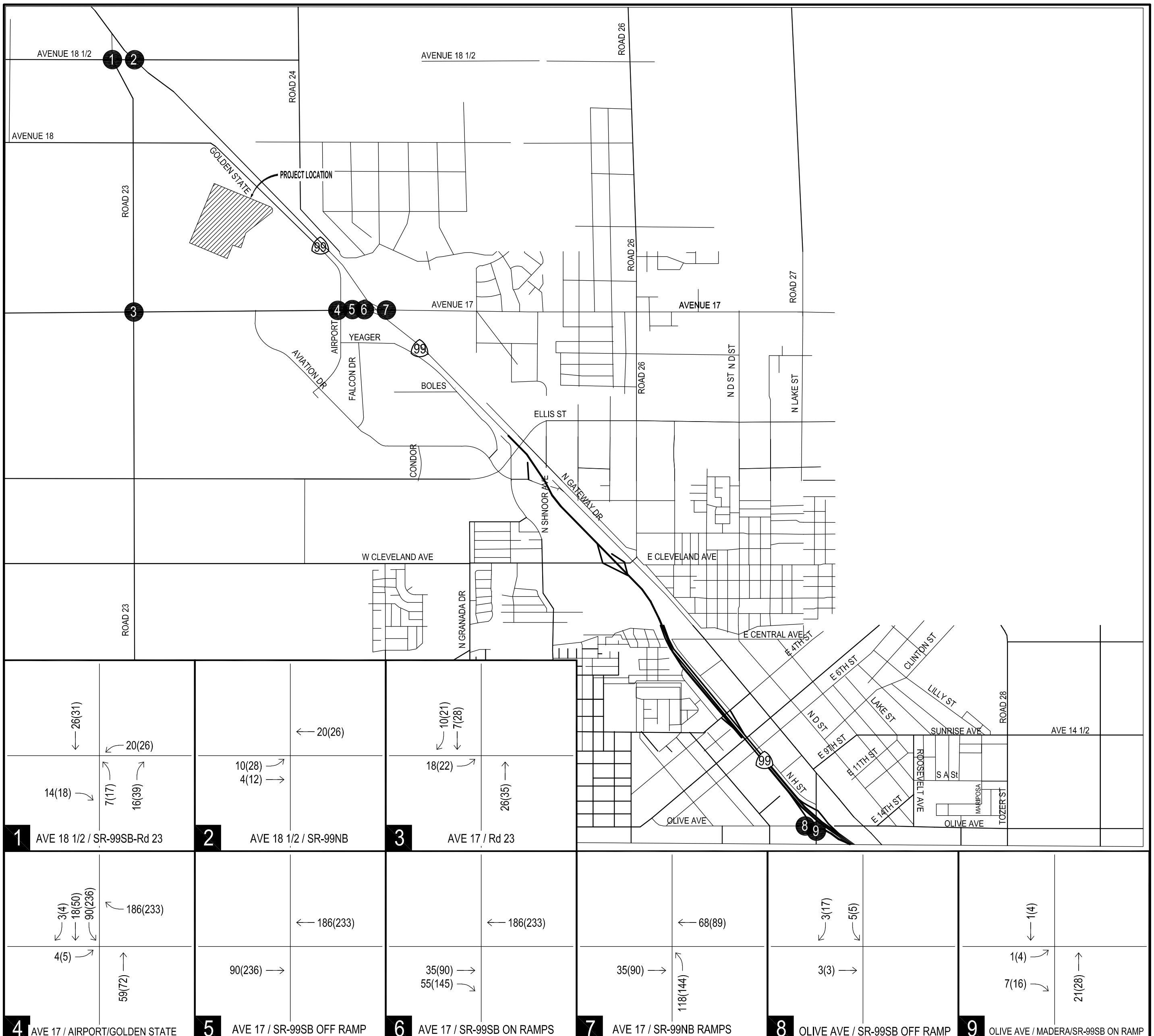
Madera County, California

EXISTING PEAK-HOUR TRAFFIC VOLUMES

Not to Scale

PETERS ENGINEERING GROUP

Figure 4



LEGEND

XX	STUDY AREA INTERSECTIONS
	PROJECT SITE
XX (YY)	AM (PM) VOLUMES

Proposed North Fork Rancheria Casino Project

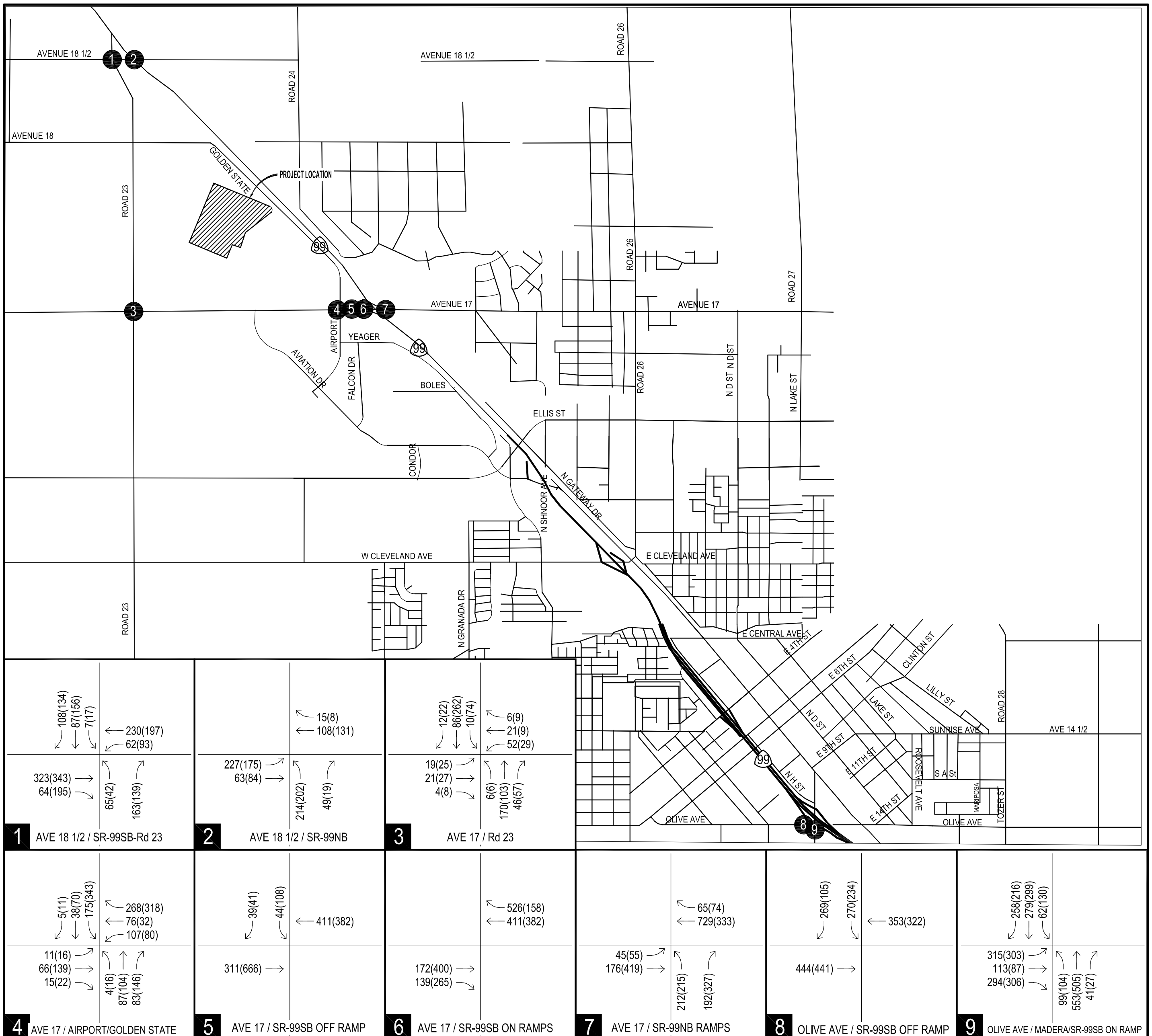
Madera County, California

PEAK-HOUR PROJECT TRAFFIC VOLUMES

Not to Scale

PETERS ENGINEERING GROUP

Figure 5



LEGEND

XX STUDY AREA INTERSECTIONS

PROJECT SITE

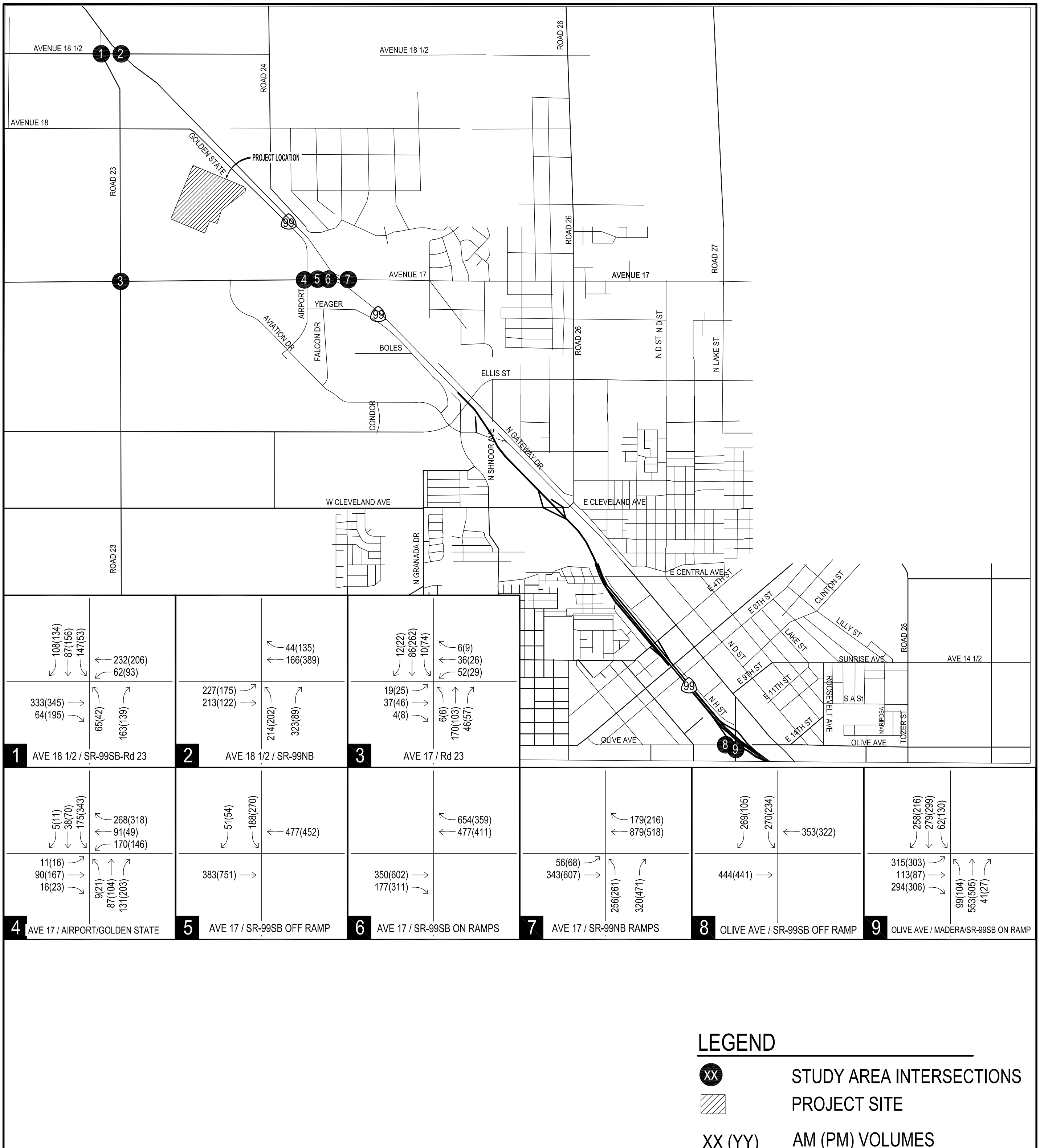
XX (YY) AM (PM) VOLUMES

Proposed North Fork Rancheria Casino Project

Madera County, California

EXISTING PLUS PROJECT PEAK-HOUR TRAFFIC VOLUMES

Not to Scale



Proposed North Fork Rancheria Casino Project

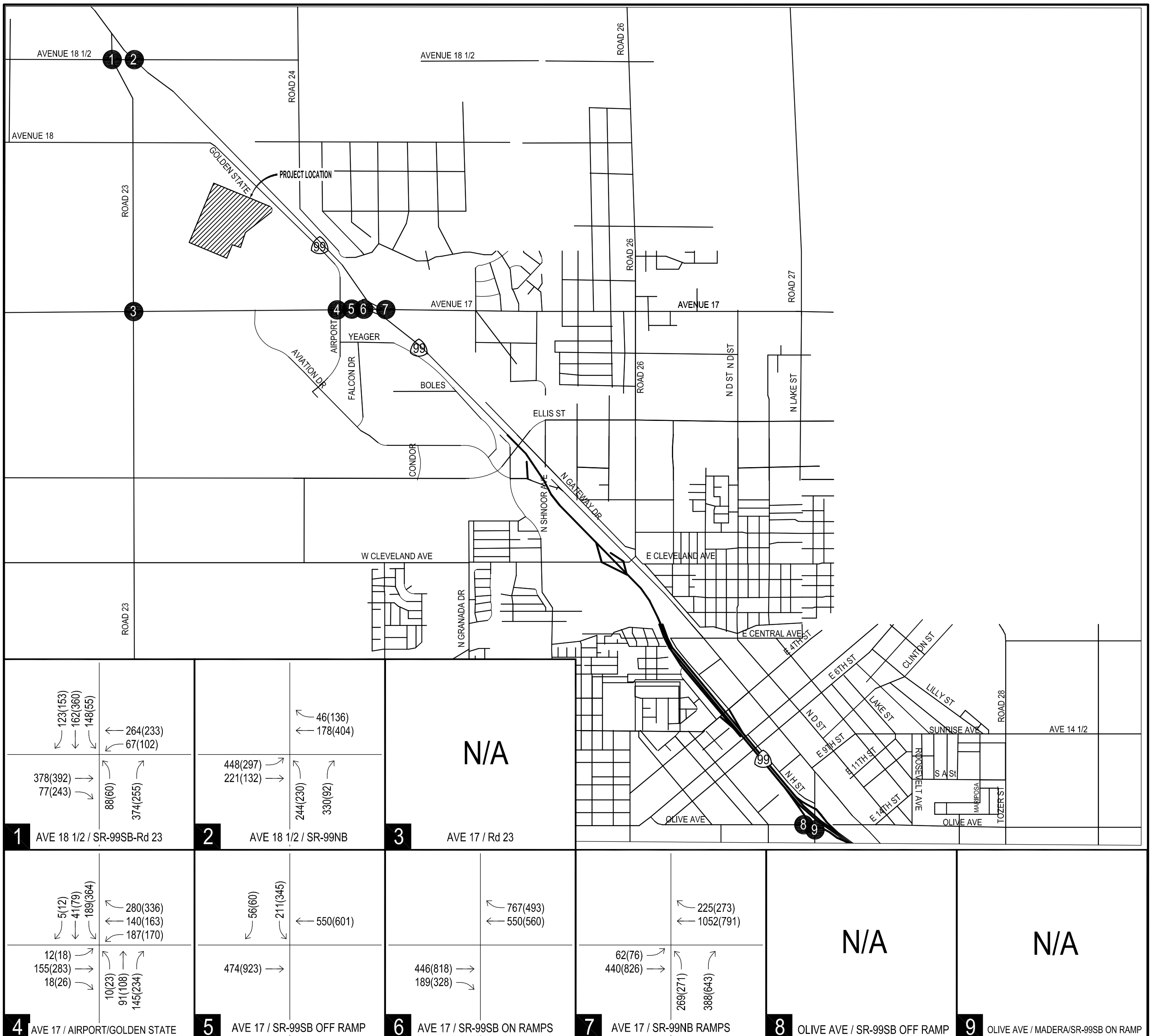
Madera County, California

NEAR-TERM WITH PROJECT PEAK-HOUR TRAFFIC VOLUMES

Not to Scale

PETERS ENGINEERING GROUP

Figure 7



LEGEND

XX STUDY AREA INTERSECTIONS

PROJECT SITE

XX (YY) AM (PM) VOLUMES

Proposed North Fork Rancheria Casino Project

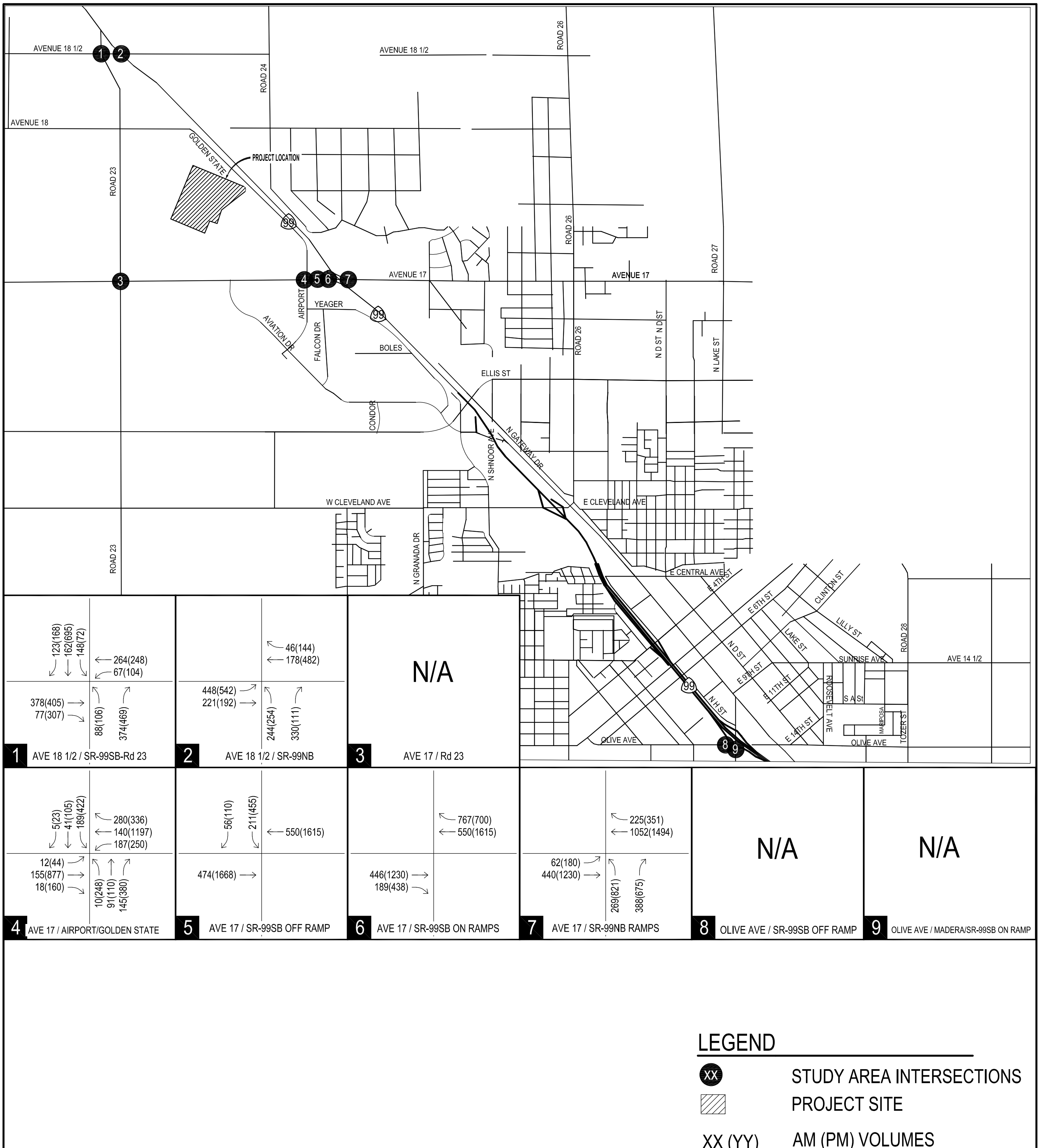
Madera County, California

YEAR 2032 WITH PROJECT PEAK-HOUR TRAFFIC VOLUMES

Not to Scale

PETERS ENGINEERING GROUP

Figure 8



Proposed North Fork Rancheria Casino Project

Madera County, California

YEAR 2042 WITH PROJECT PEAK-HOUR TRAFFIC VOLUMES

Not to Scale

PETERS ENGINEERING GROUP

Figure 9

APPENDIX A

TRAFFIC COUNT DATA SHEETS

Metro Traffic Data Inc.

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
Hanford, CA 93230

800-975-6938 Phone/Fax
www.metrotrafficdata.com

Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 17 @ SR99 SB Ramps
COUNTY Madera
COLLECTION DATE Thursday, June 6, 2019

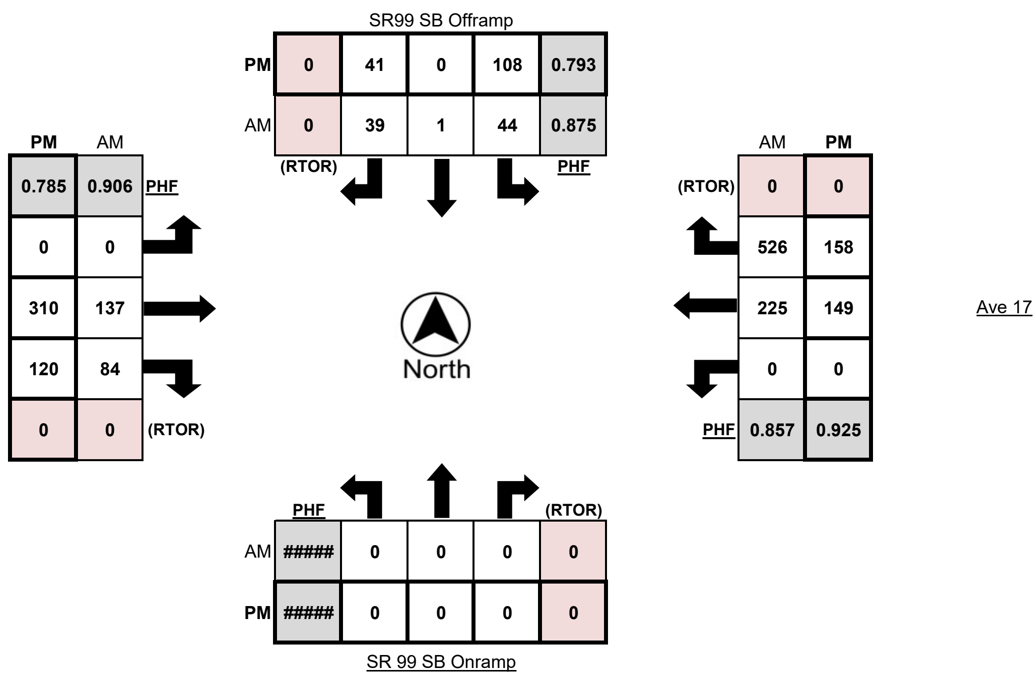
LATITUDE 36.9965
LONGITUDE -120.1043
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	0	0	0	0	0	5	0	9	0	3	0	7	16	0	6	0	54	122	0	3
7:15 AM - 7:30 AM	0	0	0	0	0	9	1	10	0	1	0	30	22	0	5	0	47	172	0	3
7:30 AM - 7:45 AM	0	0	0	0	0	14	0	10	0	0	0	33	23	0	3	0	56	155	0	3
7:45 AM - 8:00 AM	0	0	0	0	0	11	0	8	0	2	0	33	19	0	1	0	61	116	0	2
8:00 AM - 8:15 AM	0	0	0	0	0	10	0	11	0	3	0	41	20	0	7	0	61	83	0	2
8:15 AM - 8:30 AM	0	0	0	0	0	15	0	14	0	0	0	45	22	0	3	0	43	79	0	5
8:30 AM - 8:45 AM	0	0	0	0	0	10	2	11	0	3	0	24	25	0	3	0	35	56	0	2
8:45 AM - 9:00 AM	0	0	0	0	0	14	0	12	0	4	0	33	21	0	5	0	29	58	0	4
TOTAL	**0**	**0**	**0**	**0**	**0**	**88**	**3**	**85**	**0**	**16**	**0**	**246**	**168**	**0**	**33**	**0**	**386**	**841**	**0**	**24**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	0	0	0	0	0	37	0	10	0	1	0	73	40	0	6	0	35	36	0	3
4:15 PM - 4:30 PM	0	0	0	0	0	24	0	11	0	4	0	77	21	0	2	0	40	42	0	2
4:30 PM - 4:45 PM	0	0	0	0	0	24	0	11	0	2	0	98	39	0	6	0	40	31	0	2
4:45 PM - 5:00 PM	0	0	0	0	0	23	0	9	0	0	0	62	20	0	6	0	34	49	0	4
5:00 PM - 5:15 PM	0	0	0	0	0	19	0	8	0	1	0	44	36	0	2	0	34	41	0	2
5:15 PM - 5:30 PM	0	0	0	0	0	36	0	12	0	1	0	30	19	0	3	0	25	46	0	2
5:30 PM - 5:45 PM	0	0	0	0	0	33	0	10	0	1	0	38	23	0	0	0	32	39	0	1
5:45 PM - 6:00 PM	0	0	0	0	0	33	0	13	0	1	0	37	17	0	0	0	60	44	0	2
TOTAL	**0**	**0**	**0**	**0**	**0**	**229**	**0**	**84**	**0**	**11**	**0**	**459**	**215**	**0**	**25**	**0**	**300**	**328**	**0**	**18**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:15 AM - 8:15 AM	0	0	0	0	0	44	1	39	0	6	0	137	84	0	16	0	225	526	0	10
4:00 PM - 5:00 PM	0	0	0	0	0	108	0	41	0	7	0	310	120	0	20	0	149	158	0	11

	PHF	Trucks
AM	0.907	3.0%
PM	0.912	4.3%



Metro Traffic Data Inc.
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Hanford, CA 93230

800-975-6938 Phone/Fax
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Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 17 @ SR99 NB Ramps
LATITUDE 36.9965
COUNTY Madera
LONGITUDE -120.1014
COLLECTION DATE Thursday, June 6, 2019
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	32	0	30	0	3	0	0	0	0	0	4	8	0	0	2	0	145	22	0	2
7:15 AM - 7:30 AM	14	0	34	0	4	0	0	0	0	0	15	31	0	0	3	0	208	16	0	3
7:30 AM - 7:45 AM	17	0	56	0	3	0	0	0	0	0	6	40	0	0	1	0	191	18	0	4
7:45 AM - 8:00 AM	32	0	53	0	4	0	0	0	0	0	5	40	0	0	0	0	145	15	0	1
8:00 AM - 8:15 AM	31	0	49	0	2	0	0	0	0	0	19	30	0	0	7	0	117	16	0	1
8:15 AM - 8:30 AM	19	0	45	0	5	0	0	0	0	0	19	41	0	0	2	0	101	8	0	4
8:30 AM - 8:45 AM	14	0	33	0	0	0	0	0	0	0	10	24	0	0	4	0	77	14	0	3
8:45 AM - 9:00 AM	15	0	48	0	2	0	0	0	0	0	10	36	0	0	3	0	64	8	0	1
TOTAL	**174**	**0**	**348**	**0**	**23**	**0**	**0**	**0**	**0**	**0**	**88**	**250**	**0**	**0**	**22**	**0**	**1048**	**117**	**0**	**19**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	16	0	68	0	2	0	0	0	0	0	21	87	0	0	1	0	56	14	0	1
4:15 PM - 4:30 PM	15	0	67	0	1	0	0	0	0	0	8	100	0	0	3	0	65	16	0	0
4:30 PM - 4:45 PM	23	0	87	0	2	0	0	0	0	0	22	100	0	0	1	0	49	16	0	2
4:45 PM - 5:00 PM	15	1	76	0	4	0	0	0	0	0	16	71	0	0	1	0	67	17	0	2
5:00 PM - 5:15 PM	18	0	97	0	0	0	0	0	0	0	9	58	0	0	3	0	63	25	0	3
5:15 PM - 5:30 PM	9	0	90	0	0	0	0	0	0	0	4	64	0	0	3	0	61	14	0	2
5:30 PM - 5:45 PM	20	0	100	0	1	0	0	0	0	0	12	57	0	0	1	0	52	16	0	2
5:45 PM - 6:00 PM	20	0	83	0	2	0	0	0	0	0	6	69	0	0	0	0	84	14	0	3
TOTAL	**136**	**1**	**668**	**0**	**12**	**0**	**0**	**0**	**0**	**0**	**98**	**606**	**0**	**0**	**13**	**0**	**497**	**132**	**0**	**15**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:15 AM - 8:15 AM	94	0	192	0	13	0	0	0	0	0	45	141	0	0	11	0	661	65	0	9
4:15 PM - 5:15 PM	71	1	327	0	7	0	0	0	0	0	55	329	0	0	8	0	244	74	0	7

	PHF	Trucks
AM	0.913	2.8%
PM	0.927	2.0%

SR99 NB Onramp

	(RTOR)				PHF
PM	0	0	0	0	#####
AM	0	0	0	0	#####

Ave 17 (west)

PM	AM	
0.787	0.949	PHF
55	45	
329	141	
0	0	
0	0	(RTOR)

North

Ave 17 (east)

	AM	PM
(RTOR)	0	0
	65	74
	661	244
	0	0
PHF	0.81	0.903

	PHF				(RTOR)
AM	0.841	94	0	192	0
PM	0.867	71	1	327	0

SR99 NB Offramp

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Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

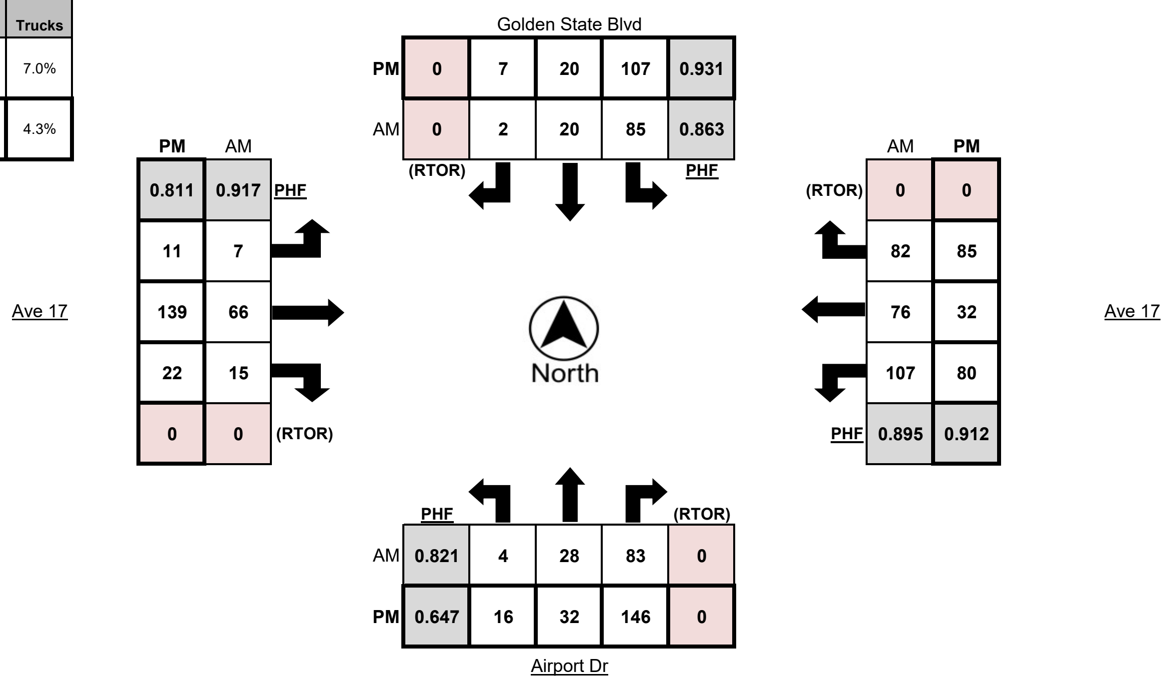
LOCATION Ave 17 @ Golden State Blvd/Airport Dr
COUNTY Madera
COLLECTION DATE Thursday, June 6, 2019
LATITUDE 36.9965
LONGITUDE -120.1062
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	1	6	2	0	0	19	2	1	0	3	0	4	3	0	1	26	12	25	0	6
7:15 AM - 7:30 AM	4	8	12	0	2	32	1	2	0	4	0	8	1	0	1	23	18	15	0	4
7:30 AM - 7:45 AM	1	8	20	0	3	19	3	1	0	0	3	16	2	0	1	24	20	23	0	4
7:45 AM - 8:00 AM	0	9	13	0	1	25	5	1	0	2	1	17	3	0	0	27	25	14	0	6
8:00 AM - 8:15 AM	3	9	23	0	5	17	7	0	0	2	1	18	3	0	0	34	14	26	0	4
8:15 AM - 8:30 AM	0	2	27	0	2	24	5	0	0	0	2	15	7	0	2	22	17	19	0	8
8:30 AM - 8:45 AM	4	9	22	0	4	19	6	0	0	3	2	9	1	0	0	21	10	17	0	3
8:45 AM - 9:00 AM	0	10	24	0	0	20	3	1	0	4	1	9	5	0	1	18	9	13	0	6
TOTAL	**13**	**61**	**143**	**0**	**17**	**175**	**32**	**6**	**0**	**18**	**10**	**96**	**25**	**0**	**6**	**195**	**125**	**152**	**0**	**41**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	4	12	49	0	6	26	5	3	0	2	3	30	7	0	0	19	10	16	0	0
4:15 PM - 4:30 PM	3	3	23	0	2	22	7	1	0	1	4	44	5	0	1	25	7	18	0	2
4:30 PM - 4:45 PM	7	10	58	0	1	30	4	2	0	2	2	37	6	0	1	24	5	25	0	4
4:45 PM - 5:00 PM	2	7	16	0	0	29	4	1	0	0	2	28	4	0	3	12	10	26	0	5
5:00 PM - 5:15 PM	3	9	38	0	3	24	2	1	0	0	4	17	2	0	0	15	13	13	0	3
5:15 PM - 5:30 PM	0	7	10	0	1	23	6	3	0	1	2	10	0	0	1	9	6	24	0	2
5:30 PM - 5:45 PM	0	4	19	0	0	25	6	2	0	0	0	16	3	0	0	15	10	19	0	0
5:45 PM - 6:00 PM	2	8	15	0	0	26	4	2	0	0	1	18	3	0	1	34	15	23	0	3
TOTAL	**21**	**60**	**228**	**0**	**13**	**205**	**38**	**15**	**0**	**6**	**18**	**200**	**30**	**0**	**7**	**153**	**76**	**164**	**0**	**19**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:30 AM - 8:30 AM	4	28	83	0	11	85	20	2	0	4	7	66	15	0	3	107	76	82	0	22
4:00 PM - 5:00 PM	16	32	146	0	9	107	20	7	0	5	11	139	22	0	5	80	32	85	0	11

	PHF	Trucks
AM	0.927	7.0%
PM	0.830	4.3%



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LOCATION Ave 18 1/2 @ SR99 SB Ramps / Rd 23
LATITUDE 37.0182
COUNTY Madera
LONGITUDE -120.1310
COLLECTION DATE Thursday, June 6, 2019
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	5	0	21	0	7	2	6	28	0	5	0	61	6	0	14	12	53	0	0	11
7:15 AM - 7:30 AM	15	0	25	0	3	1	13	29	0	13	0	85	13	0	25	5	53	0	0	6
7:30 AM - 7:45 AM	16	0	43	0	9	2	20	24	0	9	0	88	11	0	29	20	65	0	0	11
7:45 AM - 8:00 AM	10	0	52	0	13	3	14	28	0	12	0	85	16	0	23	4	66	0	0	7
8:00 AM - 8:15 AM	17	0	27	0	10	1	14	27	0	9	0	65	10	0	15	13	46	0	0	7
8:15 AM - 8:30 AM	12	0	28	0	6	3	10	29	0	8	0	78	11	0	16	9	50	0	0	10
8:30 AM - 8:45 AM	6	0	32	0	14	3	15	32	0	14	0	72	12	0	17	10	57	0	0	10
8:45 AM - 9:00 AM	10	0	26	0	5	1	17	28	0	10	0	78	11	0	19	6	58	0	0	13
TOTAL	**91**	**0**	**254**	**0**	**67**	**16**	**109**	**225**	**0**	**80**	**0**	**612**	**90**	**0**	**158**	**79**	**448**	**0**	**0**	**75**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	5	0	25	0	4	1	42	34	0	10	0	94	56	0	25	22	53	0	0	9
4:15 PM - 4:30 PM	9	0	31	0	4	6	44	30	0	17	0	76	53	0	8	23	47	0	0	13
4:30 PM - 4:45 PM	4	0	21	0	4	4	16	37	0	11	0	79	36	0	19	11	48	0	0	12
4:45 PM - 5:00 PM	7	0	23	0	5	6	23	33	0	14	0	94	32	0	19	11	49	0	0	9
5:00 PM - 5:15 PM	6	0	34	0	2	3	14	24	0	10	0	78	24	0	17	16	50	0	0	11
5:15 PM - 5:30 PM	9	0	23	0	2	2	18	31	0	9	0	79	24	0	21	13	43	0	0	14
5:30 PM - 5:45 PM	8	0	30	0	2	6	27	26	0	20	0	58	17	0	13	13	39	0	0	8
5:45 PM - 6:00 PM	9	0	18	0	3	2	29	36	0	11	0	64	17	0	23	8	38	0	0	2
TOTAL	**57**	**0**	**205**	**0**	**26**	**30**	**213**	**251**	**0**	**102**	**0**	**622**	**259**	**0**	**145**	**117**	**367**	**0**	**0**	**78**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:15 AM - 8:15 AM	58	0	147	0	35	7	61	108	0	43	0	323	50	0	92	42	230	0	0	31
4:00 PM - 5:00 PM	25	0	100	0	17	17	125	134	0	52	0	343	177	0	71	67	197	0	0	43

	PHF	Trucks
AM	0.888	19.6%
PM	0.892	15.4%

SR99 SB Offramp

	(RTOR)				PHF
PM	0	134	125	17	0.863
AM	0	108	61	7	0.957

Ave 18 1/2

	PM	AM
PHF	0.867	0.923
	0	0
	343	323
	177	50
(RTOR)	0	0

North

Ave 18 1/2

	AM	PM
(RTOR)	0	0
	0	0
	230	197
	42	67
PHF	0.8	0.88

	PHF				(RTOR)
AM	0.827	58	0	147	0
PM	0.781	25	0	100	0

Rd 23

Metro Traffic Data Inc.
310 N. Irwin Street - Suite 20
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Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

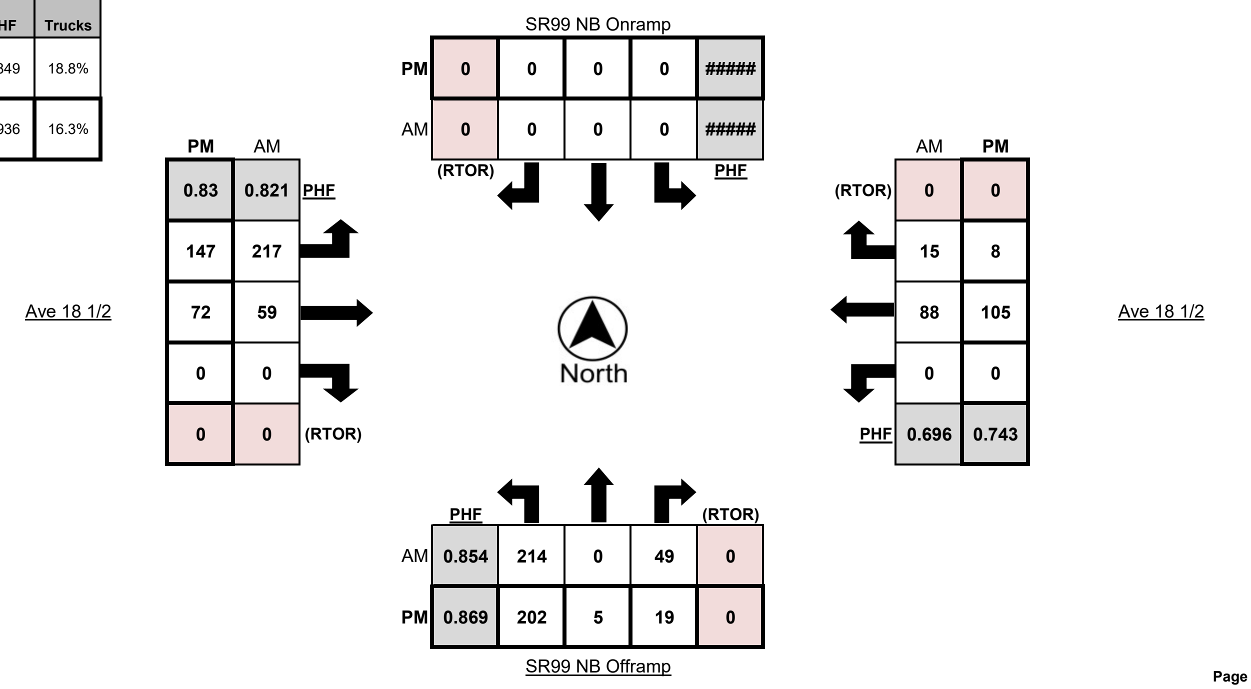
LOCATION	Ave 18 1/2 @ SR99 NB Ramps	**LATITUDE**	37.0183
COUNTY	Madera	**LONGITUDE**	-120.1279
COLLECTION DATE	Thursday, June 6, 2019	**WEATHER**	Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:00 AM - 7:15 AM	49	0	3	0	13	0	0	0	0	0	32	5	0	0	10	0	22	2	0	1
7:15 AM - 7:30 AM	37	1	9	0	9	0	0	0	0	0	37	8	0	0	8	0	34	6	0	3
7:30 AM - 7:45 AM	66	0	11	0	14	0	0	0	0	0	60	15	0	0	20	0	31	6	0	1
7:45 AM - 8:00 AM	51	0	13	0	8	0	0	0	0	0	71	13	0	0	18	0	22	4	0	1
8:00 AM - 8:15 AM	46	0	12	0	12	0	0	0	0	0	39	17	0	0	17	0	19	2	0	0
8:15 AM - 8:30 AM	51	0	13	0	17	0	0	0	0	0	47	14	0	0	12	0	16	3	0	1
8:30 AM - 8:45 AM	47	0	9	0	11	0	0	0	0	0	48	9	0	0	21	0	20	0	0	0
8:45 AM - 9:00 AM	55	1	5	0	13	0	0	0	0	0	40	19	0	0	10	0	16	2	0	3
TOTAL	**402**	**2**	**75**	**0**	**97**	**0**	**0**	**0**	**0**	**0**	**374**	**100**	**0**	**0**	**116**	**0**	**180**	**25**	**0**	**10**

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
4:00 PM - 4:15 PM	58	0	7	0	10	0	0	0	0	0	30	16	0	0	8	0	36	2	0	3
4:15 PM - 4:30 PM	48	0	7	0	11	0	0	0	0	0	41	21	0	0	8	0	26	1	0	1
4:30 PM - 4:45 PM	51	3	5	0	13	0	0	0	0	0	29	16	0	0	10	0	20	0	0	1
4:45 PM - 5:00 PM	45	2	0	0	11	0	0	0	0	0	47	19	0	0	13	0	23	5	0	2
5:00 PM - 5:15 PM	53	1	6	0	12	0	0	0	0	0	45	14	0	0	9	0	24	1	0	0
5:15 PM - 5:30 PM	49	0	5	0	14	0	0	0	0	0	36	12	0	0	9	0	17	3	0	0
5:30 PM - 5:45 PM	44	0	7	0	8	0	0	0	0	0	44	18	0	0	10	0	13	4	0	0
5:45 PM - 6:00 PM	37	0	8	0	4	0	0	0	0	0	38	11	0	0	10	0	11	2	0	0
TOTAL	**385**	**6**	**45**	**0**	**83**	**0**	**0**	**0**	**0**	**0**	**310**	**127**	**0**	**0**	**77**	**0**	**170**	**18**	**0**	**7**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:30 AM - 8:30 AM	214	0	49	0	51	0	0	0	0	0	217	59	0	0	67	0	88	15	0	3
4:00 PM - 5:00 PM	202	5	19	0	45	0	0	0	0	0	147	72	0	0	39	0	105	8	0	7

	PHF	**Trucks**
AM	0.849	18.8%
PM	0.936	16.3%



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Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Olive Ave @ SR99 SB Offramp
COUNTY Madera
COLLECTION DATE Wednesday, June 5, 2019

LATITUDE 36.9529
LONGITUDE -120.0568
WEATHER Overcast

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	0	0	0	0	0	45	0	17	6	6	0	77	0	0	0	0	66	0	0	2
7:15 AM - 7:30 AM	0	0	0	0	0	60	0	61	32	4	0	90	0	0	3	0	83	0	0	1
7:30 AM - 7:45 AM	0	0	0	0	0	65	0	97	44	3	0	115	0	0	3	0	126	0	0	1
7:45 AM - 8:00 AM	0	0	0	0	0	89	0	77	33	5	0	122	0	0	2	0	89	0	0	3
8:00 AM - 8:15 AM	0	0	0	0	0	51	0	31	11	6	0	114	0	0	5	0	55	0	0	7
8:15 AM - 8:30 AM	0	0	0	0	0	51	0	21	10	5	0	77	0	0	2	0	42	0	0	1
8:30 AM - 8:45 AM	0	0	0	0	0	40	0	15	8	3	0	72	0	0	6	0	54	0	0	4
8:45 AM - 9:00 AM	0	0	0	0	0	51	0	20	5	8	0	74	0	0	1	0	62	0	0	1
TOTAL	**0**	**0**	**0**	**0**	**0**	**452**	**0**	**339**	**149**	**40**	**0**	**741**	**0**	**0**	**22**	**0**	**577**	**0**	**0**	**20**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	0	0	0	0	0	43	0	17	1	5	0	132	0	0	4	0	72	0	0	1
4:15 PM - 4:30 PM	0	0	0	0	0	48	0	11	5	4	0	128	0	0	2	0	84	0	0	0
4:30 PM - 4:45 PM	0	0	0	0	0	44	0	22	9	1	0	107	0	0	3	0	68	0	0	2
4:45 PM - 5:00 PM	0	0	0	0	0	57	0	11	4	2	0	118	0	0	0	0	78	0	0	0
5:00 PM - 5:15 PM	0	0	0	0	0	54	0	18	10	2	0	113	0	0	2	0	67	0	0	2
5:15 PM - 5:30 PM	0	0	0	0	0	62	0	24	7	3	0	130	0	0	3	0	90	0	0	0
5:30 PM - 5:45 PM	0	0	0	0	0	56	0	35	8	2	0	77	0	0	0	0	87	0	0	1
5:45 PM - 6:00 PM	0	0	0	0	0	48	0	41	15	2	0	76	0	0	1	0	82	0	0	1
TOTAL	**0**	**0**	**0**	**0**	**0**	**412**	**0**	**179**	**59**	**21**	**0**	**881**	**0**	**0**	**15**	**0**	**628**	**0**	**0**	**7**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:15 AM - 8:15 AM	0	0	0	0	0	265	0	266	120	18	0	441	0	0	13	0	353	0	0	12
4:45 PM - 5:45 PM	0	0	0	0	0	229	0	88	29	9	0	438	0	0	5	0	322	0	0	3

	PHF	Trucks
AM	0.822	3.2%
PM	0.880	1.6%

SR99 SB Offramp

	(RTOR)				PHF
PM	29	88	0	229	0.871
AM	120	266	0	265	0.8

Olive Ave

PM	AM	
0.842	0.904	PHF
0	0	
438	441	
0	0	
0	0	(RTOR)

North

Olive Ave

	AM	PM
(RTOR)	0	0
	0	0
	353	322
	0	0
PHF	0.7	0.894

	PHF				(RTOR)
AM	#####	0	0	0	0
PM	#####	0	0	0	0

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Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

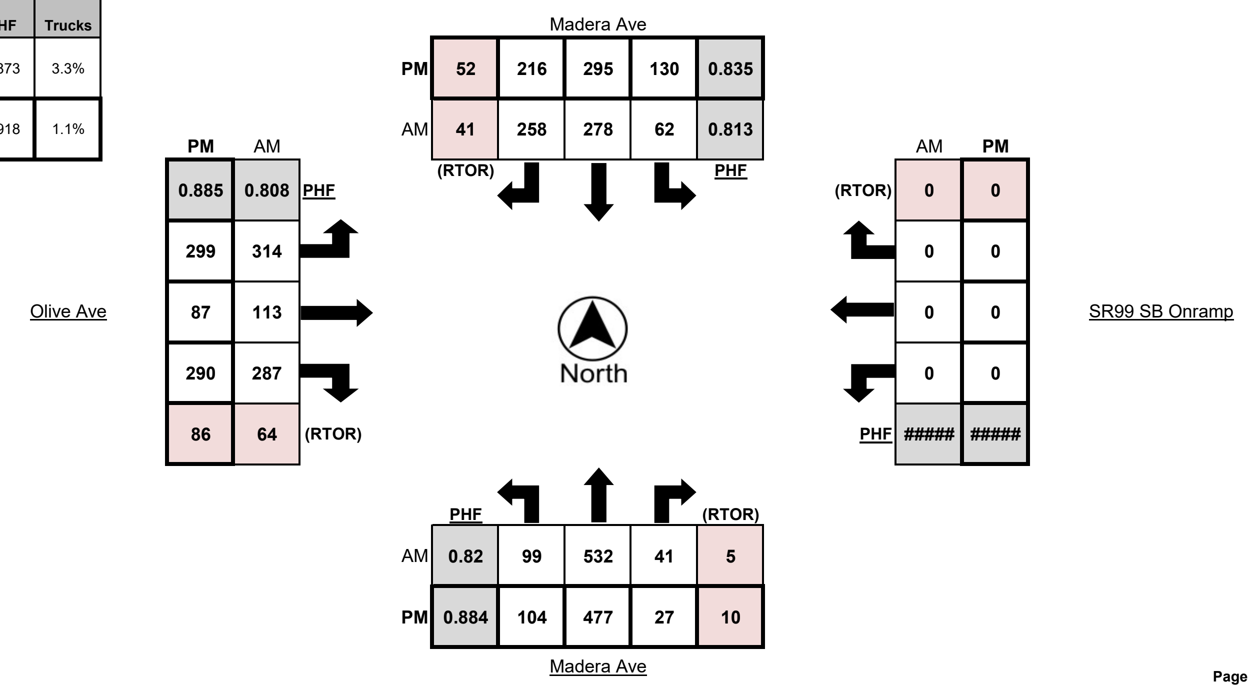
LOCATION Madera Ave @ SR99 SB Onramp / Olive Ave
COUNTY Madera
COLLECTION DATE Wednesday, June 5, 2019
LATITUDE 36.9526
LONGITUDE -120.0561
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:00 AM - 7:15 AM	15	59	7	1	5	14	29	49	10	2	40	39	48	8	4	0	0	0	0	0
7:15 AM - 7:30 AM	22	101	9	1	4	12	69	74	7	2	60	26	68	9	3	0	0	0	0	0
7:30 AM - 7:45 AM	31	127	17	3	3	11	86	87	13	5	75	33	82	18	5	0	0	0	0	0
7:45 AM - 8:00 AM	30	166	9	1	5	14	68	60	13	5	102	27	92	32	4	0	0	0	0	0
8:00 AM - 8:15 AM	16	138	6	0	7	25	55	37	8	11	77	27	45	5	12	0	0	0	0	0
8:15 AM - 8:30 AM	19	100	6	2	6	11	38	26	6	3	46	28	55	11	7	0	0	0	0	0
8:30 AM - 8:45 AM	26	110	6	1	7	15	42	29	11	4	44	28	43	7	7	0	0	0	0	0
8:45 AM - 9:00 AM	23	103	4	0	8	14	43	37	5	2	39	27	60	10	5	0	0	0	0	0
TOTAL	**182**	**904**	**64**	**9**	**45**	**116**	**430**	**399**	**73**	**34**	**483**	**235**	**493**	**100**	**47**	**0**	**0**	**0**	**0**	**0**

	Northbound					Southbound					Eastbound					Westbound				
Time	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
4:00 PM - 4:15 PM	25	140	3	0	4	24	58	42	13	1	74	24	65	24	7	0	0	0	0	0
4:15 PM - 4:30 PM	24	124	6	1	3	31	70	58	8	0	62	35	85	30	5	0	0	0	0	0
4:30 PM - 4:45 PM	15	126	6	0	1	22	62	62	11	0	52	27	68	16	4	0	0	0	0	0
4:45 PM - 5:00 PM	26	108	5	2	1	21	74	44	2	0	72	27	77	20	2	0	0	0	0	0
5:00 PM - 5:15 PM	17	134	7	2	3	42	97	53	14	0	74	23	77	26	3	0	0	0	0	0
5:15 PM - 5:30 PM	27	102	10	3	4	38	67	68	19	0	80	25	86	33	5	0	0	0	0	0
5:30 PM - 5:45 PM	34	133	5	3	1	29	57	51	17	1	73	12	50	7	1	0	0	0	0	0
5:45 PM - 6:00 PM	25	112	9	3	0	10	64	60	9	2	57	13	47	12	4	0	0	0	0	0
TOTAL	**193**	**979**	**51**	**14**	**17**	**217**	**549**	**438**	**93**	**4**	**544**	**186**	**555**	**168**	**31**	**0**	**0**	**0**	**0**	**0**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks	Left	Thru	Right	(RTOR)	Trucks
7:15 AM - 8:15 AM	99	532	41	5	19	62	278	258	41	23	314	113	287	64	24	0	0	0	0	0
4:45 PM - 5:45 PM	104	477	27	10	9	130	295	216	52	1	299	87	290	86	11	0	0	0	0	0

	PHF	Trucks
AM	0.873	3.3%
PM	0.918	1.1%



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Turning Movement Report

Prepared For:
Peters Engineering Group
952 Pollasky Avenue
Clovis, CA 93612

LOCATION Ave 17 @ Rd 26
COUNTY Madera
COLLECTION DATE Wednesday, June 5, 2019

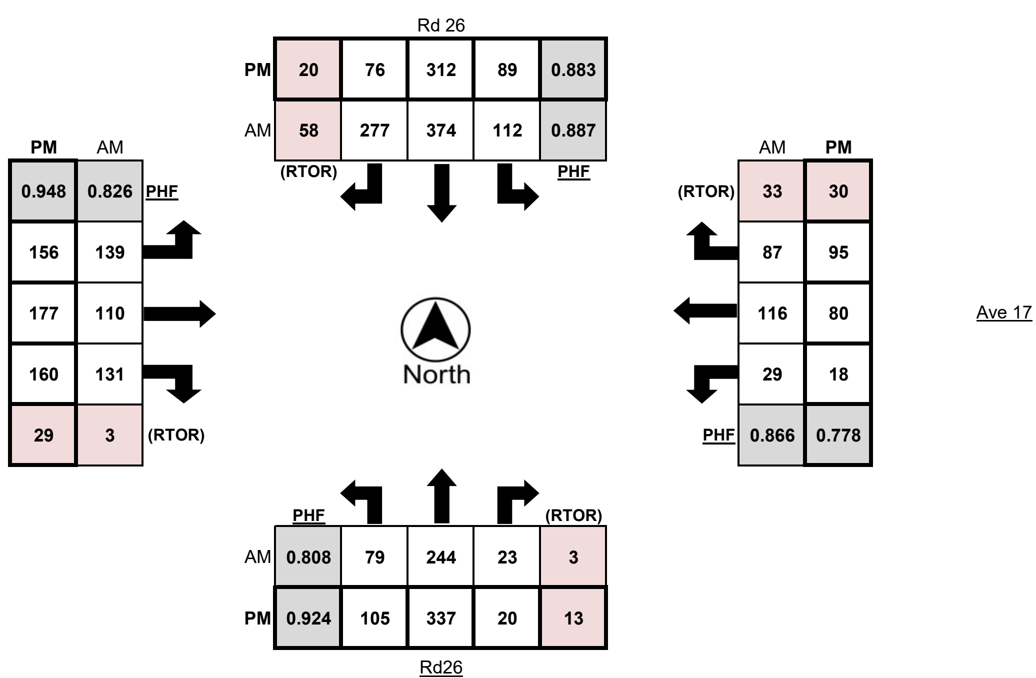
LATITUDE 36.9963
LONGITUDE -120.0743
WEATHER Clear

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:00 AM - 7:15 AM	11	23	6	1	4	17	52	56	15	2	17	21	15	1	3	5	23	9	4	1
7:15 AM - 7:30 AM	17	39	5	1	4	22	87	83	10	1	25	20	31	2	1	9	28	17	11	2
7:30 AM - 7:45 AM	14	66	3	1	4	30	91	65	15	1	42	34	33	0	2	5	28	17	3	0
7:45 AM - 8:00 AM	19	67	9	1	1	28	118	69	23	2	40	36	39	0	3	4	30	27	12	2
8:00 AM - 8:15 AM	29	72	6	0	1	32	78	60	10	2	32	20	28	1	5	11	30	26	7	1
8:15 AM - 8:30 AM	23	58	4	1	0	11	74	34	6	2	20	20	15	0	0	6	21	14	3	1
8:30 AM - 8:45 AM	6	39	7	1	0	16	62	37	5	1	16	12	15	1	1	3	15	7	2	1
8:45 AM - 9:00 AM	14	49	5	0	1	19	83	27	2	2	19	16	26	0	1	3	18	18	5	2
TOTAL	**133**	**413**	**45**	**6**	**15**	**175**	**645**	**431**	**86**	**13**	**211**	**179**	**202**	**5**	**16**	**46**	**193**	**135**	**47**	**10**

	Northbound					Southbound					Eastbound					Westbound				
Time	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
4:00 PM - 4:15 PM	27	92	6	3	2	33	84	18	6	2	37	50	43	10	2	6	25	31	13	1
4:15 PM - 4:30 PM	28	91	6	2	3	23	73	23	8	2	36	47	42	8	1	4	19	19	7	0
4:30 PM - 4:45 PM	29	82	3	3	1	17	71	20	3	1	33	44	42	5	2	4	19	24	2	1
4:45 PM - 5:00 PM	21	72	5	5	0	16	84	15	3	3	50	36	33	6	2	4	17	21	8	1
5:00 PM - 5:15 PM	25	102	5	2	2	17	52	18	4	2	46	35	30	7	2	2	30	29	8	0
5:15 PM - 5:30 PM	26	102	7	3	0	16	59	18	4	3	62	32	30	13	3	10	21	29	9	0
5:30 PM - 5:45 PM	13	105	11	2	1	10	79	19	8	2	45	31	26	5	1	5	17	44	12	0
5:45 PM - 6:00 PM	25	79	11	5	0	17	90	24	9	2	35	27	26	6	0	9	27	21	8	1
TOTAL	**194**	**725**	**54**	**25**	**9**	**149**	**592**	**155**	**45**	**17**	**344**	**302**	**272**	**60**	**13**	**44**	**175**	**218**	**67**	**4**

	Northbound					Southbound					Eastbound					Westbound				
PEAK HOUR	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**	**Left**	**Thru**	**Right**	**(RTOR)**	**Trucks**
7:15 AM - 8:15 AM	79	244	23	3	10	112	374	277	58	6	139	110	131	3	11	29	116	87	33	5
4:00 PM - 5:00 PM	105	337	20	13	6	89	312	76	20	8	156	177	160	29	7	18	80	95	30	3

	PHF	**Trucks**
AM	0.885	1.9%
PM	0.899	1.5%



APPENDIX B
INTERSECTION ANALYSIS SHEETS

Intersection	
Int Delay, s/veh	7.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	323	50	42	230	0	58	0	147	7	61	108
Future Vol, veh/h	0	323	50	42	230	0	58	0	147	7	61	108
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	20	20	20	20	20	20	20	20	20	20	20	20
Mvmt Flow	0	363	56	47	258	0	65	0	165	8	69	121

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	419	0	0	838	743	391	826	771	258
Stage 1	-	-	-	-	-	-	391	391	-	352	352	-
Stage 2	-	-	-	-	-	-	447	352	-	474	419	-
Critical Hdwy	-	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	-	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	0	-	-	1050	-	0	266	323	620	271	310	739
Stage 1	0	-	-	-	-	0	599	577	-	629	601	-
Stage 2	0	-	-	-	-	0	557	601	-	538	560	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1050	-	-	175	306	620	191	294	739
Mov Cap-2 Maneuver	-	-	-	-	-	-	175	306	-	191	294	-
Stage 1	-	-	-	-	-	-	599	577	-	629	570	-
Stage 2	-	-	-	-	-	-	388	570	-	395	560	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.3	21.5	19.1
HCM LOS			C	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	261	620	-	-	1050	-	451
HCM Lane V/C Ratio	0.461	0.178	-	-	0.045	-	0.438
HCM Control Delay (s)	30.1	12.1	-	-	8.6	0	19.1
HCM Lane LOS	D	B	-	-	A	A	C
HCM 95th %tile Q(veh)	2.3	0.6	-	-	0.1	-	2.2

Intersection	
Int Delay, s/veh	25

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	217	59	0	0	88	15	214	0	49	0	0	0
Future Vol, veh/h	217	59	0	0	88	15	214	0	49	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	19	19	19	19	19	19	19	19	19	19	19	19
Mvmt Flow	255	69	0	0	104	18	252	0	58	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	122	0	-	-	-	0	692	701	69
Stage 1	-	-	-	-	-	-	579	579	-
Stage 2	-	-	-	-	-	-	113	122	-
Critical Hdwy	4.29	-	-	-	-	-	6.59	6.69	6.39
Critical Hdwy Stg 1	-	-	-	-	-	-	5.59	5.69	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.59	5.69	-
Follow-up Hdwy	2.371	-	-	-	-	-	3.671	4.171	3.471
Pot Cap-1 Maneuver	1366	-	0	0	-	-	385	343	948
Stage 1	-	-	0	0	-	-	528	474	-
Stage 2	-	-	0	0	-	-	871	763	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1366	-	-	-	-	-	313	0	948
Mov Cap-2 Maneuver	-	-	-	-	-	-	313	0	-
Stage 1	-	-	-	-	-	-	429	0	-
Stage 2	-	-	-	-	-	-	871	0	-

Approach	EB	WB	NB
HCM Control Delay, s	6.5	0	54.1
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	358	1366	-	-	-
HCM Lane V/C Ratio	0.864	0.187	-	-	-
HCM Control Delay (s)	54.1	8.2	-	-	-
HCM Lane LOS	F	A	-	-	-
HCM 95th %tile Q(veh)	8.2	0.7	-	-	-

Intersection	
Int Delay, s/veh	3.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	1	21	4	52	21	6	6	144	46	10	79	2
Future Vol, veh/h	1	21	4	52	21	6	6	144	46	10	79	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	14	14	14	14	14	14	14	14	14	14	14	14
Mvmt Flow	1	25	5	63	25	7	7	173	55	12	95	2
Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	351	362	96	350	336	201	97	0	0	228	0	0
Stage 1	120	120	-	215	215	-	-	-	-	-	-	-
Stage 2	231	242	-	135	121	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.64	6.34	7.24	6.64	6.34	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.24	5.64	-	6.24	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.64	-	6.24	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4.126	3.426	3.626	4.126	3.426	2.326	-	-	2.326	-	-
Pot Cap-1 Maneuver	582	547	928	583	566	810	1424	-	-	1273	-	-
Stage 1	856	774	-	761	703	-	-	-	-	-	-	-
Stage 2	746	684	-	840	773	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	550	538	928	552	557	810	1424	-	-	1273	-	-
Mov Cap-2 Maneuver	550	538	-	552	557	-	-	-	-	-	-	-
Stage 1	851	766	-	756	699	-	-	-	-	-	-	-
Stage 2	708	680	-	800	765	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	11.6	12.6	0.2	0.9
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1424	-	-	576	567	1273	-	-
HCM Lane V/C Ratio	0.005	-	-	0.054	0.168	0.009	-	-
HCM Control Delay (s)	7.5	0	-	11.6	12.6	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.2	0.6	0	-	-

Intersection	
Int Delay, s/veh	6.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	7	66	15	107	76	82	4	28	83	85	20	2
Future Vol, veh/h	7	66	15	107	76	82	4	28	83	85	20	2
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	120	-	130	75	-	120	60	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	8	71	16	115	82	88	4	30	89	91	22	2

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	170	0	0	87	0	0	455	487	71	467	415	82
Stage 1	-	-	-	-	-	-	87	87	-	312	312	-
Stage 2	-	-	-	-	-	-	368	400	-	155	103	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1378	-	-	1478	-	-	507	474	978	498	520	964
Stage 1	-	-	-	-	-	-	908	813	-	688	649	-
Stage 2	-	-	-	-	-	-	642	593	-	836	800	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1378	-	-	1478	-	-	457	434	978	401	476	964
Mov Cap-2 Maneuver	-	-	-	-	-	-	457	434	-	401	476	-
Stage 1	-	-	-	-	-	-	903	808	-	684	598	-
Stage 2	-	-	-	-	-	-	569	547	-	727	795	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	3.1	10.9	16.9
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	457	743	1378	-	-	1478	-	-	418
HCM Lane V/C Ratio	0.009	0.161	0.005	-	-	0.078	-	-	0.275
HCM Control Delay (s)	13	10.8	7.6	-	-	7.6	-	-	16.9
HCM Lane LOS	B	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0	0.6	0	-	-	0.3	-	-	1.1

Intersection	
Int Delay, s/veh	1.8

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	221	225	0	44	39
Future Vol, veh/h	0	221	225	0	44	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	243	247	0	48	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	490	247
Stage 1	-	-	-	-	247	-
Stage 2	-	-	-	-	243	-
Critical Hdwy	-	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	0	-	-	0	536	789
Stage 1	0	-	-	0	792	-
Stage 2	0	-	-	0	795	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	536	789
Mov Cap-2 Maneuver	-	-	-	-	536	-
Stage 1	-	-	-	-	792	-
Stage 2	-	-	-	-	795	-

Approach	EB		WB		SB	
HCM Control Delay, s	0		0		11.2	
HCM LOS					B	

Minor Lane/Major Mvmt		EBT	WBT	SBLn1	SBLn2	
Capacity (veh/h)		-	-	536	789	
HCM Lane V/C Ratio		-	-	0.09	0.054	
HCM Control Delay (s)		-	-	12.4	9.8	
HCM Lane LOS		-	-	B	A	
HCM 95th %tile Q(veh)		-	-	0.3	0.2	

Intersection	
Int Delay, s/veh	4.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	141	0	0	661	65	94	0	192	0	0	0
Future Vol, veh/h	45	141	0	0	661	65	94	0	192	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	85	550	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	49	155	0	0	726	71	103	0	211	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	797	0	-	-	-	0	1015	-	155
Stage 1	-	-	-	-	-	-	253	-	-
Stage 2	-	-	-	-	-	-	762	-	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	-	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	-	3.327
Pot Cap-1 Maneuver	821	-	0	0	-	-	263	0	888
Stage 1	-	-	0	0	-	-	787	0	-
Stage 2	-	-	0	0	-	-	459	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	821	-	-	-	-	-	247	0	888
Mov Cap-2 Maneuver	-	-	-	-	-	-	247	0	-
Stage 1	-	-	-	-	-	-	740	0	-
Stage 2	-	-	-	-	-	-	459	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2.3	0	16.7
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	247	888	821	-	-	-
HCM Lane V/C Ratio	0.418	0.238	0.06	-	-	-
HCM Control Delay (s)	29.7	10.3	9.7	-	-	-
HCM Lane LOS	D	B	A	-	-	-
HCM 95th %tile Q(veh)	1.9	0.9	0.2	-	-	-

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	538	430	323	324
v/c Ratio	0.33	0.38	0.50	0.45
Control Delay	9.4	10.1	11.6	5.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.4	10.2	11.6	5.2
Queue Length 50th (ft)	23	27	38	10
Queue Length 95th (ft)	46	57	100	46
Internal Link Dist (ft)	650	158	474	
Turn Bay Length (ft)				
Base Capacity (vph)	4887	3401	1752	1568
Starvation Cap Reductn	0	117	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.11	0.13	0.18	0.21

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	441	353	0	265	266
Future Volume (veh/h)	0	441	353	0	265	266
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h	0	538	430	0	323	178
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	0	3	3	0	3	3
Cap, veh/h	0	1570	1093	0	533	474
Arrive On Green	0.00	0.31	0.31	0.00	0.30	0.30
Sat Flow, veh/h	0	5400	3711	0	1767	1572
Grp Volume(v), veh/h	0	538	430	0	323	178
Grp Sat Flow(s),veh/h/ln	0	1689	1763	0	1767	1572
Q Serve(g_s), s	0.0	2.1	2.4	0.0	3.9	2.2
Cycle Q Clear(g_c), s	0.0	2.1	2.4	0.0	3.9	2.2
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1570	1093	0	533	474
V/C Ratio(X)	0.00	0.34	0.39	0.00	0.61	0.38
Avail Cap(c_a), veh/h	0	7852	5465	0	4210	3747
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	6.7	6.8	0.0	7.5	6.9
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.0	1.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.4	0.0	1.0	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.8	7.1	0.0	8.6	7.4
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		538	430		501	
Approach Delay, s/veh		6.8	7.1		8.2	
Approach LOS		A	A		A	

Timer - Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				12.7		12.5		12.7
Change Period (Y+Rc), s				4.9		4.9		4.9
Max Green Setting (Gmax), s				39.1		60.1		39.1
Max Q Clear Time (g_c+I1), s				4.1		5.9		4.4
Green Ext Time (p_c), s				3.8		1.7		2.9

Intersection Summary			
HCM 6th Ctrl Delay			7.4
HCM 6th LOS			A

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	314	113	287	0	0	0	99	532	41	62	278	258
Future Volume (veh/h)	314	113	287	0	0	0	99	532	41	62	278	258
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856				1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	246	292	256				114	611	41	71	320	250
Peak Hour Factor	0.87	0.87	0.87				0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3				3	3	3	3	3	3
Cap, veh/h	486	510	432				306	1056	71	120	559	427
Arrive On Green	0.28	0.28	0.28				0.09	0.32	0.32	0.07	0.29	0.29
Sat Flow, veh/h	1767	1856	1572				3428	3353	225	1767	1903	1454
Grp Volume(v), veh/h	246	292	256				114	321	331	71	296	274
Grp Sat Flow(s),veh/h/ln	1767	1856	1572				1714	1763	1815	1767	1763	1594
Q Serve(g_s), s	4.7	5.5	5.7				1.3	6.2	6.2	1.6	5.7	5.9
Cycle Q Clear(g_c), s	4.7	5.5	5.7				1.3	6.2	6.2	1.6	5.7	5.9
Prop In Lane	1.00		1.00				1.00		0.12	1.00		0.91
Lane Grp Cap(c), veh/h	486	510	432				306	555	572	120	518	468
V/C Ratio(X)	0.51	0.57	0.59				0.37	0.58	0.58	0.59	0.57	0.59
Avail Cap(c_a), veh/h	2106	2211	1874				1189	2276	2343	788	2450	2216
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.3	12.6	12.7				17.3	11.6	11.6	18.3	12.1	12.2
Incr Delay (d2), s/veh	0.8	1.0	1.3				0.8	1.0	0.9	4.6	1.0	1.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.8	5.1				0.4	1.9	2.0	0.7	1.9	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.1	13.6	14.0				18.1	12.5	12.5	22.8	13.1	13.3
LnGrp LOS	B	B	B				B	B	B	C	B	B
Approach Vol, veh/h		794						766			641	
Approach Delay, s/veh		13.6						13.3			14.3	
Approach LOS		B						B			B	
Timer - Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	6.7	17.6		16.0	7.6	16.8						
Change Period (Y+Rc), s	4.0	4.9		4.9	4.0	4.9						
Max Green Setting (Gmax), s	18.0	52.1		48.1	14.0	56.1						
Max Q Clear Time (g_c+I1), s	3.6	8.2		7.7	3.3	7.9						
Green Ext Time (p_c), s	0.1	4.4		3.4	0.2	3.9						
Intersection Summary												
HCM 6th Ctrl Delay			13.7									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	242	249	330	114	658	71	617
v/c Ratio	0.48	0.48	0.47	0.22	0.58	0.26	0.50
Control Delay	21.7	21.6	5.0	27.6	19.2	28.7	11.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	21.7	21.6	5.0	27.6	19.2	28.7	11.8
Queue Length 50th (ft)	69	71	0	18	95	22	52
Queue Length 95th (ft)	157	162	47	49	182	68	114
Internal Link Dist (ft)		158			849		581
Turn Bay Length (ft)			125	125		100	
Base Capacity (vph)	1388	1427	1362	965	3030	640	2981
Starvation Cap Reductn	134	147	99	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.19	0.19	0.26	0.12	0.22	0.11	0.21

Intersection Summary

Intersection	
Int Delay, s/veh	19.4

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	343	177	67	197	0	25	0	100	17	125	134
Future Vol, veh/h	0	343	177	67	197	0	25	0	100	17	125	134
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	15	15	15	15	15	15	15	15	15	15	15	15
Mvmt Flow	0	385	199	75	221	0	28	0	112	19	140	151

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	584	0	0	1002	856	485	912	955	221
Stage 1	-	-	-	-	-	-	485	485	-	371	371	-
Stage 2	-	-	-	-	-	-	517	371	-	541	584	-
Critical Hdwy	-	-	-	4.25	-	-	7.25	6.65	6.35	7.25	6.65	6.35
Critical Hdwy Stg 1	-	-	-	-	-	-	6.25	5.65	-	6.25	5.65	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.25	5.65	-	6.25	5.65	-
Follow-up Hdwy	-	-	-	2.335	-	-	3.635	4.135	3.435	3.635	4.135	3.435
Pot Cap-1 Maneuver	0	-	-	930	-	0	209	281	556	241	246	787
Stage 1	0	-	-	-	-	0	540	530	-	624	597	-
Stage 2	0	-	-	-	-	0	518	597	-	502	478	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	930	-	-	79	255	556	179	223	787
Mov Cap-2 Maneuver	-	-	-	-	-	-	79	255	-	179	223	-
Stage 1	-	-	-	-	-	-	540	530	-	624	542	-
Stage 2	-	-	-	-	-	-	282	542	-	401	478	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.3	27.3	68.7
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	155	556	-	-	930	-	334
HCM Lane V/C Ratio	0.423	0.135	-	-	0.081	-	0.928
HCM Control Delay (s)	44.3	12.5	-	-	9.2	0	68.7
HCM Lane LOS	E	B	-	-	A	A	F
HCM 95th %tile Q(veh)	1.9	0.5	-	-	0.3	-	9.4

Intersection	
Int Delay, s/veh	10.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	147	72	0	0	105	8	202	0	19	0	0	0
Future Vol, veh/h	147	72	0	0	105	8	202	0	19	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	16	16	16	16	16	16	16	16	16	16	16
Mvmt Flow	156	77	0	0	112	9	215	0	20	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	121	0	-	-	-	0	506	510	77
Stage 1	-	-	-	-	-	-	389	389	-
Stage 2	-	-	-	-	-	-	117	121	-
Critical Hdwy	4.26	-	-	-	-	-	6.56	6.66	6.36
Critical Hdwy Stg 1	-	-	-	-	-	-	5.56	5.66	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.56	5.66	-
Follow-up Hdwy	2.344	-	-	-	-	-	3.644	4.144	3.444
Pot Cap-1 Maneuver	1384	-	0	0	-	-	502	447	946
Stage 1	-	-	0	0	-	-	655	585	-
Stage 2	-	-	0	0	-	-	874	769	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1384	-	-	-	-	-	445	0	946
Mov Cap-2 Maneuver	-	-	-	-	-	-	445	0	-
Stage 1	-	-	-	-	-	-	581	0	-
Stage 2	-	-	-	-	-	-	874	0	-

Approach	EB	WB	NB
HCM Control Delay, s	5.3	0	20.3
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	466	1384	-	-	-
HCM Lane V/C Ratio	0.505	0.113	-	-	-
HCM Control Delay (s)	20.3	7.9	-	-	-
HCM Lane LOS	C	A	-	-	-
HCM 95th %tile Q(veh)	2.8	0.4	-	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	3	27	8	29	9	9	6	68	57	74	234	1
Future Vol, veh/h	3	27	8	29	9	9	6	68	57	74	234	1
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	4	34	10	37	11	11	8	86	72	94	296	1

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	634	659	297	645	623	122	297	0	0	158	0	0
Stage 1	485	485	-	138	138	-	-	-	-	-	-	-
Stage 2	149	174	-	507	485	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	6.27	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	385	377	731	378	396	916	1236	-	-	1392	-	-
Stage 1	554	543	-	853	773	-	-	-	-	-	-	-
Stage 2	842	746	-	539	543	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	347	344	731	322	362	916	1236	-	-	1392	-	-
Mov Cap-2 Maneuver	347	344	-	322	362	-	-	-	-	-	-	-
Stage 1	550	499	-	847	768	-	-	-	-	-	-	-
Stage 2	813	741	-	455	499	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	15.6	16.3	0.4	1.9
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1236	-	-	387	377	1392	-	-
HCM Lane V/C Ratio	0.006	-	-	0.124	0.158	0.067	-	-
HCM Control Delay (s)	7.9	0	-	15.6	16.3	7.8	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.4	0.6	0.2	-	-

Intersection	
Int Delay, s/veh	9.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	139	22	80	32	85	16	32	146	107	20	7
Future Vol, veh/h	11	139	22	80	32	85	16	32	146	107	20	7
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	120	-	130	75	-	120	60	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	13	167	27	96	39	102	19	39	176	129	24	8

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	141	0	0	194	0	0	491	526	167	545	451	39
Stage 1	-	-	-	-	-	-	193	193	-	231	231	-
Stage 2	-	-	-	-	-	-	298	333	-	314	220	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1430	-	-	1367	-	-	485	454	872	446	501	1027
Stage 1	-	-	-	-	-	-	804	737	-	767	710	-
Stage 2	-	-	-	-	-	-	706	640	-	693	717	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1430	-	-	1367	-	-	434	419	872	311	462	1027
Mov Cap-2 Maneuver	-	-	-	-	-	-	434	419	-	311	462	-
Stage 1	-	-	-	-	-	-	797	730	-	760	660	-
Stage 2	-	-	-	-	-	-	627	595	-	519	711	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.5	3.2	12.1	24.8
HCM LOS			B	C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	434	730	1430	-	-	1367	-	-	340
HCM Lane V/C Ratio	0.044	0.294	0.009	-	-	0.071	-	-	0.475
HCM Control Delay (s)	13.7	12	7.5	-	-	7.8	-	-	24.8
HCM Lane LOS	B	B	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.1	1.2	0	-	-	0.2	-	-	2.4

Intersection	
Int Delay, s/veh	2.9

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	0	430	149	0	108	41
Future Vol, veh/h	0	430	149	0	108	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	0	473	164	0	119	45

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	637	164
Stage 1	-	-	-	-	164	-
Stage 2	-	-	-	-	473	-
Critical Hdwy	-	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	0	-	-	0	438	875
Stage 1	0	-	-	0	860	-
Stage 2	0	-	-	0	623	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	438	875
Mov Cap-2 Maneuver	-	-	-	-	438	-
Stage 1	-	-	-	-	860	-
Stage 2	-	-	-	-	623	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.3
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	438	875
HCM Lane V/C Ratio	-	-	0.271	0.051
HCM Control Delay (s)	-	-	16.2	9.3
HCM Lane LOS	-	-	C	A
HCM 95th %tile Q(veh)	-	-	1.1	0.2

Intersection												
Int Delay, s/veh	6.2											
Movement	**EBL**	**EBT**	**EBR**	**WBL**	**WBT**	**WBR**	**NBL**	**NBT**	**NBR**	**SBL**	**SBT**	**SBR**
Lane Configurations												
Traffic Vol, veh/h	55	329	0	0	244	74	71	0	327	0	0	0
Future Vol, veh/h	55	329	0	0	244	74	71	0	327	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	85	550	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	59	354	0	0	262	80	76	0	352	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	342	0	-	-	-	0	774	-	354
Stage 1	-	-	-	-	-	-	472	-	-
Stage 2	-	-	-	-	-	-	302	-	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	-	3.318
Pot Cap-1 Maneuver	1217	-	0	0	-	-	367	0	690
Stage 1	-	-	0	0	-	-	628	0	-
Stage 2	-	-	0	0	-	-	750	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1217	-	-	-	-	-	349	0	690
Mov Cap-2 Maneuver	-	-	-	-	-	-	349	0	-
Stage 1	-	-	-	-	-	-	598	0	-
Stage 2	-	-	-	-	-	-	750	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.2	0	16
HCM LOS			C

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	349	690	1217	-	-	-
HCM Lane V/C Ratio	0.219	0.51	0.049	-	-	-
HCM Control Delay (s)	18.2	15.5	8.1	-	-	-
HCM Lane LOS	C	C	A	-	-	-
HCM 95th %tile Q(veh)	0.8	2.9	0.2	-	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	438	322	0	229	88
Future Volume (veh/h)	0	438	322	0	229	88
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1885	1885	0	1885	1885
Adj Flow Rate, veh/h	0	498	366	0	260	67
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	1	1	0	1	1
Cap, veh/h	0	1605	1117	0	464	413
Arrive On Green	0.00	0.31	0.31	0.00	0.26	0.26
Sat Flow, veh/h	0	5486	3770	0	1795	1598
Grp Volume(v), veh/h	0	498	366	0	260	67
Grp Sat Flow(s),veh/h/ln	0	1716	1791	0	1795	1598
Q Serve(g_s), s	0.0	1.7	1.8	0.0	2.9	0.7
Cycle Q Clear(g_c), s	0.0	1.7	1.8	0.0	2.9	0.7
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1605	1117	0	464	413
V/C Ratio(X)	0.00	0.31	0.33	0.00	0.56	0.16
Avail Cap(c_a), veh/h	0	9274	6455	0	4574	4070
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	6.0	6.0	0.0	7.3	6.5
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.0	1.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	0.0	0.7	0.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.1	6.2	0.0	8.4	6.7
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		498	366		327	
Approach Delay, s/veh		6.1	6.2		8.1	
Approach LOS		A	A		A	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	12.0	10.8	12.0
Change Period (Y+Rc), s	4.9	4.9	4.9
Max Green Setting (Gmax), s	41.1	58.1	41.1
Max Q Clear Time (g_c+I1), s	3.7	4.9	3.8
Green Ext Time (p_c), s	3.5	1.0	2.4

Intersection Summary	
HCM 6th Ctrl Delay	6.7
HCM 6th LOS	A

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	498	366	260	100
v/c Ratio	0.30	0.32	0.42	0.16
Control Delay	8.7	9.1	10.6	3.2
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.7	9.1	10.6	3.2
Queue Length 50th (ft)	19	20	26	0
Queue Length 95th (ft)	46	53	87	19
Internal Link Dist (ft)	650	158	474	
Turn Bay Length (ft)				
Base Capacity (vph)	5030	3501	1787	1599
Starvation Cap Reductn	0	128	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.11	0.15	0.06

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	299	87	290	0	0	0	104	477	27	130	295	216
Future Volume (veh/h)	299	87	290	0	0	0	104	477	27	130	295	216
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885				1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	210	256	222				113	518	18	141	321	178
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				1	1	1	1	1	1
Cap, veh/h	452	474	402				323	955	33	192	638	346
Arrive On Green	0.25	0.25	0.25				0.09	0.27	0.27	0.11	0.28	0.28
Sat Flow, veh/h	1795	1885	1598				3483	3531	123	1795	2242	1216
Grp Volume(v), veh/h	210	256	222				113	262	274	141	255	244
Grp Sat Flow(s),veh/h/ln	1795	1885	1598				1742	1791	1863	1795	1791	1666
Q Serve(g_s), s	3.7	4.4	4.5				1.1	4.7	4.7	2.8	4.4	4.6
Cycle Q Clear(g_c), s	3.7	4.4	4.5				1.1	4.7	4.7	2.8	4.4	4.6
Prop In Lane	1.00		1.00				1.00		0.07	1.00		0.73
Lane Grp Cap(c), veh/h	452	474	402				323	484	504	192	509	474
V/C Ratio(X)	0.46	0.54	0.55				0.35	0.54	0.54	0.74	0.50	0.51
Avail Cap(c_a), veh/h	2178	2287	1938				1312	2173	2260	1352	2847	2649
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	11.8	12.0	12.1				15.8	11.6	11.6	16.1	11.1	11.1
Incr Delay (d2), s/veh	0.7	1.0	1.2				0.6	0.9	0.9	5.4	0.8	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.1	1.4	4.1				0.4	1.5	1.5	1.2	1.4	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.5	13.0	13.3				16.5	12.5	12.5	21.5	11.9	12.0
LnGrp LOS	B	B	B				B	B	B	C	B	B
Approach Vol, veh/h		688						649			640	
Approach Delay, s/veh		12.9						13.2			14.0	
Approach LOS		B						B			B	
Timer - Assigned Phs	1	2		4	5	6						
Phs Duration (G+Y+Rc), s	8.0	14.9		14.3	7.4	15.5						
Change Period (Y+Rc), s	4.0	4.9		4.9	4.0	4.9						
Max Green Setting (Gmax), s	28.0	45.1		45.1	14.0	59.1						
Max Q Clear Time (g_c+I1), s	4.8	6.7		6.5	3.1	6.6						
Green Ext Time (p_c), s	0.3	3.4		2.9	0.2	3.3						
Intersection Summary												
HCM 6th Ctrl Delay			13.4									
HCM 6th LOS			B									

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	208	212	315	113	547	141	556
v/c Ratio	0.46	0.46	0.48	0.23	0.55	0.41	0.40
Control Delay	22.2	22.1	5.5	26.4	20.2	26.6	10.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.2	22.1	5.5	26.4	20.2	26.6	10.6
Queue Length 50th (ft)	58	60	0	17	77	41	46
Queue Length 95th (ft)	143	145	54	48	158	110	104
Internal Link Dist (ft)		158			849		581
Turn Bay Length (ft)			125	125		100	
Base Capacity (vph)	1393	1427	1369	915	2911	944	3176
Starvation Cap Reductn	106	116	72	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.16	0.16	0.24	0.12	0.19	0.15	0.18

Intersection Summary

Intersection	
Int Delay, s/veh	11.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	323	64	62	230	0	65	0	163	7	87	108
Future Vol, veh/h	0	323	64	62	230	0	65	0	163	7	87	108
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	20	20	20	20	20	20	20	20	20	20	20	20
Mvmt Flow	0	363	72	70	258	0	73	0	183	8	98	121

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	435	0	0	907	797	399	889	833	258
Stage 1	-	-	-	-	-	-	399	399	-	398	398	-
Stage 2	-	-	-	-	-	-	508	398	-	491	435	-
Critical Hdwy	-	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	-	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	0	-	-	1035	-	0	239	300	613	245	285	739
Stage 1	0	-	-	-	-	0	593	572	-	593	573	-
Stage 2	0	-	-	-	-	0	516	573	-	527	551	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1035	-	-	134	276	613	161	262	739
Mov Cap-2 Maneuver	-	-	-	-	-	-	134	276	-	161	262	-
Stage 1	-	-	-	-	-	-	593	572	-	593	528	-
Stage 2	-	-	-	-	-	-	324	528	-	370	551	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.9	31.6	26.7
HCM LOS			D	D

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	208	613	-	-	1035	-	387
HCM Lane V/C Ratio	0.645	0.199	-	-	0.067	-	0.586
HCM Control Delay (s)	49.2	12.3	-	-	8.7	0	26.7
HCM Lane LOS	E	B	-	-	A	A	D
HCM 95th %tile Q(veh)	3.8	0.7	-	-	0.2	-	3.6

Intersection	
Int Delay, s/veh	30.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	227	63	0	0	108	15	214	0	49	0	0	0
Future Vol, veh/h	227	63	0	0	108	15	214	0	49	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	19	19	19	19	19	19	19	19	19	19	19	19
Mvmt Flow	267	74	0	0	127	18	252	0	58	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	145	0	-	-	-	0	744	753	74
Stage 1	-	-	-	-	-	-	608	608	-
Stage 2	-	-	-	-	-	-	136	145	-
Critical Hdwy	4.29	-	-	-	-	-	6.59	6.69	6.39
Critical Hdwy Stg 1	-	-	-	-	-	-	5.59	5.69	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.59	5.69	-
Follow-up Hdwy	2.371	-	-	-	-	-	3.671	4.171	3.471
Pot Cap-1 Maneuver	1339	-	0	0	-	-	358	319	942
Stage 1	-	-	0	0	-	-	512	460	-
Stage 2	-	-	0	0	-	-	850	746	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1339	-	-	-	-	-	287	0	942
Mov Cap-2 Maneuver	-	-	-	-	-	-	287	0	-
Stage 1	-	-	-	-	-	-	410	0	-
Stage 2	-	-	-	-	-	-	850	0	-

Approach	EB	WB	NB
HCM Control Delay, s	6.5	0	71.2
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	330	1339	-	-	-
HCM Lane V/C Ratio	0.938	0.199	-	-	-
HCM Control Delay (s)	71.2	8.4	-	-	-
HCM Lane LOS	F	A	-	-	-
HCM 95th %tile Q(veh)	9.6	0.7	-	-	-

Intersection	
Int Delay, s/veh	3.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	21	4	52	21	6	6	170	46	10	86	12
Future Vol, veh/h	19	21	4	52	21	6	6	170	46	10	86	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	14	14	14	14	14	14	14	14	14	14	14	14
Mvmt Flow	23	25	5	63	25	7	7	205	55	12	104	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	398	409	111	397	389	233	118	0	0	260	0	0
Stage 1	135	135	-	247	247	-	-	-	-	-	-	-
Stage 2	263	274	-	150	142	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.64	6.34	7.24	6.64	6.34	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.24	5.64	-	6.24	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.64	-	6.24	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4.126	3.426	3.626	4.126	3.426	2.326	-	-	2.326	-	-
Pot Cap-1 Maneuver	541	514	911	542	528	777	1399	-	-	1238	-	-
Stage 1	840	762	-	731	680	-	-	-	-	-	-	-
Stage 2	716	662	-	825	757	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	510	506	911	512	520	777	1399	-	-	1238	-	-
Mov Cap-2 Maneuver	510	506	-	512	520	-	-	-	-	-	-	-
Stage 1	835	754	-	727	676	-	-	-	-	-	-	-
Stage 2	679	658	-	785	749	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	12.6	13.3	0.2	0.7
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1399	-	-	529	528	1238	-	-
HCM Lane V/C Ratio	0.005	-	-	0.1	0.18	0.01	-	-
HCM Control Delay (s)	7.6	0	-	12.6	13.3	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.3	0.7	0	-	-

Intersection	
Int Delay, s/veh	12.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	66	15	107	76	268	4	87	83	175	38	5
Future Vol, veh/h	11	66	15	107	76	268	4	87	83	175	38	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	120	-	130	75	-	120	60	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	12	71	16	115	82	288	4	94	89	188	41	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	370	0	0	87	0	0	574	695	71	507	423	82
Stage 1	-	-	-	-	-	-	95	95	-	312	312	-
Stage 2	-	-	-	-	-	-	479	600	-	195	111	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1161	-	-	1478	-	-	422	360	978	468	515	964
Stage 1	-	-	-	-	-	-	900	807	-	688	649	-
Stage 2	-	-	-	-	-	-	558	482	-	795	794	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1161	-	-	1478	-	-	366	329	978	311	470	964
Mov Cap-2 Maneuver	-	-	-	-	-	-	366	329	-	311	470	-
Stage 1	-	-	-	-	-	-	891	799	-	681	598	-
Stage 2	-	-	-	-	-	-	477	444	-	631	786	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	1	1.8	16.8	37.1
HCM LOS			C	E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	366	487	1161	-	-	1478	-	-	336
HCM Lane V/C Ratio	0.012	0.375	0.01	-	-	0.078	-	-	0.698
HCM Control Delay (s)	15	16.8	8.1	-	-	7.6	-	-	37.1
HCM Lane LOS	C	C	A	-	-	A	-	-	E
HCM 95th %tile Q(veh)	0	1.7	0	-	-	0.3	-	-	5

Intersection						
Int Delay, s/veh	1.5					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Vol, veh/h	0	311	411	0	44	39
Future Vol, veh/h	0	311	411	0	44	39
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	342	452	0	48	43

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	794	452
Stage 1	-	-	-	-	452	-
Stage 2	-	-	-	-	342	-
Critical Hdwy	-	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	0	-	-	0	356	605
Stage 1	0	-	-	0	639	-
Stage 2	0	-	-	0	717	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	356	605
Mov Cap-2 Maneuver	-	-	-	-	356	-
Stage 1	-	-	-	-	639	-
Stage 2	-	-	-	-	717	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	14.2
HCM LOS			B

Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	356	605
HCM Lane V/C Ratio	-	-	0.136	0.071
HCM Control Delay (s)	-	-	16.7	11.4
HCM Lane LOS	-	-	C	B
HCM 95th %tile Q(veh)	-	-	0.5	0.2

Intersection	
Int Delay, s/veh	22.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	45	176	0	0	729	65	212	0	192	0	0	0
Future Vol, veh/h	45	176	0	0	729	65	212	0	192	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	85	550	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	49	193	0	0	801	71	233	0	211	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	872	0	-	-	-	0	1128	-	193
Stage 1	-	-	-	-	-	-	291	-	-
Stage 2	-	-	-	-	-	-	837	-	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	-	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	-	3.327
Pot Cap-1 Maneuver	769	-	0	0	-	-	~ 225	0	846
Stage 1	-	-	0	0	-	-	756	0	-
Stage 2	-	-	0	0	-	-	423	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	769	-	-	-	-	-	~ 211	0	846
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 211	0	-
Stage 1	-	-	-	-	-	-	708	0	-
Stage 2	-	-	-	-	-	-	423	0	-

Approach	EB	WB	NB
HCM Control Delay, s	2	0	78.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	211	846	769	-	-	-
HCM Lane V/C Ratio	1.104	0.249	0.064	-	-	-
HCM Control Delay (s)	140.5	10.7	10	-	-	-
HCM Lane LOS	F	B	B	-	-	-
HCM 95th %tile Q(veh)	10.8	1	0.2	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	444	353	0	270	269
Future Volume (veh/h)	0	444	353	0	270	269
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h	0	541	430	0	329	182
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	0	3	3	0	3	3
Cap, veh/h	0	1569	1092	0	539	479
Arrive On Green	0.00	0.31	0.31	0.00	0.30	0.30
Sat Flow, veh/h	0	5400	3711	0	1767	1572
Grp Volume(v), veh/h	0	541	430	0	329	182
Grp Sat Flow(s),veh/h/ln	0	1689	1763	0	1767	1572
Q Serve(g_s), s	0.0	2.1	2.4	0.0	4.0	2.3
Cycle Q Clear(g_c), s	0.0	2.1	2.4	0.0	4.0	2.3
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1569	1092	0	539	479
V/C Ratio(X)	0.00	0.34	0.39	0.00	0.61	0.38
Avail Cap(c_a), veh/h	0	7792	5423	0	4178	3718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	6.8	6.9	0.0	7.5	6.9
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.0	1.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.4	0.0	1.0	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.9	7.1	0.0	8.7	7.4
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		541	430		511	
Approach Delay, s/veh		6.9	7.1		8.2	
Approach LOS		A	A		A	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	12.8	12.6	12.8
Change Period (Y+Rc), s	4.9	4.9	4.9
Max Green Setting (Gmax), s	39.1	60.1	39.1
Max Q Clear Time (g_c+I1), s	4.1	6.0	4.4
Green Ext Time (p_c), s	3.8	1.7	2.9

Intersection Summary	
HCM 6th Ctrl Delay	7.4
HCM 6th LOS	A

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	541	430	329	328
v/c Ratio	0.33	0.38	0.50	0.45
Control Delay	9.5	10.3	11.6	5.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.5	10.3	11.6	5.3
Queue Length 50th (ft)	24	28	39	10
Queue Length 95th (ft)	47	58	102	46
Internal Link Dist (ft)	650	158	474	
Turn Bay Length (ft)				
Base Capacity (vph)	4881	3397	1752	1568
Starvation Cap Reductn	0	116	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.11	0.13	0.19	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	113	294	0	0	0	99	553	41	62	279	258
Future Volume (veh/h)	315	113	294	0	0	0	99	553	41	62	279	258
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856				1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	246	292	264				114	636	41	71	321	250
Peak Hour Factor	0.87	0.87	0.87				0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3				3	3	3	3	3	3
Cap, veh/h	491	516	437				304	1071	69	119	567	432
Arrive On Green	0.28	0.28	0.28				0.09	0.32	0.32	0.07	0.30	0.30
Sat Flow, veh/h	1767	1856	1572				3428	3363	217	1767	1906	1451
Grp Volume(v), veh/h	246	292	264				114	333	344	71	296	275
Grp Sat Flow(s),veh/h/ln	1767	1856	1572				1714	1763	1817	1767	1763	1594
Q Serve(g_s), s	4.8	5.5	6.0				1.3	6.5	6.5	1.6	5.8	6.0
Cycle Q Clear(g_c), s	4.8	5.5	6.0				1.3	6.5	6.5	1.6	5.8	6.0
Prop In Lane	1.00		1.00				1.00		0.12	1.00		0.91
Lane Grp Cap(c), veh/h	491	516	437				304	562	579	119	525	475
V/C Ratio(X)	0.50	0.57	0.60				0.38	0.59	0.59	0.59	0.56	0.58
Avail Cap(c_a), veh/h	2068	2171	1840				1168	2234	2302	774	2406	2176
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.4	12.7	12.9				17.7	11.8	11.8	18.6	12.2	12.2
Incr Delay (d2), s/veh	0.8	1.0	1.3				0.8	1.0	1.0	4.7	1.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.8	0.2				0.5	2.1	2.1	0.7	1.9	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	13.7	14.2				18.4	12.8	12.7	23.3	13.1	13.4
LnGrp LOS	B	B	B				B	B	B	C	B	B
Approach Vol, veh/h		802						791			642	
Approach Delay, s/veh		13.7						13.6			14.4	
Approach LOS		B						B			B	

Timer - Assigned Phs	1	2		4	5	6
Phs Duration (G+Y+Rc), s	6.8	18.0		16.3	7.6	17.1
Change Period (Y+Rc), s	4.0	4.9		4.9	4.0	4.9
Max Green Setting (Gmax), s	18.0	52.1		48.1	14.0	56.1
Max Q Clear Time (g_c+I1), s	3.6	8.5		8.0	3.3	8.0
Green Ext Time (p_c), s	0.1	4.6		3.4	0.2	3.9

Intersection Summary			
HCM 6th Ctrl Delay			13.9
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	243	249	338	114	683	71	618
v/c Ratio	0.49	0.49	0.48	0.23	0.58	0.26	0.48
Control Delay	22.4	22.2	5.1	28.3	19.2	29.5	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	22.2	5.1	28.3	19.2	29.5	11.6
Queue Length 50th (ft)	71	72	0	18	100	22	53
Queue Length 95th (ft)	164	167	48	50	192	69	116
Internal Link Dist (ft)		158			849		581
Turn Bay Length (ft)			125	125		100	
Base Capacity (vph)	1371	1410	1351	942	3004	624	2953
Starvation Cap Reductn	135	148	100	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.20	0.27	0.12	0.23	0.11	0.21

Intersection Summary

Intersection	
Int Delay, s/veh	77.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	343	195	93	197	0	42	0	139	17	156	134
Future Vol, veh/h	0	343	195	93	197	0	42	0	139	17	156	134
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	15	15	15	15	15	15	15	15	15	15	15	15
Mvmt Flow	0	385	219	104	221	0	47	0	156	19	175	151

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	604	0	0	1087	924	495	1002	1033	221
Stage 1	-	-	-	-	-	-	495	495	-	429	429	-
Stage 2	-	-	-	-	-	-	592	429	-	573	604	-
Critical Hdwy	-	-	-	4.25	-	-	7.25	6.65	6.35	7.25	6.65	6.35
Critical Hdwy Stg 1	-	-	-	-	-	-	6.25	5.65	-	6.25	5.65	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.25	5.65	-	6.25	5.65	-
Follow-up Hdwy	-	-	-	2.335	-	-	3.635	4.135	3.435	3.635	4.135	3.435
Pot Cap-1 Maneuver	0	-	-	913	-	0	183	256	549	209	221	787
Stage 1	0	-	-	-	-	0	533	525	-	579	562	-
Stage 2	0	-	-	-	-	0	471	562	-	482	468	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	913	-	-	~ 28	223	549	135	192	787
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 28	223	-	135	192	-
Stage 1	-	-	-	-	-	-	533	525	-	579	489	-
Stage 2	-	-	-	-	-	-	213	489	-	345	468	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	3	264.6	174.8
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	56	549	-	-	913	-	277
HCM Lane V/C Ratio	1.772	0.19	-	-	0.114	-	1.245
HCM Control Delay (s)	$ 528.5	13.1	-	-	9.5	0	174.8
HCM Lane LOS	F	B	-	-	A	A	F
HCM 95th %tile Q(veh)	9.4	0.7	-	-	0.4	-	16.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s   +: Computation Not Defined   *: All major volume in platoon

Intersection	
Int Delay, s/veh	11.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	175	84	0	0	131	8	202	0	19	0	0	0
Future Vol, veh/h	175	84	0	0	131	8	202	0	19	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	16	16	16	16	16	16	16	16	16	16	16
Mvmt Flow	186	89	0	0	139	9	215	0	20	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	148	0	-	-	-	0	605	609	89
Stage 1	-	-	-	-	-	-	461	461	-
Stage 2	-	-	-	-	-	-	144	148	-
Critical Hdwy	4.26	-	-	-	-	-	6.56	6.66	6.36
Critical Hdwy Stg 1	-	-	-	-	-	-	5.56	5.66	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.56	5.66	-
Follow-up Hdwy	2.344	-	-	-	-	-	3.644	4.144	3.444
Pot Cap-1 Maneuver	1352	-	0	0	-	-	439	392	932
Stage 1	-	-	0	0	-	-	607	542	-
Stage 2	-	-	0	0	-	-	850	749	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1352	-	-	-	-	-	378	0	932
Mov Cap-2 Maneuver	-	-	-	-	-	-	378	0	-
Stage 1	-	-	-	-	-	-	523	0	-
Stage 2	-	-	-	-	-	-	850	0	-

Approach	EB	WB	NB
HCM Control Delay, s	5.5	0	26.3
HCM LOS			D

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	398	1352	-	-	-
HCM Lane V/C Ratio	0.591	0.138	-	-	-
HCM Control Delay (s)	26.3	8.1	-	-	-
HCM Lane LOS	D	A	-	-	-
HCM 95th %tile Q(veh)	3.7	0.5	-	-	-

Intersection	
Int Delay, s/veh	4.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	27	8	29	9	9	6	103	57	74	262	22
Future Vol, veh/h	25	27	8	29	9	9	6	103	57	74	262	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	32	34	10	37	11	11	8	130	72	94	332	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	727	752	346	738	730	166	360	0	0	202	0	0
Stage 1	534	534	-	182	182	-	-	-	-	-	-	-
Stage 2	193	218	-	556	548	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	6.27	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	333	333	686	327	343	865	1171	-	-	1341	-	-
Stage 1	521	516	-	808	740	-	-	-	-	-	-	-
Stage 2	797	713	-	507	509	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	296	301	686	273	310	865	1171	-	-	1341	-	-
Mov Cap-2 Maneuver	296	301	-	273	310	-	-	-	-	-	-	-
Stage 1	517	471	-	802	734	-	-	-	-	-	-	-
Stage 2	768	707	-	423	464	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	19.5	18.6	0.3	1.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1171	-	-	323	323	1341	-	-
HCM Lane V/C Ratio	0.006	-	-	0.235	0.184	0.07	-	-
HCM Control Delay (s)	8.1	0	-	19.5	18.6	7.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.9	0.7	0.2	-	-

Intersection	
Int Delay, s/veh	208.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	139	22	80	32	318	16	104	146	343	70	11
Future Vol, veh/h	16	139	22	80	32	318	16	104	146	343	70	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	120	-	130	75	-	120	60	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	19	167	27	96	39	383	19	125	176	413	84	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	422	0	0	194	0	0	676	819	167	600	463	39
Stage 1	-	-	-	-	-	-	205	205	-	231	231	-
Stage 2	-	-	-	-	-	-	471	614	-	369	232	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1127	-	-	1367	-	-	365	308	872	~ 410	493	1027
Stage 1	-	-	-	-	-	-	792	728	-	767	710	-
Stage 2	-	-	-	-	-	-	570	480	-	647	709	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1127	-	-	1367	-	-	289	282	872	~ 200	451	1027
Mov Cap-2 Maneuver	-	-	-	-	-	-	289	282	-	~ 200	451	-
Stage 1	-	-	-	-	-	-	779	716	-	754	660	-
Stage 2	-	-	-	-	-	-	456	446	-	419	697	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	1.5	25.3	$ 620
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	289	466	1127	-	-	1367	-	-	225
HCM Lane V/C Ratio	0.067	0.646	0.017	-	-	0.071	-	-	2.27
HCM Control Delay (s)	18.3	25.8	8.2	-	-	7.8	-	-	$ 620
HCM Lane LOS	C	D	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.2	4.5	0.1	-	-	0.2	-	-	40.5

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection						
Int Delay, s/veh	4					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Vol, veh/h	0	666	382	0	108	41
Future Vol, veh/h	0	666	382	0	108	41
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	0	732	420	0	119	45

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	1152	420
Stage 1	-	-	-	-	420	-
Stage 2	-	-	-	-	732	-
Critical Hdwy	-	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	0	-	-	0	217	629
Stage 1	0	-	-	0	659	-
Stage 2	0	-	-	0	472	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	217	629
Mov Cap-2 Maneuver	-	-	-	-	217	-
Stage 1	-	-	-	-	659	-
Stage 2	-	-	-	-	472	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	32.1
HCM LOS			D

Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	217	629
HCM Lane V/C Ratio	-	-	0.547	0.072
HCM Control Delay (s)	-	-	40	11.2
HCM Lane LOS	-	-	E	B
HCM 95th %tile Q(veh)	-	-	2.9	0.2

Intersection	
Int Delay, s/veh	14.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	55	419	0	0	333	74	215	0	327	0	0	0
Future Vol, veh/h	55	419	0	0	333	74	215	0	327	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	85	550	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	59	451	0	0	358	80	231	0	352	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	438	0	-	-	-	0	967	-	451
Stage 1	-	-	-	-	-	-	569	-	-
Stage 2	-	-	-	-	-	-	398	-	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	-	3.318
Pot Cap-1 Maneuver	1122	-	0	0	-	-	282	0	608
Stage 1	-	-	0	0	-	-	566	0	-
Stage 2	-	-	0	0	-	-	678	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1122	-	-	-	-	-	267	0	608
Mov Cap-2 Maneuver	-	-	-	-	-	-	267	0	-
Stage 1	-	-	-	-	-	-	536	0	-
Stage 2	-	-	-	-	-	-	678	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1	0	37.8
HCM LOS			E

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	267	608	1122	-	-	-
HCM Lane V/C Ratio	0.866	0.578	0.053	-	-	-
HCM Control Delay (s)	66.8	18.7	8.4	-	-	-
HCM Lane LOS	F	C	A	-	-	-
HCM 95th %tile Q(veh)	7.3	3.7	0.2	-	-	-

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	441	322	0	234	105
Future Volume (veh/h)	0	441	322	0	234	105
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1885	1885	0	1885	1885
Adj Flow Rate, veh/h	0	501	366	0	266	86
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	1	1	0	1	1
Cap, veh/h	0	1602	1115	0	473	421
Arrive On Green	0.00	0.31	0.31	0.00	0.26	0.26
Sat Flow, veh/h	0	5486	3770	0	1795	1598
Grp Volume(v), veh/h	0	501	366	0	266	86
Grp Sat Flow(s),veh/h/ln	0	1716	1791	0	1795	1598
Q Serve(g_s), s	0.0	1.7	1.8	0.0	3.0	1.0
Cycle Q Clear(g_c), s	0.0	1.7	1.8	0.0	3.0	1.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1602	1115	0	473	421
V/C Ratio(X)	0.00	0.31	0.33	0.00	0.56	0.20
Avail Cap(c_a), veh/h	0	9182	6390	0	4528	4029
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	6.1	6.1	0.0	7.3	6.6
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.0	1.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	0.0	0.7	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.2	6.3	0.0	8.4	6.8
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		501	366		352	
Approach Delay, s/veh		6.2	6.3		8.0	
Approach LOS		A	A		A	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s				12.1		11.0		12.1
Change Period (Y+Rc), s				4.9		4.9		4.9
Max Green Setting (Gmax), s				41.1		58.1		41.1
Max Q Clear Time (g_c+I1), s				3.7		5.0		3.8
Green Ext Time (p_c), s				3.5		1.1		2.4

Intersection Summary			
HCM 6th Ctrl Delay			6.7
HCM 6th LOS			A

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	501	366	266	119
v/c Ratio	0.30	0.32	0.43	0.19
Control Delay	8.7	9.1	10.7	3.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.7	9.1	10.7	3.1
Queue Length 50th (ft)	19	20	27	0
Queue Length 95th (ft)	46	53	90	21
Internal Link Dist (ft)	650	158	474	
Turn Bay Length (ft)				
Base Capacity (vph)	5030	3501	1787	1599
Starvation Cap Reductn	0	128	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.11	0.15	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	87	306	0	0	0	104	505	27	130	299	216
Future Volume (veh/h)	303	87	306	0	0	0	104	505	27	130	299	216
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885				1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	212	259	240				113	549	18	141	325	178
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				1	1	1	1	1	1
Cap, veh/h	465	489	414				316	982	32	192	661	354
Arrive On Green	0.26	0.26	0.26				0.09	0.28	0.28	0.11	0.29	0.29
Sat Flow, veh/h	1795	1885	1598				3483	3539	116	1795	2252	1207
Grp Volume(v), veh/h	212	259	240				113	278	289	141	257	246
Grp Sat Flow(s),veh/h/ln	1795	1885	1598				1742	1791	1864	1795	1791	1668
Q Serve(g_s), s	3.8	4.6	5.1				1.2	5.1	5.1	2.9	4.6	4.7
Cycle Q Clear(g_c), s	3.8	4.6	5.1				1.2	5.1	5.1	2.9	4.6	4.7
Prop In Lane	1.00		1.00				1.00		0.06	1.00		0.72
Lane Grp Cap(c), veh/h	465	489	414				316	497	517	192	526	490
V/C Ratio(X)	0.46	0.53	0.58				0.36	0.56	0.56	0.74	0.49	0.50
Avail Cap(c_a), veh/h	2091	2196	1861				1259	2086	2172	1298	2734	2546
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	12.3	12.5				16.5	12.0	12.0	16.8	11.3	11.3
Incr Delay (d2), s/veh	0.7	0.9	1.3				0.7	1.0	0.9	5.4	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.5	0.1				0.4	1.7	1.7	1.3	1.5	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	13.2	13.8				17.2	12.9	12.9	22.2	12.0	12.1
LnGrp LOS	B	B	B				B	B	B	C	B	B
Approach Vol, veh/h		711						680			644	
Approach Delay, s/veh		13.3						13.6			14.3	
Approach LOS		B						B			B	

Timer - Assigned Phs	1	2		4	5	6
Phs Duration (G+Y+Rc), s	8.1	15.6		14.9	7.5	16.3
Change Period (Y+Rc), s	4.0	4.9		4.9	4.0	4.9
Max Green Setting (Gmax), s	28.0	45.1		45.1	14.0	59.1
Max Q Clear Time (g_c+I1), s	4.9	7.1		7.1	3.2	6.7
Green Ext Time (p_c), s	0.3	3.6		3.0	0.2	3.3

Intersection Summary			
HCM 6th Ctrl Delay			13.7
HCM 6th LOS			B

Notes
User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	213	333	113	578	141	560
v/c Ratio	0.47	0.46	0.50	0.24	0.56	0.42	0.39
Control Delay	22.8	22.5	5.5	27.3	20.6	27.5	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	22.6	5.6	27.3	20.6	27.5	10.8
Queue Length 50th (ft)	61	62	0	17	84	42	47
Queue Length 95th (ft)	148	149	56	50	170	113	106
Internal Link Dist (ft)		158			849		581
Turn Bay Length (ft)			125	125		100	
Base Capacity (vph)	1359	1392	1346	890	2840	918	3137
Starvation Cap Reductn	111	122	77	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.26	0.13	0.20	0.15	0.18

Intersection Summary

Intersection	
Int Delay, s/veh	94

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	333	64	62	232	0	65	0	163	147	87	108
Future Vol, veh/h	0	333	64	62	232	0	65	0	163	147	87	108
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	20	20	20	20	20	20	20	20	20	20	20	20
Mvmt Flow	0	374	72	70	261	0	73	0	183	165	98	121

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	446	0	0	921	811	410	903	847	261
Stage 1	-	-	-	-	-	-	410	410	-	401	401	-
Stage 2	-	-	-	-	-	-	511	401	-	502	446	-
Critical Hdwy	-	-	-	4.3	-	-	7.3	6.7	6.4	7.3	6.7	6.4
Critical Hdwy Stg 1	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.3	5.7	-	6.3	5.7	-
Follow-up Hdwy	-	-	-	2.38	-	-	3.68	4.18	3.48	3.68	4.18	3.48
Pot Cap-1 Maneuver	0	-	-	1025	-	0	233	294	604	240	280	736
Stage 1	0	-	-	-	-	0	584	566	-	591	571	-
Stage 2	0	-	-	-	-	0	514	571	-	520	545	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	1025	-	-	129	270	604	~ 157	258	736
Mov Cap-2 Maneuver	-	-	-	-	-	-	129	270	-	~ 157	258	-
Stage 1	-	-	-	-	-	-	584	566	-	591	525	-
Stage 2	-	-	-	-	-	-	321	525	-	362	545	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	1.8	33.6	$ 322.8
HCM LOS			D	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	201	604	-	-	1025	-	241
HCM Lane V/C Ratio	0.667	0.202	-	-	0.068	-	1.594
HCM Control Delay (s)	52.8	12.5	-	-	8.8	0	$ 322.8
HCM Lane LOS	F	B	-	-	A	A	F
HCM 95th %tile Q(veh)	4	0.8	-	-	0.2	-	23.9

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	181.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	227	213	0	0	166	44	214	0	323	0	0	0
Future Vol, veh/h	227	213	0	0	166	44	214	0	323	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	85	85	85	85	85	85	85	85	85	85	85	85
Heavy Vehicles, %	19	19	19	19	19	19	19	19	19	19	19	19
Mvmt Flow	267	251	0	0	195	52	252	0	380	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	247	0	-	-	-	0	1006	1032	251
Stage 1	-	-	-	-	-	-	785	785	-
Stage 2	-	-	-	-	-	-	221	247	-
Critical Hdwy	4.29	-	-	-	-	-	6.59	6.69	6.39
Critical Hdwy Stg 1	-	-	-	-	-	-	5.59	5.69	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.59	5.69	-
Follow-up Hdwy	2.371	-	-	-	-	-	3.671	4.171	3.471
Pot Cap-1 Maneuver	1226	-	0	0	-	-	~ 249	217	748
Stage 1	-	-	0	0	-	-	421	380	-
Stage 2	-	-	0	0	-	-	777	672	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	1226	-	-	-	-	-	~ 195	0	748
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 195	0	-
Stage 1	-	-	-	-	-	-	329	0	-
Stage 2	-	-	-	-	-	-	777	0	-

Approach	EB	WB	NB
HCM Control Delay, s	4.5	0	$ 397
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	351	1226	-	-	-
HCM Lane V/C Ratio	1.8	0.218	-	-	-
HCM Control Delay (s)	$ 397	8.8	-	-	-
HCM Lane LOS	F	A	-	-	-
HCM 95th %tile Q(veh)	40.9	0.8	-	-	-

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection	
Int Delay, s/veh	4.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	19	37	4	52	36	6	6	170	46	10	86	12
Future Vol, veh/h	19	37	4	52	36	6	6	170	46	10	86	12
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	14	14	14	14	14	14	14	14	14	14	14	14
Mvmt Flow	23	45	5	63	43	7	7	205	55	12	104	14

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	407	409	111	407	389	233	118	0	0	260	0	0
Stage 1	135	135	-	247	247	-	-	-	-	-	-	-
Stage 2	272	274	-	160	142	-	-	-	-	-	-	-
Critical Hdwy	7.24	6.64	6.34	7.24	6.64	6.34	4.24	-	-	4.24	-	-
Critical Hdwy Stg 1	6.24	5.64	-	6.24	5.64	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.24	5.64	-	6.24	5.64	-	-	-	-	-	-	-
Follow-up Hdwy	3.626	4.126	3.426	3.626	4.126	3.426	2.326	-	-	2.326	-	-
Pot Cap-1 Maneuver	534	514	911	534	528	777	1399	-	-	1238	-	-
Stage 1	840	762	-	731	680	-	-	-	-	-	-	-
Stage 2	708	662	-	815	757	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	489	506	911	490	520	777	1399	-	-	1238	-	-
Mov Cap-2 Maneuver	489	506	-	490	520	-	-	-	-	-	-	-
Stage 1	835	754	-	727	676	-	-	-	-	-	-	-
Stage 2	652	658	-	755	749	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	13.1	14	0.2	0.7
HCM LOS	B	B		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1399	-	-	516	513	1238	-	-
HCM Lane V/C Ratio	0.005	-	-	0.14	0.221	0.01	-	-
HCM Control Delay (s)	7.6	0	-	13.1	14	7.9	0	-
HCM Lane LOS	A	A	-	B	B	A	A	-
HCM 95th %tile Q(veh)	0	-	-	0.5	0.8	0	-	-

Intersection	
Int Delay, s/veh	36.9

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	11	90	16	170	91	268	9	87	131	175	38	5
Future Vol, veh/h	11	90	16	170	91	268	9	87	131	175	38	5
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	120	-	130	75	-	120	60	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	12	97	17	183	98	288	10	94	141	188	41	5

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	386	0	0	114	0	0	752	873	97	711	602	98
Stage 1	-	-	-	-	-	-	121	121	-	464	464	-
Stage 2	-	-	-	-	-	-	631	752	-	247	138	-
Critical Hdwy	4.17	-	-	4.17	-	-	7.17	6.57	6.27	7.17	6.57	6.27
Critical Hdwy Stg 1	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.17	5.57	-	6.17	5.57	-
Follow-up Hdwy	2.263	-	-	2.263	-	-	3.563	4.063	3.363	3.563	4.063	3.363
Pot Cap-1 Maneuver	1146	-	-	1445	-	-	320	283	946	341	407	944
Stage 1	-	-	-	-	-	-	871	786	-	569	555	-
Stage 2	-	-	-	-	-	-	461	411	-	746	773	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1146	-	-	1445	-	-	260	245	946	~ 184	352	944
Mov Cap-2 Maneuver	-	-	-	-	-	-	260	245	-	~ 184	352	-
Stage 1	-	-	-	-	-	-	862	778	-	563	485	-
Stage 2	-	-	-	-	-	-	367	359	-	553	765	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.8	2.5	21.9	155.2
HCM LOS			C	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	260	442	1146	-	-	1445	-	-	205
HCM Lane V/C Ratio	0.037	0.53	0.01	-	-	0.127	-	-	1.143
HCM Control Delay (s)	19.4	22	8.2	-	-	7.9	-	-	155.2
HCM Lane LOS	C	C	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.1	3	0	-	-	0.4	-	-	11.4

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection						
Int Delay, s/veh	8					

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Vol, veh/h	0	383	477	0	188	51
Future Vol, veh/h	0	383	477	0	188	51
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3
Mvmt Flow	0	421	524	0	207	56

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	945	524
Stage 1	-	-	-	-	524	-
Stage 2	-	-	-	-	421	-
Critical Hdwy	-	-	-	-	6.43	6.23
Critical Hdwy Stg 1	-	-	-	-	5.43	-
Critical Hdwy Stg 2	-	-	-	-	5.43	-
Follow-up Hdwy	-	-	-	-	3.527	3.327
Pot Cap-1 Maneuver	0	-	-	0	289	551
Stage 1	0	-	-	0	592	-
Stage 2	0	-	-	0	660	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	289	551
Mov Cap-2 Maneuver	-	-	-	-	289	-
Stage 1	-	-	-	-	592	-
Stage 2	-	-	-	-	660	-

Approach	EB	WB	SB
HCM Control Delay, s	0	0	36.8
HCM LOS			E

Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	289	551
HCM Lane V/C Ratio	-	-	0.715	0.102
HCM Control Delay (s)	-	-	43.4	12.3
HCM Lane LOS	-	-	E	B
HCM 95th %tile Q(veh)	-	-	5	0.3

Intersection	
Int Delay, s/veh	103.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	56	343	0	0	879	179	256	0	320	0	0	0
Future Vol, veh/h	56	343	0	0	879	179	256	0	320	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	85	550	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	91	91	91	91	91	91	91	91	91	91	91	91
Heavy Vehicles, %	3	3	3	3	3	3	3	3	3	3	3	3
Mvmt Flow	62	377	0	0	966	197	281	0	352	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	1163	0	-	-	-	0	1566	-	377
Stage 1	-	-	-	-	-	-	501	-	-
Stage 2	-	-	-	-	-	-	1065	-	-
Critical Hdwy	4.13	-	-	-	-	-	6.43	-	6.23
Critical Hdwy Stg 1	-	-	-	-	-	-	5.43	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.43	-	-
Follow-up Hdwy	2.227	-	-	-	-	-	3.527	-	3.327
Pot Cap-1 Maneuver	597	-	0	0	-	-	~ 122	0	667
Stage 1	-	-	0	0	-	-	607	0	-
Stage 2	-	-	0	0	-	-	330	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	597	-	-	-	-	-	~ 109	0	667
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 109	0	-
Stage 1	-	-	-	-	-	-	544	0	-
Stage 2	-	-	-	-	-	-	330	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1.6	0	$ 364.5
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	109	667	597	-	-	-
HCM Lane V/C Ratio	2.581	0.527	0.103	-	-	-
HCM Control Delay (s)	$ 799.8	16.3	11.7	-	-	-
HCM Lane LOS	F	C	B	-	-	-
HCM 95th %tile Q(veh)	25.7	3.1	0.3	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑↑↑	↑↑		↰	↱
Traffic Volume (veh/h)	0	444	353	0	270	269
Future Volume (veh/h)	0	444	353	0	270	269
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h	0	541	430	0	329	182
Peak Hour Factor	0.82	0.82	0.82	0.82	0.82	0.82
Percent Heavy Veh, %	0	3	3	0	3	3
Cap, veh/h	0	1569	1092	0	539	479
Arrive On Green	0.00	0.31	0.31	0.00	0.30	0.30
Sat Flow, veh/h	0	5400	3711	0	1767	1572
Grp Volume(v), veh/h	0	541	430	0	329	182
Grp Sat Flow(s),veh/h/ln	0	1689	1763	0	1767	1572
Q Serve(g_s), s	0.0	2.1	2.4	0.0	4.0	2.3
Cycle Q Clear(g_c), s	0.0	2.1	2.4	0.0	4.0	2.3
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1569	1092	0	539	479
V/C Ratio(X)	0.00	0.34	0.39	0.00	0.61	0.38
Avail Cap(c_a), veh/h	0	7792	5423	0	4178	3718
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	6.8	6.9	0.0	7.5	6.9
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.0	1.1	0.5
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.3	0.4	0.0	1.0	0.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.9	7.1	0.0	8.7	7.4
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		541	430		511	
Approach Delay, s/veh		6.9	7.1		8.2	
Approach LOS		A	A		A	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	12.8	12.6	12.8
Change Period (Y+Rc), s	4.9	4.9	4.9
Max Green Setting (Gmax), s	39.1	60.1	39.1
Max Q Clear Time (g_c+I1), s	4.1	6.0	4.4
Green Ext Time (p_c), s	3.8	1.7	2.9

Intersection Summary	
HCM 6th Ctrl Delay	7.4
HCM 6th LOS	A

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	541	430	329	328
v/c Ratio	0.33	0.38	0.50	0.45
Control Delay	9.5	10.3	11.6	5.3
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	9.5	10.3	11.6	5.3
Queue Length 50th (ft)	24	28	39	10
Queue Length 95th (ft)	47	58	102	46
Internal Link Dist (ft)	650	158	474	
Turn Bay Length (ft)				
Base Capacity (vph)	4881	3397	1752	1568
Starvation Cap Reductn	0	116	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.11	0.13	0.19	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	315	113	294	0	0	0	99	553	41	62	279	258
Future Volume (veh/h)	315	113	294	0	0	0	99	553	41	62	279	258
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856				1856	1856	1856	1856	1856	1856
Adj Flow Rate, veh/h	246	292	264				114	636	41	71	321	250
Peak Hour Factor	0.87	0.87	0.87				0.87	0.87	0.87	0.87	0.87	0.87
Percent Heavy Veh, %	3	3	3				3	3	3	3	3	3
Cap, veh/h	491	516	437				304	1071	69	119	567	432
Arrive On Green	0.28	0.28	0.28				0.09	0.32	0.32	0.07	0.30	0.30
Sat Flow, veh/h	1767	1856	1572				3428	3363	217	1767	1906	1451
Grp Volume(v), veh/h	246	292	264				114	333	344	71	296	275
Grp Sat Flow(s),veh/h/ln	1767	1856	1572				1714	1763	1817	1767	1763	1594
Q Serve(g_s), s	4.8	5.5	6.0				1.3	6.5	6.5	1.6	5.8	6.0
Cycle Q Clear(g_c), s	4.8	5.5	6.0				1.3	6.5	6.5	1.6	5.8	6.0
Prop In Lane	1.00		1.00				1.00		0.12	1.00		0.91
Lane Grp Cap(c), veh/h	491	516	437				304	562	579	119	525	475
V/C Ratio(X)	0.50	0.57	0.60				0.38	0.59	0.59	0.59	0.56	0.58
Avail Cap(c_a), veh/h	2068	2171	1840				1168	2234	2302	774	2406	2176
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.4	12.7	12.9				17.7	11.8	11.8	18.6	12.2	12.2
Incr Delay (d2), s/veh	0.8	1.0	1.3				0.8	1.0	1.0	4.7	1.0	1.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	1.8	0.2				0.5	2.1	2.1	0.7	1.9	1.8
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	13.2	13.7	14.2				18.4	12.8	12.7	23.3	13.1	13.4
LnGrp LOS	B	B	B				B	B	B	C	B	B
Approach Vol, veh/h		802						791			642	
Approach Delay, s/veh		13.7						13.6			14.4	
Approach LOS		B						B			B	

Timer - Assigned Phs	1	2		4	5	6
Phs Duration (G+Y+Rc), s	6.8	18.0		16.3	7.6	17.1
Change Period (Y+Rc), s	4.0	4.9		4.9	4.0	4.9
Max Green Setting (Gmax), s	18.0	52.1		48.1	14.0	56.1
Max Q Clear Time (g_c+I1), s	3.6	8.5		8.0	3.3	8.0
Green Ext Time (p_c), s	0.1	4.6		3.4	0.2	3.9

Intersection Summary			
HCM 6th Ctrl Delay			13.9
HCM 6th LOS			B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	243	249	338	114	683	71	618
v/c Ratio	0.49	0.49	0.48	0.23	0.58	0.26	0.48
Control Delay	22.4	22.2	5.1	28.3	19.2	29.5	11.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.4	22.2	5.1	28.3	19.2	29.5	11.6
Queue Length 50th (ft)	71	72	0	18	100	22	53
Queue Length 95th (ft)	164	167	48	50	192	69	116
Internal Link Dist (ft)		158			849		581
Turn Bay Length (ft)			125	125		100	
Base Capacity (vph)	1371	1410	1351	942	3004	624	2953
Starvation Cap Reductn	135	148	100	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.20	0.20	0.27	0.12	0.23	0.11	0.21

Intersection Summary

Intersection	
Int Delay, s/veh	121.5

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	0	345	195	93	206	0	42	0	139	53	156	134
Future Vol, veh/h	0	345	195	93	206	0	42	0	139	53	156	134
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	25	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	89	89	89	89	89	89	89	89	89	89	89	89
Heavy Vehicles, %	15	15	15	15	15	15	15	15	15	15	15	15
Mvmt Flow	0	388	219	104	231	0	47	0	156	60	175	151

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	-	0	0	607	0	0	1100	937	498	1015	1046	231
Stage 1	-	-	-	-	-	-	498	498	-	439	439	-
Stage 2	-	-	-	-	-	-	602	439	-	576	607	-
Critical Hdwy	-	-	-	4.25	-	-	7.25	6.65	6.35	7.25	6.65	6.35
Critical Hdwy Stg 1	-	-	-	-	-	-	6.25	5.65	-	6.25	5.65	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.25	5.65	-	6.25	5.65	-
Follow-up Hdwy	-	-	-	2.335	-	-	3.635	4.135	3.435	3.635	4.135	3.435
Pot Cap-1 Maneuver	0	-	-	911	-	0	179	252	547	205	217	777
Stage 1	0	-	-	-	-	0	531	523	-	572	557	-
Stage 2	0	-	-	-	-	0	465	557	-	480	466	-
Platoon blocked, %		-	-		-							
Mov Cap-1 Maneuver	-	-	-	911	-	-	~ 25	219	547	132	189	777
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 25	219	-	132	189	-
Stage 1	-	-	-	-	-	-	531	523	-	572	484	-
Stage 2	-	-	-	-	-	-	208	484	-	343	466	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0	2.9	$ 316.8	$ 313
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBT	EBR	WBL	WBT	SBLn1
Capacity (veh/h)	50	547	-	-	911	-	245
HCM Lane V/C Ratio	1.985	0.19	-	-	0.115	-	1.573
HCM Control Delay (s)	$ 635.4	13.1	-	-	9.5	0	$ 313
HCM Lane LOS	F	B	-	-	A	A	F
HCM 95th %tile Q(veh)	9.9	0.7	-	-	0.4	-	23.7

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	38.3

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	175	122	0	0	389	135	202	0	89	0	0	0
Future Vol, veh/h	175	122	0	0	389	135	202	0	89	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	145	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	94	94	94	94	94	94	94	94	94	94	94	94
Heavy Vehicles, %	16	16	16	16	16	16	16	16	16	16	16	16
Mvmt Flow	186	130	0	0	414	144	215	0	95	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	558	0	-	-	-	0	988	1060	130
Stage 1	-	-	-	-	-	-	502	502	-
Stage 2	-	-	-	-	-	-	486	558	-
Critical Hdwy	4.26	-	-	-	-	-	6.56	6.66	6.36
Critical Hdwy Stg 1	-	-	-	-	-	-	5.56	5.66	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.56	5.66	-
Follow-up Hdwy	2.344	-	-	-	-	-	3.644	4.144	3.444
Pot Cap-1 Maneuver	946	-	0	0	-	-	258	212	884
Stage 1	-	-	0	0	-	-	580	519	-
Stage 2	-	-	0	0	-	-	590	490	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	946	-	-	-	-	-	~ 207	0	884
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 207	0	-
Stage 1	-	-	-	-	-	-	466	0	-
Stage 2	-	-	-	-	-	-	590	0	-

Approach	EB	WB	NB
HCM Control Delay, s	5.7	0	140.6
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	WBT	WBR
Capacity (veh/h)	270	946	-	-	-
HCM Lane V/C Ratio	1.147	0.197	-	-	-
HCM Control Delay (s)	140.6	9.7	-	-	-
HCM Lane LOS	F	A	-	-	-
HCM 95th %tile Q(veh)	13.5	0.7	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	5.6

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	25	46	8	29	26	9	6	103	57	74	262	22
Future Vol, veh/h	25	46	8	29	26	9	6	103	57	74	262	22
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop	Free	Free	Free	Free	Free	Free
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	-	-	-	-	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	79	79	79	79	79	79	79	79	79	79	79	79
Heavy Vehicles, %	7	7	7	7	7	7	7	7	7	7	7	7
Mvmt Flow	32	58	10	37	33	11	8	130	72	94	332	28

Major/Minor	Minor2			Minor1			Major1			Major2		
Conflicting Flow All	738	752	346	750	730	166	360	0	0	202	0	0
Stage 1	534	534	-	182	182	-	-	-	-	-	-	-
Stage 2	204	218	-	568	548	-	-	-	-	-	-	-
Critical Hdwy	7.17	6.57	6.27	7.17	6.57	6.27	4.17	-	-	4.17	-	-
Critical Hdwy Stg 1	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Critical Hdwy Stg 2	6.17	5.57	-	6.17	5.57	-	-	-	-	-	-	-
Follow-up Hdwy	3.563	4.063	3.363	3.563	4.063	3.363	2.263	-	-	2.263	-	-
Pot Cap-1 Maneuver	327	333	686	321	343	865	1171	-	-	1341	-	-
Stage 1	521	516	-	808	740	-	-	-	-	-	-	-
Stage 2	787	713	-	499	509	-	-	-	-	-	-	-
Platoon blocked, %								-	-		-	-
Mov Cap-1 Maneuver	275	301	686	250	310	865	1171	-	-	1341	-	-
Mov Cap-2 Maneuver	275	301	-	250	310	-	-	-	-	-	-	-
Stage 1	517	471	-	802	734	-	-	-	-	-	-	-
Stage 2	736	707	-	393	464	-	-	-	-	-	-	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	22.1	21.1	0.3	1.6
HCM LOS	C	C		

Minor Lane/Major Mvmt	NBL	NBT	NBR	EBLn1	WBLn1	SBL	SBT	SBR
Capacity (veh/h)	1171	-	-	309	304	1341	-	-
HCM Lane V/C Ratio	0.006	-	-	0.324	0.266	0.07	-	-
HCM Control Delay (s)	8.1	0	-	22.1	21.1	7.9	0	-
HCM Lane LOS	A	A	-	C	C	A	A	-
HCM 95th %tile Q(veh)	0	-	-	1.4	1.1	0.2	-	-

Intersection	
Int Delay, s/veh	558.1

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	16	167	23	146	49	318	21	104	203	343	70	11
Future Vol, veh/h	16	167	23	146	49	318	21	104	203	343	70	11
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	120	-	130	75	-	120	60	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	83	83	83	83	83	83	83	83	83	83	83	83
Heavy Vehicles, %	4	4	4	4	4	4	4	4	4	4	4	4
Mvmt Flow	19	201	28	176	59	383	25	125	245	413	84	13

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	442	0	0	229	0	0	890	1033	201	849	678	59
Stage 1	-	-	-	-	-	-	239	239	-	411	411	-
Stage 2	-	-	-	-	-	-	651	794	-	438	267	-
Critical Hdwy	4.14	-	-	4.14	-	-	7.14	6.54	6.24	7.14	6.54	6.24
Critical Hdwy Stg 1	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.14	5.54	-	6.14	5.54	-
Follow-up Hdwy	2.236	-	-	2.236	-	-	3.536	4.036	3.336	3.536	4.036	3.336
Pot Cap-1 Maneuver	1107	-	-	1327	-	-	261	231	835	~ 279	372	1001
Stage 1	-	-	-	-	-	-	760	704	-	614	591	-
Stage 2	-	-	-	-	-	-	454	397	-	594	684	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1107	-	-	1327	-	-	182	197	835	~ 87	317	1001
Mov Cap-2 Maneuver	-	-	-	-	-	-	182	197	-	~ 87	317	-
Stage 1	-	-	-	-	-	-	747	692	-	604	512	-
Stage 2	-	-	-	-	-	-	325	344	-	~ 338	672	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.6	2.3	59.5	$ 1887.1
HCM LOS			F	F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	182	398	1107	-	-	1327	-	-	102
HCM Lane V/C Ratio	0.139	0.929	0.017	-	-	0.133	-	-	5.008
HCM Control Delay (s)	27.9	61.7	8.3	-	-	8.1	-	$	1887.1
HCM Lane LOS	D	F	A	-	-	A	-	-	F
HCM 95th %tile Q(veh)	0.5	10.2	0.1	-	-	0.5	-	-	54.6

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Intersection	
Int Delay, s/veh	71.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations		↑	↑		↰	↱
Traffic Vol, veh/h	0	751	452	0	270	54
Future Vol, veh/h	0	751	452	0	270	54
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	-	-	-	-	0	0
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	91	91	91	91	91	91
Heavy Vehicles, %	4	4	4	4	4	4
Mvmt Flow	0	825	497	0	297	59

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	-	0	-	0	1322	497
Stage 1	-	-	-	-	497	-
Stage 2	-	-	-	-	825	-
Critical Hdwy	-	-	-	-	6.44	6.24
Critical Hdwy Stg 1	-	-	-	-	5.44	-
Critical Hdwy Stg 2	-	-	-	-	5.44	-
Follow-up Hdwy	-	-	-	-	3.536	3.336
Pot Cap-1 Maneuver	0	-	-	0	~ 171	569
Stage 1	0	-	-	0	607	-
Stage 2	0	-	-	0	427	-
Platoon blocked, %		-	-			
Mov Cap-1 Maneuver	-	-	-	-	~ 171	569
Mov Cap-2 Maneuver	-	-	-	-	~ 171	-
Stage 1	-	-	-	-	607	-
Stage 2	-	-	-	-	427	-

Approach	EB		WB		SB
HCM Control Delay, s	0		0		$ 335.9
HCM LOS					F

Minor Lane/Major Mvmt	EBT	WBT	SBLn1	SBLn2
Capacity (veh/h)	-	-	171	569
HCM Lane V/C Ratio	-	-	1.735	0.104
HCM Control Delay (s)	-	-	$ 400.7	12.1
HCM Lane LOS	-	-	F	B
HCM 95th %tile Q(veh)	-	-	21	0.3

Notes			
~: Volume exceeds capacity	$: Delay exceeds 300s	+: Computation Not Defined	*: All major volume in platoon

Intersection												
Int Delay, s/veh	96.7											

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	68	607	0	0	518	216	261	0	471	0	0	0
Future Vol, veh/h	68	607	0	0	518	216	261	0	471	0	0	0
Conflicting Peds, #/hr	0	0	0	0	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	115	-	-	-	-	85	550	-	0	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	93	93	93	93	93	93	93	93	93	93	93	93
Heavy Vehicles, %	2	2	2	2	2	2	2	2	2	2	2	2
Mvmt Flow	73	653	0	0	557	232	281	0	506	0	0	0

Major/Minor	Major1			Major2			Minor1		
Conflicting Flow All	789	0	-	-	-	0	1472	-	653
Stage 1	-	-	-	-	-	-	799	-	-
Stage 2	-	-	-	-	-	-	673	-	-
Critical Hdwy	4.12	-	-	-	-	-	6.42	-	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	5.42	-	-
Critical Hdwy Stg 2	-	-	-	-	-	-	5.42	-	-
Follow-up Hdwy	2.218	-	-	-	-	-	3.518	-	3.318
Pot Cap-1 Maneuver	831	-	0	0	-	-	~ 140	0	~ 467
Stage 1	-	-	0	0	-	-	443	0	-
Stage 2	-	-	0	0	-	-	507	0	-
Platoon blocked, %		-			-	-			
Mov Cap-1 Maneuver	831	-	-	-	-	-	~ 128	0	~ 467
Mov Cap-2 Maneuver	-	-	-	-	-	-	~ 128	0	-
Stage 1	-	-	-	-	-	-	404	0	-
Stage 2	-	-	-	-	-	-	507	0	-

Approach	EB	WB	NB
HCM Control Delay, s	1	0	281.8
HCM LOS			F

Minor Lane/Major Mvmt	NBLn1	NBLn2	EBL	EBT	WBT	WBR
Capacity (veh/h)	128	467	831	-	-	-
HCM Lane V/C Ratio	2.193	1.084	0.088	-	-	-
HCM Control Delay (s)	$ 617.3	95.9	9.8	-	-	-
HCM Lane LOS	F	F	A	-	-	-
HCM 95th %tile Q(veh)	23.6	16.5	0.3	-	-	-

Notes

~: Volume exceeds capacity $: Delay exceeds 300s +: Computation Not Defined *: All major volume in platoon

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	441	322	0	234	105
Future Volume (veh/h)	0	441	322	0	234	105
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1885	1885	0	1885	1885
Adj Flow Rate, veh/h	0	501	366	0	266	86
Peak Hour Factor	0.88	0.88	0.88	0.88	0.88	0.88
Percent Heavy Veh, %	0	1	1	0	1	1
Cap, veh/h	0	1602	1115	0	473	421
Arrive On Green	0.00	0.31	0.31	0.00	0.26	0.26
Sat Flow, veh/h	0	5486	3770	0	1795	1598
Grp Volume(v), veh/h	0	501	366	0	266	86
Grp Sat Flow(s),veh/h/ln	0	1716	1791	0	1795	1598
Q Serve(g_s), s	0.0	1.7	1.8	0.0	3.0	1.0
Cycle Q Clear(g_c), s	0.0	1.7	1.8	0.0	3.0	1.0
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1602	1115	0	473	421
V/C Ratio(X)	0.00	0.31	0.33	0.00	0.56	0.20
Avail Cap(c_a), veh/h	0	9182	6390	0	4528	4029
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	6.1	6.1	0.0	7.3	6.6
Incr Delay (d2), s/veh	0.0	0.1	0.2	0.0	1.1	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.2	0.2	0.0	0.7	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.2	6.3	0.0	8.4	6.8
LnGrp LOS	A	A	A	A	A	A
Approach Vol, veh/h		501	366		352	
Approach Delay, s/veh		6.2	6.3		8.0	
Approach LOS		A	A		A	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	12.1	11.0	12.1
Change Period (Y+Rc), s	4.9	4.9	4.9
Max Green Setting (Gmax), s	41.1	58.1	41.1
Max Q Clear Time (g_c+I1), s	3.7	5.0	3.8
Green Ext Time (p_c), s	3.5	1.1	2.4

Intersection Summary	
HCM 6th Ctrl Delay	6.7
HCM 6th LOS	A

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	501	366	266	119
v/c Ratio	0.30	0.32	0.43	0.19
Control Delay	8.7	9.1	10.7	3.1
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	8.7	9.1	10.7	3.1
Queue Length 50th (ft)	19	20	27	0
Queue Length 95th (ft)	46	53	90	21
Internal Link Dist (ft)	650	158	474	
Turn Bay Length (ft)				
Base Capacity (vph)	5030	3501	1787	1599
Starvation Cap Reductn	0	128	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.10	0.11	0.15	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	303	87	306	0	0	0	104	505	27	130	299	216
Future Volume (veh/h)	303	87	306	0	0	0	104	505	27	130	299	216
Initial Q (Qb), veh	0	0	0				0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00				1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No						No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885				1885	1885	1885	1885	1885	1885
Adj Flow Rate, veh/h	212	259	240				113	549	18	141	325	178
Peak Hour Factor	0.92	0.92	0.92				0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	1	1	1				1	1	1	1	1	1
Cap, veh/h	465	489	414				316	982	32	192	661	354
Arrive On Green	0.26	0.26	0.26				0.09	0.28	0.28	0.11	0.29	0.29
Sat Flow, veh/h	1795	1885	1598				3483	3539	116	1795	2252	1207
Grp Volume(v), veh/h	212	259	240				113	278	289	141	257	246
Grp Sat Flow(s),veh/h/ln	1795	1885	1598				1742	1791	1864	1795	1791	1668
Q Serve(g_s), s	3.8	4.6	5.1				1.2	5.1	5.1	2.9	4.6	4.7
Cycle Q Clear(g_c), s	3.8	4.6	5.1				1.2	5.1	5.1	2.9	4.6	4.7
Prop In Lane	1.00		1.00				1.00		0.06	1.00		0.72
Lane Grp Cap(c), veh/h	465	489	414				316	497	517	192	526	490
V/C Ratio(X)	0.46	0.53	0.58				0.36	0.56	0.56	0.74	0.49	0.50
Avail Cap(c_a), veh/h	2091	2196	1861				1259	2086	2172	1298	2734	2546
HCM Platoon Ratio	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00				1.00	1.00	1.00	1.00	1.00	1.00
Uniform Delay (d), s/veh	12.0	12.3	12.5				16.5	12.0	12.0	16.8	11.3	11.3
Incr Delay (d2), s/veh	0.7	0.9	1.3				0.7	1.0	0.9	5.4	0.7	0.8
Initial Q Delay(d3),s/veh	0.0	0.0	0.0				0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.2	1.5	0.1				0.4	1.7	1.7	1.3	1.5	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	12.7	13.2	13.8				17.2	12.9	12.9	22.2	12.0	12.1
LnGrp LOS	B	B	B				B	B	B	C	B	B
Approach Vol, veh/h		711						680			644	
Approach Delay, s/veh		13.3						13.6			14.3	
Approach LOS		B						B			B	

Timer - Assigned Phs	1	2		4	5	6
Phs Duration (G+Y+Rc), s	8.1	15.6		14.9	7.5	16.3
Change Period (Y+Rc), s	4.0	4.9		4.9	4.0	4.9
Max Green Setting (Gmax), s	28.0	45.1		45.1	14.0	59.1
Max Q Clear Time (g_c+I1), s	4.9	7.1		7.1	3.2	6.7
Green Ext Time (p_c), s	0.3	3.6		3.0	0.2	3.3

Intersection Summary	
HCM 6th Ctrl Delay	13.7
HCM 6th LOS	B

Notes

User approved volume balancing among the lanes for turning movement.

Lane Group	EBL	EBT	EBR	NBL	NBT	SBL	SBT
Lane Group Flow (vph)	211	213	333	113	578	141	560
v/c Ratio	0.47	0.46	0.50	0.24	0.56	0.42	0.39
Control Delay	22.8	22.5	5.5	27.3	20.6	27.5	10.8
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	22.8	22.6	5.6	27.3	20.6	27.5	10.8
Queue Length 50th (ft)	61	62	0	17	84	42	47
Queue Length 95th (ft)	148	149	56	50	170	113	106
Internal Link Dist (ft)		158			849		581
Turn Bay Length (ft)			125	125		100	
Base Capacity (vph)	1359	1392	1346	890	2840	918	3137
Starvation Cap Reductn	111	122	77	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0
Reduced v/c Ratio	0.17	0.17	0.26	0.13	0.20	0.15	0.18

Intersection Summary

APPENDIX C

MITIGATED INTERSECTION ANALYSIS SHEETS

Signalized Alternative

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	378	77	67	264	0	88	0	374	148	162	123
Future Volume (veh/h)	0	378	77	67	264	0	88	0	374	148	162	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1604	1604	1604	1604	0	1604	0	1604	1604	1604	1604
Adj Flow Rate, veh/h	0	425	87	75	297	0	99	0	420	166	182	138
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	20	20	20	20	0	20	0	20	20	20	20
Cap, veh/h	0	514	105	162	977	0	0	0	0	277	291	247
Arrive On Green	0.00	0.40	0.40	0.11	0.61	0.00	0.00	0.00	0.00	0.18	0.18	0.18
Sat Flow, veh/h	0	1292	264	1527	1604	0		0		1527	1604	1359
Grp Volume(v), veh/h	0	0	512	75	297	0		0.0		166	182	138
Grp Sat Flow(s),veh/h/ln	0	0	1556	1527	1604	0				1527	1604	1359
Q Serve(g_s), s	0.0	0.0	13.8	2.2	4.2	0.0				4.7	4.9	4.3
Cycle Q Clear(g_c), s	0.0	0.0	13.8	2.2	4.2	0.0				4.7	4.9	4.3
Prop In Lane	0.00		0.17	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	0	620	162	977	0				277	291	247
V/C Ratio(X)	0.00	0.00	0.83	0.46	0.30	0.00				0.60	0.62	0.56
Avail Cap(c_a), veh/h	0	0	1044	587	1860	0				587	617	523
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	12.6	19.7	4.4	0.0				17.6	17.7	17.4
Incr Delay (d2), s/veh	0.0	0.0	2.9	2.1	0.2	0.0				2.1	2.2	2.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	3.9	0.7	0.7	0.0				1.6	1.8	1.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	15.5	21.7	4.6	0.0				19.6	19.9	19.4
LnGrp LOS	A	A	B	C	A	A				B	B	B
Approach Vol, veh/h		512			372						486	
Approach Delay, s/veh		15.5			8.0						19.7	
Approach LOS		B			A						B	
Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.9	23.5		13.4		33.4				
Change Period (Y+Rc), s			4.9	4.9		4.9		4.9				
Max Green Setting (Gmax), s			18.0	31.4		18.0		54.3				
Max Q Clear Time (g_c+I1), s			4.2	15.8		6.9		6.2				
Green Ext Time (p_c), s			0.1	2.8		1.6		1.8				
Intersection Summary												
HCM 6th Ctrl Delay			15.0									
HCM 6th LOS			B									

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	512	75	297	99	420	166	182	138
v/c Ratio	0.88	0.42	0.36	0.46	0.85	0.66	0.69	0.41
Control Delay	48.0	46.0	15.4	44.2	25.6	50.3	51.2	10.7
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	46.0	15.4	44.2	25.6	50.3	51.2	10.7
Queue Length 50th (ft)	277	41	97	53	36	88	97	0
Queue Length 95th (ft)	#583	88	173	111	#193	#175	#200	51
Internal Link Dist (ft)	199		890				396	
Turn Bay Length (ft)		150			25			
Base Capacity (vph)	582	321	1019	321	563	321	337	396
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.88	0.23	0.29	0.31	0.75	0.52	0.54	0.35

Intersection Summary

\# 95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	448	221	0	0	178	46	244	0	330	0	0	0
Future Volume (veh/h)	448	221	0	0	178	46	244	0	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1618	1618	0	0	1618	1618	1618	0	1618			
Adj Flow Rate, veh/h	527	260	0	0	209	54	287	0	388			
Peak Hour Factor	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85	0.85			
Percent Heavy Veh, %	19	19	0	0	19	19	19	0	19			
Cap, veh/h	566	990	0	0	238	62	436	0	388			
Arrive On Green	0.37	0.61	0.00	0.00	0.19	0.19	0.28	0.00	0.28			
Sat Flow, veh/h	1541	1618	0	0	1240	320	1541	0	1372			
Grp Volume(v), veh/h	527	260	0	0	0	263	287	0	388			
Grp Sat Flow(s),veh/h/ln	1541	1618	0	0	0	1561	1541	0	1372			
Q Serve(g_s), s	30.6	6.9	0.0	0.0	0.0	15.2	15.3	0.0	26.3			
Cycle Q Clear(g_c), s	30.6	6.9	0.0	0.0	0.0	15.2	15.3	0.0	26.3			
Prop In Lane	1.00		0.00	0.00		0.21	1.00		1.00			
Lane Grp Cap(c), veh/h	566	990	0	0	0	300	436	0	388			
V/C Ratio(X)	0.93	0.26	0.00	0.00	0.00	0.88	0.66	0.00	1.00			
Avail Cap(c_a), veh/h	782	1286	0	0	0	381	436	0	388			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	28.3	8.3	0.0	0.0	0.0	36.5	29.4	0.0	33.4			
Incr Delay (d2), s/veh	14.4	0.1	0.0	0.0	0.0	16.9	3.6	0.0	45.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	12.7	2.1	0.0	0.0	0.0	7.0	6.0	0.0	13.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.7	8.5	0.0	0.0	0.0	53.4	33.0	0.0	79.1			
LnGrp LOS	D	A	A	A	A	D	C	A	F			
Approach Vol, veh/h		787			263			675				
Approach Delay, s/veh		31.4			53.4			59.5				
Approach LOS		C			D			E				
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		31.2		61.8			39.0	22.8				
Change Period (Y+Rc), s		4.9		4.9			4.9	* 4.9				
Max Green Setting (Gmax), s		26.3		73.9			47.2	* 23				
Max Q Clear Time (g_c+I1), s		28.3		8.9			32.6	17.2				
Green Ext Time (p_c), s		0.0		1.6			1.6	0.6				
Intersection Summary												
HCM 6th Ctrl Delay			45.8									
HCM 6th LOS			D									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	527	260	263	287	388
v/c Ratio	0.90	0.26	0.83	0.70	0.60
Control Delay	48.0	8.4	59.8	46.0	7.9
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	48.0	8.4	59.8	46.0	7.9
Queue Length 50th (ft)	319	65	159	177	0
Queue Length 95th (ft)	428	94	#273	#291	58
Internal Link Dist (ft)		890	1504		
Turn Bay Length (ft)	145				
Base Capacity (vph)	737	1215	371	410	650
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.72	0.21	0.71	0.70	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	12	155	18	187	140	280	10	91	145	189	41	5
Future Volume (veh/h)	12	155	18	187	140	280	10	91	145	189	41	5
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	13	167	19	201	151	301	11	98	156	203	44	5
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	29	271	229	264	518	439	25	646	548	443	393	45
Arrive On Green	0.02	0.15	0.15	0.15	0.29	0.29	0.01	0.36	0.36	0.25	0.25	0.25
Sat Flow, veh/h	1711	1796	1522	1711	1796	1522	1711	1796	1522	1081	1584	180
Grp Volume(v), veh/h	13	167	19	201	151	301	11	98	156	203	0	49
Grp Sat Flow(s),veh/h/ln	1711	1796	1522	1711	1796	1522	1711	1796	1522	1081	0	1764
Q Serve(g_s), s	0.3	3.6	0.4	4.6	2.7	7.2	0.3	1.5	3.0	7.2	0.0	0.9
Cycle Q Clear(g_c), s	0.3	3.6	0.4	4.6	2.7	7.2	0.3	1.5	3.0	7.2	0.0	0.9
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.10
Lane Grp Cap(c), veh/h	29	271	229	264	518	439	25	646	548	443	0	438
V/C Ratio(X)	0.45	0.62	0.08	0.76	0.29	0.69	0.45	0.15	0.28	0.46	0.00	0.11
Avail Cap(c_a), veh/h	249	790	669	831	1401	1187	249	1663	1409	937	0	1243
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	20.0	16.4	15.0	16.7	11.4	13.0	20.1	8.9	9.4	14.3	0.0	12.0
Incr Delay (d2), s/veh	10.7	2.3	0.2	4.5	0.3	1.9	12.2	0.1	0.3	0.7	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.2	1.3	0.1	1.7	0.8	1.9	0.2	0.4	0.7	1.5	0.0	0.3
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	30.8	18.6	15.2	21.2	11.7	14.9	32.4	9.0	9.7	15.1	0.0	12.1
LnGrp LOS	C	B	B	C	B	B	C	A	A	B	A	B
Approach Vol, veh/h		199			653			265			252	
Approach Delay, s/veh		19.1			16.1			10.4			14.5	
Approach LOS		B			B			B			B	
Timer - Assigned Phs		2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s		19.7	10.4	11.1	4.6	15.1	4.7	16.8				
Change Period (Y+Rc), s		4.9	4.0	4.9	4.0	* 4.9	4.0	4.9				
Max Green Setting (Gmax), s		38.1	20.0	18.1	6.0	* 29	6.0	32.1				
Max Q Clear Time (g_c+I1), s		5.0	6.6	5.6	2.3	9.2	2.3	9.2				
Green Ext Time (p_c), s		1.0	0.4	0.6	0.0	1.1	0.0	1.7				
Intersection Summary												
HCM 6th Ctrl Delay			15.1									
HCM 6th LOS			B									

Notes
* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	13	167	19	201	151	301	11	98	156	203	49
v/c Ratio	0.06	0.42	0.04	0.48	0.19	0.36	0.05	0.18	0.28	0.55	0.09
Control Delay	31.5	26.2	0.2	25.7	12.0	3.6	31.5	16.2	4.6	25.3	16.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	31.5	26.2	0.2	25.7	12.0	3.6	31.5	16.2	4.6	25.3	16.4
Queue Length 50th (ft)	3	42	0	50	20	0	3	22	0	49	9
Queue Length 95th (ft)	25	145	0	168	103	52	22	65	35	163	43
Internal Link Dist (ft)		6447			365			1367			840
Turn Bay Length (ft)	120		130	75		120	60				
Base Capacity (vph)	234	742	728	779	1181	1104	234	1335	1173	764	1086
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.06	0.23	0.03	0.26	0.13	0.27	0.05	0.07	0.13	0.27	0.05

Intersection Summary

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	474	550	0	211	56
Future Volume (veh/h)	0	474	550	0	211	56
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h	0	521	604	0	232	62
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	3	3	0	3	3
Cap, veh/h	0	858	858	0	384	342
Arrive On Green	0.00	0.46	0.46	0.00	0.22	0.22
Sat Flow, veh/h	0	1856	1856	0	1767	1572
Grp Volume(v), veh/h	0	521	604	0	232	62
Grp Sat Flow(s),veh/h/ln	0	1856	1856	0	1767	1572
Q Serve(g_s), s	0.0	5.8	7.2	0.0	3.3	0.9
Cycle Q Clear(g_c), s	0.0	5.8	7.2	0.0	3.3	0.9
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	858	858	0	384	342
V/C Ratio(X)	0.00	0.61	0.70	0.00	0.60	0.18
Avail Cap(c_a), veh/h	0	2077	2077	0	1272	1132
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	5.6	6.0	0.0	9.8	8.9
Incr Delay (d2), s/veh	0.0	0.7	1.1	0.0	1.5	0.3
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.6	0.8	0.0	1.0	0.2
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	6.3	7.0	0.0	11.3	9.1
LnGrp LOS	A	A	A	A	B	A
Approach Vol, veh/h		521	604		294	
Approach Delay, s/veh		6.3	7.0		10.9	
Approach LOS		A	A		B	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	17.7	10.0	17.7
Change Period (Y+Rc), s	4.9	4.0	4.9
Max Green Setting (Gmax), s	31.1	20.0	31.1
Max Q Clear Time (g_c+I1), s	7.8	5.3	9.2
Green Ext Time (p_c), s	3.0	0.8	3.6

Intersection Summary	
HCM 6th Ctrl Delay	7.5
HCM 6th LOS	A

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	521	604	232	62
v/c Ratio	0.60	0.70	0.47	0.13
Control Delay	11.2	13.3	16.6	5.4
Queue Delay	0.0	0.0	0.0	0.0
Total Delay	11.2	13.3	16.6	5.4
Queue Length 50th (ft)	68	84	38	0
Queue Length 95th (ft)	178	220	117	22
Internal Link Dist (ft)	365	293	424	
Turn Bay Length (ft)				
Base Capacity (vph)	1505	1505	970	895
Starvation Cap Reductn	0	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.35	0.40	0.24	0.07

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	62	440	0	0	1052	225	269	0	388	0	0	0
Future Volume (veh/h)	62	440	0	0	1052	225	269	0	388	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	0	1856			
Adj Flow Rate, veh/h	68	484	0	0	1156	160	296	0	277			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	3	3	0	0	3	3	3	0	3			
Cap, veh/h	87	1343	0	0	1184	1003	329	0	292			
Arrive On Green	0.05	0.72	0.00	0.00	0.64	0.64	0.19	0.00	0.19			
Sat Flow, veh/h	1767	1856	0	0	1856	1572	1767	0	1572			
Grp Volume(v), veh/h	68	484	0	0	1156	160	296	0	277			
Grp Sat Flow(s),veh/h/ln	1767	1856	0	0	1856	1572	1767	0	1572			
Q Serve(g_s), s	4.1	10.6	0.0	0.0	65.0	4.5	17.8	0.0	18.9			
Cycle Q Clear(g_c), s	4.1	10.6	0.0	0.0	65.0	4.5	17.8	0.0	18.9			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	87	1343	0	0	1184	1003	329	0	292			
V/C Ratio(X)	0.78	0.36	0.00	0.00	0.98	0.16	0.90	0.00	0.95			
Avail Cap(c_a), veh/h	96	1366	0	0	1197	1014	329	0	292			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	51.1	5.6	0.0	0.0	18.9	7.9	43.3	0.0	43.7			
Incr Delay (d2), s/veh	30.7	0.2	0.0	0.0	20.4	0.1	26.4	0.0	38.7			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.5	3.2	0.0	0.0	29.3	1.3	10.1	0.0	10.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	81.8	5.8	0.0	0.0	39.3	8.0	69.7	0.0	82.4			
LnGrp LOS	F	A	A	A	D	A	E	A	F			
Approach Vol, veh/h		552			1316			573				
Approach Delay, s/veh		15.1			35.5			75.8				
Approach LOS		B			D			E				
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		25.1		83.6			9.3	74.2				
Change Period (Y+Rc), s		4.9		4.9			4.0	4.9				
Max Green Setting (Gmax), s		20.2		80.0			5.9	70.1				
Max Q Clear Time (g_c+I1), s		20.9		12.6			6.1	67.0				
Green Ext Time (p_c), s		0.0		3.0			0.0	2.3				
Intersection Summary												
HCM 6th Ctrl Delay			40.4									
HCM 6th LOS			D									

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	68	484	1156	247	296	426
v/c Ratio	0.69	0.37	0.97	0.24	0.90	0.67
Control Delay	85.8	6.5	39.6	5.9	73.8	9.6
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	85.8	6.5	39.6	5.9	73.8	9.6
Queue Length 50th (ft)	48	109	729	42	207	0
Queue Length 95th (ft)	#124	157	#1090	78	#370	92
Internal Link Dist (ft)		526	2810			
Turn Bay Length (ft)	115			85	550	
Base Capacity (vph)	98	1414	1239	1081	339	646
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.69	0.34	0.93	0.23	0.87	0.66

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	392	243	102	233	0	60	0	255	55	360	153
Future Volume (veh/h)	0	392	243	102	233	0	60	0	255	55	360	153
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1693	1693	1693	1693	0	1693	0	1693	1693	1693	1693
Adj Flow Rate, veh/h	0	440	177	115	262	0	67	0	232	62	404	112
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	14	14	14	14	0	14	0	14	14	14	14
Cap, veh/h	0	499	201	143	980	0	0	0	0	457	480	407
Arrive On Green	0.00	0.43	0.43	0.09	0.58	0.00	0.00	0.00	0.00	0.28	0.28	0.28
Sat Flow, veh/h	0	1148	462	1612	1693	0		0		1612	1693	1434
Grp Volume(v), veh/h	0	0	617	115	262	0		0.0		62	404	112
Grp Sat Flow(s),veh/h/ln	0	0	1609	1612	1693	0				1612	1693	1434
Q Serve(g_s), s	0.0	0.0	25.1	5.0	5.5	0.0				2.0	16.0	4.3
Cycle Q Clear(g_c), s	0.0	0.0	25.1	5.0	5.5	0.0				2.0	16.0	4.3
Prop In Lane	0.00		0.29	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	0	699	143	980	0				457	480	407
V/C Ratio(X)	0.00	0.00	0.88	0.81	0.27	0.00				0.14	0.84	0.28
Avail Cap(c_a), veh/h	0	0	1039	199	1396	0				625	656	556
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	0.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	0.0	18.5	31.9	7.5	0.0				19.1	24.1	19.9
Incr Delay (d2), s/veh	0.0	0.0	6.3	15.2	0.1	0.0				0.1	7.2	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	0.0	9.1	2.4	1.6	0.0				0.7	7.0	1.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	0.0	24.8	47.1	7.6	0.0				19.2	31.3	20.2
LnGrp LOS	A	A	C	D	A	A				B	C	C
Approach Vol, veh/h		617			377						578	
Approach Delay, s/veh		24.8			19.7						27.8	
Approach LOS		C			B						C	
Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			10.3	35.9		25.2		46.3				
Change Period (Y+Rc), s			4.0	4.9		4.9		4.9				
Max Green Setting (Gmax), s			8.8	46.1		27.7		58.9				
Max Q Clear Time (g_c+I1), s			7.0	27.1		18.0		7.5				
Green Ext Time (p_c), s			0.0	3.9		2.2		1.6				
Intersection Summary												
HCM 6th Ctrl Delay			24.7									
HCM 6th LOS			C									

Lane Group	EBT	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	713	115	262	67	287	62	404	172
v/c Ratio	1.04	0.91	0.29	0.57	0.78	0.16	0.96	0.35
Control Delay	75.8	109.1	15.0	68.4	21.0	33.4	76.7	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	75.8	109.1	15.0	68.4	21.0	33.4	76.7	7.2
Queue Length 50th (ft)	~533	82	97	46	0	34	283	0
Queue Length 95th (ft)	#750	#190	148	#96	#106	69	#469	52
Internal Link Dist (ft)	199		890				396	
Turn Bay Length (ft)					25			
Base Capacity (vph)	686	127	898	126	376	401	422	487
Starvation Cap Reductn	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.04	0.91	0.29	0.53	0.76	0.15	0.96	0.35

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	297	132	0	0	404	136	230	0	92	0	0	0
Future Volume (veh/h)	297	132	0	0	404	136	230	0	92	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1693	1693	0	0	1693	1693	1693	0	1693			
Adj Flow Rate, veh/h	316	140	0	0	430	99	245	0	63			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	14	14	0	0	14	14	14	0	14			
Cap, veh/h	367	1140	0	0	499	115	298	0	265			
Arrive On Green	0.23	0.67	0.00	0.00	0.37	0.37	0.19	0.00	0.19			
Sat Flow, veh/h	1612	1693	0	0	1331	306	1612	0	1434			
Grp Volume(v), veh/h	316	140	0	0	0	529	245	0	63			
Grp Sat Flow(s),veh/h/ln	1612	1693	0	0	0	1637	1612	0	1434			
Q Serve(g_s), s	13.0	2.0	0.0	0.0	0.0	20.7	10.1	0.0	2.6			
Cycle Q Clear(g_c), s	13.0	2.0	0.0	0.0	0.0	20.7	10.1	0.0	2.6			
Prop In Lane	1.00		0.00	0.00		0.19	1.00		1.00			
Lane Grp Cap(c), veh/h	367	1140	0	0	0	614	298	0	265			
V/C Ratio(X)	0.86	0.12	0.00	0.00	0.00	0.86	0.82	0.00	0.24			
Avail Cap(c_a), veh/h	647	1880	0	0	0	1045	542	0	483			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	25.7	4.0	0.0	0.0	0.0	20.0	27.1	0.0	24.0			
Incr Delay (d2), s/veh	6.0	0.0	0.0	0.0	0.0	3.9	5.6	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.1	0.5	0.0	0.0	0.0	7.4	4.2	0.0	0.9			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	31.7	4.1	0.0	0.0	0.0	23.9	32.7	0.0	24.5			
LnGrp LOS	C	A	A	A	A	C	C	A	C			
Approach Vol, veh/h		456			529			308				
Approach Delay, s/veh		23.2			23.9			31.0				
Approach LOS		C			C			C				
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		17.7		51.5			20.7	30.9				
Change Period (Y+Rc), s		4.9		4.9			4.9	4.9				
Max Green Setting (Gmax), s		23.3		76.9			27.8	44.2				
Max Q Clear Time (g_c+I1), s		12.1		4.0			15.0	22.7				
Green Ext Time (p_c), s		0.7		0.8			0.8	3.3				
Intersection Summary												
HCM 6th Ctrl Delay			25.3									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	316	140	575	245	98
v/c Ratio	0.82	0.12	0.89	0.77	0.27
Control Delay	54.0	5.5	45.6	55.5	9.8
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	54.0	5.5	45.6	55.5	9.8
Queue Length 50th (ft)	206	28	350	161	0
Queue Length 95th (ft)	#346	49	#571	#273	44
Internal Link Dist (ft)		890	1504		
Turn Bay Length (ft)	145				
Base Capacity (vph)	479	1329	784	401	432
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.66	0.11	0.73	0.61	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	18	283	26	170	163	336	23	108	234	364	79	12
Future Volume (veh/h)	18	283	26	170	163	336	23	108	234	364	79	12
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	22	341	8	205	196	312	28	130	99	439	95	7
Peak Hour Factor	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83	0.83
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	44	423	359	255	645	547	53	199	169	490	605	45
Arrive On Green	0.02	0.23	0.23	0.14	0.34	0.34	0.03	0.11	0.11	0.27	0.35	0.35
Sat Flow, veh/h	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	1721	127
Grp Volume(v), veh/h	22	341	8	205	196	312	28	130	99	439	0	102
Grp Sat Flow(s),veh/h/ln	1781	1870	1585	1781	1870	1585	1781	1870	1585	1781	0	1848
Q Serve(g_s), s	0.9	12.3	0.3	8.0	5.5	11.5	1.1	4.8	4.3	16.9	0.0	2.7
Cycle Q Clear(g_c), s	0.9	12.3	0.3	8.0	5.5	11.5	1.1	4.8	4.3	16.9	0.0	2.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.07
Lane Grp Cap(c), veh/h	44	423	359	255	645	547	53	199	169	490	0	649
V/C Ratio(X)	0.50	0.81	0.02	0.80	0.30	0.57	0.53	0.65	0.59	0.90	0.00	0.16
Avail Cap(c_a), veh/h	160	1023	867	623	1510	1280	224	631	535	598	0	1011
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	34.4	26.2	21.5	29.6	17.1	19.1	34.2	30.7	30.4	24.9	0.0	15.9
Incr Delay (d2), s/veh	8.5	3.7	0.0	5.8	0.3	0.9	7.9	3.6	3.2	14.2	0.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.5	5.3	0.1	3.5	2.1	3.8	0.6	2.2	1.6	8.6	0.0	1.1
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	42.9	29.8	21.5	35.5	17.4	20.0	42.0	34.3	33.7	39.1	0.0	16.0
LnGrp LOS	D	C	C	D	B	C	D	C	C	D	A	B
Approach Vol, veh/h		371			713			257			541	
Approach Delay, s/veh		30.4			23.8			34.9			34.8	
Approach LOS		C			C			C			C	
Timer - Assigned Phs	1	2	3	4	5	6	7	8				
Phs Duration (G+Y+Rc), s	23.6	12.5	14.2	21.1	6.1	30.0	5.8	29.5				
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9				
Max Green Setting (Gmax), s	24.0	24.1	25.0	39.1	9.0	39.1	6.4	57.7				
Max Q Clear Time (g_c+I1), s	18.9	6.8	10.0	14.3	3.1	4.7	2.9	13.5				
Green Ext Time (p_c), s	0.7	0.8	0.5	1.8	0.0	0.6	0.0	2.1				
Intersection Summary												
HCM 6th Ctrl Delay			29.8									
HCM 6th LOS			C									

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	22	341	31	205	196	405	28	130	282	439	109
v/c Ratio	0.19	0.76	0.06	0.67	0.25	0.45	0.21	0.53	0.62	0.96	0.16
Control Delay	53.2	45.9	0.2	49.7	19.7	3.8	51.3	49.6	11.9	71.2	25.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
Total Delay	53.2	45.9	0.2	49.7	19.7	3.9	51.3	49.6	11.9	71.2	25.9
Queue Length 50th (ft)	13	187	0	114	67	0	16	73	0	257	44
Queue Length 95th (ft)	41	303	0	206	134	37	48	144	54	#565	100
Internal Link Dist (ft)		6447			365			1367			840
Turn Bay Length (ft)	120		130	75		120	60				
Base Capacity (vph)	122	787	755	478	1162	1139	172	485	621	459	775
Starvation Cap Reductn	0	0	0	0	0	160	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.18	0.43	0.04	0.43	0.17	0.41	0.16	0.27	0.45	0.96	0.14

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	923	601	0	345	60
Future Volume (veh/h)	0	923	601	0	345	60
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1841	1841	0	1841	1841
Adj Flow Rate, veh/h	0	1014	660	0	379	33
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	4	4	0	4	4
Cap, veh/h	0	1143	1143	0	438	389
Arrive On Green	0.00	0.62	0.62	0.00	0.25	0.25
Sat Flow, veh/h	0	1841	1841	0	1753	1560
Grp Volume(v), veh/h	0	1014	660	0	379	33
Grp Sat Flow(s),veh/h/ln	0	1841	1841	0	1753	1560
Q Serve(g_s), s	0.0	35.2	16.1	0.0	15.7	1.2
Cycle Q Clear(g_c), s	0.0	35.2	16.1	0.0	15.7	1.2
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	1143	1143	0	438	389
V/C Ratio(X)	0.00	0.89	0.58	0.00	0.87	0.08
Avail Cap(c_a), veh/h	0	2028	2028	0	849	756
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	12.1	8.5	0.0	27.2	21.8
Incr Delay (d2), s/veh	0.0	2.5	0.5	0.0	5.3	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	10.8	4.7	0.0	6.9	0.4
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	14.7	8.9	0.0	32.5	21.9
LnGrp LOS	A	B	A	A	C	C
Approach Vol, veh/h		1014	660		412	
Approach Delay, s/veh		14.7	8.9		31.6	
Approach LOS		B	A		C	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	52.0	23.8	52.0
Change Period (Y+Rc), s	4.9	4.9	4.9
Max Green Setting (Gmax), s	83.5	36.7	83.5
Max Q Clear Time (g_c+I1), s	37.2	17.7	18.1
Green Ext Time (p_c), s	9.8	1.2	4.7

Intersection Summary	
HCM 6th Ctrl Delay	16.2
HCM 6th LOS	B

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1014	660	379	66
v/c Ratio	0.89	0.58	0.80	0.14
Control Delay	28.4	14.1	51.0	9.1
Queue Delay	1.6	0.0	0.0	0.0
Total Delay	30.0	14.1	51.0	9.1
Queue Length 50th (ft)	526	238	238	0
Queue Length 95th (ft)	897	396	#421	35
Internal Link Dist (ft)	365	293	424	
Turn Bay Length (ft)				
Base Capacity (vph)	1484	1484	674	643
Starvation Cap Reductn	286	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.85	0.44	0.56	0.10

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	826	0	0	791	273	271	0	643	0	0	0
Future Volume (veh/h)	76	826	0	0	791	273	271	0	643	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	82	888	0	0	851	206	291	0	483			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	104	1089	0	0	907	769	576	0	513			
Arrive On Green	0.06	0.58	0.00	0.00	0.48	0.48	0.32	0.00	0.32			
Sat Flow, veh/h	1781	1870	0	0	1870	1585	1781	0	1585			
Grp Volume(v), veh/h	82	888	0	0	851	206	291	0	483			
Grp Sat Flow(s),veh/h/ln	1781	1870	0	0	1870	1585	1781	0	1585			
Q Serve(g_s), s	4.7	39.2	0.0	0.0	44.6	8.0	13.7	0.0	30.8			
Cycle Q Clear(g_c), s	4.7	39.2	0.0	0.0	44.6	8.0	13.7	0.0	30.8			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	104	1089	0	0	907	769	576	0	513			
V/C Ratio(X)	0.78	0.82	0.00	0.00	0.94	0.27	0.51	0.00	0.94			
Avail Cap(c_a), veh/h	120	1174	0	0	976	827	603	0	537			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	48.2	17.2	0.0	0.0	25.2	15.8	28.4	0.0	34.1			
Incr Delay (d2), s/veh	25.0	4.3	0.0	0.0	15.5	0.2	0.7	0.0	24.8			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.8	15.6	0.0	0.0	21.5	2.7	5.9	0.0	15.1			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	73.2	21.5	0.0	0.0	40.7	16.0	29.1	0.0	58.9			
LnGrp LOS	E	C	A	A	D	B	C	A	E			
Approach Vol, veh/h		970			1057			774				
Approach Delay, s/veh		25.9			35.9			47.7				
Approach LOS		C			D			D				
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		38.4		65.3			10.1	55.2				
Change Period (Y+Rc), s		4.9		4.9			4.0	4.9				
Max Green Setting (Gmax), s		35.1		65.1			7.0	54.1				
Max Q Clear Time (g_c+I1), s		32.8		41.2			6.7	46.6				
Green Ext Time (p_c), s		0.8		6.6			0.0	3.7				
Intersection Summary												
HCM 6th Ctrl Delay			35.7									
HCM 6th LOS			D									

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	82	888	851	294	291	691
v/c Ratio	0.62	0.81	0.90	0.34	0.54	0.92
Control Delay	70.9	23.5	37.9	11.9	34.1	34.3
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	70.9	23.5	37.9	11.9	34.1	34.3
Queue Length 50th (ft)	58	459	543	78	167	229
Queue Length 95th (ft)	#138	653	#817	140	253	#477
Internal Link Dist (ft)		526	2810			
Turn Bay Length (ft)	115			85	550	
Base Capacity (vph)	134	1277	1090	967	672	841
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.61	0.70	0.78	0.30	0.43	0.82

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

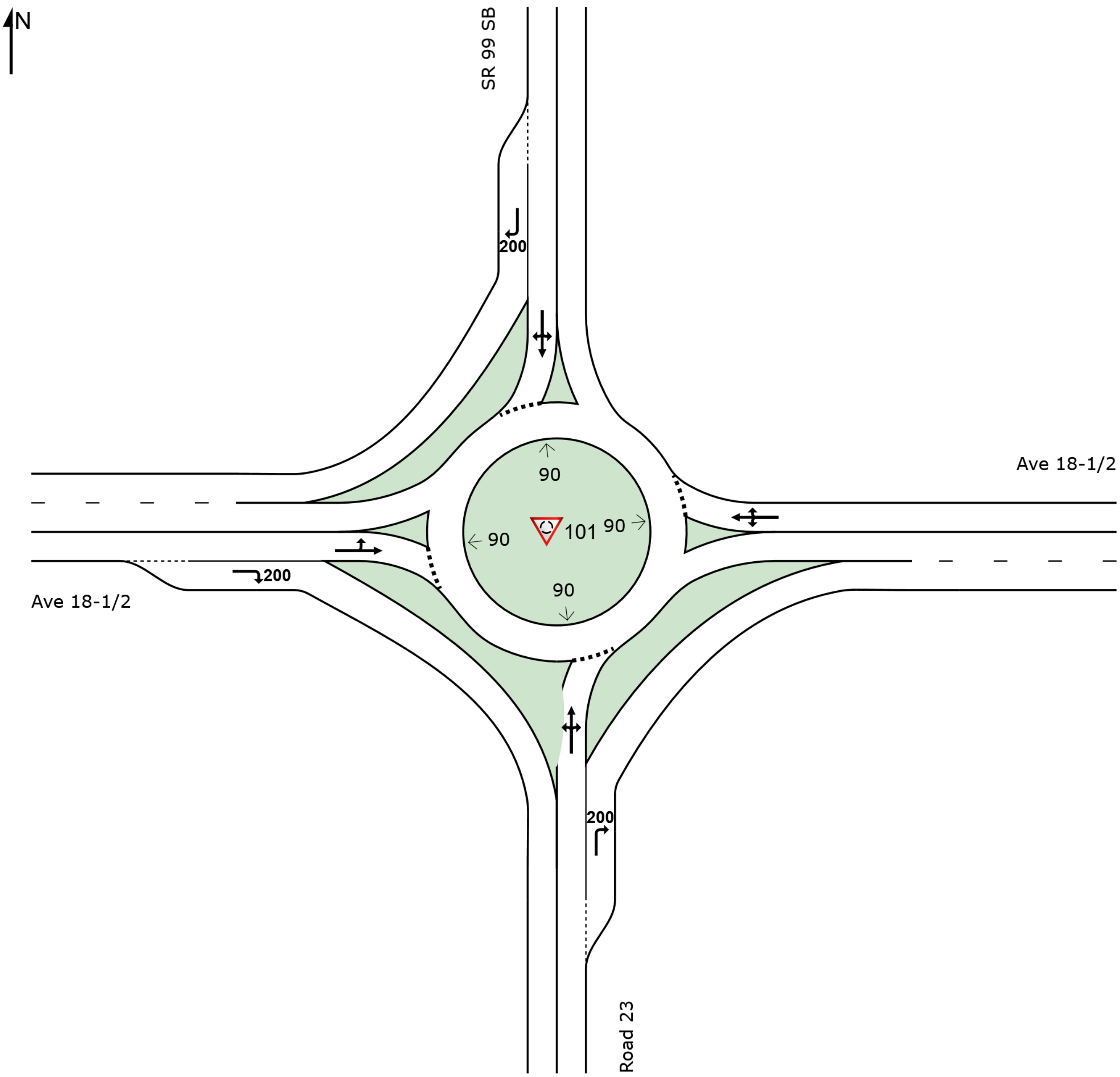
Roundabout Alternative

SITE LAYOUT

Site: 101 [Ave 18-1/2 & SR 99 SB (AM) (Site Folder: General)]

Ave 18-1/2 - SR 99 SB 10-Year AM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 18-1/2 & SR 99 SB (AM) (Site Folder: General)]

Ave 18-1/2 - SR 99 SB 10-Year AM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: Road 23													
Lane 1 d	170	20.0	677	0.251	100	8.4	LOS A	1.6	46.0	Full	1600	0.0	0.0
Lane 2	350	20.0	1395	0.251	100	0.1	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	520	20.0		0.251		2.8	LOS A	1.6	46.0				
East: Ave 18-1/2													
Lane 1 d	474	20.0	1029	0.461	100	8.8	LOS A	3.6	103.3	Full	700	0.0	0.0
Approach	474	20.0		0.461		8.8	LOS A	3.6	103.3				
North: SR 99 SB													
Lane 1 d	348	20.0	803	0.434	100	10.1	LOS B	3.0	86.3	Full	1600	0.0	0.0
Lane 2	138	20.0	1395	0.099	23 5	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	487	20.0		0.434		7.2	LOS A	3.0	86.3				
West: Ave 18-1/2													
Lane 1 d	426	20.0	812	0.524	100	11.9	LOS B	4.7	135.9	Full	1600	0.0	0.0
Lane 2	87	20.0	1395	0.062	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	512	20.0		0.524		9.9	LOS A	4.7	135.9				
Intersection	1993	20.0		0.524		7.1	LOS A	4.7	135.9				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Road 23

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	99	1	70	170	20.0	677	0.251	100	NA	NA
Lane 2	-	-	350	350	20.0	1395	0.251	100	0.0	1
Approach	99	1	420	520	20.0		0.251			

East: Ave 18-1/2

Mov.	L2	T1	R2	Total	%HV	Deg.	Lane	Prob.	Ov.

From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	75	297	102	474	20.0	1029	0.461	100	NA	NA
Approach	75	297	102	474	20.0		0.461			

North: SR 99 SB

Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	166	182	-	348	20.0	803	0.434	100	NA	NA
Lane 2	-	-	138	138	20.0	1395	0.099	23 [5]	0.0	1
Approach	166	182	138	487	20.0		0.434			

West: Ave 18-1/2

Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	425	-	426	20.0	812	0.524	100	NA	NA
Lane 2	-	-	87	87	20.0	1395	0.062	100	0.0	1
Approach	1	425	87	512	20.0		0.524			

	Total	%HV	Deg.Satn (v/c)
Intersection	1993	20.0	0.524

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

Merge Analysis

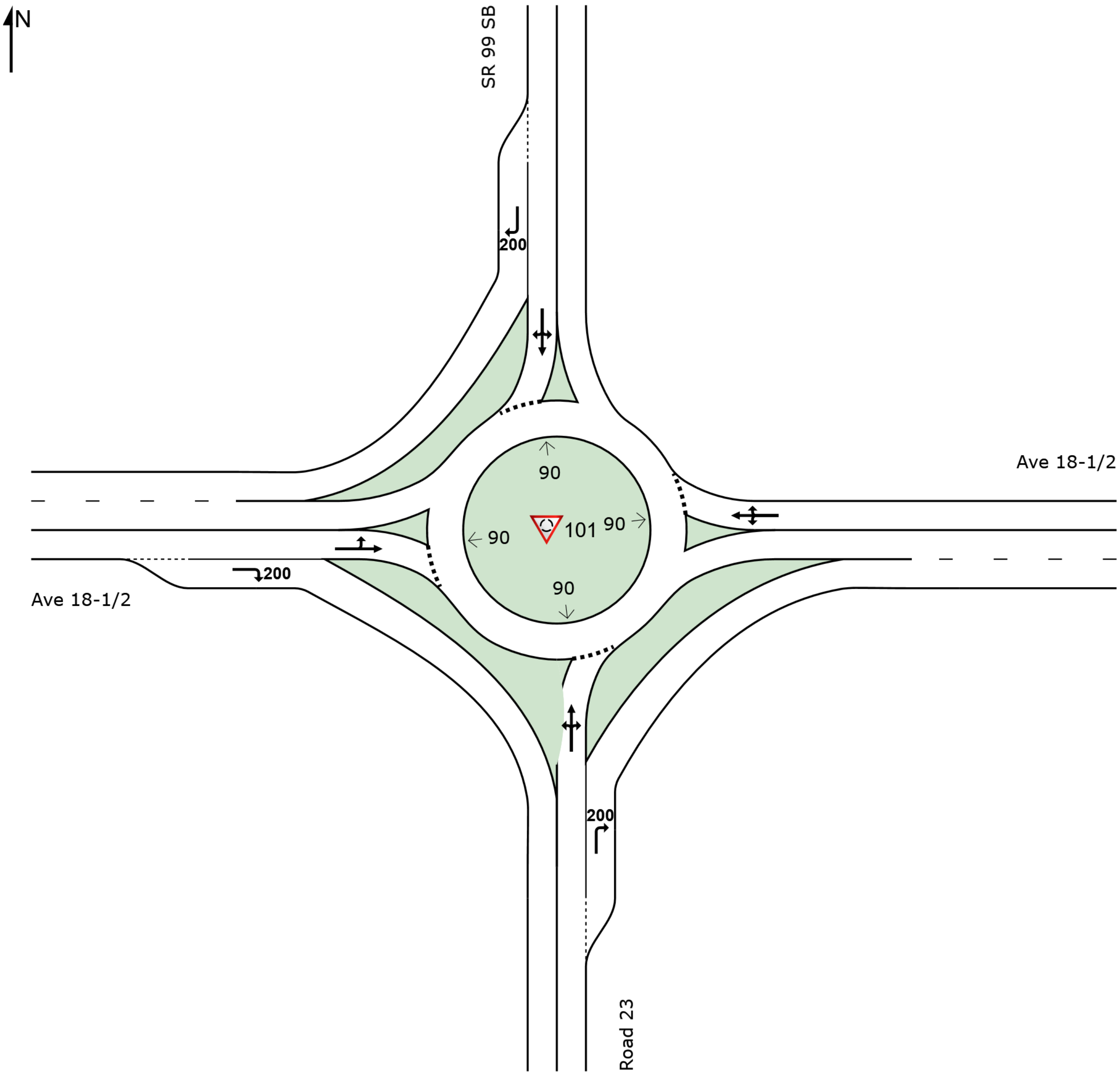
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Road 23 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: SR 99 SB Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 18-1/2 & SR 99 SB (PM) (Site Folder: General)]

Ave 18-1/2 - SR 99 SB 10-Year PM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 18-1/2 & SR 99 SB (PM) (Site Folder: General)]

Ave 18-1/2 - SR 99 SB 10-Year PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: Road 23													
Lane 1[d]	125	14.0	797	0.157	100	6.2	LOS A	1.0	27.0	Full	1600	0.0	0.0
Lane 2	230	14.0	1469	0.157	100	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	355	14.0		0.157		2.2	LOS A	1.0	27.0				
East: Ave 18-1/2													
Lane 1[d]	712	14.0	1201	0.593	100	10.2	LOS B	5.9	163.4	Full	700	0.0	0.0
Approach	712	14.0		0.593		10.2	LOS B	5.9	163.4				
North: SR 99 SB													
Lane 1[d]	466	14.0	900	0.518	100	10.8	LOS B	4.4	123.5	Full	1600	0.0	0.0
Lane 2	172	14.0	1469	0.117	23[5]	0.0	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	638	14.0		0.518		7.9	LOS A	4.4	123.5				
West: Ave 18-1/2													
Lane 1[d]	442	14.0	756	0.584	100	14.2	LOS B	6.1	170.8	Full	1600	0.0	0.0
Lane 2	273	14.0	1469	0.186	100	0.1	LOS A	0.0	0.0	Short	200	0.0	NA
Approach	715	14.0		0.584		8.8	LOS A	6.1	170.8				
Intersection	2420	14.0		0.593		8.0	LOS A	6.1	170.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Road 23

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	67	1	56	125	14.0	797	0.157	100	NA	NA
Lane 2	-	-	230	230	14.0	1469	0.157	100	0.0	1
Approach	67	1	287	355	14.0		0.157			

East: Ave 18-1/2

Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.

From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	115	262	336	712	14.0	1201	0.593	100	NA	NA
Approach	115	262	336	712	14.0		0.593			
North: SR 99 SB										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	62	404	-	466	14.0	900	0.518	100	NA	NA
Lane 2	-	-	172	172	14.0	1469	0.117	23[5]	0.0	1
Approach	62	404	172	638	14.0		0.518			
West: Ave 18-1/2										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	440	-	442	14.0	756	0.584	100	NA	NA
Lane 2	-	-	273	273	14.0	1469	0.186	100	0.0	1
Approach	1	440	273	715	14.0		0.584			

	Total	%HV	Deg.Satn (v/c)
Intersection	2420	14.0	0.593

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

Merge Analysis

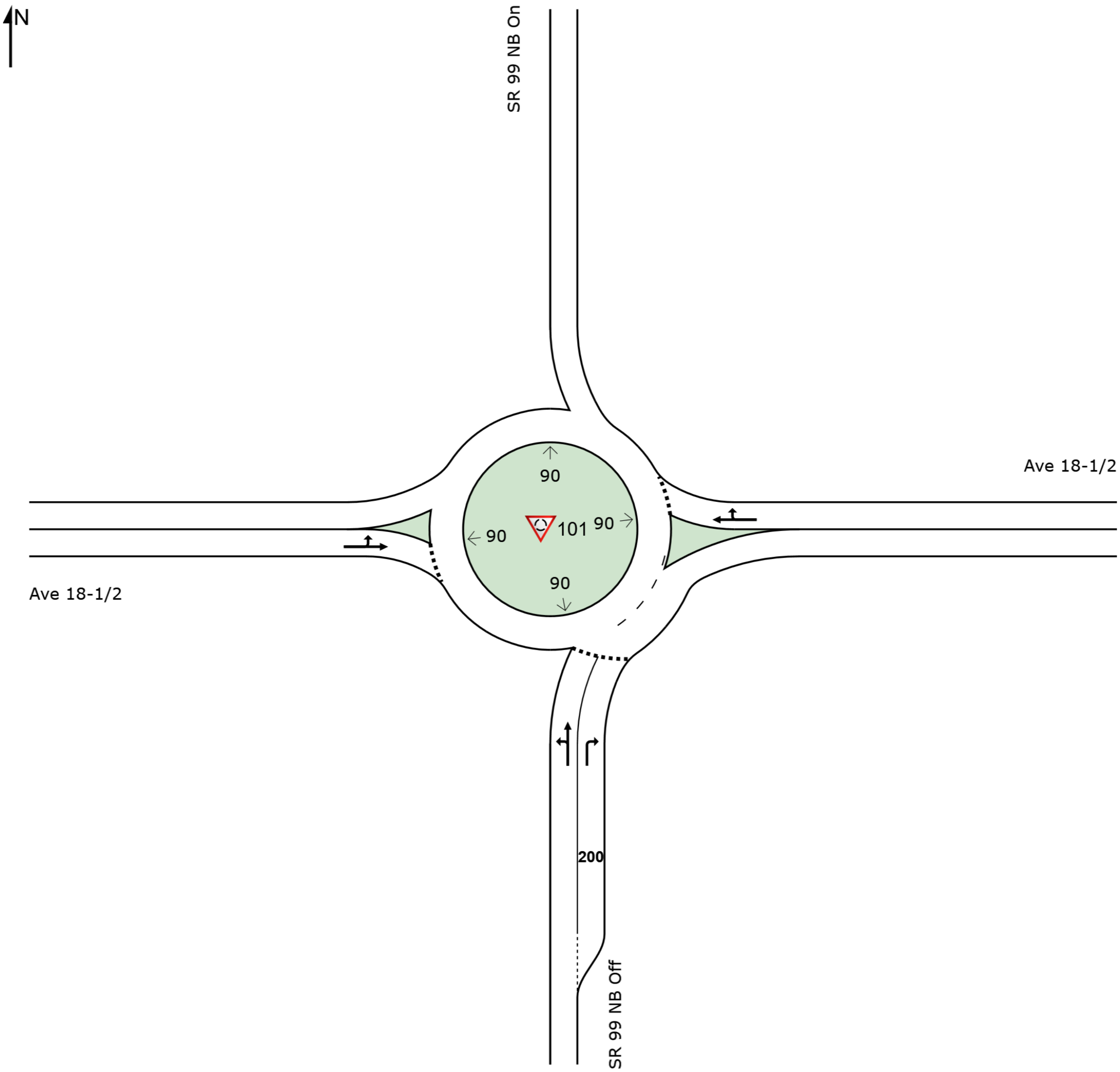
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Road 23 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: SR 99 SB Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 18-1/2 & SR 99 NB (AM) (Site Folder: General)]

Ave 18-1/2 - SR 99 NB 10-Year AM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 18-1/2 & SR 99 NB (AM) (Site Folder: General)]

Ave 18-1/2 - SR 99 NB 10-Year AM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 99 NB Off													
Lane 1	288	19.0	510	0.565	100	18.6	LOS C	4.6	133.8	Full	1600	0.0	0.0
Lane 2[d]	388	19.0	655	0.593	100	16.1	LOS C	5.6	162.7	Short	200	0.0	NA
Approach	676	19.0		0.593		17.2	LOS C	5.6	162.7				
East: Ave 18-1/2													
Lane 1[d]	264	19.0	430	0.613	100	23.9	LOS C	5.5	158.8	Full	1600	0.0	0.0
Approach	264	19.0		0.613		23.9	LOS C	5.5	158.8				
West: Ave 18-1/2													
Lane 1[d]	787	19.0	1431	0.550	100	8.3	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	787	19.0		0.550		8.3	LOS A	0.0	0.0				
Intersection	1727	19.0		0.613		14.2	LOS B	5.6	162.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: SR 99 NB Off

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	287	1	-	288	19.0	510	0.565	100	NA	NA
Lane 2	-	-	388	388	19.0	655	0.593	100	0.0	1
Approach	287	1	388	676	19.0		0.593			

East: Ave 18-1/2

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	209	54	264	19.0	430	0.613	100	NA	NA
Approach	209	54	264	19.0		0.613			

West: Ave 18-1/2

Mov.	L2	T1	Total	%HV	Deg.	Lane	Prob.	Ov.

From W To Exit:	N	E			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	527	260	787	19.0	1431	0.550	100	NA	NA
Approach	527	260	787	19.0		0.550			

	Total	%HV	Deg.Satn (v/c)
Intersection	1727	19.0	0.613

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

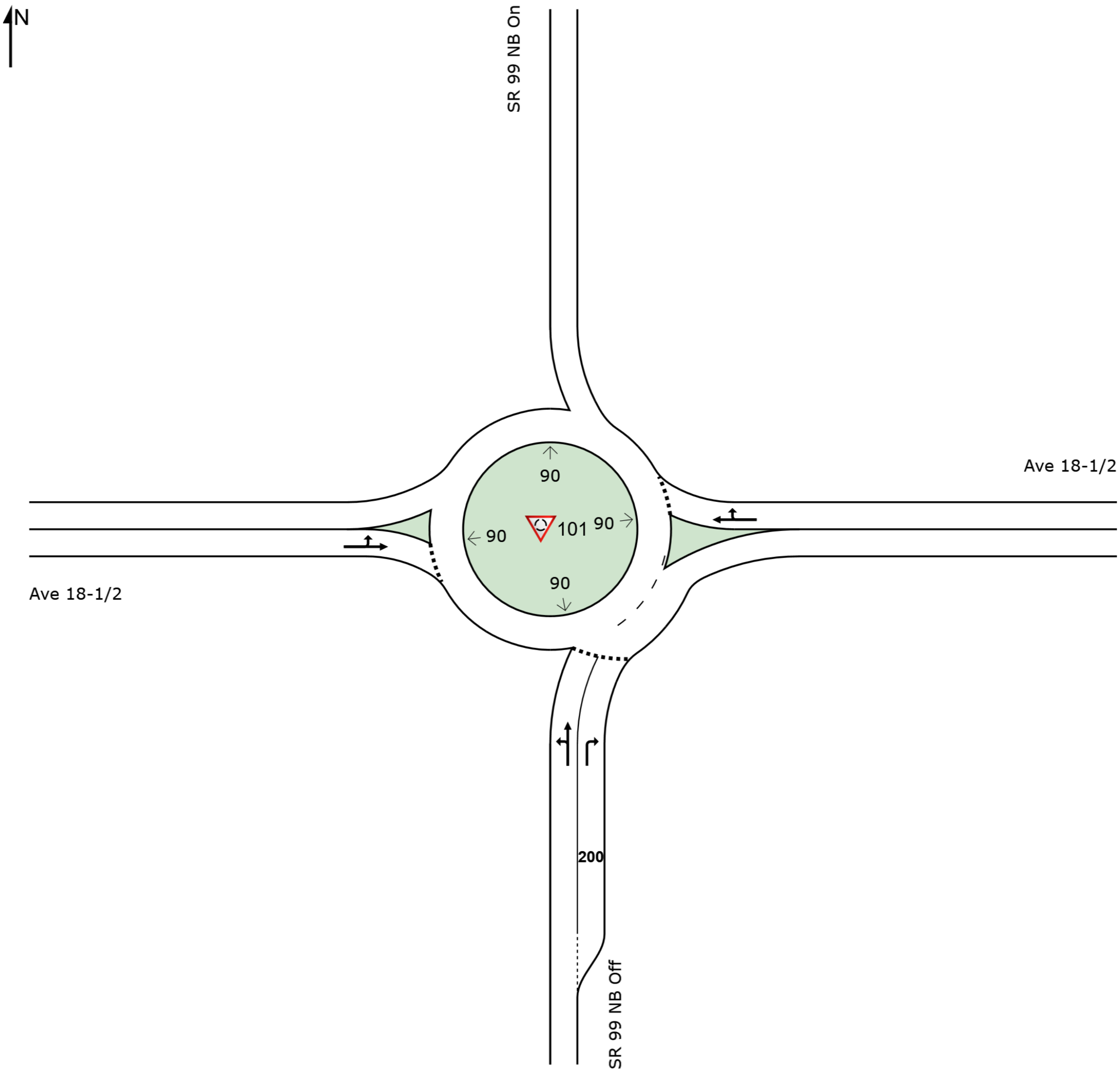
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SR 99 NB On Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 18-1/2 & SR 99 NB (PM) (Site Folder: General)]

Ave 18-1/2 - SR 99 NB 10-Year PM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 18-1/2 & SR 99 NB (PM) (Site Folder: General)]

Ave 18-1/2 - SR 99 NB 10-Year PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 99 NB Off													
Lane 1[d]	246	14.0	938	0.262	100	6.5	LOS A	1.4	39.5	Full	1600	0.0	0.0
Lane 2	98	14.0	676	0.145	100	6.9	LOS A	0.7	18.8	Short	200	0.0	NA
Approach	344	14.0		0.262		6.6	LOS A	1.4	39.5				
East: Ave 18-1/2													
Lane 1[d]	574	14.0	651	0.882	100	37.3	LOS E	18.2	506.5	Full	1600	0.0	0.0
Approach	574	14.0		0.882		37.3	LOS E	18.2	506.5				
West: Ave 18-1/2													
Lane 1[d]	456	14.0	1493	0.306	100	5.0	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	456	14.0		0.306		5.0	LOS A	0.0	0.0				
Intersection	1374	14.0		0.882		18.9	LOS C	18.2	506.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: SR 99 NB Off

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	245	1	-	246	14.0	938	0.262	100	NA	NA
Lane 2	-	-	98	98	14.0	676	0.145	100	0.0	1
Approach	245	1	98	344	14.0		0.262			

East: Ave 18-1/2

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	430	145	574	14.0	651	0.882	100	NA	NA
Approach	430	145	574	14.0		0.882			

West: Ave 18-1/2

Mov.	L2	T1	Total	%HV	Deg.	Lane	Prob.	Ov.

From W To Exit:	N	E			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	316	140	456	14.0	1493	0.306	100	NA	NA
Approach	316	140	456	14.0		0.306			

	Total	%HV	Deg.Satn (v/c)
Intersection	1374	14.0	0.882

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

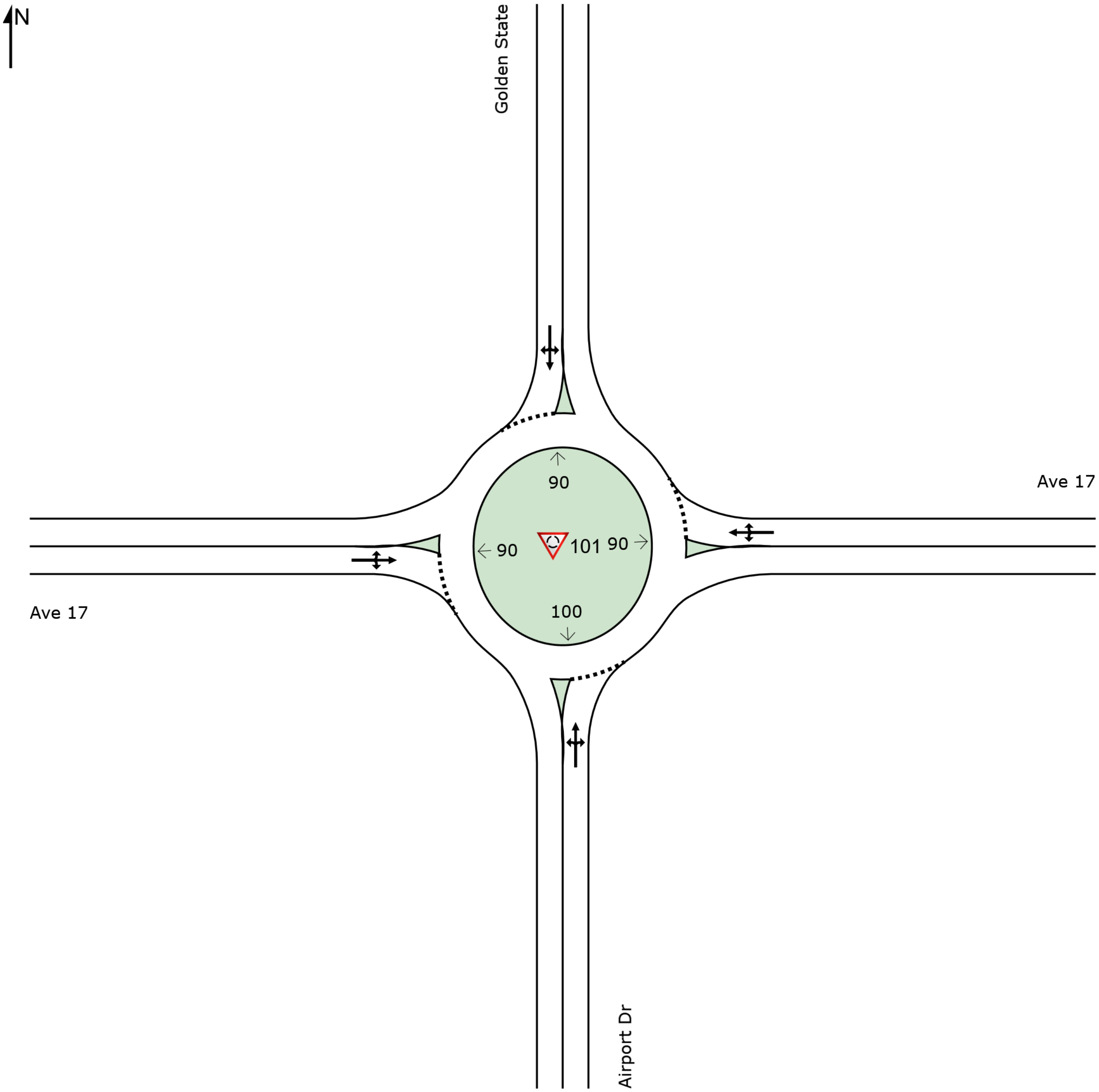
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SR 99 NB On Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 17-Golden St (AM) (Site Folder: General)]

Ave 17 - Golden St - Airport 10-Year AM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 17-Golden St (AM) (Site Folder: General)]

Ave 17 - Golden St - Airport 10-Year AM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Airport Dr													
Lane 1[d]	265	7.0	853	0.310	100	7.7	LOS A	1.9	49.7	Full	1600	0.0	0.0
Approach	265	7.0		0.310		7.7	LOS A	1.9	49.7				
East: Ave 17													
Lane 1[d]	653	7.0	1180	0.553	100	9.5	LOS A	4.8	125.8	Full	300	0.0	0.0
Approach	653	7.0		0.553		9.5	LOS A	4.8	125.8				
North: Golden State													
Lane 1[d]	253	7.0	838	0.302	100	7.7	LOS A	1.9	49.1	Full	1600	0.0	0.0
Approach	253	7.0		0.302		7.7	LOS A	1.9	49.1				
West: Ave 17													
Lane 1[d]	199	7.0	806	0.247	100	7.2	LOS A	1.4	36.5	Full	1600	0.0	0.0
Approach	199	7.0		0.247		7.2	LOS A	1.4	36.5				
Intersection	1369	7.0		0.553		8.5	LOS A	4.8	125.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Airport Dr

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	11	98	156	265	7.0	853	0.310	100	NA	NA
Approach	11	98	156	265	7.0		0.310			

East: Ave 17

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	201	151	301	653	7.0	1180	0.553	100	NA	NA
Approach	201	151	301	653	7.0		0.553			

North: Golden State										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	203	44	5	253	7.0	838	0.302	100	NA	NA
Approach	203	44	5	253	7.0		0.302			

West: Ave 17										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	13	167	19	199	7.0	806	0.247	100	NA	NA
Approach	13	167	19	199	7.0		0.247			

	Total	%HV	Deg.Satn (v/c)
Intersection	1369	7.0	0.553

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

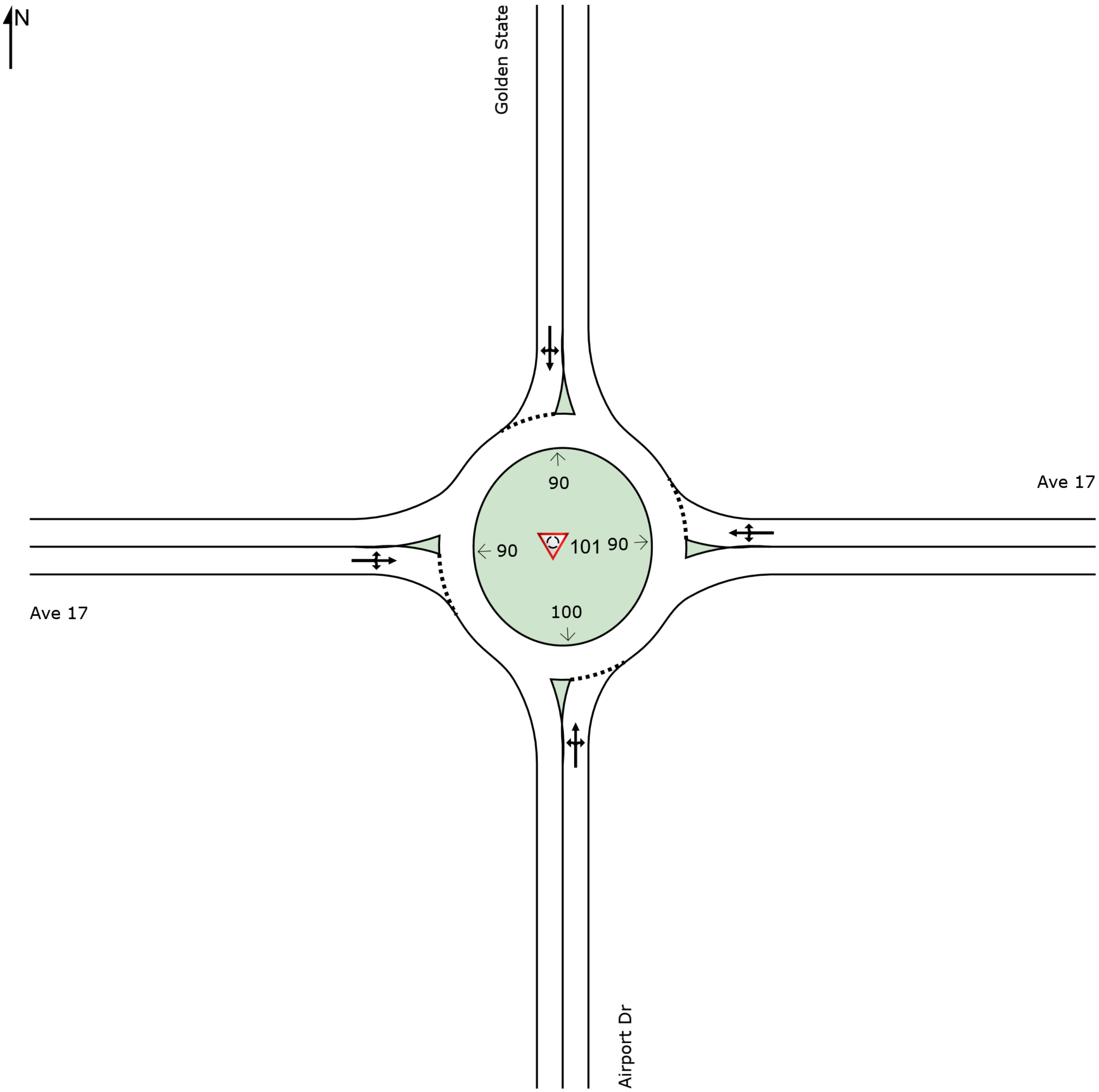
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Airport Dr Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Golden State Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 17-Golden St (PM) (Site Folder: General)]

Ave 17 - Golden St - Airport 10-Year PM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 17-Golden St (PM) (Site Folder: General)]

Ave 17 - Golden St - Airport 10-Year PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: Airport Dr													
Lane 1[d]	440	2.0	597	0.736	100	24.7	LOS C	9.9	252.3	Full	1600	0.0	0.0
Approach	440	2.0		0.736		24.7	LOS C	9.9	252.3				
East: Ave 17													
Lane 1[d]	806	2.0	1153	0.699	100	13.5	LOS B	8.5	215.3	Full	300	0.0	0.0
Approach	806	2.0		0.699		13.5	LOS B	8.5	215.3				
North: Golden State													
Lane 1[d]	548	2.0	834	0.658	100	15.5	LOS C	8.8	222.4	Full	1600	0.0	0.0
Approach	548	2.0		0.658		15.5	LOS C	8.8	222.4				
West: Ave 17													
Lane 1[d]	394	2.0	619	0.636	100	18.7	LOS C	7.1	179.4	Full	1600	0.0	0.0
Approach	394	2.0		0.636		18.7	LOS C	7.1	179.4				
Intersection	2188	2.0		0.736		17.2	LOS C	9.9	252.3				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Airport Dr

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	28	130	282	440	2.0	597	0.736	100	NA	NA
Approach	28	130	282	440	2.0		0.736			

East: Ave 17

Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	205	196	405	806	2.0	1153	0.699	100	NA	NA
Approach	205	196	405	806	2.0		0.699			

North: Golden State										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	439	95	14	548	2.0	834	0.658	100	NA	NA
Approach	439	95	14	548	2.0		0.658			

West: Ave 17										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	22	341	31	394	2.0	619	0.636	100	NA	NA
Approach	22	341	31	394	2.0		0.636			

	Total	%HV	Deg.Satn (v/c)
Intersection	2188	2.0	0.736

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

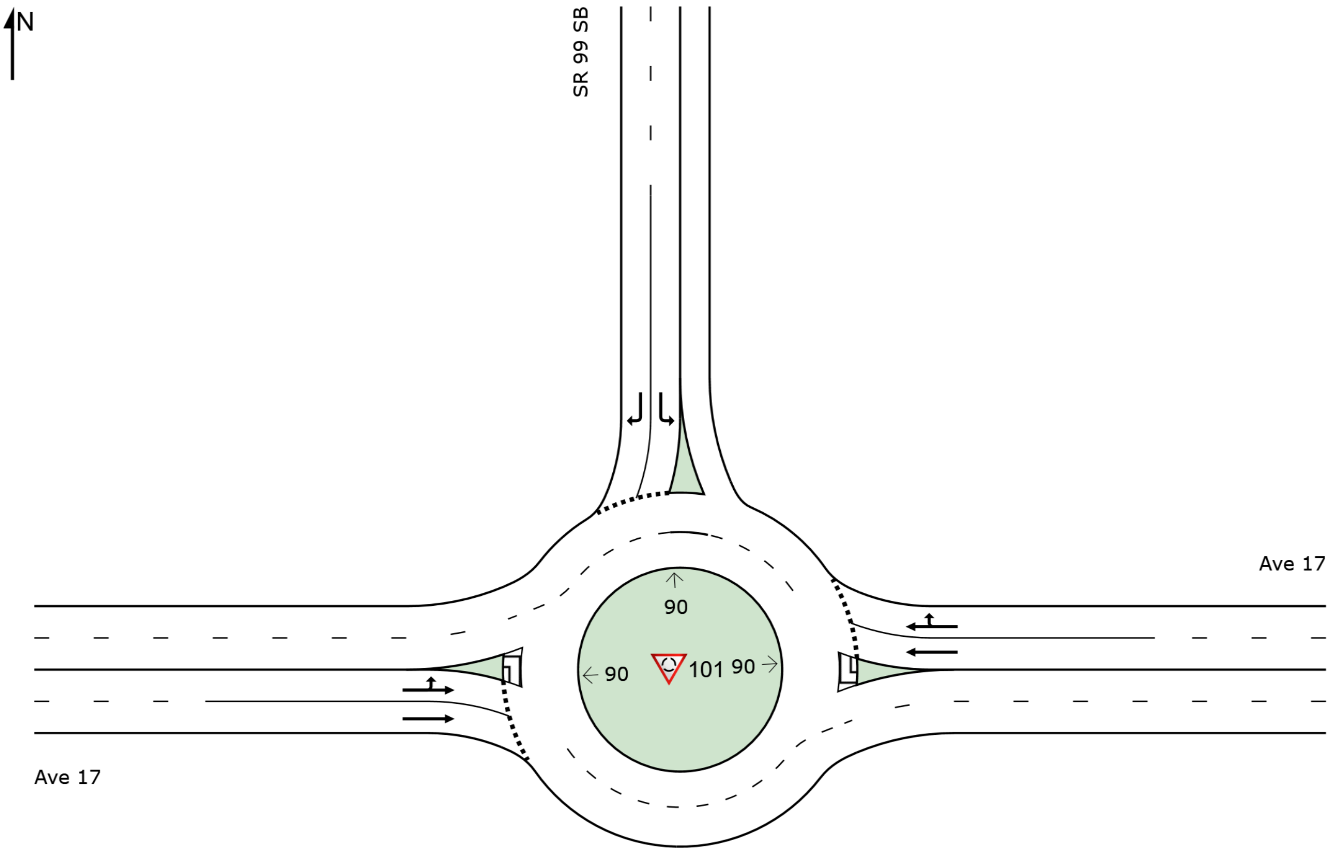
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Airport Dr Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
East Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: Golden State Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 17 SR 99 SB (AM) (Site Folder: General)]

Ave 17 - SR 99 SB 10-Year AM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 17 SR 99 SB (AM) (Site Folder: General)]

Ave 17 - SR 99 SB 10-Year AM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Ave 17													
Lane 1	604	3.0	1468	0.412	85[5]	6.2	LOS A	3.1	79.6	Full	650	0.0	0.0
Lane 2[d]	843	3.0	1743	0.483	100	6.4	LOS A	4.1	104.8	Full	650	0.0	0.0
Approach	1447	3.0		0.483		6.3	LOS A	4.1	104.8				
North: SR 99 SB													
Lane 1[d]	232	3.0	894	0.259	100	6.7	LOS A	1.3	34.3	Full	1600	0.0	0.0
Lane 2	62	3.0	531	0.116	100	8.3	LOS A	0.5	12.3	Full	1600	0.0	0.0
Approach	293	3.0		0.259		7.1	LOS A	1.3	34.3				
West: Ave 17													
Lane 1	247	3.0	1100	0.225	100	5.4	LOS A	1.3	33.6	Full	300	0.0	0.0
Lane 2[d]	275	3.0	1224	0.225	100	4.9	LOS A	1.3	34.4	Full	300	0.0	0.0
Approach	522	3.0		0.225		5.1	LOS A	1.3	34.4				
Intersection	2263	3.0		0.483		6.1	LOS A	4.1	104.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

East: Ave 17

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	604	-	604	3.0	1468	0.412	85[5]	NA	NA
Lane 2	-	843	843	3.0	1743	0.483	100	NA	NA
Approach	604	843	1447	3.0		0.483			

North: SR 99 SB

Mov. From N To Exit:	L2 E	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	232	-	232	3.0	894	0.259	100	NA	NA
Lane 2	-	62	62	3.0	531	0.116	100	NA	NA

Approach	232	62	293	3.0		0.259			
West: Ave 17									
Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	246	247	3.0	1100	0.225	100	NA	NA
Lane 2	-	275	275	3.0	1224	0.225	100	NA	NA
Approach	1	521	522	3.0		0.225			

	Total	%HV	Deg.Satn (v/c)
Intersection	2263	3.0	0.483

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

Merge Analysis

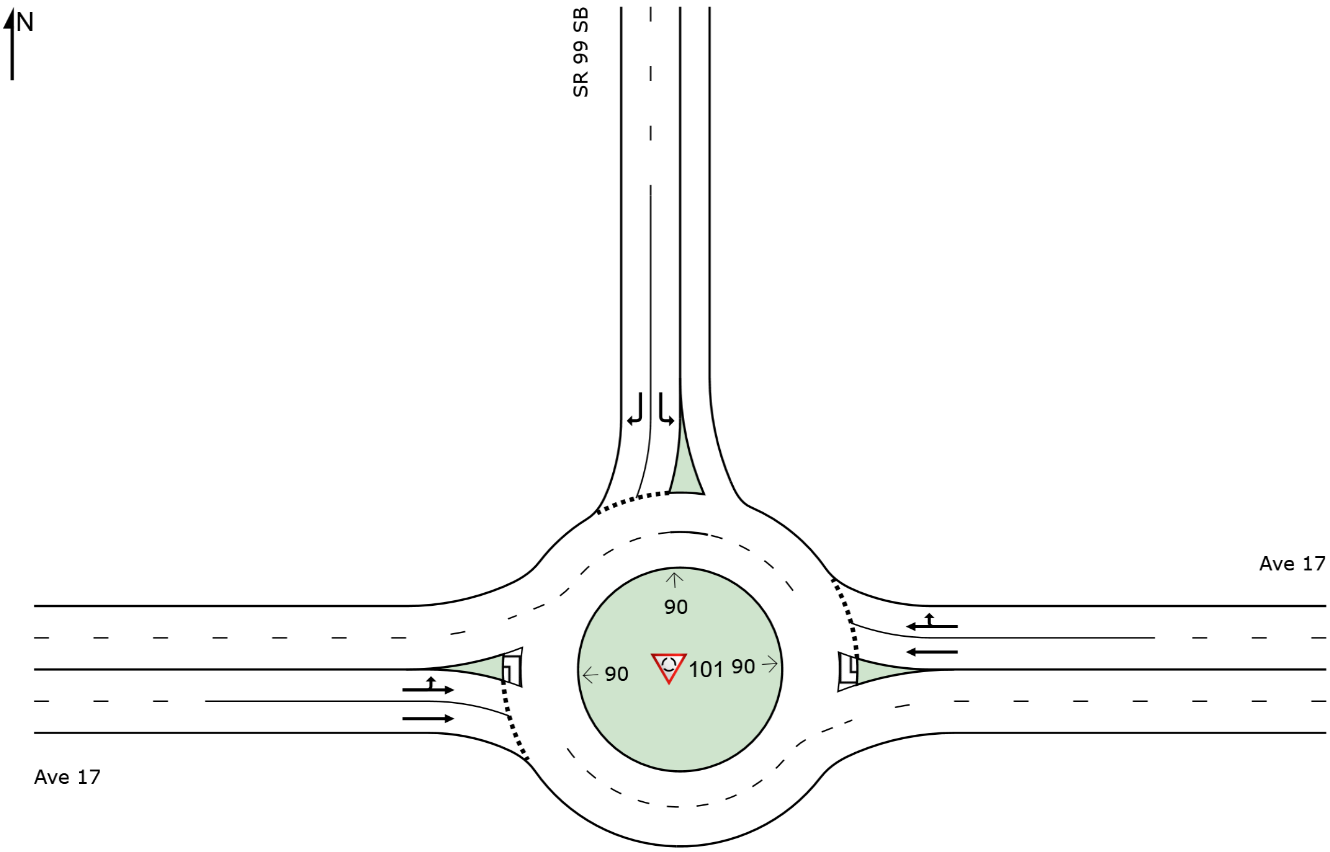
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 17 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
North Exit: SR 99 SB Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: Ave 17 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

SITE LAYOUT

Site: 101 [Ave 17 SR 99 SB (PM) (Site Folder: General)]

Ave 17 - SR 99 SB 10-Year PM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 17 SR 99 SB (PM) (Site Folder: General)]

Ave 17 - SR 99 SB 10-Year PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Ave 17													
Lane 1	554	4.0	1477	0.375	100	5.8	LOS A	2.9	76.0	Full	650	0.0	0.0
Lane 2[d]	648	4.0	1726	0.375	100	5.2	LOS A	3.0	77.7	Full	650	0.0	0.0
Approach	1202	4.0		0.375		5.5	LOS A	3.0	77.7				
North: SR 99 SB													
Lane 1[d]	379	4.0	904	0.419	100	8.9	LOS A	2.3	59.8	Full	1600	0.0	0.0
Lane 2	66	4.0	510	0.129	100	8.8	LOS A	0.5	12.4	Full	1600	0.0	0.0
Approach	445	4.0		0.419		8.9	LOS A	2.3	59.8				
West: Ave 17													
Lane 1	473	4.0	943	0.502	100	10.1	LOS B	4.0	102.8	Full	300	0.0	0.0
Lane 2[d]	542	4.0	1081	0.502	100	9.2	LOS A	3.8	99.0	Full	300	0.0	0.0
Approach	1015	4.0		0.502		9.6	LOS A	4.0	102.8				
Intersection	2663	4.0		0.502		7.6	LOS A	4.0	102.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

East: Ave 17

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	554	-	554	4.0	1477	0.375	100	NA	NA
Lane 2	106	542	648	4.0	1726	0.375	100	NA	NA
Approach	660	542	1202	4.0		0.375			

North: SR 99 SB

Mov. From N To Exit:	L2 E	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	379	-	379	4.0	904	0.419	100	NA	NA
Lane 2	-	66	66	4.0	510	0.129	100	NA	NA

Approach	379	66	445	4.0		0.419				

West: Ave 17

Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	472	473	4.0	943	0.502	100	NA	NA
Lane 2	-	542	542	4.0	1081	0.502	100	NA	NA
Approach	1	1014	1015	4.0		0.502			

	Total	%HV	Deg.Satn (v/c)
Intersection	2663	4.0	0.502

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

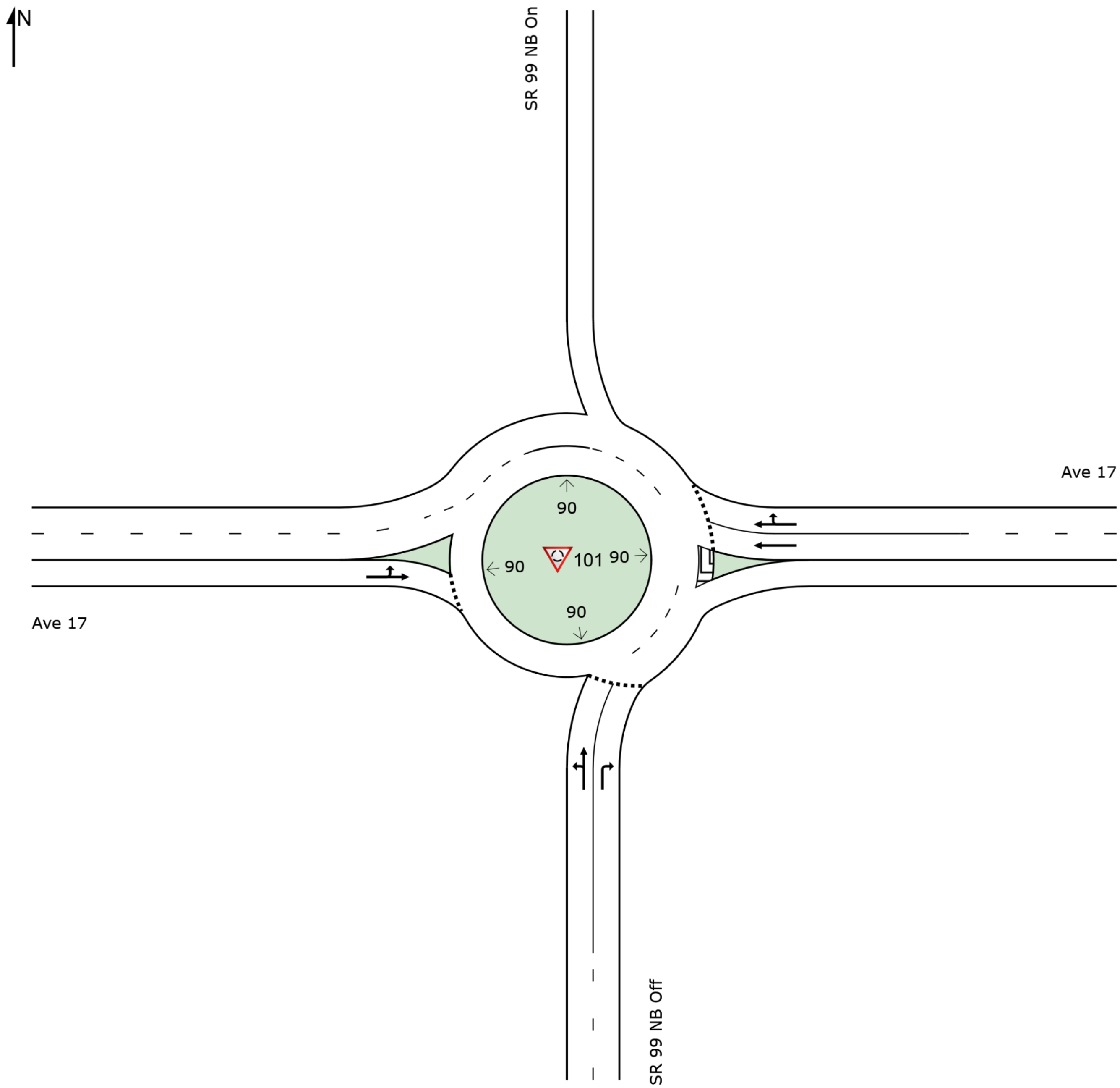
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: SR 99 SB Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 17 SR 99 NB (AM) (Site Folder: General)]

Ave 17 - SR 99 NB 10-Year AM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 17 SR 99 NB (AM) (Site Folder: General)]

Ave 17 - SR 99 NB 10-Year AM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 99 NB Off													
Lane 1	297	3.0	873	0.340	100	7.9	LOS A	1.9	49.6	Full	1600	0.0	0.0
Lane 2[d]	426	3.0	1075	0.397	100	7.5	LOS A	2.5	63.9	Full	1600	0.0	0.0
Approach	723	3.0		0.397		7.7	LOS A	2.5	63.9				
East: Ave 17													
Lane 1	652	3.0	984	0.663	100	13.9	LOS B	9.1	232.1	Full	1600	0.0	0.0
Lane 2[d]	751	3.0	1133	0.663	100	12.5	LOS B	9.1	232.7	Full	1600	0.0	0.0
Approach	1403	3.0		0.663		13.1	LOS B	9.1	232.7				
West: Ave 17													
Lane 1[d]	552	3.0	1653	0.334	100	4.9	LOS A	0.0	0.0	Full	650	0.0	0.0
Approach	552	3.0		0.334		4.9	LOS A	0.0	0.0				
Intersection	2678	3.0		0.663		10.0	LOS A	9.1	232.7				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: SR 99 NB Off

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	296	1	-	297	3.0	873	0.340	100	NA	NA
Lane 2	-	-	426	426	3.0	1075	0.397	100	NA	NA
Approach	296	1	426	723	3.0		0.397			

East: Ave 17

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	652	-	652	3.0	984	0.663	100	NA	NA
Lane 2	504	247	751	3.0	1133	0.663	100	NA	NA
Approach	1156	247	1403	3.0		0.663			

West: Ave 17									
Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	68	484	552	3.0	1653	0.334	100	NA	NA
Approach	68	484	552	3.0		0.334			

	Total	%HV	Deg.Satn (v/c)
Intersection	2678	3.0	0.663

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

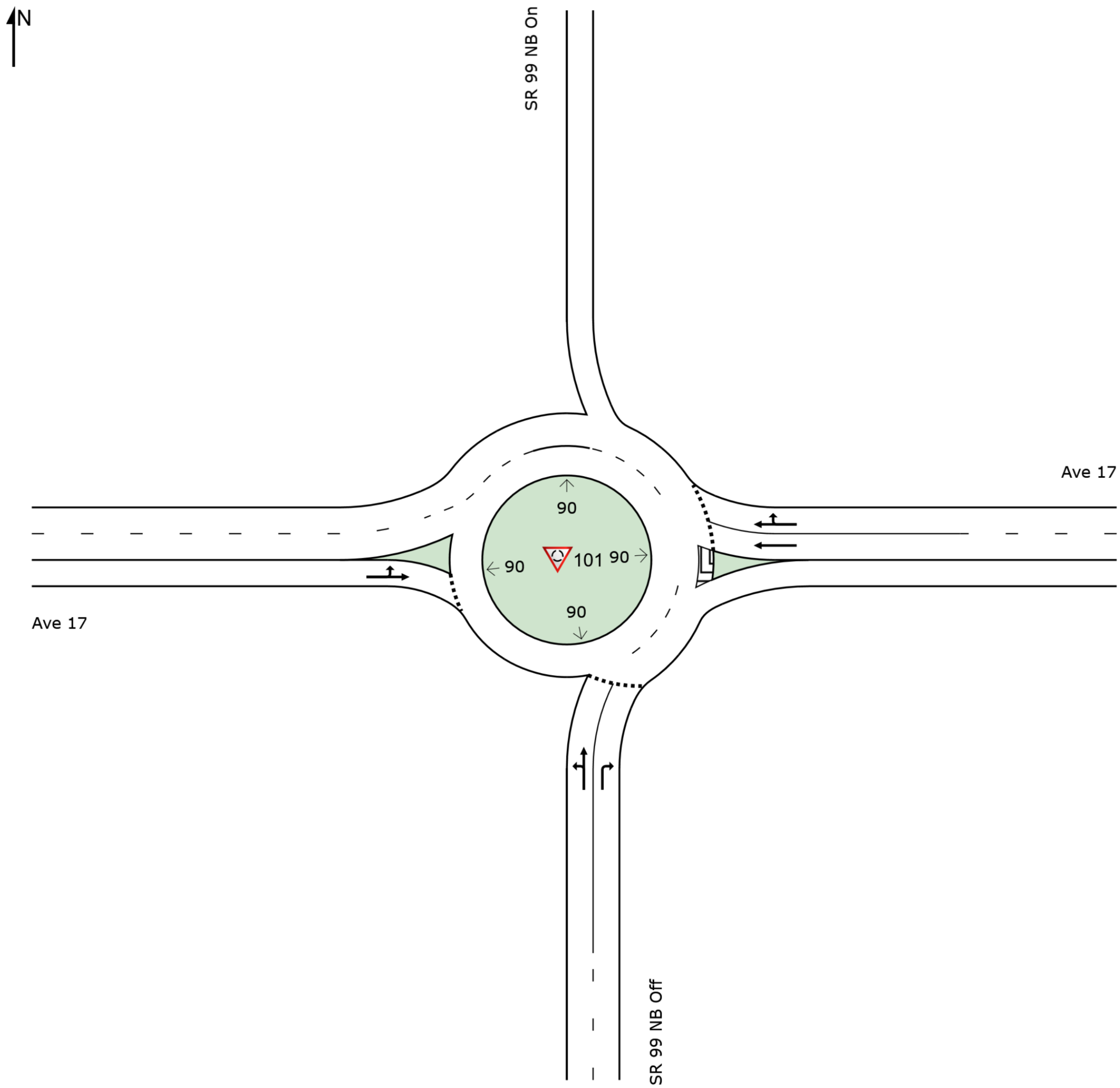
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SR 99 NB On Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 17 SR 99 NB (PM) (Site Folder: General)]

Ave 17 - SR 99 NB 10-Year PM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 17 SR 99 NB (PM) (Site Folder: General)]

Ave 17 - SR 99 NB 10-Year PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 99 NB Off													
Lane 1	292	2.0	581	0.504	100	14.8	LOS B	4.0	101.6	Full	1600	0.0	0.0
Lane 2[d]	691	2.0	805	0.859	100	29.3	LOS D	17.2	437.4	Full	1600	0.0	0.0
Approach	984	2.0		0.859		25.0	LOS C	17.2	437.4				
East: Ave 17													
Lane 1	533	2.0	974	0.547	100	10.8	LOS B	5.1	129.9	Full	1600	0.0	0.0
Lane 2[d]	611	2.0	1117	0.547	100	9.8	LOS A	4.9	125.0	Full	1600	0.0	0.0
Approach	1144	2.0		0.547		10.3	LOS B	5.1	129.9				
West: Ave 17													
Lane 1[d]	970	2.0	1669	0.581	100	8.0	LOS A	0.0	0.0	Full	650	0.0	0.0
Approach	970	2.0		0.581		8.0	LOS A	0.0	0.0				
Intersection	3098	2.0		0.859		14.2	LOS B	17.2	437.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: SR 99 NB Off

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	291	1	-	292	2.0	581	0.504	100	NA	NA
Lane 2	-	-	691	691	2.0	805	0.859	100	NA	NA
Approach	291	1	691	984	2.0		0.859			

East: Ave 17

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	533	-	533	2.0	974	0.547	100	NA	NA
Lane 2	318	294	611	2.0	1117	0.547	100	NA	NA
Approach	851	294	1144	2.0		0.547			

West: Ave 17									
Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	82	888	970	2.0	1669	0.581	100	NA	NA
Approach	82	888	970	2.0		0.581			

	Total	%HV	Deg.Satn (v/c)
Intersection	3098	2.0	0.859

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis												
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SR 99 NB On Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

APPENDIX D
YEAR 2042 INTERSECTION ANALYSIS SHEETS

Signalized Alternative

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	378	83	67	286	0	137	0	738	148	265	123
Future Volume (veh/h)	0	378	83	67	286	0	137	0	738	148	265	123
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1604	1604	1604	1604	0	1604	0	1604	1604	1604	1604
Adj Flow Rate, veh/h	0	425	60	75	321	0	154	0	539	166	298	90
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	20	20	20	20	0	20	0	20	20	20	20
Cap, veh/h	0	538	456	157	866	0	0	0	0	392	412	349
Arrive On Green	0.00	0.34	0.34	0.10	0.54	0.00	0.00	0.00	0.00	0.26	0.26	0.26
Sat Flow, veh/h	0	1604	1359	1527	1604	0		0		1527	1604	1359
Grp Volume(v), veh/h	0	425	60	75	321	0		0.0		166	298	90
Grp Sat Flow(s),veh/h/ln	0	1604	1359	1527	1604	0				1527	1604	1359
Q Serve(g_s), s	0.0	11.6	1.5	2.2	5.6	0.0				4.4	8.2	2.5
Cycle Q Clear(g_c), s	0.0	11.6	1.5	2.2	5.6	0.0				4.4	8.2	2.5
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	538	456	157	866	0				392	412	349
V/C Ratio(X)	0.00	0.79	0.13	0.48	0.37	0.00				0.42	0.72	0.26
Avail Cap(c_a), veh/h	0	1137	963	570	1898	0				731	768	651
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	14.5	11.1	20.4	6.4	0.0				15.0	16.4	14.3
Incr Delay (d2), s/veh	0.0	2.6	0.1	2.2	0.3	0.0				0.7	2.4	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	3.6	0.4	0.8	1.2	0.0				1.4	2.9	0.7
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	17.1	11.3	22.6	6.6	0.0				15.7	18.8	14.7
LnGrp LOS	A	B	B	C	A	A				B	B	B
Approach Vol, veh/h		485			396						554	
Approach Delay, s/veh		16.4			9.7						17.2	
Approach LOS		B			A						B	
Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			9.9	21.1		17.3		31.0				
Change Period (Y+Rc), s			4.9	4.9		4.9		4.9				
Max Green Setting (Gmax), s			18.0	34.2		23.1		57.1				
Max Q Clear Time (g_c+I1), s			4.2	13.6		10.2		7.6				
Green Ext Time (p_c), s			0.1	2.6		2.2		2.0				
Intersection Summary												
HCM 6th Ctrl Delay			14.9									
HCM 6th LOS			B									

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	425	93	75	321	154	829	166	298	138
v/c Ratio	0.99	0.21	0.54	0.53	0.32	1.17	0.60	1.03	0.38
Control Delay	88.4	8.5	69.5	33.5	36.8	114.1	59.5	111.9	10.9
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	88.4	8.5	69.5	33.5	36.8	114.1	59.5	111.9	10.9
Queue Length 50th (ft)	~362	0	61	201	98	~582	129	~270	0
Queue Length 95th (ft)	#607	42	112	287	169	#854	215	#474	58
Internal Link Dist (ft)	199			890				396	
Turn Bay Length (ft)			150			25			
Base Capacity (vph)	429	434	214	716	478	706	275	289	359
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.99	0.21	0.35	0.45	0.32	1.17	0.60	1.03	0.38

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	806	221	0	0	178	46	244	0	330	0	0	0
Future Volume (veh/h)	806	221	0	0	178	46	244	0	330	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1618	1618	0	0	1618	1618	1618	0	1618			
Adj Flow Rate, veh/h	876	240	0	0	193	39	265	0	234			
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92			
Percent Heavy Veh, %	19	19	0	0	19	19	19	0	19			
Cap, veh/h	1065	1009	0	0	246	50	337	0	300			
Arrive On Green	0.36	0.62	0.00	0.00	0.19	0.19	0.22	0.00	0.22			
Sat Flow, veh/h	2990	1618	0	0	1307	264	1541	0	1372			
Grp Volume(v), veh/h	876	240	0	0	0	232	265	0	234			
Grp Sat Flow(s),veh/h/ln	1495	1618	0	0	0	1571	1541	0	1372			
Q Serve(g_s), s	16.6	4.1	0.0	0.0	0.0	8.7	10.1	0.0	10.0			
Cycle Q Clear(g_c), s	16.6	4.1	0.0	0.0	0.0	8.7	10.1	0.0	10.0			
Prop In Lane	1.00		0.00	0.00		0.17	1.00		1.00			
Lane Grp Cap(c), veh/h	1065	1009	0	0	0	296	337	0	300			
V/C Ratio(X)	0.82	0.24	0.00	0.00	0.00	0.78	0.79	0.00	0.78			
Avail Cap(c_a), veh/h	2116	1877	0	0	0	609	697	0	620			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	18.2	5.2	0.0	0.0	0.0	24.0	22.9	0.0	22.9			
Incr Delay (d2), s/veh	1.7	0.1	0.0	0.0	0.0	4.5	4.0	0.0	4.4			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.1	0.9	0.0	0.0	0.0	3.3	3.8	0.0	3.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	19.9	5.3	0.0	0.0	0.0	28.6	26.9	0.0	27.2			
LnGrp LOS	B	A	A	A	A	C	C	A	C			
Approach Vol, veh/h		1116			232			499				
Approach Delay, s/veh		16.7			28.6			27.1				
Approach LOS		B			C			C				
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		18.5		43.7			27.0	16.6				
Change Period (Y+Rc), s		4.9		4.9			4.9	* 4.9				
Max Green Setting (Gmax), s		28.1		72.1			44.0	* 24				
Max Q Clear Time (g_c+I1), s		12.1		6.1			18.6	10.7				
Green Ext Time (p_c), s		1.5		1.4			3.6	1.0				
Intersection Summary												
HCM 6th Ctrl Delay			21.0									
HCM 6th LOS			C									
Notes												

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Lane Group	EBL	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	876	240	243	265	359
v/c Ratio	0.85	0.25	0.77	0.58	0.54
Control Delay	37.1	9.4	52.6	37.3	7.0
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	37.1	9.4	52.6	37.3	7.0
Queue Length 50th (ft)	248	63	134	138	0
Queue Length 95th (ft)	345	98	#246	264	78
Internal Link Dist (ft)		890	1504		
Turn Bay Length (ft)	145				
Base Capacity (vph)	1391	1237	409	458	660
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.63	0.19	0.59	0.58	0.54

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	24	1177	241	302	503	286	101	114	180	216	54	18
Future Volume (veh/h)	24	1177	241	302	503	286	101	114	180	216	54	18
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	26	1266	169	325	541	200	109	123	126	232	58	14
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93
Percent Heavy Veh, %	7	7	7	7	7	7	7	7	7	7	7	7
Cap, veh/h	44	1405	627	357	2028	905	135	193	163	298	165	40
Arrive On Green	0.03	0.41	0.41	0.21	0.59	0.59	0.08	0.11	0.11	0.09	0.12	0.12
Sat Flow, veh/h	1711	3413	1522	1711	3413	1522	1711	1796	1522	3319	1398	337
Grp Volume(v), veh/h	26	1266	169	325	541	200	109	123	126	232	0	72
Grp Sat Flow(s),veh/h/ln	1711	1706	1522	1711	1706	1522	1711	1796	1522	1659	0	1736
Q Serve(g_s), s	1.5	33.8	7.2	18.1	7.4	6.0	6.1	6.4	7.8	6.7	0.0	3.7
Cycle Q Clear(g_c), s	1.5	33.8	7.2	18.1	7.4	6.0	6.1	6.4	7.8	6.7	0.0	3.7
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.19
Lane Grp Cap(c), veh/h	44	1405	627	357	2028	905	135	193	163	298	0	205
V/C Ratio(X)	0.59	0.90	0.27	0.91	0.27	0.22	0.81	0.64	0.77	0.78	0.00	0.35
Avail Cap(c_a), veh/h	107	1483	661	390	2047	913	142	332	281	331	0	349
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.9	26.8	19.0	37.7	9.5	9.2	44.1	41.6	42.3	43.4	0.0	39.5
Incr Delay (d2), s/veh	11.7	7.7	0.2	24.0	0.1	0.1	27.1	3.5	7.5	10.3	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.7	13.9	2.4	9.5	2.4	1.7	3.5	2.9	3.2	3.1	0.0	1.6
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	58.6	34.4	19.2	61.6	9.6	9.3	71.2	45.1	49.8	53.7	0.0	40.5
LnGrp LOS	E	C	B	E	A	A	E	D	D	D	A	D
Approach Vol, veh/h		1461			1066			358			304	
Approach Delay, s/veh		33.1			25.4			54.7			50.6	
Approach LOS		C			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	12.7	15.4	24.3	45.0	11.7	16.4	6.5	62.8
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	9.7	18.0	22.2	42.3	8.1	19.6	6.1	58.4
Max Q Clear Time (g_c+I1), s	8.7	9.8	20.1	35.8	8.1	5.7	3.5	9.4
Green Ext Time (p_c), s	0.1	0.6	0.2	4.3	0.0	0.2	0.0	4.4

Intersection Summary	
HCM 6th Ctrl Delay	34.6
HCM 6th LOS	C

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	26	1266	259	325	541	308	109	123	194	232	77
v/c Ratio	0.27	0.93	0.37	0.91	0.27	0.30	0.83	0.58	0.55	0.77	0.32
Control Delay	55.9	43.1	12.1	72.0	11.7	2.3	93.1	54.3	12.3	64.2	37.4
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.0
Total Delay	55.9	43.1	12.1	72.0	11.7	2.6	93.1	54.3	12.3	64.2	37.4
Queue Length 50th (ft)	17	416	51	213	94	0	73	79	0	79	39
Queue Length 95th (ft)	47	#614	124	#406	143	41	#183	138	63	#146	83
Internal Link Dist (ft)		6447			365			1367			840
Turn Bay Length (ft)	120		130	75		120	60				
Base Capacity (vph)	98	1372	695	360	2015	1025	131	307	421	305	332
Starvation Cap Reductn	0	0	0	0	0	272	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.27	0.92	0.37	0.90	0.27	0.41	0.83	0.40	0.46	0.76	0.23

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1574	949	0	289	141
Future Volume (veh/h)	0	1574	949	0	289	141
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1856	1856	0	1856	1856
Adj Flow Rate, veh/h	0	1730	1043	0	318	155
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	3	3	0	3	3
Cap, veh/h	0	2284	2284	0	391	348
Arrive On Green	0.00	0.65	0.65	0.00	0.22	0.22
Sat Flow, veh/h	0	3711	3711	0	1767	1572
Grp Volume(v), veh/h	0	1730	1043	0	318	155
Grp Sat Flow(s),veh/h/ln	0	1763	1763	0	1767	1572
Q Serve(g_s), s	0.0	23.1	10.1	0.0	11.6	5.8
Cycle Q Clear(g_c), s	0.0	23.1	10.1	0.0	11.6	5.8
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	2284	2284	0	391	348
V/C Ratio(X)	0.00	0.76	0.46	0.00	0.81	0.45
Avail Cap(c_a), veh/h	0	3526	3526	0	856	762
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	8.3	6.0	0.0	25.2	22.9
Incr Delay (d2), s/veh	0.0	0.5	0.1	0.0	4.1	0.9
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	5.4	2.3	0.0	5.0	2.1
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	8.8	6.1	0.0	29.3	23.8
LnGrp LOS	A	A	A	A	C	C
Approach Vol, veh/h		1730	1043		473	
Approach Delay, s/veh		8.8	6.1		27.5	
Approach LOS		A	A		C	

Timer - Assigned Phs				4		6		8
Phs Duration (G+Y+Rc), s				49.0		19.1		49.0
Change Period (Y+Rc), s				4.9		4.0		4.9
Max Green Setting (Gmax), s				68.1		33.0		68.1
Max Q Clear Time (g_c+I1), s				25.1		13.6		12.1
Green Ext Time (p_c), s				19.0		1.4		8.7

Intersection Summary	
HCM 6th Ctrl Delay	10.7
HCM 6th LOS	B

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1730	1043	318	155
v/c Ratio	0.80	0.48	0.69	0.31
Control Delay	15.8	9.7	37.2	10.8
Queue Delay	0.3	0.0	0.0	0.0
Total Delay	16.1	9.7	37.2	10.8
Queue Length 50th (ft)	301	131	143	14
Queue Length 95th (ft)	548	242	287	68
Internal Link Dist (ft)	365	293	424	
Turn Bay Length (ft)				
Base Capacity (vph)	2922	2922	768	753
Starvation Cap Reductn	489	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	0.71	0.36	0.41	0.21

Intersection Summary

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	145	885	0	0	1111	253	546	0	389	0	0	0
Future Volume (veh/h)	145	885	0	0	1111	253	546	0	389	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1856	1856	0	0	1856	1856	1856	0	1856			
Adj Flow Rate, veh/h	159	973	0	0	1221	191	600	0	278			
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91	0.91			
Percent Heavy Veh, %	3	3	0	0	3	3	3	0	3			
Cap, veh/h	201	2196	0	0	1597	712	818	0	375			
Arrive On Green	0.11	0.62	0.00	0.00	0.45	0.45	0.24	0.00	0.24			
Sat Flow, veh/h	1767	3618	0	0	3618	1572	3428	0	1572			
Grp Volume(v), veh/h	159	973	0	0	1221	191	600	0	278			
Grp Sat Flow(s),veh/h/ln	1767	1763	0	0	1763	1572	1714	0	1572			
Q Serve(g_s), s	6.2	10.2	0.0	0.0	20.5	5.4	11.4	0.0	11.6			
Cycle Q Clear(g_c), s	6.2	10.2	0.0	0.0	20.5	5.4	11.4	0.0	11.6			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	201	2196	0	0	1597	712	818	0	375			
V/C Ratio(X)	0.79	0.44	0.00	0.00	0.76	0.27	0.73	0.00	0.74			
Avail Cap(c_a), veh/h	374	3190	0	0	2244	1001	1747	0	801			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	30.6	7.0	0.0	0.0	16.2	12.1	24.9	0.0	24.9			
Incr Delay (d2), s/veh	6.9	0.1	0.0	0.0	1.0	0.2	1.3	0.0	2.9			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	2.8	2.6	0.0	0.0	6.9	1.6	4.5	0.0	4.4			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	37.5	7.1	0.0	0.0	17.3	12.3	26.2	0.0	27.8			
LnGrp LOS	D	A	A	A	B	B	C	A	C			
Approach Vol, veh/h		1132			1412			878				
Approach Delay, s/veh		11.4			16.6			26.7				
Approach LOS		B			B			C				
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		21.8		49.0			12.0	37.0				
Change Period (Y+Rc), s		4.9		4.9			4.0	4.9				
Max Green Setting (Gmax), s		36.1		64.1			15.0	45.1				
Max Q Clear Time (g_c+I1), s		13.6		12.2			8.2	22.5				
Green Ext Time (p_c), s		3.3		7.8			0.2	9.6				
Intersection Summary												
HCM 6th Ctrl Delay			17.4									
HCM 6th LOS			B									

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	159	973	1221	278	600	427
v/c Ratio	0.65	0.46	0.82	0.38	0.63	0.81
Control Delay	55.0	11.4	30.3	13.9	32.9	36.1
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	55.0	11.4	30.3	13.9	32.9	36.1
Queue Length 50th (ft)	98	156	345	68	175	191
Queue Length 95th (ft)	#192	246	499	150	232	314
Internal Link Dist (ft)		526	2810			
Turn Bay Length (ft)	115			85	550	
Base Capacity (vph)	296	2514	1785	850	1386	710
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.54	0.39	0.68	0.33	0.43	0.60

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	0	405	307	104	248	0	106	0	469	72	695	168
Future Volume (veh/h)	0	405	307	104	248	0	106	0	469	72	695	168
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	0	1693	1693	1693	1693	0	1693	0	1693	1693	1693	1693
Adj Flow Rate, veh/h	0	455	225	117	279	0	119	0	343	81	781	123
Peak Hour Factor	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89	0.89
Percent Heavy Veh, %	0	14	14	14	14	0	14	0	14	14	14	14
Cap, veh/h	0	487	412	136	697	0	0	0	0	791	830	704
Arrive On Green	0.00	0.29	0.29	0.08	0.41	0.00	0.00	0.00	0.00	0.49	0.49	0.49
Sat Flow, veh/h	0	1693	1434	1612	1693	0		0		1612	1693	1434
Grp Volume(v), veh/h	0	455	225	117	279	0		0.0		81	781	123
Grp Sat Flow(s),veh/h/ln	0	1693	1434	1612	1693	0				1612	1693	1434
Q Serve(g_s), s	0.0	26.3	13.3	7.2	11.7	0.0				2.7	43.9	4.8
Cycle Q Clear(g_c), s	0.0	26.3	13.3	7.2	11.7	0.0				2.7	43.9	4.8
Prop In Lane	0.00		1.00	1.00		0.00				1.00		1.00
Lane Grp Cap(c), veh/h	0	487	412	136	697	0				791	830	704
V/C Ratio(X)	0.00	0.94	0.55	0.86	0.40	0.00				0.10	0.94	0.17
Avail Cap(c_a), veh/h	0	502	425	136	712	0				845	888	752
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00				1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	1.00	1.00	0.00				1.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	34.9	30.3	45.4	20.8	0.0				13.7	24.2	14.3
Incr Delay (d2), s/veh	0.0	24.7	1.4	38.7	0.4	0.0				0.1	17.0	0.1
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0				0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	13.6	4.6	4.3	4.5	0.0				1.0	20.3	1.5
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	0.0	59.5	31.6	84.1	21.2	0.0				13.8	41.2	14.4
LnGrp LOS	A	E	C	F	C	A				B	D	B
Approach Vol, veh/h		680			396						985	
Approach Delay, s/veh		50.3			39.8						35.6	
Approach LOS		D			D						D	
Timer - Assigned Phs			3	4		6		8				
Phs Duration (G+Y+Rc), s			12.5	33.8		54.2		46.3				
Change Period (Y+Rc), s			4.0	4.9		4.9		4.9				
Max Green Setting (Gmax), s			8.5	29.8		52.7		42.3				
Max Q Clear Time (g_c+I1), s			9.2	28.3		45.9		13.7				
Green Ext Time (p_c), s			0.0	0.6		3.4		1.6				
Intersection Summary												
HCM 6th Ctrl Delay			41.3									
HCM 6th LOS			D									

Lane Group	EBT	EBR	WBL	WBT	NBL	NBR	SBL	SBT	SBR
Lane Group Flow (vph)	455	345	117	279	119	527	81	781	189
v/c Ratio	1.10	0.64	1.04	0.48	0.88	0.87	0.12	1.07	0.27
Control Delay	117.1	17.7	151.4	33.5	105.7	21.0	20.5	85.9	7.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	117.1	17.7	151.4	33.5	105.7	21.0	20.5	85.9	7.2
Queue Length 50th (ft)	~400	61	~98	167	93	0	36	~669	21
Queue Length 95th (ft)	#595	164	#216	247	#202	#166	67	#891	66
Internal Link Dist (ft)	199			890				396	
Turn Bay Length (ft)						25			
Base Capacity (vph)	413	538	112	587	135	603	695	732	701
Starvation Cap Reductn	0	0	0	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	1.10	0.64	1.04	0.48	0.88	0.87	0.12	1.07	0.27

Intersection Summary

~ Volume exceeds capacity, queue is theoretically infinite.
Queue shown is maximum after two cycles.

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	542	192	0	0	482	144	254	0	111	0	0	0
Future Volume (veh/h)	542	192	0	0	482	144	254	0	111	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1707	1707	0	0	1707	1707	1707	0	1707			
Adj Flow Rate, veh/h	577	204	0	0	513	100	270	0	77			
Peak Hour Factor	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94	0.94			
Percent Heavy Veh, %	13	13	0	0	13	13	13	0	13			
Cap, veh/h	689	1171	0	0	567	110	317	0	282			
Arrive On Green	0.22	0.69	0.00	0.00	0.41	0.41	0.20	0.00	0.20			
Sat Flow, veh/h	3155	1707	0	0	1388	271	1626	0	1447			
Grp Volume(v), veh/h	577	204	0	0	0	613	270	0	77			
Grp Sat Flow(s),veh/h/ln	1577	1707	0	0	0	1659	1626	0	1447			
Q Serve(g_s), s	14.4	3.5	0.0	0.0	0.0	28.6	13.2	0.0	3.7			
Cycle Q Clear(g_c), s	14.4	3.5	0.0	0.0	0.0	28.6	13.2	0.0	3.7			
Prop In Lane	1.00		0.00	0.00		0.16	1.00		1.00			
Lane Grp Cap(c), veh/h	689	1171	0	0	0	677	317	0	282			
V/C Ratio(X)	0.84	0.17	0.00	0.00	0.00	0.91	0.85	0.00	0.27			
Avail Cap(c_a), veh/h	999	1514	0	0	0	847	535	0	476			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	0.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	30.8	4.6	0.0	0.0	0.0	22.9	32.0	0.0	28.2			
Incr Delay (d2), s/veh	4.3	0.1	0.0	0.0	0.0	11.4	6.6	0.0	0.5			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	5.5	0.9	0.0	0.0	0.0	12.1	5.6	0.0	1.3			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	35.1	4.7	0.0	0.0	0.0	34.3	38.6	0.0	28.7			
LnGrp LOS	D	A	A	A	A	C	D	A	C			
Approach Vol, veh/h		781			613			347				
Approach Delay, s/veh		27.1			34.3			36.4				
Approach LOS		C			C			D				
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		21.0		61.4			22.9	38.5				
Change Period (Y+Rc), s		4.9		4.9			4.9	4.9				
Max Green Setting (Gmax), s		27.1		73.1			26.1	42.1				
Max Q Clear Time (g_c+I1), s		15.2		5.5			16.4	30.6				
Green Ext Time (p_c), s		0.9		1.2			1.6	3.0				
Intersection Summary												
HCM 6th Ctrl Delay			31.5									
HCM 6th LOS			C									

Lane Group	EBL	EBT	WBT	NBL	NBR
Lane Group Flow (vph)	577	204	666	270	118
v/c Ratio	0.83	0.18	0.96	0.80	0.30
Control Delay	49.6	6.6	57.3	56.4	8.4
Queue Delay	0.0	0.0	0.0	0.0	0.0
Total Delay	49.6	6.6	57.3	56.4	8.4
Queue Length 50th (ft)	186	43	425	170	0
Queue Length 95th (ft)	262	80	#736	269	45
Internal Link Dist (ft)		890	1504		
Turn Bay Length (ft)	145				
Base Capacity (vph)	804	1222	691	430	470
Starvation Cap Reductn	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0
Reduced v/c Ratio	0.72	0.17	0.96	0.63	0.25

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	44	877	160	250	1197	336	248	110	380	422	105	23
Future Volume (veh/h)	44	877	160	250	1197	336	248	110	380	422	105	23
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870	1870
Adj Flow Rate, veh/h	48	953	113	272	1301	238	270	120	248	459	114	18
Peak Hour Factor	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92	0.92
Percent Heavy Veh, %	2	2	2	2	2	2	2	2	2	2	2	2
Cap, veh/h	67	1097	489	307	1577	703	305	337	285	535	258	41
Arrive On Green	0.04	0.31	0.31	0.17	0.44	0.44	0.17	0.18	0.18	0.15	0.16	0.16
Sat Flow, veh/h	1781	3554	1585	1781	3554	1585	1781	1870	1585	3456	1577	249
Grp Volume(v), veh/h	48	953	113	272	1301	238	270	120	248	459	0	132
Grp Sat Flow(s),veh/h/ln	1781	1777	1585	1781	1777	1585	1781	1870	1585	1728	0	1826
Q Serve(g_s), s	2.6	24.5	5.1	14.4	31.1	9.5	14.3	5.4	14.7	12.5	0.0	6.3
Cycle Q Clear(g_c), s	2.6	24.5	5.1	14.4	31.1	9.5	14.3	5.4	14.7	12.5	0.0	6.3
Prop In Lane	1.00		1.00	1.00		1.00	1.00		1.00	1.00		0.14
Lane Grp Cap(c), veh/h	67	1097	489	307	1577	703	305	337	285	535	0	298
V/C Ratio(X)	0.72	0.87	0.23	0.89	0.82	0.34	0.88	0.36	0.87	0.86	0.00	0.44
Avail Cap(c_a), veh/h	109	1215	542	368	1733	773	368	427	362	607	0	360
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	46.1	31.6	24.9	39.1	23.6	17.6	39.2	34.8	38.6	39.9	0.0	36.5
Incr Delay (d2), s/veh	13.5	6.5	0.2	19.4	3.2	0.3	19.2	0.6	16.6	10.7	0.0	1.0
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.4	10.8	1.9	7.7	12.4	3.2	7.7	2.5	6.7	6.0	0.0	2.9
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	59.6	38.1	25.1	58.6	26.8	17.9	58.3	35.4	55.2	50.6	0.0	37.5
LnGrp LOS	E	D	C	E	C	B	E	D	E	D	A	D
Approach Vol, veh/h		1114			1811			638			591	
Approach Delay, s/veh		37.7			30.4			52.8			47.7	
Approach LOS		D			C			D			D	

Timer - Assigned Phs	1	2	3	4	5	6	7	8
Phs Duration (G+Y+Rc), s	19.0	22.3	20.7	34.8	20.6	20.7	7.6	47.9
Change Period (Y+Rc), s	4.0	4.9	4.0	4.9	4.0	4.9	4.0	4.9
Max Green Setting (Gmax), s	17.0	22.1	20.0	33.1	20.0	19.1	5.9	47.2
Max Q Clear Time (g_c+I1), s	14.5	16.7	16.4	26.5	16.3	8.3	4.6	33.1
Green Ext Time (p_c), s	0.5	0.7	0.3	3.4	0.3	0.4	0.0	8.0

Intersection Summary			
HCM 6th Ctrl Delay			38.2
HCM 6th LOS			D

Lane Group	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT
Lane Group Flow (vph)	48	953	174	272	1301	365	270	120	413	459	139
v/c Ratio	0.47	0.87	0.30	0.83	0.80	0.44	0.83	0.41	0.85	0.82	0.54
Control Delay	64.6	43.2	9.5	63.0	29.2	12.1	62.8	42.8	31.8	55.3	46.7
Queue Delay	0.0	0.0	0.0	0.0	9.7	0.4	0.0	0.0	0.0	0.0	0.0
Total Delay	64.6	43.2	9.5	63.0	38.9	12.5	62.8	42.8	31.8	55.3	46.7
Queue Length 50th (ft)	32	316	17	178	393	79	176	73	90	156	83
Queue Length 95th (ft)	#80	#455	70	#329	526	169	#327	128	#221	#250	145
Internal Link Dist (ft)		6447			365			1367			840
Turn Bay Length (ft)	120		130	75		120	60				
Base Capacity (vph)	105	1189	623	359	1695	850	359	418	569	592	358
Starvation Cap Reductn	0	0	0	0	376	168	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0	0	0	0	0	0
Reduced v/c Ratio	0.46	0.80	0.28	0.76	0.99	0.54	0.75	0.29	0.73	0.78	0.39

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Volume (veh/h)	0	1668	1615	0	455	110
Future Volume (veh/h)	0	1668	1615	0	455	110
Initial Q (Qb), veh	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00			1.00	1.00	1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No	No		No	
Adj Sat Flow, veh/h/ln	0	1841	1841	0	1841	1841
Adj Flow Rate, veh/h	0	1833	1775	0	500	88
Peak Hour Factor	0.91	0.91	0.91	0.91	0.91	0.91
Percent Heavy Veh, %	0	4	4	0	4	4
Cap, veh/h	0	2066	2066	0	543	483
Arrive On Green	0.00	0.59	0.59	0.00	0.31	0.31
Sat Flow, veh/h	0	3681	3681	0	1753	1560
Grp Volume(v), veh/h	0	1833	1775	0	500	88
Grp Sat Flow(s),veh/h/ln	0	1749	1749	0	1753	1560
Q Serve(g_s), s	0.0	44.3	41.5	0.0	27.1	4.1
Cycle Q Clear(g_c), s	0.0	44.3	41.5	0.0	27.1	4.1
Prop In Lane	0.00			0.00	1.00	1.00
Lane Grp Cap(c), veh/h	0	2066	2066	0	543	483
V/C Ratio(X)	0.00	0.89	0.86	0.00	0.92	0.18
Avail Cap(c_a), veh/h	0	2246	2246	0	662	589
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	0.00	1.00	1.00	0.00	1.00	1.00
Uniform Delay (d), s/veh	0.0	17.3	16.7	0.0	32.8	24.8
Incr Delay (d2), s/veh	0.0	4.5	3.4	0.0	16.4	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	0.0	16.0	14.7	0.0	13.6	1.5
Unsig. Movement Delay, s/veh						
LnGrp Delay(d),s/veh	0.0	21.8	20.1	0.0	49.1	25.0
LnGrp LOS	A	C	C	A	D	C
Approach Vol, veh/h		1833	1775		588	
Approach Delay, s/veh		21.8	20.1		45.5	
Approach LOS		C	C		D	

Timer - Assigned Phs	4	6	8
Phs Duration (G+Y+Rc), s	62.9	35.3	62.9
Change Period (Y+Rc), s	4.9	4.9	4.9
Max Green Setting (Gmax), s	63.1	37.1	63.1
Max Q Clear Time (g_c+I1), s	46.3	29.1	43.5
Green Ext Time (p_c), s	11.7	1.4	12.7

Intersection Summary	
HCM 6th Ctrl Delay	24.4
HCM 6th LOS	C

Lane Group	EBT	WBT	SBL	SBR
Lane Group Flow (vph)	1833	1775	500	121
v/c Ratio	0.91	0.88	0.89	0.24
Control Delay	28.2	25.8	53.3	24.0
Queue Delay	36.8	0.0	0.0	0.0
Total Delay	65.0	25.8	53.3	24.0
Queue Length 50th (ft)	581	543	326	52
Queue Length 95th (ft)	#734	668	#510	99
Internal Link Dist (ft)	365	293	424	
Turn Bay Length (ft)				
Base Capacity (vph)	2179	2179	640	583
Starvation Cap Reductn	475	0	0	0
Spillback Cap Reductn	0	0	0	0
Storage Cap Reductn	0	0	0	0
Reduced v/c Ratio	1.08	0.81	0.78	0.21

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	180	1230	0	0	1494	351	821	0	675	0	0	0
Future Volume (veh/h)	180	1230	0	0	1494	351	821	0	675	0	0	0
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0			
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00			
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Work Zone On Approach		No			No			No				
Adj Sat Flow, veh/h/ln	1870	1870	0	0	1870	1870	1870	0	1870			
Adj Flow Rate, veh/h	194	1323	0	0	1606	245	883	0	472			
Peak Hour Factor	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93	0.93			
Percent Heavy Veh, %	2	2	0	0	2	2	2	0	2			
Cap, veh/h	204	2155	0	0	1619	722	1052	0	483			
Arrive On Green	0.11	0.61	0.00	0.00	0.46	0.46	0.30	0.00	0.30			
Sat Flow, veh/h	1781	3647	0	0	3647	1585	3456	0	1585			
Grp Volume(v), veh/h	194	1323	0	0	1606	245	883	0	472			
Grp Sat Flow(s),veh/h/ln	1781	1777	0	0	1777	1585	1728	0	1585			
Q Serve(g_s), s	11.9	25.7	0.0	0.0	49.4	11.0	26.3	0.0	32.4			
Cycle Q Clear(g_c), s	11.9	25.7	0.0	0.0	49.4	11.0	26.3	0.0	32.4			
Prop In Lane	1.00		0.00	0.00		1.00	1.00		1.00			
Lane Grp Cap(c), veh/h	204	2155	0	0	1619	722	1052	0	483			
V/C Ratio(X)	0.95	0.61	0.00	0.00	0.99	0.34	0.84	0.00	0.98			
Avail Cap(c_a), veh/h	204	2155	0	0	1619	722	1052	0	483			
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00			
Upstream Filter(I)	1.00	1.00	0.00	0.00	1.00	1.00	1.00	0.00	1.00			
Uniform Delay (d), s/veh	48.4	13.6	0.0	0.0	29.8	19.3	35.7	0.0	37.9			
Incr Delay (d2), s/veh	49.0	0.5	0.0	0.0	20.5	0.3	6.1	0.0	35.1			
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
%ile BackOfQ(50%),veh/ln	7.9	9.1	0.0	0.0	23.8	3.8	11.8	0.0	17.0			
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	97.4	14.1	0.0	0.0	50.2	19.6	41.9	0.0	73.0			
LnGrp LOS	F	B	A	A	D	B	D	A	E			
Approach Vol, veh/h		1517			1851			1355				
Approach Delay, s/veh		24.7			46.2			52.7				
Approach LOS		C			D			D				
Timer - Assigned Phs		2		4			7	8				
Phs Duration (G+Y+Rc), s		38.4		71.6			16.6	55.0				
Change Period (Y+Rc), s		4.9		4.9			4.0	4.9				
Max Green Setting (Gmax), s		33.5		66.7			12.6	50.1				
Max Q Clear Time (g_c+I1), s		34.4		27.7			13.9	51.4				
Green Ext Time (p_c), s		0.0		11.9			0.0	0.0				
Intersection Summary												
HCM 6th Ctrl Delay			41.2									
HCM 6th LOS			D									

Lane Group	EBL	EBT	WBT	WBR	NBL	NBR
Lane Group Flow (vph)	194	1323	1606	377	883	726
v/c Ratio	0.95	0.61	0.99	0.48	0.86	0.98
Control Delay	100.7	14.8	49.5	16.0	46.2	46.2
Queue Delay	0.0	0.0	0.0	0.0	0.0	0.0
Total Delay	100.7	14.8	49.5	16.0	46.2	46.2
Queue Length 50th (ft)	138	287	579	121	300	276
Queue Length 95th (ft)	#282	354	#758	205	#380	#543
Internal Link Dist (ft)		526	2810			
Turn Bay Length (ft)	115			85	550	
Base Capacity (vph)	204	2165	1626	791	1055	754
Starvation Cap Reductn	0	0	0	0	0	0
Spillback Cap Reductn	0	0	0	0	0	0
Storage Cap Reductn	0	0	0	0	0	0
Reduced v/c Ratio	0.95	0.61	0.99	0.48	0.84	0.96

Intersection Summary

95th percentile volume exceeds capacity, queue may be longer.
Queue shown is maximum after two cycles.

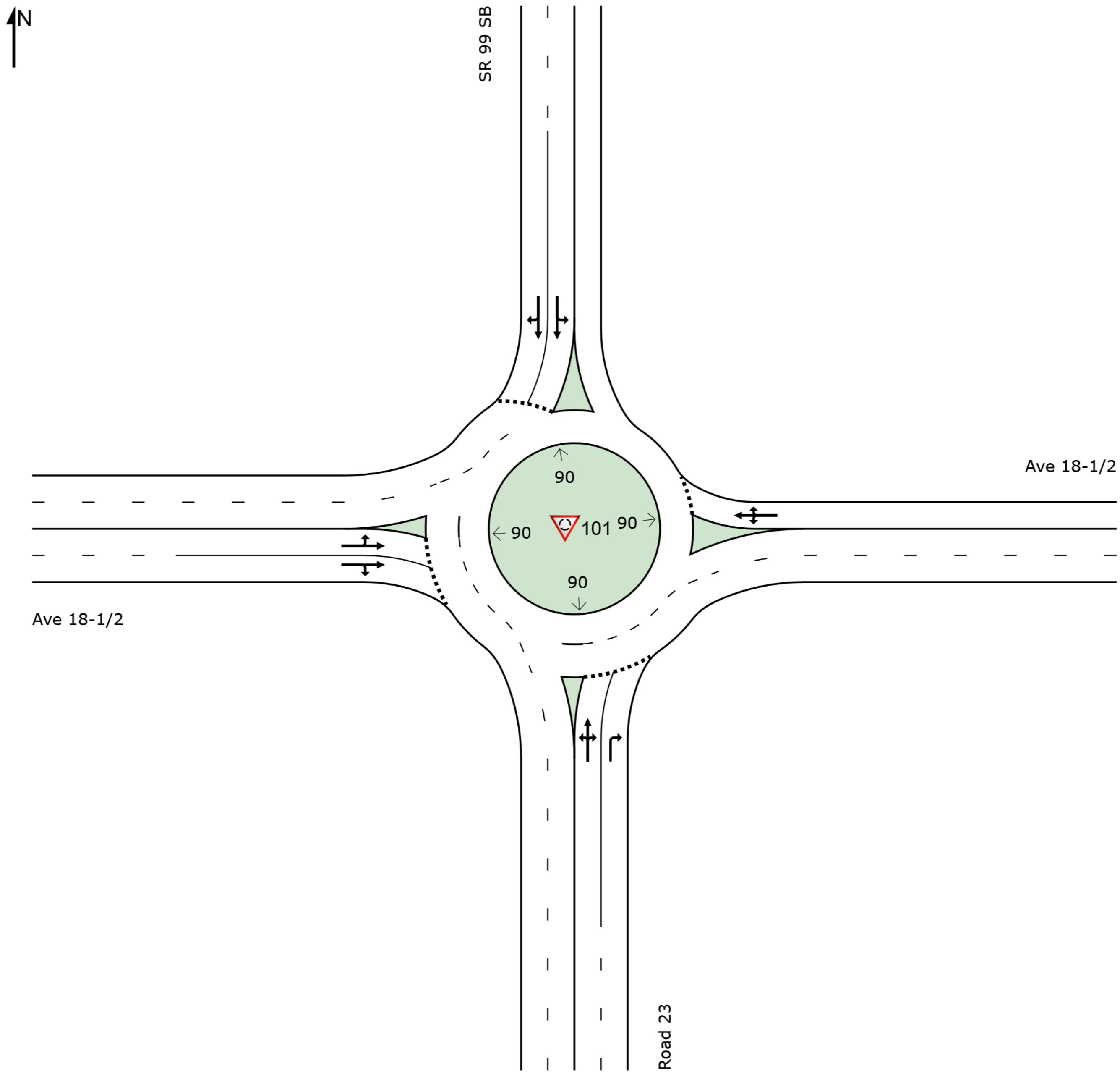
Roundabout Alternative

SITE LAYOUT

Site: 101 [Ave 18-1/2 & SR 99 SB (AM) - 2042 (Site Folder: General)]

Ave 18-1/2 - SR 99 SB 2042 AM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 18-1/2 & SR 99 SB (AM) - 2042 (Site Folder: General)]

Ave 18-1/2 - SR 99 SB 2042 AM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Road 23													
Lane 1	462	20.0	668	0.693	100	20.1	LOS C	6.9	199.8	Full	1600	0.0	0.0
Lane 2[d]	522	20.0	753	0.693	100	18.3	LOS C	7.2	209.8	Full	1600	0.0	0.0
Approach	984	20.0		0.693		19.2	LOS C	7.2	209.8				
East: Ave 18-1/2													
Lane 1[d]	499	20.0	1002	0.498	100	9.6	LOS A	3.9	113.1	Full	700	0.0	0.0
Approach	499	20.0		0.498		9.6	LOS A	3.9	113.1				
North: SR 99 SB													
Lane 1	265	20.0	642	0.413	100	11.6	LOS B	2.8	80.6	Full	1600	0.0	0.0
Lane 2[d]	337	20.0	818	0.413	100	9.6	LOS A	2.9	82.9	Full	1600	0.0	0.0
Approach	602	20.0		0.413		10.5	LOS B	2.9	82.9				
West: Ave 18-1/2													
Lane 1	244	20.0	681	0.359	100	10.1	LOS B	1.7	50.1	Full	1600	0.0	0.0
Lane 2[d]	275	20.0	765	0.359	100	9.1	LOS A	1.7	50.1	Full	1600	0.0	0.0
Approach	519	20.0		0.359		9.6	LOS A	1.7	50.1				
Intersection	2604	20.0		0.693		13.4	LOS B	7.2	209.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Road 23										
Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	154	1	307	462	20.0	668	0.693	100	NA	NA
Lane 2	-	-	522	522	20.0	753	0.693	100	NA	NA
Approach	154	1	829	984	20.0		0.693			
East: Ave 18-1/2										
Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.

From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	75	321	102	499	20.0	1002	0.498	100	NA	NA
Approach	75	321	102	499	20.0		0.498			
North: SR 99 SB										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	166	98	-	265	20.0	642	0.413	100	NA	NA
Lane 2	-	199	138	337	20.0	818	0.413	100	NA	NA
Approach	166	298	138	602	20.0		0.413			
West: Ave 18-1/2										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1	243	-	244	20.0	681	0.359	100	NA	NA
Lane 2	-	181	93	275	20.0	765	0.359	100	NA	NA
Approach	1	425	93	519	20.0		0.359			

	Total	%HV	Deg.Satn (v/c)
Intersection	2604	20.0	0.693

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Road 23 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
East Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: SR 99 SB Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [Ave 18-1/2 & SR 99 SB (PM) - 2042 (Site Folder: General)]

Ave 18-1/2 - SR 99 SB 2042 PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Road 23													
Lane 1	307	14.0	722	0.425	100	10.8	LOS B	2.5	70.0	Full	1600	0.0	0.0
Lane 2[d]	340	14.0	801	0.425	100	9.9	LOS A	2.5	70.8	Full	1600	0.0	0.0
Approach	647	14.0		0.425		10.3	LOS B	2.5	70.8				
East: Ave 18-1/2													
Lane 1[d]	827	14.0	1165	0.710	100	13.8	LOS B	8.0	222.4	Full	700	0.0	0.0
Approach	827	14.0		0.710		13.8	LOS B	8.0	222.4				
North: SR 99 SB													
Lane 1	466	14.0	725	0.643	100	16.7	LOS C	7.4	205.8	Full	1600	0.0	0.0
Lane 2[d]	584	14.0	909	0.643	100	14.0	LOS B	8.0	222.1	Full	1600	0.0	0.0
Approach	1051	14.0		0.643		15.2	LOS C	8.0	222.1				
West: Ave 18-1/2													
Lane 1	361	14.0	498	0.725	100	27.7	LOS D	6.5	180.6	Full	1600	0.0	0.0
Lane 2[d]	440	14.0	607	0.725	100	23.6	LOS C	7.1	198.2	Full	1600	0.0	0.0
Approach	801	14.0		0.725		25.5	LOS D	7.1	198.2				
Intersection	3326	14.0		0.725		16.4	LOS C	8.0	222.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Road 23

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	119	1	187	307	14.0	722	0.425	100	NA	NA
Lane 2	-	-	340	340	14.0	801	0.425	100	NA	NA
Approach	119	1	527	647	14.0		0.425			

East: Ave 18-1/2

Mov.	L2	T1	R2	Total	%HV		Deg.	Lane	Prob.	Ov.

Mov.	L2	T1	R2	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
From E To Exit:	S	W	N			Cap. veh/h	Satn v/c	Util. %	SL Ov. %	Lane No.
Lane 1	117	279	431	827	14.0	1165	0.710	100	NA	NA
Approach	117	279	431	827	14.0		0.710			
North: SR 99 SB										
From N To Exit:	E	S	W							
Lane 1	81	385	-	466	14.0	725	0.643	100	NA	NA
Lane 2	-	396	189	584	14.0	909	0.643	100	NA	NA
Approach	81	781	189	1051	14.0		0.643			
West: Ave 18-1/2										
From W To Exit:	N	E	S							
Lane 1	1	360	-	361	14.0	498	0.725	100	NA	NA
Lane 2	-	95	345	440	14.0	607	0.725	100	NA	NA
Approach	1	455	345	801	14.0		0.725			

	Total	%HV	Deg.Satn (v/c)
Intersection	3326	14.0	0.725

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

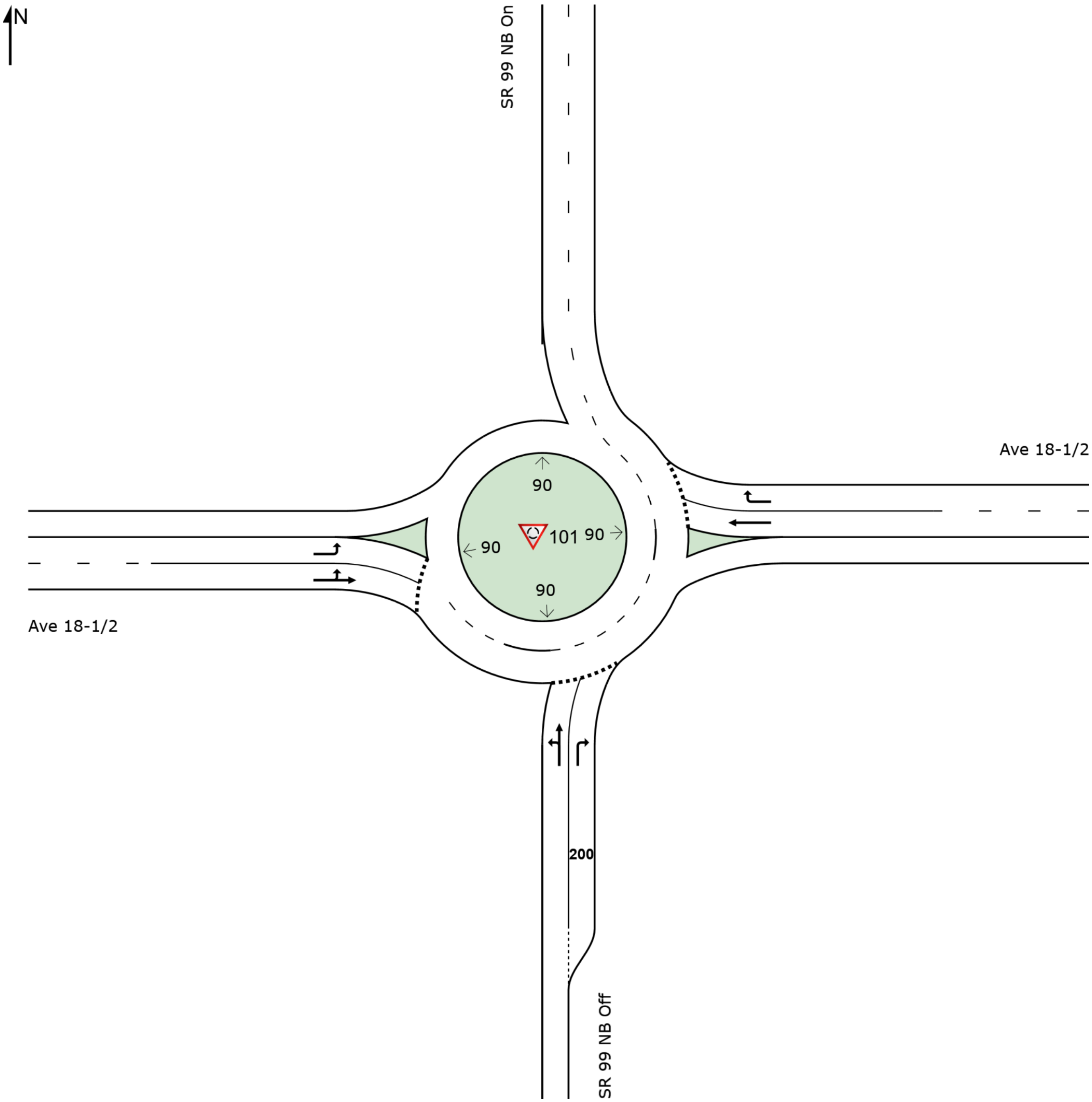
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Road 23 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
East Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: SR 99 SB Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 18-1/2 & SR 99 NB (AM) 2042 (Site Folder: General)]

Ave 18-1/2 - SR 99 NB 2042 AM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 18-1/2 & SR 99 NB (AM) 2042 (Site Folder: General)]

Ave 18-1/2 - SR 99 NB 2042 AM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total	HV]	Cap.	Deg. Satn	Lane Util.	Aver. Delay	Level of Service	95% BACK OF QUEUE [Veh	Dist]	Lane Config	Lane Length	Cap. Adj.	Prob. Block.
	veh/h	%	veh/h	v/c	%	sec			ft		ft	%	%
South: SR 99 NB Off													
Lane 1	288	19.0	506	0.569	100	18.9	LOS C	3.2	92.0	Full	1600	0.0	0.0
Lane 2[d]	388	19.0	639	0.607	100	17.0	LOS C	3.9	113.1	Short	200	0.0	NA
Approach	676	19.0		0.607		17.8	LOS C	3.9	113.1				
East: Ave 18-1/2													
Lane 1[d]	209	19.0	529	0.396	100	13.2	LOS B	2.0	58.9	Full	1600	0.0	0.0
Lane 2	54	19.0	301	0.180	100	15.6	LOS C	0.7	18.8	Full	1600	0.0	0.0
Approach	264	19.0		0.396		13.7	LOS B	2.0	58.9				
West: Ave 18-1/2													
Lane 1	556	19.0	1298	0.428	100	7.0	LOS A	0.0	0.0	Full	700	0.0	0.0
Lane 2[d]	653	19.0	1524	0.428	100	6.3	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	1208	19.0		0.428		6.6	LOS A	0.0	0.0				
Intersection	2148	19.0		0.607		11.0	LOS B	3.9	113.1				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: SR 99 NB Off

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	287	1	-	288	19.0	506	0.569	100	NA	NA
Lane 2	-	-	388	388	19.0	639	0.607	100	0.0	1
Approach	287	1	388	676	19.0		0.607			

East: Ave 18-1/2

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	209	-	209	19.0	529	0.396	100	NA	NA
Lane 2	-	54	54	19.0	301	0.180	100	NA	NA

Approach	209	54	264	19.0		0.396			
West: Ave 18-1/2									
Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	556	-	556	19.0	1298	0.428	100	NA	NA
Lane 2	393	260	653	19.0	1524	0.428	100	NA	NA
Approach	948	260	1208	19.0		0.428			

	Total	%HV	Deg.Satn (v/c)
Intersection	2148	19.0	0.607

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SR 99 NB On Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [Ave 18-1/2 & SR 99 NB (PM) 2042 (Site Folder: General)]

Ave 18-1/2 - SR 99 NB 2042 PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 99 NB Off													
Lane 1[d]	271	14.0	795	0.341	100	8.6	LOS A	1.4	38.5	Full	1600	0.0	0.0
Lane 2	118	14.0	572	0.206	100	9.0	LOS A	0.7	19.4	Short	200	0.0	NA
Approach	389	14.0		0.341		8.7	LOS A	1.4	38.5				
East: Ave 18-1/2													
Lane 1[d]	513	14.0	702	0.730	100	21.4	LOS C	7.5	208.8	Full	1600	0.0	0.0
Lane 2	153	14.0	427	0.359	100	14.9	LOS B	1.6	44.0	Full	1600	0.0	0.0
Approach	666	14.0		0.730		19.9	LOS C	7.5	208.8				
West: Ave 18-1/2													
Lane 1	359	14.0	1355	0.265	100	4.9	LOS A	0.0	0.0	Full	700	0.0	0.0
Lane 2[d]	422	14.0	1591	0.265	100	4.4	LOS A	0.0	0.0	Full	700	0.0	0.0
Approach	781	14.0		0.265		4.7	LOS A	0.0	0.0				
Intersection	1836	14.0		0.730		11.0	LOS B	7.5	208.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: SR 99 NB Off

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	270	1	-	271	14.0	795	0.341	100	NA	NA
Lane 2	-	-	118	118	14.0	572	0.206	100	0.0	1
Approach	270	1	118	389	14.0		0.341			

East: Ave 18-1/2

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	513	-	513	14.0	702	0.730	100	NA	NA
Lane 2	-	153	153	14.0	427	0.359	100	NA	NA

Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Approach	513	153	666	14.0		0.730			
West: Ave 18-1/2									
Lane 1	359	-	359	14.0	1355	0.265	100	NA	NA
Lane 2	217	204	422	14.0	1591	0.265	100	NA	NA
Approach	577	204	781	14.0		0.265			

	Total	%HV	Deg.Satn (v/c)
Intersection	1836	14.0	0.730

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

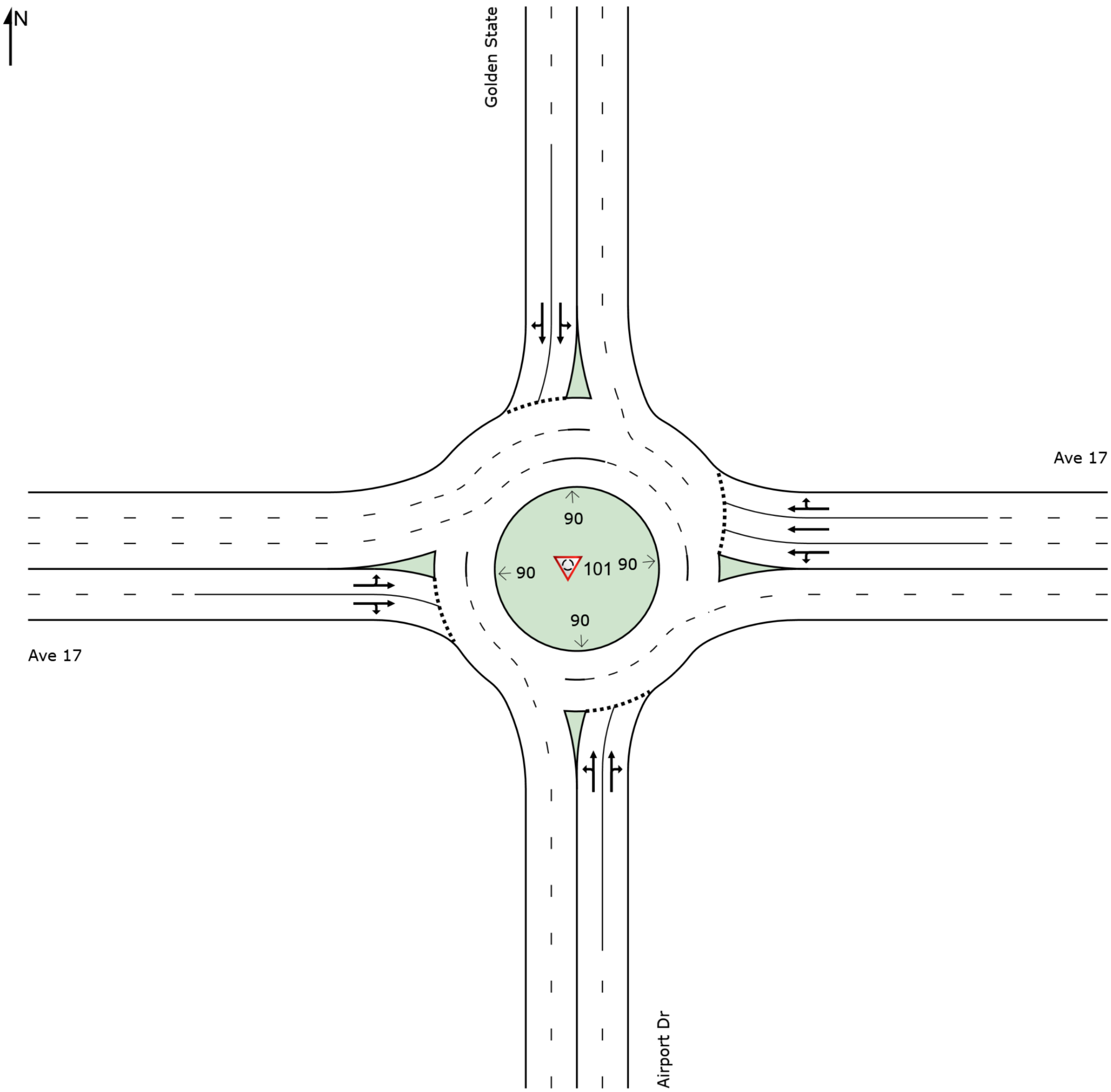
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
North Exit: SR 99 NB On Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Ave 18-1/2 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 17-Golden St (AM) 2042 (Site Folder: General)]

Ave 17 - Golden St - Airport 2042 AM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 17-Golden St (AM) 2042 (Site Folder: General)]

Ave 17 - Golden St - Airport 2042 AM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Airport Dr													
Lane 1	207	7.0	362	0.573	100	25.4	LOS D	3.8	101.6	Full	1600	0.0	0.0
Lane 2 [d]	282	7.0	492	0.573	100	19.6	LOS C	4.4	116.8	Full	1600	0.0	0.0
Approach	489	7.0		0.573		22.1	LOS C	4.4	116.8				
East: Ave 17													
Lane 1	365	7.0	1071	0.341	100	6.8	LOS A	1.8	47.5	Full	300	0.0	0.0
Lane 2	365	7.0	1071	0.341	100	6.8	LOS A	1.8	47.5	Full	300	0.0	0.0
Lane 3 [d]	443	7.0	1301	0.341	100	5.9	LOS A	1.9	50.1	Full	300	0.0	0.0
Approach	1173	7.0		0.341		6.5	LOS A	1.9	50.1				
North: Golden State													
Lane 1 [d]	232	7.0	756	0.307	100	8.4	LOS A	1.2	31.0	Full	1600	0.0	0.0
Lane 2	77	7.0	490	0.158	51 [5]	9.5	LOS A	0.5	13.1	Full	1600	0.0	0.0
Approach	310	7.0		0.307		8.7	LOS A	1.2	31.0				
West: Ave 17													
Lane 1	725	7.0	821	0.883	100	31.8	LOS D	18.4	486.8	Full	1600	0.0	0.0
Lane 2 [d]	826	7.0	935	0.883	100	29.1	LOS D	19.8	522.4	Full	1600	0.0	0.0
Approach	1551	7.0		0.883		30.4	LOS D	19.8	522.4				
Intersection	3523	7.0		0.883		19.4	LOS C	19.8	522.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Airport Dr

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	109	99	-	207	7.0	362	0.573	100	NA	NA
Lane 2	-	89	194	282	7.0	492	0.573	100	NA	NA
Approach	109	187	194	489	7.0		0.573			

East: Ave 17										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	325	40	-	365	7.0	1071	0.341	100	NA	NA
Lane 2	-	365	-	365	7.0	1071	0.341	100	NA	NA
Lane 3	-	136	308	443	7.0	1301	0.341	100	NA	NA
Approach	325	541	308	1173	7.0		0.341			
North: Golden State										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	232	-	-	232	7.0	756	0.307	100	NA	NA
Lane 2	-	58	19	77	7.0	490	0.158	51[5]	NA	NA
Approach	232	58	19	310	7.0		0.307			
West: Ave 17										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	26	699	-	725	7.0	821	0.883	100	NA	NA
Lane 2	-	566	259	826	7.0	935	0.883	100	NA	NA
Approach	26	1266	259	1551	7.0		0.883			

	Total	%HV	Deg.Satn (v/c)
Intersection	3523	7.0	0.883

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

Merge Analysis											
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Airport Dr Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
East Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Golden State Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [Ave 17-Golden St (PM) 2042 (Site Folder: General)]

Ave 17 - Golden St - Airport 2042 PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: Airport Dr													
Lane 1	346	2.0	462	0.749	100	31.4	LOS D	7.1	179.4	Full	1600	0.0	0.0
Lane 2[d]	456	2.0	610	0.749	100	25.1	LOS D	8.2	207.3	Full	1600	0.0	0.0
Approach	802	2.0		0.749		27.8	LOS D	8.2	207.3				
East: Ave 17													
Lane 1	599	2.0	1052	0.570	100	10.7	LOS B	5.3	134.1	Full	300	0.0	0.0
Lane 2	599	2.0	1052	0.570	100	10.7	LOS B	5.3	134.1	Full	300	0.0	0.0
Lane 3[d]	739	2.0	1298	0.570	100	9.2	LOS A	5.2	131.4	Full	300	0.0	0.0
Approach	1938	2.0		0.570		10.1	LOS B	5.3	134.1				
North: Golden State													
Lane 1[d]	459	2.0	523	0.876	100	42.5	LOS E	10.1	256.7	Full	1600	0.0	0.0
Lane 2	139	2.0	327	0.426	49[5]	21.1	LOS C	1.9	48.6	Full	1600	0.0	0.0
Approach	598	2.0		0.876		37.5	LOS E	10.1	256.7				
West: Ave 17													
Lane 1	541	2.0	705	0.768	100	23.7	LOS C	9.9	252.6	Full	1600	0.0	0.0
Lane 2[d]	634	2.0	826	0.768	100	21.0	LOS C	10.8	273.5	Full	1600	0.0	0.0
Approach	1175	2.0		0.768		22.3	LOS C	10.8	273.5				
Intersection	4513	2.0		0.876		20.1	LOS C	10.8	273.5				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: Airport Dr

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	270	76	-	346	2.0	462	0.749	100	NA	NA
Lane 2	-	43	413	456	2.0	610	0.749	100	NA	NA
Approach	270	120	413	802	2.0		0.749			

East: Ave 17										
Mov. From E To Exit:	L2 S	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	272	328	-	599	2.0	1052	0.570	100	NA	NA
Lane 2	-	599	-	599	2.0	1052	0.570	100	NA	NA
Lane 3	-	374	365	739	2.0	1298	0.570	100	NA	NA
Approach	272	1301	365	1938	2.0		0.570			

North: Golden State										
Mov. From N To Exit:	L2 E	T1 S	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	459	-	-	459	2.0	523	0.876	100	NA	NA
Lane 2	-	114	25	139	2.0	327	0.426	49[5]	NA	NA
Approach	459	114	25	598	2.0		0.876			

West: Ave 17										
Mov. From W To Exit:	L2 N	T1 E	R2 S	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	48	493	-	541	2.0	705	0.768	100	NA	NA
Lane 2	-	460	174	634	2.0	826	0.768	100	NA	NA
Approach	48	953	174	1175	2.0		0.768			

	Total	%HV	Deg.Satn (v/c)
Intersection	4513	2.0	0.876

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

Merge Analysis

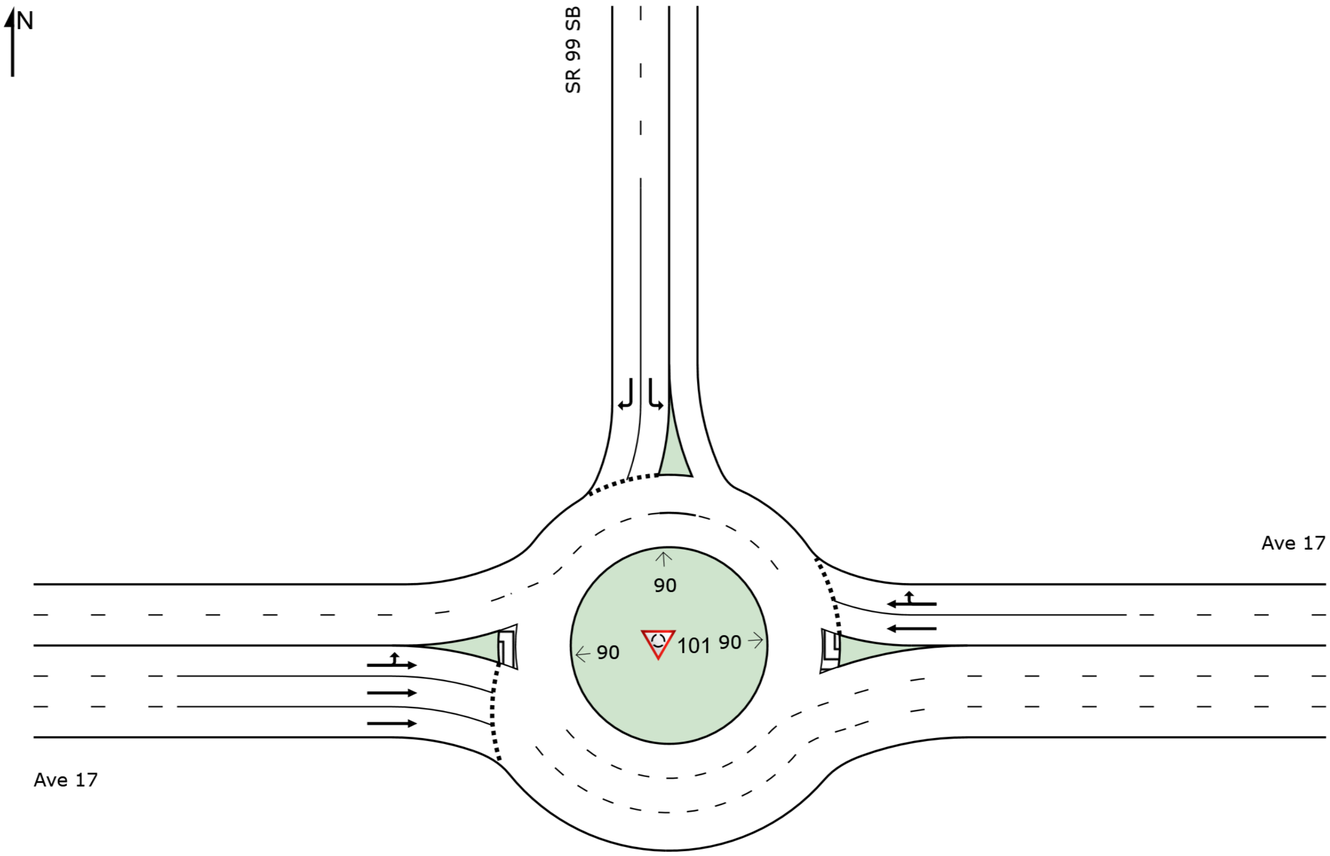
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
South Exit: Airport Dr Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
East Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: Golden State Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
West Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 17 SR 99 SB (AM) 2042 (Site Folder: General)]

Ave 17 - SR 99 SB 2042 AM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 17 SR 99 SB (AM) 2042 (Site Folder: General)]

Ave 17 - SR 99 SB 2042 AM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Ave 17													
Lane 1	870	3.0	1504	0.578	100	8.5	LOS A	6.3	160.6	Full	650	0.0	0.0
Lane 2[d]	1027	3.0	1775	0.578	100	7.7	LOS A	6.3	160.4	Full	650	0.0	0.0
Approach	1897	3.0		0.578		8.1	LOS A	6.3	160.6				
North: SR 99 SB													
Lane 1[d]	318	3.0	826	0.384	100	9.0	LOS A	2.1	54.8	Full	1600	0.0	0.0
Lane 2	155	3.0	615	0.252	100	9.1	LOS A	1.1	28.6	Full	1600	0.0	0.0
Approach	473	3.0		0.384		9.0	LOS A	2.1	54.8				
West: Ave 17													
Lane 1	545	3.0	1040	0.524	100	9.9	LOS A	4.1	104.8	Full	300	0.0	0.0
Lane 2	545	3.0	1040	0.524	100	9.9	LOS A	4.1	104.8	Full	300	0.0	0.0
Lane 3[d]	641	3.0	1222	0.524	100	8.8	LOS A	4.3	109.8	Full	300	0.0	0.0
Approach	1731	3.0		0.524		9.5	LOS A	4.3	109.8				
Intersection	4100	3.0		0.578		8.8	LOS A	6.3	160.6				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

East: Ave 17

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	870	-	870	3.0	1504	0.578	100	NA	NA
Lane 2	173	854	1027	3.0	1775	0.578	100	NA	NA
Approach	1043	854	1897	3.0		0.578			

North: SR 99 SB

Mov. From N To Exit:	L2 E	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	318	-	318	3.0	826	0.384	100	NA	NA
Lane 2	-	155	155	3.0	615	0.252	100	NA	NA

Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Approach	318	155	473	3.0		0.384			
West: Ave 17									
Lane 1	1	544	545	3.0	1040	0.524	100	NA	NA
Lane 2	-	545	545	3.0	1040	0.524	100	NA	NA
Lane 3	-	641	641	3.0	1222	0.524	100	NA	NA
Approach	1	1730	1731	3.0		0.524			

	Total	%HV	Deg.Satn (v/c)
Intersection	4100	3.0	0.578

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 17 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									
Full Length Lane	3	Merge Analysis not applied.									
North Exit: SR 99 SB Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
West Exit: Ave 17 Merge Type: **Not Applied**											
Full Length Lane	1	Merge Analysis not applied.									
Full Length Lane	2	Merge Analysis not applied.									

LANE SUMMARY

Site: 101 [Ave 17 SR 99 SB (PM) 2042 (Site Folder: General)]

Ave 17 - SR 99 SB 10-Year PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
East: Ave 17													
Lane 1	1166	4.0	1488	0.784	100	14.4	LOS B	16.2	419.1	Full	650	0.0	0.0
Lane 2[d]	1378	4.0	1758	0.784	100	12.9	LOS B	17.1	440.4	Full	650	0.0	0.0
Approach	2544	4.0		0.784		13.6	LOS B	17.1	440.4				
North: SR 99 SB													
Lane 1[d]	500	4.0	604	0.828	100	32.4	LOS D	9.8	252.8	Full	1600	0.0	0.0
Lane 2	121	4.0	394	0.307	100	14.7	LOS B	1.4	36.7	Full	1600	0.0	0.0
Approach	621	4.0		0.828		28.9	LOS D	9.8	252.8				
West: Ave 17													
Lane 1	571	4.0	809	0.706	100	17.9	LOS C	10.6	272.5	Full	300	0.0	2.2
Lane 2	571	4.0	809	0.706	100	17.9	LOS C	10.6	272.5	Full	300	0.0	2.2
Lane 3[d]	692	4.0	980	0.706	100	15.5	LOS C	11.3	291.5	Full	300	0.0	4.2
Approach	1834	4.0		0.706		17.0	LOS C	11.3	291.5				
Intersection	4999	4.0		0.828		16.8	LOS C	17.1	440.4				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

East: Ave 17

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	1166	-	1166	4.0	1488	0.784	100	NA	NA
Lane 2	609	769	1378	4.0	1758	0.784	100	NA	NA
Approach	1775	769	2544	4.0		0.784			

North: SR 99 SB

Mov. From N To Exit:	L2 E	R2 W	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	500	-	500	4.0	604	0.828	100	NA	NA
Lane 2	-	121	121	4.0	394	0.307	100	NA	NA

Approach	500	121	621	4.0		0.828				
West: Ave 17										
Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.	
Lane 1	1	570	571	4.0	809	0.706	100	NA	NA	
Lane 2	-	571	571	4.0	809	0.706	100	NA	NA	
Lane 3	-	692	692	4.0	980	0.706	100	NA	NA	
Approach	1	1833	1834	4.0		0.706				
	Total	%HV	Deg.Satn (v/c)							
Intersection	4999	4.0	0.828							

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

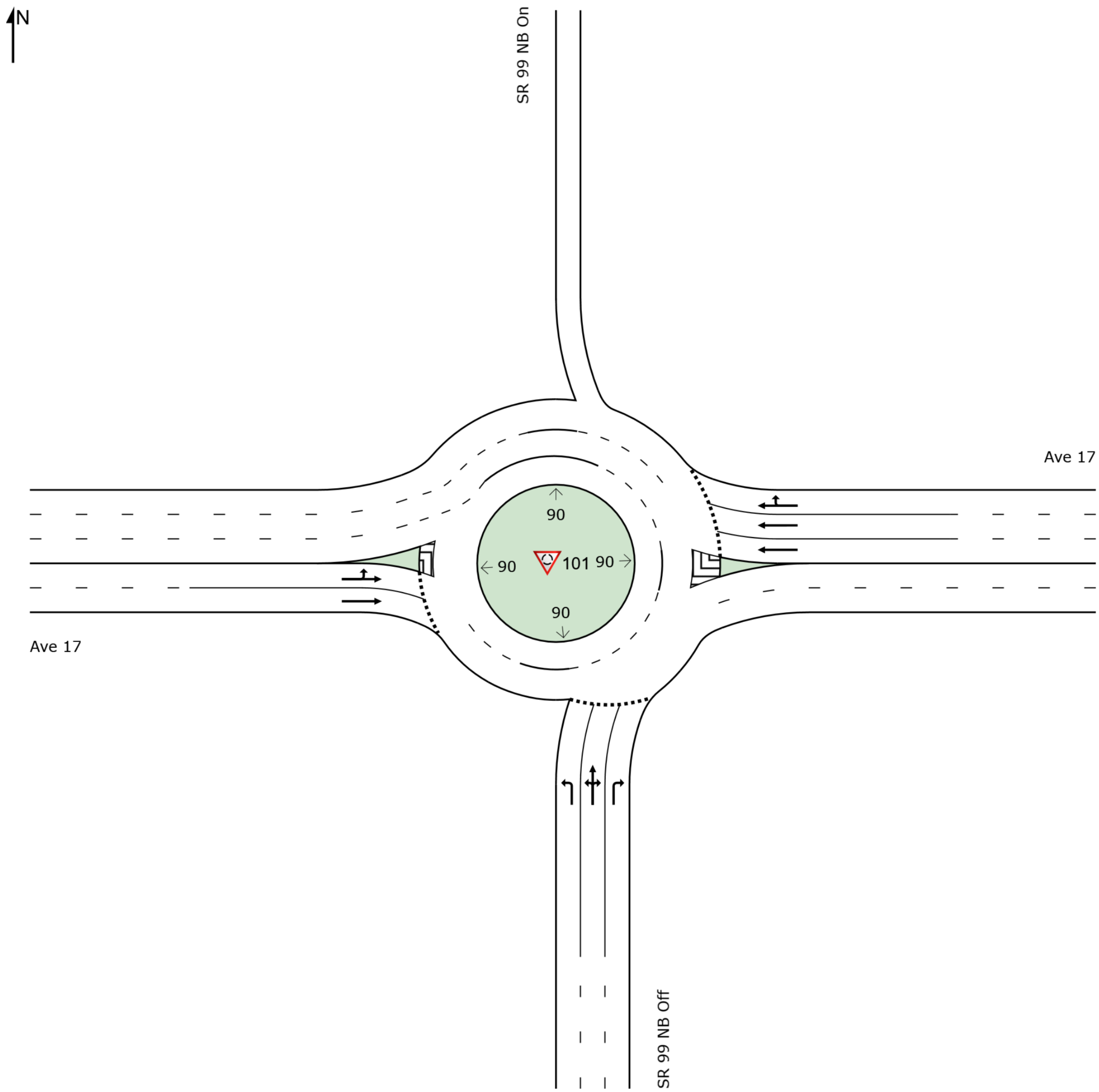
	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										
North Exit: SR 99 SB Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										

SITE LAYOUT

Site: 101 [Ave 17 SR 99 NB (AM) 2042 (Site Folder: General)]

Ave 17 - SR 99 NB 2042 AM
Site Category: (None)
Roundabout

Layout pictures are schematic functional drawings reflecting input data. They are not design drawings.



LANE SUMMARY

Site: 101 [Ave 17 SR 99 NB (PM) 2042 (Site Folder: General)]

Ave 17 - SR 99 NB 2042 PM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 99 NB Off													
Lane 1	465	2.0	835	0.557	100	12.4	LOS B	3.6	92.6	Full	1600	0.0	0.0
Lane 2	465	2.0	835	0.557	100	12.4	LOS B	3.6	92.6	Full	1600	0.0	0.0
Lane 3[d]	679	2.0	1218	0.557	100	9.4	LOS A	4.3	108.4	Full	1600	0.0	0.0
Approach	1610	2.0		0.557		11.1	LOS B	4.3	108.4				
East: Ave 17													
Lane 1	589	2.0	744	0.792	100	24.6	LOS C	9.8	247.8	Full	1600	0.0	0.0
Lane 2	589	2.0	744	0.792	100	24.6	LOS C	9.8	247.8	Full	1600	0.0	0.0
Lane 3[d]	805	2.0	1016	0.792	100	19.5	LOS C	11.3	288.2	Full	1600	0.0	0.0
Approach	1984	2.0		0.792		22.6	LOS C	11.3	288.2				
West: Ave 17													
Lane 1	693	2.0	1527	0.454	100	6.6	LOS A	0.0	0.0	Full	650	0.0	0.0
Lane 2[d]	823	2.0	1815	0.454	100	5.9	LOS A	0.0	0.0	Full	650	0.0	0.0
Approach	1516	2.0		0.454		6.2	LOS A	0.0	0.0				
Intersection	5110	2.0		0.792		14.1	LOS B	11.3	288.2				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: SR 99 NB Off

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	465	-	-	465	2.0	835	0.557	100	NA	NA
Lane 2	417	1	47	465	2.0	835	0.557	100	NA	NA
Lane 3	-	-	679	679	2.0	1218	0.557	100	NA	NA
Approach	883	1	726	1610	2.0		0.557			

East: Ave 17

Mov. From E To Exit:	T1 W	R2 N	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.

Lane 1	589	-	589	2.0	744	0.792	100	NA	NA
Lane 2	589	-	589	2.0	744	0.792	100	NA	NA
Lane 3	428	377	805	2.0	1016	0.792	100	NA	NA
Approach	1606	377	1984	2.0		0.792			

West: Ave 17

Mov. From W To Exit:	L2 N	T1 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	194	499	693	2.0	1527	0.454	100	NA	NA
Lane 2	-	823	823	2.0	1815	0.454	100	NA	NA
Approach	194	1323	1516	2.0		0.454			

	Total	%HV	Deg.Satn (v/c)
Intersection	5110	2.0	0.792

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: SR 99 NB On Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

LANE SUMMARY

Site: 101 [Ave 17 SR 99 NB (AM) 2042 (Site Folder: General)]

Ave 17 - SR 99 NB 2042 AM
Site Category: (None)
Roundabout

Lane Use and Performance

	DEMAND FLOWS [Total veh/h	HV] %	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Aver. Delay sec	Level of Service	95% BACK OF QUEUE [Veh	Dist] ft	Lane Config	Lane Length ft	Cap. Adj. %	Prob. Block. %
South: SR 99 NB Off													
Lane 1	301	3.0	932	0.322	100	7.3	LOS A	1.3	33.5	Full	1600	0.0	0.0
Lane 2	301	3.0	932	0.322	100	7.3	LOS A	1.3	33.5	Full	1600	0.0	0.0
Lane 3[d]	427	3.0	1331	0.321	100[5]	5.6	LOS A	1.4	35.7	Full	1600	0.0	0.0
Approach	1029	3.0		0.322		6.6	LOS A	1.4	35.7				
East: Ave 17													
Lane 1	455	3.0	908	0.501	100	10.4	LOS B	3.5	88.4	Full	1600	0.0	0.0
Lane 2	455	3.0	908	0.501	100	10.4	LOS B	3.5	88.4	Full	1600	0.0	0.0
Lane 3[d]	589	3.0	1175	0.501	100	8.6	LOS A	3.6	92.8	Full	1600	0.0	0.0
Approach	1499	3.0		0.501		9.7	LOS A	3.6	92.8				
West: Ave 17													
Lane 1	517	3.0	1513	0.342	100	5.3	LOS A	0.0	0.0	Full	650	0.0	0.0
Lane 2[d]	615	3.0	1797	0.342	100	4.8	LOS A	0.0	0.0	Full	650	0.0	0.0
Approach	1132	3.0		0.342		5.0	LOS A	0.0	0.0				
Intersection	3659	3.0		0.501		7.4	LOS A	3.6	92.8				

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Lane LOS values are based on average delay and v/c ratio (degree of saturation) per lane.
LOS F will result if v/c > 1 irrespective of lane delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all lanes (v/c not used as specified in HCM 6).
Roundabout Capacity Model: SIDRA Standard.
Delay Model: HCM Delay Formula (Geometric Delay is not included).
Queue Model: HCM Queue Formula.
Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

5 Lane under-utilisation found by the program
d Dominant lane on roundabout approach

Approach Lane Flows (veh/h)

South: SR 99 NB Off

Mov. From S To Exit:	L2 W	T1 N	R2 E	Total	%HV	Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	301	-	-	301	3.0	932	0.322	100	NA	NA
Lane 2	299	1	-	301	3.0	932	0.322	100	NA	NA
Lane 3	-	-	427	427	3.0	1331	0.321	100[5]	NA	NA
Approach	600	1	427	1029	3.0		0.322			

East: Ave 17

Mov. From E	T1	R2	Total	%HV	Cap.	Deg. Satn	Lane Util.	Prob. SL Ov.	Ov. Lane

To Exit:	W	N				veh/h	v/c	%	%	No.
Lane 1	455	-	455	3.0		908	0.501	100	NA	NA
Lane 2	455	-	455	3.0		908	0.501	100	NA	NA
Lane 3	311	278	589	3.0		1175	0.501	100	NA	NA
Approach	1221	278	1499	3.0			0.501			
West: Ave 17										
Mov. From W To Exit:	L2 N	T1 E	Total	%HV		Cap. veh/h	Deg. Satn v/c	Lane Util. %	Prob. SL Ov. %	Ov. Lane No.
Lane 1	159	358	517	3.0		1513	0.342	100	NA	NA
Lane 2	-	615	615	3.0		1797	0.342	100	NA	NA
Approach	159	973	1132	3.0			0.342			

	Total	%HV	Deg.Satn (v/c)
Intersection	3659	3.0	0.501

Lane flow rates given in this report are based on the arrival flow rates subject to upstream capacity constraint where applicable.

5 Lane under-utilisation found by the program

Merge Analysis

	Exit Lane Number	Short Lane Length ft	Percent Opng in Lane %	Opposing Flow Rate veh/h	Opposing Flow Rate pcu/h	Critical Gap sec	Follow-up Headway sec	Lane Flow Rate veh/h	Capacity veh/h	Deg. Satn v/c	Min. Delay sec	Merge Delay sec
East Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
North Exit: SR 99 NB On Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
West Exit: Ave 17 Merge Type: **Not Applied**												
Full Length Lane	1	Merge Analysis not applied.										
Full Length Lane	2	Merge Analysis not applied.										
Full Length Lane	3	Merge Analysis not applied.										

ATTACHMENT B

MITIGATION, MONITORING, AND REPORTING PLAN FOR OFF SITE WORK

NORTH FORK RANCHERIA MADERA CASINO PROJECT

OFF SITE MITIGATION MONITORING AND ENFORCEMENT PLAN

This Mitigation, Monitoring, and Enforcement Program (MMEP) has been created to guide mitigation compliance before, during, and after construction of project components occurring off the Madera Site trust property. The mitigation measures described below in **Table 1** were created through the analysis of potential impacts within the Final Environmental Impact Statement (FEIS) and modified through the analysis of the Proposed Project. This MMEP includes the following:

- Requirements for compliance of the mitigation measures;
- A list of responsible parties;
- Timing of mitigation measure implementation; and
- Off-site improvement component that the mitigation measure applies to (refer to Section 2.0 of the North Fork Casino Project Off-Site Improvements CEQA Technical Memorandum).

Implementation of these measures shall occur either during the planning phase or during the physical construction of the off-site improvement.

Table 1 – Mitigation Monitoring and Enforcement

MITIGATION MEASURE	PARTY RESPONSIBLE FOR MONITORING AND/OR REPORTING	TIMING OF IMPLEMENTATION	APPLICABLE PROJECT COMPONENT (OFF-SITE UTILITY IMPROVEMENTS, ACCESS IMPROVEMENTS AND/ OR TRAFFIC MITIGATION IMPROVEMENTS)	VERIFICATION (DATE AND INITIALS)
Land Resources				
A. All structures shall be designed in compliance with the California Building Code (CBC) Building Code (Article VI Chapter 6.04) current at the start of construction such that risks to the health or safety of workers or members of the public from earthquake hazards are reduced to a less-than-significant level.	Tribe	Planning Phase Construction Phase	Access Improvements	
Biological Resources				
Swainson's Hawk				
A. The pre-construction survey for Swainson's hawk shall be conducted consistent with the Recommended Timing and Methodology For Swainson's Hawk Nesting Surveys in California's Central Valley (CDFW, 2000). If active nests are found, consultation with the California Department of Fish and Game (CDFW) shall occur. Appropriate measures shall be adopted similar to CDFW mitigation guidelines, regarding losses of suitable foraging habitat. Impacts within 10 miles of a Swainson's hawk nest site shall be mitigated by protecting or creating equally suitable foraging habitat elsewhere within the territory's 10-mile radius (CDFW, 1994). The acreage of Habitat Management (HM) lands provided shall be derived from the 1994 CDFW staff report.	Tribe CDFW	Planning Phase Construction Phase	Off-site Utility Improvements Access Improvements Traffic Mitigation Improvements	

MITIGATION MEASURE	PARTY RESPONSIBLE FOR MONITORING AND/OR REPORTING	TIMING OF IMPLEMENTATION	APPLICABLE PROJECT COMPONENT (OFF-SITE UTILITY IMPROVEMENTS, ACCESS IMPROVEMENTS AND/ OR TRAFFIC MITIGATION IMPROVEMENTS)	VERIFICATION (DATE AND INITIALS)
Projects within five miles of an active nest tree but greater than one mile from the nest tree shall provide 0.75 acres of Habitat Management (HM) land for each acre of urban development planned (0.75:1 ratio). All HM lands protected under this requirement shall be protected through fee title acquisition or conservation easement (acceptable to the CDFW) on agricultural lands or other suitable habitats that provide foraging habitat for Swainson's hawks. Management Authorization holders/project sponsors shall provide for the long-term management of the HM lands by funding a management endowment (the interest on which shall be used for managing the HM lands).				
Migratory and Nesting Birds				
B. Vegetation removal activities shall occur outside of the nesting season (approximately March through September) for migratory birds. If construction activities, including vegetation removal activities are to commence during the nesting season, a qualified biologist shall conduct a pre-construction survey for active bird nests in and around proposed disturbance areas within five days of the commencement of construction. If vegetation removal or other construction activities are delayed or	Tribe USFWS and/or CDFW as needed	Planning Phase Construction Phase	Off-site Utility Improvements Access Improvements Traffic Mitigation Improvements	

MITIGATION MEASURE	PARTY RESPONSIBLE FOR MONITORING AND/OR REPORTING	TIMING OF IMPLEMENTATION	APPLICABLE PROJECT COMPONENT (OFF-SITE UTILITY IMPROVEMENTS, ACCESS IMPROVEMENTS AND/ OR TRAFFIC MITIGATION IMPROVEMENTS)	VERIFICATION (DATE AND INITIALS)
suspended for more than five days after the pre-construction survey, the site shall be resurveyed. If a migratory bird nest is present, consultation with USFWS and/or CDFW as appropriate shall occur. A disturbance-free buffer of 250 feet, or the appropriate buffer size determine through consultation, shall be established around the nest and demarcated with fencing or flagging. No project-related construction activities, including vegetation removal, shall occur within the buffer zone until a qualified biologist determines the young have fledged and are independent of the nest.				
C. A pre-construction survey for burrowing owls shall be conducted to ensure that impacts to burrowing owls, if present, do not occur during the nesting season. The pre-construction survey shall be conducted within 30 days prior to initiation of construction activity. If active burrows are found prior to the nesting season, consultation with USFWS and CDFW shall occur and an impact avoidance and minimization strategy shall be determined utilizing the best available methodology including CDFW protocol, as appropriate. Passive relocation measures shall be provided for each burrow in the area of the Madera Site, as appropriate, that is rendered biologically unsuitable. Passive	Tribe USFWS and/or CDFW as needed	Planning Phase Construction Phase	Off-site Utility Improvements Access Improvements Traffic Mitigation Improvements (only intersections 3 and 4 shown in **Figure 7b** of the CEQA memo)	

MITIGATION MEASURE	PARTY RESPONSIBLE FOR MONITORING AND/OR REPORTING	TIMING OF IMPLEMENTATION	APPLICABLE PROJECT COMPONENT (OFF-SITE UTILITY IMPROVEMENTS, ACCESS IMPROVEMENTS AND/ OR TRAFFIC MITIGATION IMPROVEMENTS)	VERIFICATION (DATE AND INITIALS)
relocation measures shall include the creation of two natural or artificial burrows for each burrow rendered biologically unsuitable. Daily monitoring will be implemented until the owls have been relocated to the new burrows. This measure will reduce potential impacts to burrowing owl species.				
Other Values				
Noise				
A. Construction activities shall be restricted to weekdays and normal daytime hours (7:00 a.m. to 7:00 p.m.).	Tribe	Construction Phase	Off-site Access Improvements	

ATTACHMENT C

AIR QUALITY EMISSIONS MODELING

Golden State-Airport / Ave 17

Madera County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	6.50	User Defined Unit	0.15	6,500.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	51
Climate Zone	3			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Estimated area.

Grading -

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialExported	0.00	500.00
tblGrading	MaterialImported	0.00	500.00
tblLandUse	LandUseSquareFeet	0.00	6,500.00
tblLandUse	LotAcreage	0.00	0.15
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	63.00	62.00
tblTripsAndVMT	HaulingTripNumber	63.00	62.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0844	0.3901	0.4337	7.7000e-004	5.0300e-003	0.0187	0.0237	1.5200e-003	0.0173	0.0188	0.0000	67.5367	67.5367	0.0185	0.0000	67.9995
Maximum	**0.0844**	**0.3901**	**0.4337**	**7.7000e-004**	**5.0300e-003**	**0.0187**	**0.0237**	**1.5200e-003**	**0.0173**	**0.0188**	**0.0000**	**67.5367**	**67.5367**	**0.0185**	**0.0000**	**67.9995**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0844	0.3901	0.4337	7.7000e-004	5.0300e-003	0.0187	0.0237	1.5200e-003	0.0173	0.0188	0.0000	67.5366	67.5366	0.0185	0.0000	67.9994
Maximum	**0.0844**	**0.3901**	**0.4337**	**7.7000e-004**	**5.0300e-003**	**0.0187**	**0.0237**	**1.5200e-003**	**0.0173**	**0.0188**	**0.0000**	**67.5366**	**67.5366**	**0.0185**	**0.0000**	**67.9994**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2023**	**3-31-2023**	0.2405	0.2405
2	**4-1-2023**	**6-30-2023**	0.2381	0.2381
		Highest	0.2405	0.2405

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0299	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.2000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0299**	**0.0000**	**6.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0299	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.2000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0299**	**0.0000**	**6.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2023	1/13/2023	5	10	
2	Site Preparation	Site Preparation	1/14/2023	1/16/2023	5	1	
3	Grading	Grading	1/17/2023	1/18/2023	5	2	
4	Building Construction	Building Construction	1/19/2023	6/7/2023	5	100	
5	Paving	Paving	6/8/2023	6/14/2023	5	5	
6	Architectural Coating	Architectural Coating	6/15/2023	6/21/2023	5	5	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 9,750; Non-Residential Outdoor: 3,250; Striped Parking Area: 0 (Architectural Coating – sqft)

OffRoad Equipment

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	62.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	62.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	2.00	1.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.2300e-003	0.0289	0.0370	6.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	5.2091	5.2091	9.5000e-004	0.0000	5.2328
Total	**3.2300e-003**	**0.0289**	**0.0370**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3500e-003**	**1.3500e-003**	**0.0000**	**5.2091**	**5.2091**	**9.5000e-004**	**0.0000**	**5.2328**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.2300e-003	0.0289	0.0370	6.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	5.2091	5.2091	9.5000e-004	0.0000	5.2328
Total	**3.2300e-003**	**0.0289**	**0.0370**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3500e-003**	**1.3500e-003**	**0.0000**	**5.2091**	**5.2091**	**9.5000e-004**	**0.0000**	**5.2328**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	3.0900e-003	1.9600e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.4275	0.4275	1.4000e-004	0.0000	0.4309
Total	**2.7000e-004**	**3.0900e-003**	**1.9600e-003**	**0.0000**	**3.1000e-004**	**1.1000e-004**	**4.2000e-004**	**3.0000e-005**	**1.0000e-004**	**1.3000e-004**	**0.0000**	**0.4275**	**0.4275**	**1.4000e-004**	**0.0000**	**0.4309**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.6000e-004**	**4.9700e-003**	**1.1000e-003**	**2.0000e-005**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**1.6000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**2.2526**	**2.2526**	**9.0000e-005**	**0.0000**	**2.2549**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	3.0900e-003	1.9600e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.4275	0.4275	1.4000e-004	0.0000	0.4309
Total	**2.7000e-004**	**3.0900e-003**	**1.9600e-003**	**0.0000**	**3.1000e-004**	**1.1000e-004**	**4.2000e-004**	**3.0000e-005**	**1.0000e-004**	**1.3000e-004**	**0.0000**	**0.4275**	**0.4275**	**1.4000e-004**	**0.0000**	**0.4309**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.6000e-004**	**4.9700e-003**	**1.1000e-003**	**2.0000e-005**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**1.6000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**2.2526**	**2.2526**	**9.0000e-005**	**0.0000**	**2.2549**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9000e-004	0.0000	7.9000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-004	5.7800e-003	7.3900e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.7000e-004	2.7000e-004	0.0000	1.0418	1.0418	1.9000e-004	0.0000	1.0466
Total	**6.5000e-004**	**5.7800e-003**	**7.3900e-003**	**1.0000e-005**	**7.9000e-004**	**2.8000e-004**	**1.0700e-003**	**4.2000e-004**	**2.7000e-004**	**6.9000e-004**	**0.0000**	**1.0418**	**1.0418**	**1.9000e-004**	**0.0000**	**1.0466**

3.4 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1015	0.1015	0.0000	0.0000	0.1016
Total	**2.0000e-004**	**4.9900e-003**	**1.3700e-003**	**2.0000e-005**	**6.5000e-004**	**1.0000e-005**	**6.6000e-004**	**1.8000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**2.3287**	**2.3287**	**9.0000e-005**	**0.0000**	**2.3311**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9000e-004	0.0000	7.9000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-004	5.7800e-003	7.3900e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.7000e-004	2.7000e-004	0.0000	1.0418	1.0418	1.9000e-004	0.0000	1.0466
Total	**6.5000e-004**	**5.7800e-003**	**7.3900e-003**	**1.0000e-005**	**7.9000e-004**	**2.8000e-004**	**1.0700e-003**	**4.2000e-004**	**2.7000e-004**	**6.9000e-004**	**0.0000**	**1.0418**	**1.0418**	**1.9000e-004**	**0.0000**	**1.0466**

3.4 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1015	0.1015	0.0000	0.0000	0.1016
Total	**2.0000e-004**	**4.9900e-003**	**1.3700e-003**	**2.0000e-005**	**6.5000e-004**	**1.0000e-005**	**6.6000e-004**	**1.8000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**2.3287**	**2.3287**	**9.0000e-005**	**0.0000**	**2.3311**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-004	3.8200e-003	9.1000e-004	1.0000e-005	3.0000e-004	0.0000	3.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	1.2049	1.2049	7.0000e-005	0.0000	1.2068
Worker	5.0000e-004	3.2000e-004	3.6000e-003	1.0000e-005	1.2400e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.0153	1.0153	2.0000e-005	0.0000	1.0159
Total	**6.1000e-004**	**4.1400e-003**	**4.5100e-003**	**2.0000e-005**	**1.5400e-003**	**1.0000e-005**	**1.5500e-003**	**4.2000e-004**	**1.0000e-005**	**4.3000e-004**	**0.0000**	**2.2202**	**2.2202**	**9.0000e-005**	**0.0000**	**2.2226**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-004	3.8200e-003	9.1000e-004	1.0000e-005	3.0000e-004	0.0000	3.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	1.2049	1.2049	7.0000e-005	0.0000	1.2068
Worker	5.0000e-004	3.2000e-004	3.6000e-003	1.0000e-005	1.2400e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.0153	1.0153	2.0000e-005	0.0000	1.0159
Total	**6.1000e-004**	**4.1400e-003**	**4.5100e-003**	**2.0000e-005**	**1.5400e-003**	**1.0000e-005**	**1.5500e-003**	**4.2000e-004**	**1.0000e-005**	**4.3000e-004**	**0.0000**	**2.2202**	**2.2202**	**9.0000e-005**	**0.0000**	**2.2226**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5300e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.4000e-004	1.6200e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4569	0.4569	1.0000e-005	0.0000	0.4571
Total	**2.3000e-004**	**1.4000e-004**	**1.6200e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4569**	**0.4569**	**1.0000e-005**	**0.0000**	**0.4571**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5300e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.4000e-004	1.6200e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4569	0.4569	1.0000e-005	0.0000	0.4571
Total	**2.3000e-004**	**1.4000e-004**	**1.6200e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4569**	**0.4569**	**1.0000e-005**	**0.0000**	**0.4571**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0452					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0457**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0452					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0457**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Commercial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Commercial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Commercial	0.544823	0.030518	0.165561	0.108739	0.017640	0.004881	0.013984	0.100698	0.002705	0.001640	0.006798	0.001202	0.000811

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0299	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.2000e-004
Unmitigated	0.0299	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.2000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.5200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0254					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.2000e-004
Total	**0.0299**	**0.0000**	**6.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	4.5200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0254					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	6.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.2000e-004	1.2000e-004	0.0000	0.0000	1.2000e-004
Total	**0.0299**	**0.0000**	**6.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.2000e-004**	**1.2000e-004**	**0.0000**	**0.0000**	**1.2000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

SR 99 NB Ave 17

Madera County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	5.50	User Defined Unit	0.13	5,500.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	51
Climate Zone	3			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Estimated area.

Grading -

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialExported	0.00	500.00
tblGrading	MaterialImported	0.00	500.00
tblLandUse	LandUseSquareFeet	0.00	5,500.00
tblLandUse	LotAcreage	0.00	0.13
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	63.00	62.00
tblTripsAndVMT	HaulingTripNumber	63.00	62.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0775	0.3901	0.4337	7.7000e-004	5.0300e-003	0.0187	0.0237	1.5200e-003	0.0173	0.0188	0.0000	67.5367	67.5367	0.0185	0.0000	67.9995
Maximum	**0.0775**	**0.3901**	**0.4337**	**7.7000e-004**	**5.0300e-003**	**0.0187**	**0.0237**	**1.5200e-003**	**0.0173**	**0.0188**	**0.0000**	**67.5367**	**67.5367**	**0.0185**	**0.0000**	**67.9995**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0775	0.3901	0.4337	7.7000e-004	5.0300e-003	0.0187	0.0237	1.5200e-003	0.0173	0.0188	0.0000	67.5366	67.5366	0.0185	0.0000	67.9994
Maximum	**0.0775**	**0.3901**	**0.4337**	**7.7000e-004**	**5.0300e-003**	**0.0187**	**0.0237**	**1.5200e-003**	**0.0173**	**0.0188**	**0.0000**	**67.5366**	**67.5366**	**0.0185**	**0.0000**	**67.9994**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2023**	**3-31-2023**	0.2405	0.2405
2	**4-1-2023**	**6-30-2023**	0.2312	0.2312
		Highest	0.2405	0.2405

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0253	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.0000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0253**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.0000**	**1.0000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0253	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.0000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0253**	**0.0000**	**5.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.0000**	**1.0000e-004**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2023	1/13/2023	5	10	
2	Site Preparation	Site Preparation	1/14/2023	1/16/2023	5	1	
3	Grading	Grading	1/17/2023	1/18/2023	5	2	
4	Building Construction	Building Construction	1/19/2023	6/7/2023	5	100	
5	Paving	Paving	6/8/2023	6/14/2023	5	5	
6	Architectural Coating	Architectural Coating	6/15/2023	6/21/2023	5	5	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 8,250; Non-Residential Outdoor: 2,750; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	62.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	62.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	2.00	1.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.2300e-003	0.0289	0.0370	6.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	5.2091	5.2091	9.5000e-004	0.0000	5.2328
Total	**3.2300e-003**	**0.0289**	**0.0370**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3500e-003**	**1.3500e-003**	**0.0000**	**5.2091**	**5.2091**	**9.5000e-004**	**0.0000**	**5.2328**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.2300e-003	0.0289	0.0370	6.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	5.2091	5.2091	9.5000e-004	0.0000	5.2328
Total	**3.2300e-003**	**0.0289**	**0.0370**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3500e-003**	**1.3500e-003**	**0.0000**	**5.2091**	**5.2091**	**9.5000e-004**	**0.0000**	**5.2328**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	3.0900e-003	1.9600e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.4275	0.4275	1.4000e-004	0.0000	0.4309
Total	**2.7000e-004**	**3.0900e-003**	**1.9600e-003**	**0.0000**	**3.1000e-004**	**1.1000e-004**	**4.2000e-004**	**3.0000e-005**	**1.0000e-004**	**1.3000e-004**	**0.0000**	**0.4275**	**0.4275**	**1.4000e-004**	**0.0000**	**0.4309**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.6000e-004**	**4.9700e-003**	**1.1000e-003**	**2.0000e-005**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**1.6000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**2.2526**	**2.2526**	**9.0000e-005**	**0.0000**	**2.2549**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	3.0900e-003	1.9600e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.4275	0.4275	1.4000e-004	0.0000	0.4309
Total	**2.7000e-004**	**3.0900e-003**	**1.9600e-003**	**0.0000**	**3.1000e-004**	**1.1000e-004**	**4.2000e-004**	**3.0000e-005**	**1.0000e-004**	**1.3000e-004**	**0.0000**	**0.4275**	**0.4275**	**1.4000e-004**	**0.0000**	**0.4309**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.6000e-004**	**4.9700e-003**	**1.1000e-003**	**2.0000e-005**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**1.6000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**2.2526**	**2.2526**	**9.0000e-005**	**0.0000**	**2.2549**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9000e-004	0.0000	7.9000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-004	5.7800e-003	7.3900e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.7000e-004	2.7000e-004	0.0000	1.0418	1.0418	1.9000e-004	0.0000	1.0466
Total	**6.5000e-004**	**5.7800e-003**	**7.3900e-003**	**1.0000e-005**	**7.9000e-004**	**2.8000e-004**	**1.0700e-003**	**4.2000e-004**	**2.7000e-004**	**6.9000e-004**	**0.0000**	**1.0418**	**1.0418**	**1.9000e-004**	**0.0000**	**1.0466**

3.4 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1015	0.1015	0.0000	0.0000	0.1016
Total	**2.0000e-004**	**4.9900e-003**	**1.3700e-003**	**2.0000e-005**	**6.5000e-004**	**1.0000e-005**	**6.6000e-004**	**1.8000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**2.3287**	**2.3287**	**9.0000e-005**	**0.0000**	**2.3311**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9000e-004	0.0000	7.9000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-004	5.7800e-003	7.3900e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.7000e-004	2.7000e-004	0.0000	1.0418	1.0418	1.9000e-004	0.0000	1.0466
Total	**6.5000e-004**	**5.7800e-003**	**7.3900e-003**	**1.0000e-005**	**7.9000e-004**	**2.8000e-004**	**1.0700e-003**	**4.2000e-004**	**2.7000e-004**	**6.9000e-004**	**0.0000**	**1.0418**	**1.0418**	**1.9000e-004**	**0.0000**	**1.0466**

3.4 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1015	0.1015	0.0000	0.0000	0.1016
Total	**2.0000e-004**	**4.9900e-003**	**1.3700e-003**	**2.0000e-005**	**6.5000e-004**	**1.0000e-005**	**6.6000e-004**	**1.8000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**2.3287**	**2.3287**	**9.0000e-005**	**0.0000**	**2.3311**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-004	3.8200e-003	9.1000e-004	1.0000e-005	3.0000e-004	0.0000	3.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	1.2049	1.2049	7.0000e-005	0.0000	1.2068
Worker	5.0000e-004	3.2000e-004	3.6000e-003	1.0000e-005	1.2400e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.0153	1.0153	2.0000e-005	0.0000	1.0159
Total	**6.1000e-004**	**4.1400e-003**	**4.5100e-003**	**2.0000e-005**	**1.5400e-003**	**1.0000e-005**	**1.5500e-003**	**4.2000e-004**	**1.0000e-005**	**4.3000e-004**	**0.0000**	**2.2202**	**2.2202**	**9.0000e-005**	**0.0000**	**2.2226**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-004	3.8200e-003	9.1000e-004	1.0000e-005	3.0000e-004	0.0000	3.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	1.2049	1.2049	7.0000e-005	0.0000	1.2068
Worker	5.0000e-004	3.2000e-004	3.6000e-003	1.0000e-005	1.2400e-003	1.0000e-005	1.2500e-003	3.3000e-004	1.0000e-005	3.4000e-004	0.0000	1.0153	1.0153	2.0000e-005	0.0000	1.0159
Total	**6.1000e-004**	**4.1400e-003**	**4.5100e-003**	**2.0000e-005**	**1.5400e-003**	**1.0000e-005**	**1.5500e-003**	**4.2000e-004**	**1.0000e-005**	**4.3000e-004**	**0.0000**	**2.2202**	**2.2202**	**9.0000e-005**	**0.0000**	**2.2226**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5300e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.4000e-004	1.6200e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4569	0.4569	1.0000e-005	0.0000	0.4571
Total	**2.3000e-004**	**1.4000e-004**	**1.6200e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4569**	**0.4569**	**1.0000e-005**	**0.0000**	**0.4571**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5300e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.4000e-004	1.6200e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4569	0.4569	1.0000e-005	0.0000	0.4571
Total	**2.3000e-004**	**1.4000e-004**	**1.6200e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4569**	**0.4569**	**1.0000e-005**	**0.0000**	**0.4571**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0382					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0387**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0382					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0387**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Commercial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Commercial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Commercial	0.544823	0.030518	0.165561	0.108739	0.017640	0.004881	0.013984	0.100698	0.002705	0.001640	0.006798	0.001202	0.000811

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0253	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.0000e-004
Unmitigated	0.0253	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.0000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.8200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0215					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.0000e-004
Total	**0.0253**	**0.0000**	**5.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.0000**	**1.0000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.8200e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0215					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	5.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.0000e-004	1.0000e-004	0.0000	0.0000	1.0000e-004
Total	**0.0253**	**0.0000**	**5.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.0000e-004**	**1.0000e-004**	**0.0000**	**0.0000**	**1.0000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

SR 99 NB / Ave 18½

Madera County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	8.50	User Defined Unit	0.20	8,500.00	0

1.2 Other Project Characteristics

Urbanization Rural **Wind Speed (m/s)** 2.9 **Precipitation Freq (Days)** 51

Climate Zone 3 **Operational Year** 2024

Utility Company

CO2 Intensity (lb/MWhr) 0 **CH4 Intensity (lb/MWhr)** 0 **N2O Intensity (lb/MWhr)** 0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Estimated area.

Grading -

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialExported	0.00	500.00
tblGrading	MaterialImported	0.00	500.00
tblLandUse	LandUseSquareFeet	0.00	8,500.00
tblLandUse	LotAcreage	0.00	0.20
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	63.00	62.00
tblTripsAndVMT	HaulingTripNumber	63.00	62.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0986	0.3903	0.4356	7.7000e-004	5.6800e-003	0.0187	0.0244	1.6900e-003	0.0173	0.0190	0.0000	68.0697	68.0697	0.0185	0.0000	68.5328
Maximum	**0.0986**	**0.3903**	**0.4356**	**7.7000e-004**	**5.6800e-003**	**0.0187**	**0.0244**	**1.6900e-003**	**0.0173**	**0.0190**	**0.0000**	**68.0697**	**68.0697**	**0.0185**	**0.0000**	**68.5328**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0986	0.3903	0.4356	7.7000e-004	5.6800e-003	0.0187	0.0244	1.6900e-003	0.0173	0.0190	0.0000	68.0696	68.0696	0.0185	0.0000	68.5328
Maximum	**0.0986**	**0.3903**	**0.4356**	**7.7000e-004**	**5.6800e-003**	**0.0187**	**0.0244**	**1.6900e-003**	**0.0173**	**0.0190**	**0.0000**	**68.0696**	**68.0696**	**0.0185**	**0.0000**	**68.5328**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2023**	**3-31-2023**	0.2408	0.2408
2	**4-1-2023**	**6-30-2023**	0.2523	0.2523
		Highest	0.2523	0.2523

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0391	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5000e-004	1.5000e-004	0.0000	0.0000	1.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0391**	**0.0000**	**8.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.5000e-004**	**1.5000e-004**	**0.0000**	**0.0000**	**1.6000e-004**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0391	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5000e-004	1.5000e-004	0.0000	0.0000	1.6000e-004
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0391**	**0.0000**	**8.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**1.5000e-004**	**1.5000e-004**	**0.0000**	**0.0000**	**1.6000e-004**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2023	1/13/2023	5	10	
2	Site Preparation	Site Preparation	1/14/2023	1/16/2023	5	1	
3	Grading	Grading	1/17/2023	1/18/2023	5	2	
4	Building Construction	Building Construction	1/19/2023	6/7/2023	5	100	
5	Paving	Paving	6/8/2023	6/14/2023	5	5	
6	Architectural Coating	Architectural Coating	6/15/2023	6/21/2023	5	5	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 12,750; Non-Residential Outdoor: 4,250; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	62.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	62.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	3.00	1.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	1.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.2300e-003	0.0289	0.0370	6.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	5.2091	5.2091	9.5000e-004	0.0000	5.2328
Total	**3.2300e-003**	**0.0289**	**0.0370**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3500e-003**	**1.3500e-003**	**0.0000**	**5.2091**	**5.2091**	**9.5000e-004**	**0.0000**	**5.2328**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.2300e-003	0.0289	0.0370	6.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	5.2091	5.2091	9.5000e-004	0.0000	5.2328
Total	**3.2300e-003**	**0.0289**	**0.0370**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3500e-003**	**1.3500e-003**	**0.0000**	**5.2091**	**5.2091**	**9.5000e-004**	**0.0000**	**5.2328**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	3.0900e-003	1.9600e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.4275	0.4275	1.4000e-004	0.0000	0.4309
Total	**2.7000e-004**	**3.0900e-003**	**1.9600e-003**	**0.0000**	**3.1000e-004**	**1.1000e-004**	**4.2000e-004**	**3.0000e-005**	**1.0000e-004**	**1.3000e-004**	**0.0000**	**0.4275**	**0.4275**	**1.4000e-004**	**0.0000**	**0.4309**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.6000e-004**	**4.9700e-003**	**1.1000e-003**	**2.0000e-005**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**1.6000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**2.2526**	**2.2526**	**9.0000e-005**	**0.0000**	**2.2549**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	3.0900e-003	1.9600e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.4275	0.4275	1.4000e-004	0.0000	0.4309
Total	**2.7000e-004**	**3.0900e-003**	**1.9600e-003**	**0.0000**	**3.1000e-004**	**1.1000e-004**	**4.2000e-004**	**3.0000e-005**	**1.0000e-004**	**1.3000e-004**	**0.0000**	**0.4275**	**0.4275**	**1.4000e-004**	**0.0000**	**0.4309**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.6000e-004**	**4.9700e-003**	**1.1000e-003**	**2.0000e-005**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**1.6000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**2.2526**	**2.2526**	**9.0000e-005**	**0.0000**	**2.2549**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9000e-004	0.0000	7.9000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-004	5.7800e-003	7.3900e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.7000e-004	2.7000e-004	0.0000	1.0418	1.0418	1.9000e-004	0.0000	1.0466
Total	**6.5000e-004**	**5.7800e-003**	**7.3900e-003**	**1.0000e-005**	**7.9000e-004**	**2.8000e-004**	**1.0700e-003**	**4.2000e-004**	**2.7000e-004**	**6.9000e-004**	**0.0000**	**1.0418**	**1.0418**	**1.9000e-004**	**0.0000**	**1.0466**

3.4 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1015	0.1015	0.0000	0.0000	0.1016
Total	**2.0000e-004**	**4.9900e-003**	**1.3700e-003**	**2.0000e-005**	**6.5000e-004**	**1.0000e-005**	**6.6000e-004**	**1.8000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**2.3287**	**2.3287**	**9.0000e-005**	**0.0000**	**2.3311**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9000e-004	0.0000	7.9000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-004	5.7800e-003	7.3900e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.7000e-004	2.7000e-004	0.0000	1.0418	1.0418	1.9000e-004	0.0000	1.0466
Total	**6.5000e-004**	**5.7800e-003**	**7.3900e-003**	**1.0000e-005**	**7.9000e-004**	**2.8000e-004**	**1.0700e-003**	**4.2000e-004**	**2.7000e-004**	**6.9000e-004**	**0.0000**	**1.0418**	**1.0418**	**1.9000e-004**	**0.0000**	**1.0466**

3.4 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1015	0.1015	0.0000	0.0000	0.1016
Total	**2.0000e-004**	**4.9900e-003**	**1.3700e-003**	**2.0000e-005**	**6.5000e-004**	**1.0000e-005**	**6.6000e-004**	**1.8000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**2.3287**	**2.3287**	**9.0000e-005**	**0.0000**	**2.3311**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-004	3.8200e-003	9.1000e-004	1.0000e-005	3.0000e-004	0.0000	3.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	1.2049	1.2049	7.0000e-005	0.0000	1.2068
Worker	7.5000e-004	4.7000e-004	5.4000e-003	2.0000e-005	1.8600e-003	1.0000e-005	1.8700e-003	4.9000e-004	1.0000e-005	5.1000e-004	0.0000	1.5229	1.5229	4.0000e-005	0.0000	1.5238
Total	**8.6000e-004**	**4.2900e-003**	**6.3100e-003**	**3.0000e-005**	**2.1600e-003**	**1.0000e-005**	**2.1700e-003**	**5.8000e-004**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**2.7278**	**2.7278**	**1.1000e-004**	**0.0000**	**2.7306**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-004	3.8200e-003	9.1000e-004	1.0000e-005	3.0000e-004	0.0000	3.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	1.2049	1.2049	7.0000e-005	0.0000	1.2068
Worker	7.5000e-004	4.7000e-004	5.4000e-003	2.0000e-005	1.8600e-003	1.0000e-005	1.8700e-003	4.9000e-004	1.0000e-005	5.1000e-004	0.0000	1.5229	1.5229	4.0000e-005	0.0000	1.5238
Total	**8.6000e-004**	**4.2900e-003**	**6.3100e-003**	**3.0000e-005**	**2.1600e-003**	**1.0000e-005**	**2.1700e-003**	**5.8000e-004**	**1.0000e-005**	**6.0000e-004**	**0.0000**	**2.7278**	**2.7278**	**1.1000e-004**	**0.0000**	**2.7306**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5300e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.4000e-004	1.6200e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4569	0.4569	1.0000e-005	0.0000	0.4571
Total	**2.3000e-004**	**1.4000e-004**	**1.6200e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4569**	**0.4569**	**1.0000e-005**	**0.0000**	**0.4571**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5300e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.4000e-004	1.6200e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4569	0.4569	1.0000e-005	0.0000	0.4571
Total	**2.3000e-004**	**1.4000e-004**	**1.6200e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4569**	**0.4569**	**1.0000e-005**	**0.0000**	**0.4571**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0591					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0596**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.0000e-005**	**1.0000e-005**	**9.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0254**	**0.0254**	**0.0000**	**0.0000**	**0.0254**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0591					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0596**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.0000e-005**	**1.0000e-005**	**9.0000e-005**	**0.0000**	**3.0000e-005**	**0.0000**	**3.0000e-005**	**1.0000e-005**	**0.0000**	**1.0000e-005**	**0.0000**	**0.0254**	**0.0254**	**0.0000**	**0.0000**	**0.0254**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Commercial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Commercial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Commercial	0.544823	0.030518	0.165561	0.108739	0.017640	0.004881	0.013984	0.100698	0.002705	0.001640	0.006798	0.001202	0.000811

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0391	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5000e-004	1.5000e-004	0.0000	0.0000	1.6000e-004
Unmitigated	0.0391	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5000e-004	1.5000e-004	0.0000	0.0000	1.6000e-004

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.9100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0332					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5000e-004	1.5000e-004	0.0000	0.0000	1.6000e-004
Total	**0.0391**	**0.0000**	**8.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.5000e-004**	**1.5000e-004**	**0.0000**	**0.0000**	**1.6000e-004**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	5.9100e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0332					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	1.0000e-005	0.0000	8.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	1.5000e-004	1.5000e-004	0.0000	0.0000	1.6000e-004
Total	**0.0391**	**0.0000**	**8.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**1.5000e-004**	**1.5000e-004**	**0.0000**	**0.0000**	**1.6000e-004**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

SR 99 SB / Ave 17
Madera County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	3.00	User Defined Unit	0.07	3,000.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	51
Climate Zone	3			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Estimated area.

Grading -

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialExported	0.00	500.00
tblGrading	MaterialImported	0.00	500.00
tblLandUse	LandUseSquareFeet	0.00	3,000.00
tblLandUse	LotAcreage	0.00	0.07
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	63.00	62.00
tblTripsAndVMT	HaulingTripNumber	63.00	62.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0597	0.3861	0.4310	7.5000e-004	4.1100e-003	0.0187	0.0228	1.2600e-003	0.0173	0.0185	0.0000	65.8241	65.8241	0.0184	0.0000	66.2848
Maximum	**0.0597**	**0.3861**	**0.4310**	**7.5000e-004**	**4.1100e-003**	**0.0187**	**0.0228**	**1.2600e-003**	**0.0173**	**0.0185**	**0.0000**	**65.8241**	**65.8241**	**0.0184**	**0.0000**	**66.2848**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0597	0.3861	0.4310	7.5000e-004	4.1100e-003	0.0187	0.0228	1.2600e-003	0.0173	0.0185	0.0000	65.8241	65.8241	0.0184	0.0000	66.2847
Maximum	**0.0597**	**0.3861**	**0.4310**	**7.5000e-004**	**4.1100e-003**	**0.0187**	**0.0228**	**1.2600e-003**	**0.0173**	**0.0185**	**0.0000**	**65.8241**	**65.8241**	**0.0184**	**0.0000**	**66.2847**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	**1-1-2023**	**3-31-2023**	0.2383	0.2383
2	**4-1-2023**	**6-30-2023**	0.2117	0.2117
		Highest	0.2383	0.2383

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0138	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-005	5.0000e-005	0.0000	0.0000	6.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0138**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.0000**	**6.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0138	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-005	5.0000e-005	0.0000	0.0000	6.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0138**	**0.0000**	**3.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.0000**	**6.0000e-005**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2023	1/13/2023	5	10	
2	Site Preparation	Site Preparation	1/14/2023	1/16/2023	5	1	
3	Grading	Grading	1/17/2023	1/18/2023	5	2	
4	Building Construction	Building Construction	1/19/2023	6/7/2023	5	100	
5	Paving	Paving	6/8/2023	6/14/2023	5	5	
6	Architectural Coating	Architectural Coating	6/15/2023	6/21/2023	5	5	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 4,500; Non-Residential Outdoor: 1,500; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	62.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	62.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	1.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.2300e-003	0.0289	0.0370	6.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	5.2091	5.2091	9.5000e-004	0.0000	5.2328
Total	**3.2300e-003**	**0.0289**	**0.0370**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3500e-003**	**1.3500e-003**	**0.0000**	**5.2091**	**5.2091**	**9.5000e-004**	**0.0000**	**5.2328**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.2300e-003	0.0289	0.0370	6.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	5.2091	5.2091	9.5000e-004	0.0000	5.2328
Total	**3.2300e-003**	**0.0289**	**0.0370**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3500e-003**	**1.3500e-003**	**0.0000**	**5.2091**	**5.2091**	**9.5000e-004**	**0.0000**	**5.2328**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	3.0900e-003	1.9600e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.4275	0.4275	1.4000e-004	0.0000	0.4309
Total	**2.7000e-004**	**3.0900e-003**	**1.9600e-003**	**0.0000**	**3.1000e-004**	**1.1000e-004**	**4.2000e-004**	**3.0000e-005**	**1.0000e-004**	**1.3000e-004**	**0.0000**	**0.4275**	**0.4275**	**1.4000e-004**	**0.0000**	**0.4309**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.6000e-004**	**4.9700e-003**	**1.1000e-003**	**2.0000e-005**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**1.6000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**2.2526**	**2.2526**	**9.0000e-005**	**0.0000**	**2.2549**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	3.0900e-003	1.9600e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.4275	0.4275	1.4000e-004	0.0000	0.4309
Total	**2.7000e-004**	**3.0900e-003**	**1.9600e-003**	**0.0000**	**3.1000e-004**	**1.1000e-004**	**4.2000e-004**	**3.0000e-005**	**1.0000e-004**	**1.3000e-004**	**0.0000**	**0.4275**	**0.4275**	**1.4000e-004**	**0.0000**	**0.4309**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.6000e-004**	**4.9700e-003**	**1.1000e-003**	**2.0000e-005**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**1.6000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**2.2526**	**2.2526**	**9.0000e-005**	**0.0000**	**2.2549**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9000e-004	0.0000	7.9000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-004	5.7800e-003	7.3900e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.7000e-004	2.7000e-004	0.0000	1.0418	1.0418	1.9000e-004	0.0000	1.0466
Total	**6.5000e-004**	**5.7800e-003**	**7.3900e-003**	**1.0000e-005**	**7.9000e-004**	**2.8000e-004**	**1.0700e-003**	**4.2000e-004**	**2.7000e-004**	**6.9000e-004**	**0.0000**	**1.0418**	**1.0418**	**1.9000e-004**	**0.0000**	**1.0466**

3.4 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1015	0.1015	0.0000	0.0000	0.1016
Total	**2.0000e-004**	**4.9900e-003**	**1.3700e-003**	**2.0000e-005**	**6.5000e-004**	**1.0000e-005**	**6.6000e-004**	**1.8000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**2.3287**	**2.3287**	**9.0000e-005**	**0.0000**	**2.3311**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9000e-004	0.0000	7.9000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-004	5.7800e-003	7.3900e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.7000e-004	2.7000e-004	0.0000	1.0418	1.0418	1.9000e-004	0.0000	1.0466
Total	**6.5000e-004**	**5.7800e-003**	**7.3900e-003**	**1.0000e-005**	**7.9000e-004**	**2.8000e-004**	**1.0700e-003**	**4.2000e-004**	**2.7000e-004**	**6.9000e-004**	**0.0000**	**1.0418**	**1.0418**	**1.9000e-004**	**0.0000**	**1.0466**

3.4 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1015	0.1015	0.0000	0.0000	0.1016
Total	**2.0000e-004**	**4.9900e-003**	**1.3700e-003**	**2.0000e-005**	**6.5000e-004**	**1.0000e-005**	**6.6000e-004**	**1.8000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**2.3287**	**2.3287**	**9.0000e-005**	**0.0000**	**2.3311**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5300e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.4000e-004	1.6200e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4569	0.4569	1.0000e-005	0.0000	0.4571
Total	**2.3000e-004**	**1.4000e-004**	**1.6200e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4569**	**0.4569**	**1.0000e-005**	**0.0000**	**0.4571**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5300e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.4000e-004	1.6200e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4569	0.4569	1.0000e-005	0.0000	0.4571
Total	**2.3000e-004**	**1.4000e-004**	**1.6200e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4569**	**0.4569**	**1.0000e-005**	**0.0000**	**0.4571**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0209					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0213**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0209					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0213**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

Category	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Commercial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Commercial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Commercial	0.544823	0.030518	0.165561	0.108739	0.017640	0.004881	0.013984	0.100698	0.002705	0.001640	0.006798	0.001202	0.000811

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0138	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-005	5.0000e-005	0.0000	0.0000	6.0000e-005
Unmitigated	0.0138	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-005	5.0000e-005	0.0000	0.0000	6.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.0900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0117					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-005	5.0000e-005	0.0000	0.0000	6.0000e-005
Total	**0.0138**	**0.0000**	**3.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.0000**	**6.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	2.0900e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0117					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	3.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	5.0000e-005	5.0000e-005	0.0000	0.0000	6.0000e-005
Total	**0.0138**	**0.0000**	**3.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**5.0000e-005**	**5.0000e-005**	**0.0000**	**0.0000**	**6.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

SR 99 SB-Road 23 / Ave 18½

Madera County, Annual

1.0 Project Characteristics

1.1 Land Usage

Land Uses	Size	Metric	Lot Acreage	Floor Surface Area	Population
User Defined Commercial	4.50	User Defined Unit	0.10	4,500.00	0

1.2 Other Project Characteristics

Urbanization	Rural	**Wind Speed (m/s)**	2.9	**Precipitation Freq (Days)**	51
Climate Zone	3			**Operational Year**	2024
Utility Company					
CO2 Intensity (lb/MWhr)	0	**CH4 Intensity (lb/MWhr)**	0	**N2O Intensity (lb/MWhr)**	0

1.3 User Entered Comments & Non-Default Data

Project Characteristics -

Land Use - Estimated area.

Grading -

Table Name	Column Name	Default Value	New Value
tblGrading	MaterialExported	0.00	500.00
tblGrading	MaterialImported	0.00	500.00
tblLandUse	LandUseSquareFeet	0.00	4,500.00
tblLandUse	LotAcreage	0.00	0.10
tblProjectCharacteristics	UrbanizationLevel	Urban	Rural
tblTripsAndVMT	HaulingTripNumber	63.00	62.00
tblTripsAndVMT	HaulingTripNumber	63.00	62.00

2.0 Emissions Summary

2.1 Overall Construction

Unmitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0703	0.3900	0.4319	7.6000e-004	4.4100e-003	0.0187	0.0231	1.3500e-003	0.0173	0.0186	0.0000	67.0290	67.0290	0.0185	0.0000	67.4916
Maximum	**0.0703**	**0.3900**	**0.4319**	**7.6000e-004**	**4.4100e-003**	**0.0187**	**0.0231**	**1.3500e-003**	**0.0173**	**0.0186**	**0.0000**	**67.0290**	**67.0290**	**0.0185**	**0.0000**	**67.4916**

Mitigated Construction

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Year	tons/yr										MT/yr					
2023	0.0703	0.3900	0.4319	7.6000e-004	4.4100e-003	0.0187	0.0231	1.3500e-003	0.0173	0.0186	0.0000	67.0290	67.0290	0.0185	0.0000	67.4915
Maximum	**0.0703**	**0.3900**	**0.4319**	**7.6000e-004**	**4.4100e-003**	**0.0187**	**0.0231**	**1.3500e-003**	**0.0173**	**0.0186**	**0.0000**	**67.0290**	**67.0290**	**0.0185**	**0.0000**	**67.4915**

	ROG	**NOx**	**CO**	**SO2**	**Fugitive PM10**	**Exhaust PM10**	**PM10 Total**	**Fugitive PM2.5**	**Exhaust PM2.5**	**PM2.5 Total**	**Bio- CO2**	**NBio-CO2**	**Total CO2**	**CH4**	**N20**	**CO2e**
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

Quarter	Start Date	End Date	Maximum Unmitigated ROG + NOX (tons/quarter)	Maximum Mitigated ROG + NOX (tons/quarter)
1	1-1-2023	3-31-2023	0.2403	0.2403
2	4-1-2023	6-30-2023	0.2240	0.2240
		Highest	0.2403	0.2403

2.2 Overall Operational

Unmitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0207	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.0000e-005	8.0000e-005	0.0000	0.0000	9.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0207**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0000**	**9.0000e-005**

2.2 Overall Operational

Mitigated Operational

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Area	0.0207	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.0000e-005	8.0000e-005	0.0000	0.0000	9.0000e-005
Energy	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Mobile	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Waste						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Water						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0207**	**0.0000**	**4.0000e-005**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0000**	**9.0000e-005**

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio-CO2	Total CO2	CH4	N20	CO2e
Percent Reduction	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	**0.00**

3.0 Construction Detail

Construction Phase

Phase Number	Phase Name	Phase Type	Start Date	End Date	Num Days Week	Num Days	Phase Description
1	Demolition	Demolition	1/1/2023	1/13/2023	5	10	
2	Site Preparation	Site Preparation	1/14/2023	1/16/2023	5	1	
3	Grading	Grading	1/17/2023	1/18/2023	5	2	
4	Building Construction	Building Construction	1/19/2023	6/7/2023	5	100	
5	Paving	Paving	6/8/2023	6/14/2023	5	5	
6	Architectural Coating	Architectural Coating	6/15/2023	6/21/2023	5	5	

Acres of Grading (Site Preparation Phase): 0.5

Acres of Grading (Grading Phase): 0

Acres of Paving: 0

Residential Indoor: 0; Residential Outdoor: 0; Non-Residential Indoor: 6,750; Non-Residential Outdoor: 2,250; Striped Parking Area: 0 (Architectural Coating – sqft)

<u>OffRoad Equipment</u>

SR 99 SB-Road 23 / Ave 18½ - Madera County, Annual

Phase Name	Offroad Equipment Type	Amount	Usage Hours	Horse Power	Load Factor
Architectural Coating	Air Compressors	1	6.00	78	0.48
Paving	Cement and Mortar Mixers	4	6.00	9	0.56
Demolition	Concrete/Industrial Saws	1	8.00	81	0.73
Grading	Concrete/Industrial Saws	1	8.00	81	0.73
Building Construction	Cranes	1	4.00	231	0.29
Building Construction	Forklifts	2	6.00	89	0.20
Site Preparation	Graders	1	8.00	187	0.41
Paving	Pavers	1	7.00	130	0.42
Paving	Rollers	1	7.00	80	0.38
Demolition	Rubber Tired Dozers	1	1.00	247	0.40
Grading	Rubber Tired Dozers	1	1.00	247	0.40
Building Construction	Tractors/Loaders/Backhoes	2	8.00	97	0.37
Demolition	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Grading	Tractors/Loaders/Backhoes	2	6.00	97	0.37
Paving	Tractors/Loaders/Backhoes	1	7.00	97	0.37
Site Preparation	Tractors/Loaders/Backhoes	1	8.00	97	0.37

Trips and VMT

Phase Name	Offroad Equipment Count	Worker Trip Number	Vendor Trip Number	Hauling Trip Number	Worker Trip Length	Vendor Trip Length	Hauling Trip Length	Worker Vehicle Class	Vendor Vehicle Class	Hauling Vehicle Class
Demolition	4	10.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Site Preparation	2	5.00	0.00	62.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Grading	4	10.00	0.00	62.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Building Construction	5	1.00	1.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Paving	7	18.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT
Architectural Coating	1	0.00	0.00	0.00	16.80	6.60	20.00	LD_Mix	HDT_Mix	HHDT

3.1 Mitigation Measures Construction

3.2 Demolition - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.2300e-003	0.0289	0.0370	6.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	5.2091	5.2091	9.5000e-004	0.0000	5.2328
Total	**3.2300e-003**	**0.0289**	**0.0370**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3500e-003**	**1.3500e-003**	**0.0000**	**5.2091**	**5.2091**	**9.5000e-004**	**0.0000**	**5.2328**

3.2 Demolition - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	3.2300e-003	0.0289	0.0370	6.0000e-005		1.4100e-003	1.4100e-003		1.3500e-003	1.3500e-003	0.0000	5.2091	5.2091	9.5000e-004	0.0000	5.2328
Total	**3.2300e-003**	**0.0289**	**0.0370**	**6.0000e-005**		**1.4100e-003**	**1.4100e-003**		**1.3500e-003**	**1.3500e-003**	**0.0000**	**5.2091**	**5.2091**	**9.5000e-004**	**0.0000**	**5.2328**

3.2 Demolition - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**2.5000e-004**	**1.6000e-004**	**1.8000e-003**	**1.0000e-005**	**6.2000e-004**	**0.0000**	**6.2000e-004**	**1.6000e-004**	**0.0000**	**1.7000e-004**	**0.0000**	**0.5076**	**0.5076**	**1.0000e-005**	**0.0000**	**0.5079**

3.3 Site Preparation - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	3.0900e-003	1.9600e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.4275	0.4275	1.4000e-004	0.0000	0.4309
Total	**2.7000e-004**	**3.0900e-003**	**1.9600e-003**	**0.0000**	**3.1000e-004**	**1.1000e-004**	**4.2000e-004**	**3.0000e-005**	**1.0000e-004**	**1.3000e-004**	**0.0000**	**0.4275**	**0.4275**	**1.4000e-004**	**0.0000**	**0.4309**

3.3 Site Preparation - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.6000e-004**	**4.9700e-003**	**1.1000e-003**	**2.0000e-005**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**1.6000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**2.2526**	**2.2526**	**9.0000e-005**	**0.0000**	**2.2549**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					3.1000e-004	0.0000	3.1000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	2.7000e-004	3.0900e-003	1.9600e-003	0.0000		1.1000e-004	1.1000e-004		1.0000e-004	1.0000e-004	0.0000	0.4275	0.4275	1.4000e-004	0.0000	0.4309
Total	**2.7000e-004**	**3.0900e-003**	**1.9600e-003**	**0.0000**	**3.1000e-004**	**1.1000e-004**	**4.2000e-004**	**3.0000e-005**	**1.0000e-004**	**1.3000e-004**	**0.0000**	**0.4275**	**0.4275**	**1.4000e-004**	**0.0000**	**0.4309**

3.3 Site Preparation - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	1.0000e-005	1.0000e-005	9.0000e-005	0.0000	3.0000e-005	0.0000	3.0000e-005	1.0000e-005	0.0000	1.0000e-005	0.0000	0.0254	0.0254	0.0000	0.0000	0.0254
Total	**1.6000e-004**	**4.9700e-003**	**1.1000e-003**	**2.0000e-005**	**5.6000e-004**	**1.0000e-005**	**5.7000e-004**	**1.6000e-004**	**1.0000e-005**	**1.6000e-004**	**0.0000**	**2.2526**	**2.2526**	**9.0000e-005**	**0.0000**	**2.2549**

3.4 Grading - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9000e-004	0.0000	7.9000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-004	5.7800e-003	7.3900e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.7000e-004	2.7000e-004	0.0000	1.0418	1.0418	1.9000e-004	0.0000	1.0466
Total	**6.5000e-004**	**5.7800e-003**	**7.3900e-003**	**1.0000e-005**	**7.9000e-004**	**2.8000e-004**	**1.0700e-003**	**4.2000e-004**	**2.7000e-004**	**6.9000e-004**	**0.0000**	**1.0418**	**1.0418**	**1.9000e-004**	**0.0000**	**1.0466**

3.4 Grading - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1015	0.1015	0.0000	0.0000	0.1016
Total	**2.0000e-004**	**4.9900e-003**	**1.3700e-003**	**2.0000e-005**	**6.5000e-004**	**1.0000e-005**	**6.6000e-004**	**1.8000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**2.3287**	**2.3287**	**9.0000e-005**	**0.0000**	**2.3311**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Fugitive Dust					7.9000e-004	0.0000	7.9000e-004	4.2000e-004	0.0000	4.2000e-004	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	6.5000e-004	5.7800e-003	7.3900e-003	1.0000e-005		2.8000e-004	2.8000e-004		2.7000e-004	2.7000e-004	0.0000	1.0418	1.0418	1.9000e-004	0.0000	1.0466
Total	**6.5000e-004**	**5.7800e-003**	**7.3900e-003**	**1.0000e-005**	**7.9000e-004**	**2.8000e-004**	**1.0700e-003**	**4.2000e-004**	**2.7000e-004**	**6.9000e-004**	**0.0000**	**1.0418**	**1.0418**	**1.9000e-004**	**0.0000**	**1.0466**

3.4 Grading - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	1.5000e-004	4.9600e-003	1.0100e-003	2.0000e-005	5.3000e-004	1.0000e-005	5.4000e-004	1.5000e-004	1.0000e-005	1.5000e-004	0.0000	2.2272	2.2272	9.0000e-005	0.0000	2.2295
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	5.0000e-005	3.0000e-005	3.6000e-004	0.0000	1.2000e-004	0.0000	1.2000e-004	3.0000e-005	0.0000	3.0000e-005	0.0000	0.1015	0.1015	0.0000	0.0000	0.1016
Total	**2.0000e-004**	**4.9900e-003**	**1.3700e-003**	**2.0000e-005**	**6.5000e-004**	**1.0000e-005**	**6.6000e-004**	**1.8000e-004**	**1.0000e-005**	**1.8000e-004**	**0.0000**	**2.3287**	**2.3287**	**9.0000e-005**	**0.0000**	**2.3311**

3.5 Building Construction - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

3.5 Building Construction - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-004	3.8200e-003	9.1000e-004	1.0000e-005	3.0000e-004	0.0000	3.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	1.2049	1.2049	7.0000e-005	0.0000	1.2068
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**3.6000e-004**	**3.9800e-003**	**2.7100e-003**	**2.0000e-005**	**9.2000e-004**	**0.0000**	**9.2000e-004**	**2.5000e-004**	**0.0000**	**2.6000e-004**	**0.0000**	**1.7125**	**1.7125**	**8.0000e-005**	**0.0000**	**1.7147**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	0.0316	0.3209	0.3549	5.7000e-004		0.0160	0.0160		0.0147	0.0147	0.0000	50.1042	50.1042	0.0162	0.0000	50.5093
Total	**0.0316**	**0.3209**	**0.3549**	**5.7000e-004**		**0.0160**	**0.0160**		**0.0147**	**0.0147**	**0.0000**	**50.1042**	**50.1042**	**0.0162**	**0.0000**	**50.5093**

3.5 Building Construction - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	1.1000e-004	3.8200e-003	9.1000e-004	1.0000e-005	3.0000e-004	0.0000	3.0000e-004	9.0000e-005	0.0000	9.0000e-005	0.0000	1.2049	1.2049	7.0000e-005	0.0000	1.2068
Worker	2.5000e-004	1.6000e-004	1.8000e-003	1.0000e-005	6.2000e-004	0.0000	6.2000e-004	1.6000e-004	0.0000	1.7000e-004	0.0000	0.5076	0.5076	1.0000e-005	0.0000	0.5079
Total	**3.6000e-004**	**3.9800e-003**	**2.7100e-003**	**2.0000e-005**	**9.2000e-004**	**0.0000**	**9.2000e-004**	**2.5000e-004**	**0.0000**	**2.6000e-004**	**0.0000**	**1.7125**	**1.7125**	**8.0000e-005**	**0.0000**	**1.7147**

3.6 Paving - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5300e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

3.6 Paving - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.4000e-004	1.6200e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4569	0.4569	1.0000e-005	0.0000	0.4571
Total	**2.3000e-004**	**1.4000e-004**	**1.6200e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4569**	**0.4569**	**1.0000e-005**	**0.0000**	**0.4571**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Off-Road	1.5300e-003	0.0138	0.0176	3.0000e-005		6.6000e-004	6.6000e-004		6.2000e-004	6.2000e-004	0.0000	2.3498	2.3498	6.8000e-004	0.0000	2.3669
Paving	0.0000					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**1.5300e-003**	**0.0138**	**0.0176**	**3.0000e-005**		**6.6000e-004**	**6.6000e-004**		**6.2000e-004**	**6.2000e-004**	**0.0000**	**2.3498**	**2.3498**	**6.8000e-004**	**0.0000**	**2.3669**

3.6 Paving - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	2.3000e-004	1.4000e-004	1.6200e-003	1.0000e-005	5.6000e-004	0.0000	5.6000e-004	1.5000e-004	0.0000	1.5000e-004	0.0000	0.4569	0.4569	1.0000e-005	0.0000	0.4571
Total	**2.3000e-004**	**1.4000e-004**	**1.6200e-003**	**1.0000e-005**	**5.6000e-004**	**0.0000**	**5.6000e-004**	**1.5000e-004**	**0.0000**	**1.5000e-004**	**0.0000**	**0.4569**	**0.4569**	**1.0000e-005**	**0.0000**	**0.4571**

3.7 Architectural Coating - 2023

Unmitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0313					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0318**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

3.7 Architectural Coating - 2023

Unmitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated Construction On-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Archit. Coating	0.0313					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Off-Road	4.8000e-004	3.2600e-003	4.5300e-003	1.0000e-005		1.8000e-004	1.8000e-004		1.8000e-004	1.8000e-004	0.0000	0.6383	0.6383	4.0000e-005	0.0000	0.6393
Total	**0.0318**	**3.2600e-003**	**4.5300e-003**	**1.0000e-005**		**1.8000e-004**	**1.8000e-004**		**1.8000e-004**	**1.8000e-004**	**0.0000**	**0.6383**	**0.6383**	**4.0000e-005**	**0.0000**	**0.6393**

3.7 Architectural Coating - 2023

Mitigated Construction Off-Site

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Hauling	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Vendor	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Worker	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

4.0 Operational Detail - Mobile

4.1 Mitigation Measures Mobile

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4.2 Trip Summary Information

	Average Daily Trip Rate			Unmitigated	Mitigated
Land Use	Weekday	Saturday	Sunday	Annual VMT	Annual VMT
User Defined Commercial	0.00	0.00	0.00		
Total	0.00	0.00	0.00		

4.3 Trip Type Information

	Miles			Trip %			Trip Purpose %		
Land Use	H-W or C-W	H-S or C-C	H-O or C-NW	H-W or C-W	H-S or C-C	H-O or C-NW	Primary	Diverted	Pass-by
User Defined Commercial	14.70	6.60	6.60	0.00	0.00	0.00	0	0	0

4.4 Fleet Mix

Land Use	LDA	LDT1	LDT2	MDV	LHD1	LHD2	MHD	HHD	OBUS	UBUS	MCY	SBUS	MH
User Defined Commercial	0.544823	0.030518	0.165561	0.108739	0.017640	0.004881	0.013984	0.100698	0.002705	0.001640	0.006798	0.001202	0.000811

5.0 Energy Detail

Historical Energy Use: N

5.1 Mitigation Measures Energy

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Electricity Mitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Electricity Unmitigated						0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Mitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
NaturalGas Unmitigated	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

5.2 Energy by Land Use - NaturalGas

Unmitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.2 Energy by Land Use - NaturalGas

Mitigated

	NaturalGas Use	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Land Use	kBTU/yr	tons/yr										MT/yr					
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Unmitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

5.3 Energy by Land Use - Electricity

Mitigated

	Electricity Use	Total CO2	CH4	N2O	CO2e
Land Use	kWh/yr	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

6.0 Area Detail

6.1 Mitigation Measures Area

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
Category	tons/yr										MT/yr					
Mitigated	0.0207	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.0000e-005	8.0000e-005	0.0000	0.0000	9.0000e-005
Unmitigated	0.0207	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.0000e-005	8.0000e-005	0.0000	0.0000	9.0000e-005

6.2 Area by SubCategory

Unmitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.1300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0176					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.0000e-005	8.0000e-005	0.0000	0.0000	9.0000e-005
Total	**0.0207**	**0.0000**	**4.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0000**	**9.0000e-005**

Mitigated

	ROG	NOx	CO	SO2	Fugitive PM10	Exhaust PM10	PM10 Total	Fugitive PM2.5	Exhaust PM2.5	PM2.5 Total	Bio- CO2	NBio- CO2	Total CO2	CH4	N2O	CO2e
SubCategory	tons/yr										MT/yr					
Architectural Coating	3.1300e-003					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Consumer Products	0.0176					0.0000	0.0000		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Landscaping	0.0000	0.0000	4.0000e-005	0.0000		0.0000	0.0000		0.0000	0.0000	0.0000	8.0000e-005	8.0000e-005	0.0000	0.0000	9.0000e-005
Total	**0.0207**	**0.0000**	**4.0000e-005**	**0.0000**		**0.0000**	**0.0000**		**0.0000**	**0.0000**	**0.0000**	**8.0000e-005**	**8.0000e-005**	**0.0000**	**0.0000**	**9.0000e-005**

7.0 Water Detail

7.1 Mitigation Measures Water

	Total CO2	CH4	N2O	CO2e
Category	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

7.2 Water by Land Use

Unmitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

7.2 Water by Land Use

Mitigated

	Indoor/Outdoor Use	Total CO2	CH4	N2O	CO2e
Land Use	Mgal	MT/yr			
User Defined Commercial	0 / 0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

8.0 Waste Detail

8.1 Mitigation Measures Waste

Category/Year

	Total CO2	CH4	N2O	CO2e
	MT/yr			
Mitigated	0.0000	0.0000	0.0000	0.0000
Unmitigated	0.0000	0.0000	0.0000	0.0000

8.2 Waste by Land Use

Unmitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

Mitigated

	Waste Disposed	Total CO2	CH4	N2O	CO2e
Land Use	tons	MT/yr			
User Defined Commercial	0	0.0000	0.0000	0.0000	0.0000
Total		**0.0000**	**0.0000**	**0.0000**	**0.0000**

9.0 Operational Offroad

Equipment Type	Number	Hours/Day	Days/Year	Horse Power	Load Factor	Fuel Type

10.0 Stationary Equipment

Fire Pumps and Emergency Generators

Equipment Type	Number	Hours/Day	Hours/Year	Horse Power	Load Factor	Fuel Type

Boilers

Equipment Type	Number	Heat Input/Day	Heat Input/Year	Boiler Rating	Fuel Type

User Defined Equipment

Equipment Type	Number

11.0 Vegetation

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Avenue 17 Widening

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.32	10.69	14.28	1.11	0.61	0.50	0.64	0.54	0.10	0.02	2,370.17	0.59	0.07	2,405.54
Grading/Excavation	6.59	49.72	75.09	3.71	3.21	0.50	2.97	2.87	0.10	0.11	11,126.63	2.89	0.34	11,301.39
Drainage/Utilities/Sub-Grade	3.69	31.06	37.22	2.30	1.80	0.50	1.78	1.67	0.10	0.06	5,736.14	1.21	0.08	5,791.45
Paving	2.60	20.29	29.16	1.39	1.39	0.00	1.17	1.17	0.00	0.06	5,904.32	0.79	0.53	6,082.33
Maximum (pounds/day)	6.59	49.72	75.09	3.71	3.21	0.50	2.97	2.87	0.10	0.11	11,126.63	2.89	0.53	11,301.39
Total (tons/construction project)	0.29	2.30	3.22	0.17	0.14	0.03	0.14	0.13	0.01	0.01	500.34	0.12	0.02	508.23

Notes:

Project Start Year ->	2020
Project Length (months) ->	6
Total Project Area (acres) ->	6
Maximum Area Disturbed/Day (acres) ->	0
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	5	0	30	0	280	40
Grading/Excavation	37	171	60	270	880	40
Drainage/Utilities/Sub-Grade	0	0	0	0	600	40
Paving	9	447	30	690	480	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Avenue 17 Widening

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.07	0.09	0.01	0.00	0.00	0.00	0.00	0.00	0.00	15.64	0.00	0.00	14.40
Grading/Excavation	0.17	1.31	1.98	0.10	0.08	0.01	0.08	0.08	0.00	0.00	293.74	0.08	0.01	270.67
Drainage/Utilities/Sub-Grade	0.09	0.72	0.86	0.05	0.04	0.01	0.04	0.04	0.00	0.00	132.50	0.03	0.00	121.37
Paving	0.03	0.20	0.29	0.01	0.01	0.00	0.01	0.01	0.00	0.00	58.45	0.01	0.01	54.63
Maximum (tons/phase)	0.17	1.31	1.98	0.10	0.08	0.01	0.08	0.08	0.00	0.00	293.74	0.08	0.01	270.67
Total (tons/construction project)	0.29	2.30	3.22	0.17	0.14	0.03	0.14	0.13	0.01	0.01	500.34	0.12	0.02	461.06

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Golden State Widening Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	1.45	11.53	15.02	1.64	0.64	1.00	0.78	0.57	0.21	0.03	2,531.35	0.60	0.07	2,567.82
Grading/Excavation	7.11	51.51	81.40	4.42	3.42	1.00	3.23	3.03	0.21	0.13	12,664.32	2.92	0.56	12,905.11
Drainage/Utilities/Sub-Grade	3.83	32.03	37.98	2.84	1.84	1.00	1.91	1.70	0.21	0.06	5,928.60	1.23	0.09	5,985.31
Paving	3.50	23.02	41.05	1.77	1.77	0.00	1.45	1.45	0.00	0.09	8,818.52	0.84	0.97	9,127.49
Maximum (pounds/day)	7.11	51.51	81.40	4.42	3.42	1.00	3.23	3.03	0.21	0.13	12,664.32	2.92	0.97	12,905.11
Total (tons/construction project)	0.32	2.40	3.53	0.21	0.15	0.06	0.15	0.14	0.01	0.01	575.30	0.12	0.03	586.27

Notes:

Project Start Year ->	2020
Project Length (months) ->	6
Total Project Area (acres) ->	11
Maximum Area Disturbed/Day (acres) ->	0
Water Truck Used? ->	Yes

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	11	0	30	0	360	40
Grading/Excavation	74	343	120	540	960	40
Drainage/Utilities/Sub-Grade	0	0	0	0	720	40
Paving	18	894	30	1,350	560	40

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Golden State Widening Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.01	0.08	0.10	0.01	0.00	0.01	0.01	0.00	0.00	0.00	16.71	0.00	0.00	15.37
Grading/Excavation	0.19	1.36	2.15	0.12	0.09	0.03	0.09	0.08	0.01	0.00	334.34	0.08	0.01	309.08
Drainage/Utilities/Sub-Grade	0.09	0.74	0.88	0.07	0.04	0.02	0.04	0.04	0.00	0.00	136.95	0.03	0.00	125.43
Paving	0.03	0.23	0.41	0.02	0.02	0.00	0.01	0.01	0.00	0.00	87.30	0.01	0.01	81.98
Maximum (tons/phase)	0.19	1.36	2.15	0.12	0.09	0.03	0.09	0.08	0.01	0.00	334.34	0.08	0.01	309.08
Total (tons/construction project)	0.32	2.40	3.53	0.21	0.15	0.06	0.15	0.14	0.01	0.01	575.30	0.12	0.03	531.86

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Water Line Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.00	0.00	0.00	0.40	0.00	0.40	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	2.39	14.73	27.38	1.62	1.22	0.40	1.14	1.06	0.08	0.05	4,557.93	0.84	0.31	4,670.46
Drainage/Utilities/Sub-Grade	2.15	14.13	23.84	1.51	1.11	0.40	1.06	0.98	0.08	0.04	3,681.97	0.83	0.17	3,753.19
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (pounds/day)	2.39	14.73	27.38	1.62	1.22	0.40	1.14	1.06	0.08	0.05	4,557.93	0.84	0.31	4,670.46
Total (tons/construction project)	0.15	0.95	1.65	0.10	0.08	0.03	0.07	0.07	0.01	0.00	262.28	0.05	0.01	267.89

Notes:
Project Start Year -> 2020
Project Length (months) -> 6
Total Project Area (acres) -> 2
Maximum Area Disturbed/Day (acres) -> 0
Water Truck Used? -> No

Phase	Total Material Imported/Exported Volume (yd^3/day): Soil	Asphalt	Daily VMT (miles/day): Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	262	0	420	0	400	0
Drainage/Utilities/Sub-Grade	131	0	210	0	400	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Water Line Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	0.05	0.32	0.60	0.04	0.03	0.01	0.03	0.02	0.00	0.00	100.27	0.02	0.01	93.21
Drainage/Utilities/Sub-Grade	0.09	0.62	1.05	0.07	0.05	0.02	0.05	0.04	0.00	0.00	162.01	0.04	0.01	149.81
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (tons/phase)	0.09	0.62	1.05	0.07	0.05	0.02	0.05	0.04	0.00	0.00	162.01	0.04	0.01	149.81
Total (tons/construction project)	0.15	0.95	1.65	0.10	0.08	0.03	0.07	0.07	0.01	0.00	262.28	0.05	0.01	243.03

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

Road Construction Emissions Model, Version 9.0.0

Daily Emission Estimates for -> Sewer Line

Project Phases (Pounds)	ROG (lbs/day)	CO (lbs/day)	NOx (lbs/day)	Total PM10 (lbs/day)	Exhaust PM10 (lbs/day)	Fugitive Dust PM10 (lbs/day)	Total PM2.5 (lbs/day)	Exhaust PM2.5 (lbs/day)	Fugitive Dust PM2.5 (lbs/day)	SOx (lbs/day)	CO2 (lbs/day)	CH4 (lbs/day)	N2O (lbs/day)	CO2e (lbs/day)
Grubbing/Land Clearing	0.00	0.00	0.00	0.20	0.00	0.20	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	2.00	13.27	22.26	1.25	1.05	0.20	0.98	0.94	0.04	0.03	3,150.18	0.82	0.11	3,202.18
Drainage/Utilities/Sub-Grade	1.93	13.10	21.24	1.21	1.01	0.20	0.96	0.92	0.04	0.03	2,899.90	0.81	0.07	2,940.10
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (pounds/day)	2.00	13.27	22.26	1.25	1.05	0.20	0.98	0.94	0.04	0.03	3,150.18	0.82	0.11	3,202.18
Total (tons/construction project)	0.06	0.43	0.71	0.04	0.03	0.01	0.03	0.03	0.00	0.00	98.45	0.03	0.00	99.91

Notes: Project Start Year -> 2020
Project Length (months) -> 3
Total Project Area (acres) -> 0
Maximum Area Disturbed/Day (acres) -> 0
Water Truck Used? -> No

	Total Material Imported/Exported Volume (yd^3/day)		Daily VMT (miles/day)			
Phase	Soil	Asphalt	Soil Hauling	Asphalt Hauling	Worker Commute	Water Truck
Grubbing/Land Clearing	0	0	0	0	0	0
Grading/Excavation	65	0	120	0	200	0
Drainage/Utilities/Sub-Grade	33	0	60	0	200	0
Paving	0	0	0	0	0	0

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

Total Emission Estimates by Phase for -> Sewer Line

Project Phases (Tons for all except CO2e. Metric tonnes for CO2e)	ROG (tons/phase)	CO (tons/phase)	NOx (tons/phase)	Total PM10 (tons/phase)	Exhaust PM10 (tons/phase)	Fugitive Dust PM10 (tons/phase)	Total PM2.5 (tons/phase)	Exhaust PM2.5 (tons/phase)	Fugitive Dust PM2.5 (tons/phase)	SOx (tons/phase)	CO2 (tons/phase)	CH4 (tons/phase)	N2O (tons/phase)	CO2e (MT/phase)
Grubbing/Land Clearing	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Grading/Excavation	0.02	0.15	0.24	0.01	0.01	0.00	0.01	0.01	0.00	0.00	34.65	0.01	0.00	31.95
Drainage/Utilities/Sub-Grade	0.04	0.29	0.47	0.03	0.02	0.00	0.02	0.02	0.00	0.00	63.80	0.02	0.00	58.68
Paving	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Maximum (tons/phase)	0.04	0.29	0.47	0.03	0.02	0.00	0.02	0.02	0.00	0.00	63.80	0.02	0.00	58.68
Total (tons/construction project)	0.06	0.43	0.71	0.04	0.03	0.01	0.03	0.03	0.00	0.00	98.45	0.03	0.00	90.63

PM10 and PM2.5 estimates assume 50% control of fugitive dust from watering and associated dust control measures if a minimum number of water trucks are specified.

Total PM10 emissions shown in column F are the sum of exhaust and fugitive dust emissions shown in columns G and H. Total PM2.5 emissions shown in Column I are the sum of exhaust and fugitive dust emissions shown in columns J and K.

CO2e emissions are estimated by multiplying mass emissions for each GHG by its global warming potential (GWP), 1 , 25 and 298 for CO2, CH4 and N2O, respectively. Total CO2e is then estimated by summing CO2e estimates over all GHGs.

The CO2e emissions are reported as metric tons per phase.

ATTACHMENT D

BIOLOGICAL MEMORANDUM

ANALYTICAL ENVIRONMENTAL SERVICES
1801 7TH STREET, SUITE 100
SACRAMENTO, CA 95811
(916) 447-3479 | FAX (916) 447-1665

BIOLOGICAL MEMORANDUM

To:	North Fork Rancheria of Mono Indians
From:	Kelli Raymond, Biologist Analytical Environmental Services
Project:	North Fork Casino Project
Date:	2/23/2021

1.0 INTRODUCTION

The North Fork Rancheria of Mono Indians (Tribe) proposes to develop a casino gaming facility within lands held in trust for the Tribe in Madera County, CA (Proposed Project). The Proposed Project would occur entirely on trust land located immediately north of the City of Madera and adjacent to State Route 99 (project site)(**Figure 1** and **2**). The Proposed Project includes the following components:

- A casino with gaming tables, high-limit gaming, and bingo;
- A food court, several bars, and two restaurants;
- A bioretention pond;
- On-site parking;
- Installation of an off-site groundwater well to be owned and operated by the City of Madera (City); and
- On and off-site installation of water and wastewater pipelines with connections to City services.

The transfer of the project site into federal trust and development of a larger casino project that included a hotel resort was evaluated in an Environmental Impact Statement finalized and approved in 2012. Due to the passage of time and reduction in the size of the Proposed Project, an updated analysis of the Proposed Project's environmental impacts is necessary. The purpose of the memorandum is to describe current biological conditions on the project site in support of the analysis to be included in the Supplemental Information Report being prepared for the Proposed Project. This memorandum also evaluates resources present in areas subject to traffic improvement mitigation activities.

2.0 METHODOLOGY

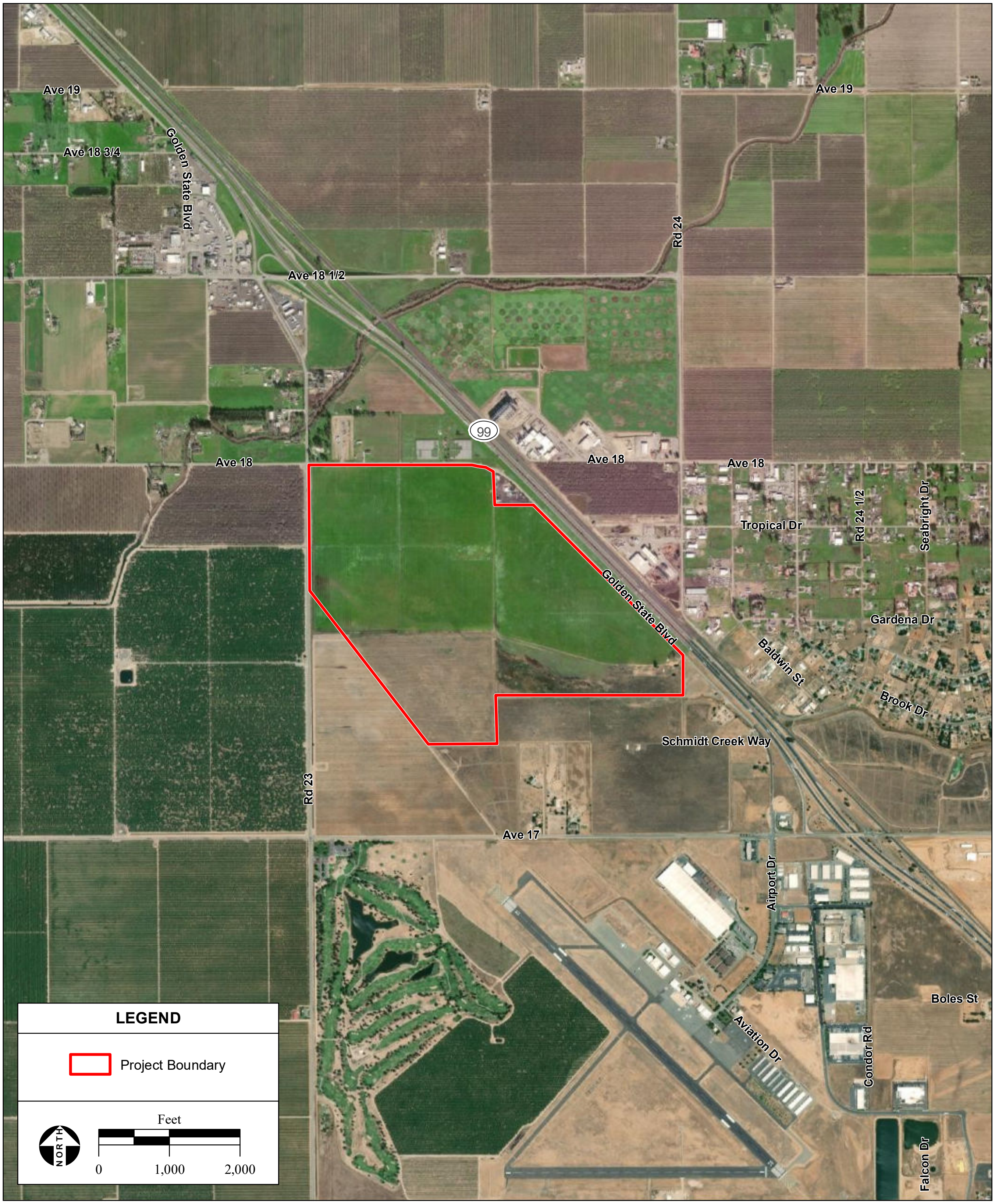
The following information was obtained and reviewed in support of this analysis:

- Aerial photographs of the project site and surrounding area;
- U.S. Fish and Wildlife Service (USFWS) Information for Planning and Conservation list, queried January 19, 2021 (**Attachment A**);
- California Natural Diversity Database list, queried January 19, 2021 (**Attachment A**);
- California Native Plant Society list, queried January 19, 2021 (**Attachment A**);
- USFWS National Wetlands Inventory map of wetland features, queried January 27, 2021 (**Attachment A**); and
- Natural Resources Conservation Service (NRCS) custom soils report, queried January 27, 2021 (**Attachment B**)

SOURCE: NatGeo 2021; AES, 2/8/2021

North Fork Casino Project Biological Memorandum / 204502

Figure 1
Regional Location



SOURCE: Vivid/Maxar aerial photograph, 2019; AES, 2/8/2021

Figure 2
Aerial Site Map

3.0 ENVIRONMENTAL SETTING

3.1 SOIL TYPES

The project site is comprised of several soil types. The approximate acres and percentage of the project site by soil type is summarized in **Table 1**. A custom soils report for the project site can be found in **Attachment B**.

Table 1 – Soil Types on the Project Site

Soil Type	Approximate Acres	Approximate Percentage of Project Site
San Joaquin sandy loam, 0 to 3 percent slopes	234.2	73.4
Atwater loamy sand, moderately deep and deep over hardpan, 0 to 3 percent slopes	55.9	17.5
Tujunga loamy sand, 0 to 3 percent slopes	13.4	4.2
Hanford sandy loam, moderately deep and deep over hardpan, 0 to 3 percent slopes	12.9	4.0
Hanford sandy loam, 0 to 3 percent slopes	1.7	0.5
San Joaquin-Alamo complex, 0 to 3 percent slopes	1.1	0.4

San Joaquin sandy loam and San Joaquin-Alamo complex are not prime farmland and are moderately drained with high runoff potential. Other soils on the project site are well-drained with low runoff potential and can be prime farmland if irrigated properly. In addition, Hanford sandy loam, moderately deep and deep over hardpan, 0 to 3 percent slopes is considered a soil that underlays farmland of statewide importance.

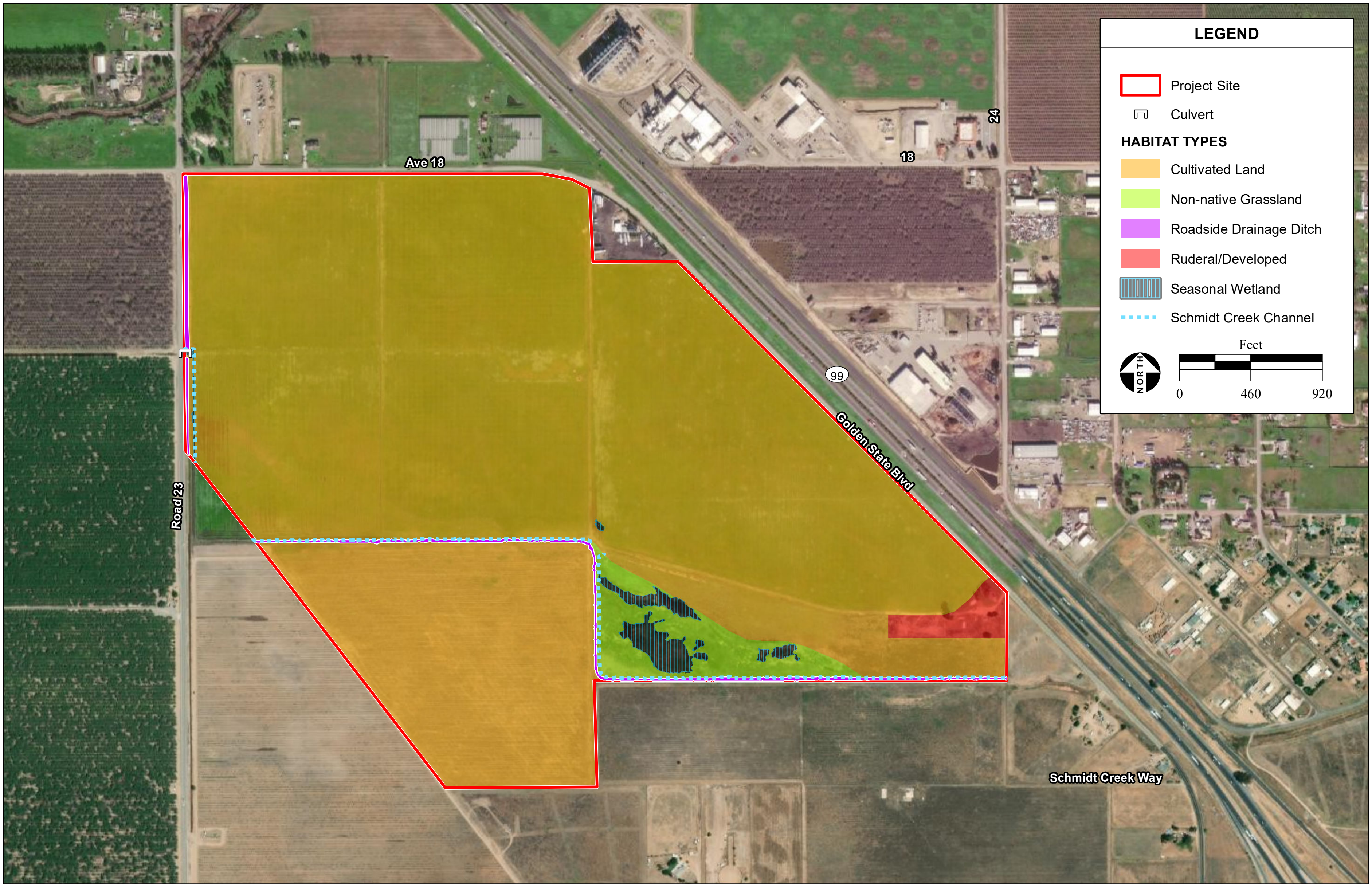
3.2 HABITAT TYPES

Habitat types and acreages are summarized in **Table 2** and discussed further below. A figure showing habitat types present on the project site is presented as **Figure 3**.

Table 2 – Habitat Types on the Project Site

Habitat Type	Acres on the Project Site
Cultivated Land	288.3
Non-native Grassland	11.2
Ruderal/Developed	3.8
Seasonal Wetland	4.0
Roadside Drainage Ditch	0.7
Schmidt Creek Channel	6,672.6 linear feet
Total	**308**

The majority of the project site consists of cultivated land. Historically the site was largely used for grain farming. Annual grassland occurs in the southwest portion of the project site where agricultural activities have not recently occurred. An existing, uninhabited structure and associated development occur in the southeast portion of the project site. A few seasonal wetlands occur in the southern portion of the project site within the cultivated lands. A roadside drainage ditch bounds the western extent of the project site along Road 23, and Schmidt Creek Channel occurs along the boundary between the annual grassland and cultivated habitat.



SOURCE: Vivid/Maxar 7/24/2019; AES, 1/28/2021

Figure 3
Habitat Map

Additionally, areas identified for future water pipeline, wastewater pipeline, and traffic improvement were surveyed. These areas consisted of roadways and road shoulders that were paved or highly modified and did not contain significant plant or wildlife habitat. A small swale was observed near the SR-99 intersection improvement area, though this area was recently mowed and occurs between offramp and highway lanes.

3.3 Special-Status Species

Data review and special-status species searches yield 14 special-status plant species and 13 special-status wildlife species with the potential to occur in the region of the project site and infrastructure improvement areas (**Attachment A**). Habitat requirements of regionally occurring special-status species were compared with the type, quality, and quantity of habitat present on the project site. Species with no potential to occur on the project site were ruled out based on site characteristics such as habitat type, level of disturbance, soils, elevation, or similar environmental indicators. The project site and infrastructure improvement areas do not contain suitable habitat to support regionally occurring special-status plants, and no special-status plants were observed at the time of the survey. The following special-status species were determined to have the potential to occur on the project site:

- Western spadefoot toad (*Spea hammondii*): Has the potential to occur within the seasonal wetlands associated with the Schmidt Creek Channel and may utilize non-native grasslands for upland habitat. Has not historically been observed on site and does not have the potential to occur within infrastructure improvement areas.
- Burrowing owl (*Athene cunicularia*): Has the potential to forage in agricultural lands on the project site and adjacent to infrastructure improvement areas with nearby agricultural or undeveloped lands. Burrows suitable to support burrowing owls were not observed but may appear over time. At the time of the survey, ground cover over foraging lands was sub-optimal for target prey species such as rodents. Has not historically been observed on site.
- Swainson's hawk (*Buteo swainsoni*): Has the potential to forage over agricultural lands. Scattered trees on site may also provide nesting habitat. At the time of the survey, ground cover over foraging lands was sub-optimal for target prey species such as rodents. Has not historically been observed on site. May also nest in the vicinity of the infrastructure improvement areas.

3.4 Wildlife Movement

The project site is located immediately north of the City of Madera. Adjacent land uses consist largely of agricultural production lands, and State Route 99 bounds the site to the east. The Madera Municipal Airport and Madera Municipal Golf Course are immediately south of the project site. Rural to dense residential development occur to the east and south of the project site. Due to the existing disturbance on the project site and the surrounding development, disturbance, and major roadways, wildlife access to the project site is extremely limited. Additionally, the project site and infrastructure improvement areas do not contain any features that would facilitate wildlife movement or access to adjacent areas.

3.5 Critical Habitat

No USFWS designated or proposed Critical Habitat occurs on the project site (**Attachment A**). The nearest Critical Habitat is approximately 6.0 miles northeast of the project site for Greene's tuctoria (Tuctoria greenei) and San Joaquin Orcutt grass (*Orcuttia inaequalis*)(USFWS, 2021).

4.0 RESULTS

4.1 SENSITIVE HABITAT

Table 3 below identifies the habitats on the project site that will be affected by the Proposed Project. Additionally, areas proposed for off-site infrastructure improvements were along existing roadways and roadway shoulders. These habitats are developed and highly disturbed and are not considered sensitive or suitable for special-status species. The cultivated land, annual grassland, and ruderal/developed habitats on the project site are not considered sensitive. The roadside drainage ditch along the western boundary of the project site is manmade, channelized, and does not support significant vegetation. This feature does not offer habitat suitable for supporting special-status species and will not be altered by the Proposed Project, though it is noted in **Table 3** that minimal fringe impacts may exist near the western access road.

Table 3 – Habitat Types Impacted by the Proposed Project

Habitat Type	Acres on the Project Site
Cultivated Land	64.3
Non-native Grassland	0.0
Ruderal/Developed	0.2
Seasonal Wetland	0.0
Roadside Drainage Ditch	0.03
Schmidt Creek Channel	0.0
Total	**64.53**

Schmidt Creek Channel on the project site is a manmade and channelized feature that typically contains water only after periods of intense rainfall. However, this feature is associated with nearby seasonal wetland habitat, which has the potential to support western spadefoot toad. Therefore, both the seasonal wetland and Schmidt Creek Channel are considered sensitive and direct or indirect impacts to these habitats would therefore be significant. The project design avoids direct impacts to these features and would be required to obtain and adhere to a Stormwater Pollution Prevention Plan, thus preventing degradation of off-site aquatic habitat.

4.2 NESTING AND MIGRATORY BIRDS

Migratory birds and their nests are protected from "take" by the Migratory Bird Treaty Act (16 U.SC. 703-711), which makes it unlawful to "…pursue, hunt, take, capture, kill, attempt to take, capture or kill, possess or any part, nest, or egg of any such bird…" (50 CFR 10). Nesting birds are similarly afforded protection against disturbance or destruction under California Fish and Game Code. The project site, off-site infrastructure improvement areas, and habitat surrounding these areas have the potential to support nesting birds, including the special-status Swainson's hawk and burrowing owl. Disturbance of active burrowing owl burrows or nesting birds would be a significant impact.

4.3 SPECIAL-STATUS SPECIES

As discussed in **Section 3.3**, the project site does not have the potential to support special-status plant species. However, there is the potential for burrowing owls to occur on the project site. Although burrows were not observed at the time of surveys, removal and disturbance of suitable burrows, should burrows become established, would be potentially significant. Additionally, loss of foraging habitat is generally considered a significant impact to Swainson's hawk. Finally, direct or indirect impact to western spadefoot toad habitat would be potentially significant. However, the Proposed Project avoids impacts to suitable habitat for this species and would avoid indirect impacts associated with impaired water runoff through implementation of the required Stormwater Pollution Prevention Plan.

4.4 Wildlife Movement

As discussed in **Section 3.4**, the project site is within a highly developed area that is surrounded by barriers to wildlife movement. The project site within an area that lacks wildlife corridors and does not contain any features that would facilitate wildlife movement. Therefore, there would be no impacts to migrating wildlife or wildlife corridors.

5.0 CONCLUSION

The project site is developed within an area of agricultural development, residential development, and major roadways. Surrounding highways, neighboring commercial uses, and nearby residential areas further increase the level of disturbance and decrease wildlife access to the vicinity of the project site. However, seasonal wetlands and the Schmidt Creek Channel on the project site would be considered sensitive, and there is potential for western spadefoot toad, Swainson's hawk, and burrowing owl to occur on the project site. There is also some potential for Swainson's hawk to nest in the vicinity of the infrastructure improvement areas, and burrowing owls have the potential to establish near infrastructure improvements adjacent to agricultural fields and undeveloped land.

6.0 REFERENCES

U.S. Fish and Wildlife Service (USFWS), 2021. Critical Habitat for Threatened and Endangered Species. Available online at: https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap-=9d8de5e265ad4fe09893cf75b8dbfb77. Accessed January 2021.

ATTACHMENT A

PRELIMINARY RESEARCH DATA

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
Phone: (916) 414-6600 Fax: (916) 414-6713

In Reply Refer To: January 19, 2021
Consultation Code: 08ESMF00-2021-SLI-0742
Event Code: 08ESMF00-2021-E-02157
Project Name: North Fork Casino

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, under the jurisdiction of the U.S. Fish and Wildlife Service (Service) that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the Service under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Please follow the link below to see if your proposed project has the potential to affect other species or their habitats under the jurisdiction of the National Marine Fisheries Service:

http://www.nwr.noaa.gov/protected_species/species_list/species_lists.html

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Sacramento Fish And Wildlife Office
Federal Building
2800 Cottage Way, Room W-2605
Sacramento, CA 95825-1846
(916) 414-6600

Project Summary

Consultation Code: 08ESMF00-2021-SLI-0742
Event Code: 08ESMF00-2021-E-02157
Project Name: North Fork Casino
Project Type: DEVELOPMENT
Project Description: Casino development
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@37.00376895,-120.11954602680973,14z

Counties: Madera County, California

Endangered Species Act Species

There is a total of 13 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Mammals

NAME	STATUS
Fresno Kangaroo Rat *Dipodomys nitratoides exilis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5150	Endangered
San Joaquin Kit Fox *Vulpes macrotis mutica* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2873	Endangered

Reptiles

NAME	STATUS
Blunt-nosed Leopard Lizard *Gambelia silus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/625	Endangered
Giant Garter Snake *Thamnophis gigas* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/4482	Threatened

Amphibians

NAME	STATUS
California Red-legged Frog *Rana draytonii* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2891	Threatened
California Tiger Salamander *Ambystoma californiense* Population: U.S.A. (Central CA DPS) There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2076	Threatened

Fishes

NAME	STATUS
Delta Smelt *Hypomesus transpacificus* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/321	Threatened

Crustaceans

NAME	STATUS
Conservancy Fairy Shrimp *Branchinecta conservatio* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8246	Endangered
Vernal Pool Fairy Shrimp *Branchinecta lynchi* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/498	Threatened

Flowering Plants

NAME	STATUS
Fleshy Owl's-clover *Castilleja campestris ssp. succulenta* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/8095	Threatened
Greene's Tuctoria *Tuctoria greenei* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/1573	Endangered
Hairy Orcutt Grass *Orcuttia pilosa* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/2262	Endangered
San Joaquin Orcutt Grass *Orcuttia inaequalis* There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/5506	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

Selected Elements by Scientific Name

California Department of Fish and Wildlife

California Natural Diversity Database

Query Criteria: Quad IS (Kismet (3712011) OR Madera (3612081) OR Berenda (3712012) OR Bonita Ranch (3612082))

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Ambystoma californiense California tiger salamander	AAAAA01180	Threatened	Threatened	G2G3	S2S3	WL
Athene cunicularia burrowing owl	ABNSB10010	None	None	G4	S3	SSC
Atriplex cordulata var. cordulata heartscale	PDCHE040B0	None	None	G3T2	S2	1B.2
Atriplex minuscula lesser saltscale	PDCHE042M0	None	None	G2	S2	1B.1
Atriplex persistens vernal pool smallscale	PDCHE042P0	None	None	G2	S2	1B.2
Atriplex subtilis subtle orache	PDCHE042T0	None	None	G1	S1	1B.2
Branchinecta lynchi vernal pool fairy shrimp	ICBRA03030	Threatened	None	G3	S3	
Branchinecta mesovallensis midvalley fairy shrimp	ICBRA03150	None	None	G2	S2S3	
Buteo swainsoni Swainson's hawk	ABNKC19070	None	Threatened	G5	S3	
Castilleja campestris var. succulenta succulent owl's-clover	PDSCR0D3Z1	Threatened	Endangered	G4?T2T3	S2S3	1B.2
Delphinium recurvatum recurved larkspur	PDRAN0B1J0	None	None	G2?	S2?	1B.2
Dipodomys nitratoides exilis Fresno kangaroo rat	AMAFD03151	Endangered	Endangered	G3TH	SH	
Eryngium spinosepalum spiny-sepaled button-celery	PDAPI0Z0Y0	None	None	G2	S2	1B.2
Gambelia sila blunt-nosed leopard lizard	ARACF07010	Endangered	Endangered	G1	S1	FP
Lasiurus cinereus hoary bat	AMACC05030	None	None	G5	S4	
Layia munzii Munz's tidy-tips	PDAST5N0B0	None	None	G2	S2	1B.2
Leptosiphon serrulatus Madera leptosiphon	PDPLM09130	None	None	G3	S3	1B.2
Linderiella occidentalis California linderiella	ICBRA06010	None	None	G2G3	S2S3	
Lytta moesta moestan blister beetle	IICOL4C020	None	None	G2	S2	

Species	Element Code	Federal Status	State Status	Global Rank	State Rank	Rare Plant Rank/CDFW SSC or FP
Lytta molesta molestan blister beetle	IICOL4C030	None	None	G2	S2	
Navarretia nigelliformis ssp. radians shining navarretia	PDPLM0C0J2	None	None	G4T2	S2	1B.2
Northern Hardpan Vernal Pool Northern Hardpan Vernal Pool	CTT44110CA	None	None	G3	S3.1	
Orcuttia inaequalis San Joaquin Valley Orcutt grass	PMPOA4G060	Threatened	Endangered	G1	S1	1B.1
Orcuttia pilosa hairy Orcutt grass	PMPOA4G040	Endangered	Endangered	G1	S1	1B.1
Phrynosoma blainvillii coast horned lizard	ARACF12100	None	None	G3G4	S3S4	SSC
Puccinellia simplex California alkali grass	PMPOA53110	None	None	G3	S2	1B.2
Spea hammondii western spadefoot	AAABF02020	None	None	G3	S3	SSC
Tuctoria greenei Greene's tuctoria	PMPOA6N010	Endangered	Rare	G1	S1	1B.1
Valley Sacaton Grassland Valley Sacaton Grassland	CTT42120CA	None	None	G1	S1.1	

Record Count: 29

CNPS California Native Plant Society

Inventory of Rare and Endangered Plants

*The database used to provide updates to the Online Inventory is under construction. View updates and changes made since May 2019 here.

Plant List

14 matches found. *Click on scientific name for details*

Search Criteria

Found in Quads 3712012, 3712011 3612081 and 3612082;

Modify Search Criteria Export to Excel Modify Columns Modify Sort Display Photos

Scientific Name	Common Name	Family	Blooming Period	CA Rare Plant Rank	State Rank	State Listing Status	Federal Listing Status
Atriplex cordulata var. cordulata	heartscale	Chenopodiaceae	Apr-Oct	1B.2	S2		
Atriplex minuscula	lesser saltscale	Chenopodiaceae	May-Oct	1B.1	S2		
Atriplex persistens	vernal pool smallscale	Chenopodiaceae	Jun,Aug,Sep,Oct	1B.2	S2		
Atriplex subtilis	subtle orache	Chenopodiaceae	Jun,Aug,Sep(Oct)	1B.2	S1		
Castilleja campestris var. succulenta	succulent owl's-clover	Orobanchaceae	(Mar)Apr-May	1B.2	S2S3	CE	FT
Delphinium hansenii ssp. ewanianum	Ewan's larkspur	Ranunculaceae	Mar-May	4.2	S3		
Delphinium recurvatum	recurved larkspur	Ranunculaceae	Mar-Jun	1B.2	S2?		
Eryngium spinosepalum	spiny-sepaled button-celery	Apiaceae	Apr-Jun	1B.2	S2		
Leptosiphon serrulatus	Madera leptosiphon	Polemoniaceae	Apr-May	1B.2	S3		
Navarretia nigelliformis ssp. radians	shining navarretia	Polemoniaceae	(Mar)Apr-Jul	1B.2	S2		
Orcuttia inaequalis	San Joaquin Valley Orcutt grass	Poaceae	Apr-Sep	1B.1	S1	CE	FT
Orcuttia pilosa	hairy Orcutt grass	Poaceae	May-Sep	1B.1	S1	CE	FE
Puccinellia simplex	California alkali grass	Poaceae	Mar-May	1B.2	S2		
Tuctoria greenei	Greene's tuctoria	Poaceae	May-Jul(Sep)	1B.1	S1	CR	FE

Suggested Citation

California Native Plant Society, Rare Plant Program. 2021. Inventory of Rare and Endangered Plants of California (online edition, v8-03 0.39). Website http://www.rareplants.cnps.org [accessed 19 January 2021].

Search the Inventory

Simple Search

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Glossary

Information

About the Inventory

About the Rare Plant Program

CNPS Home Page

About CNPS

Join CNPS

Contributors

The Calflora Database

The California Lichen Society

California Natural Diversity Database

The Jepson Flora Project

The Consortium of California Herbaria

CalPhotos

Questions and Comments

rareplants@cnps.org

U.S. Fish and Wildlife Service

National Wetlands Inventory

North Fork Casino Project

January 27, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

This map is for general reference only. The US Fish and Wildlife Service is not responsible for the accuracy or currentness of the base data shown on this map. All wetlands related data should be used in accordance with the layer metadata found on the Wetlands Mapper web site.

ATTACHMENT B

NRCS CUSTOM SOILS REPORT

United States Department of Agriculture

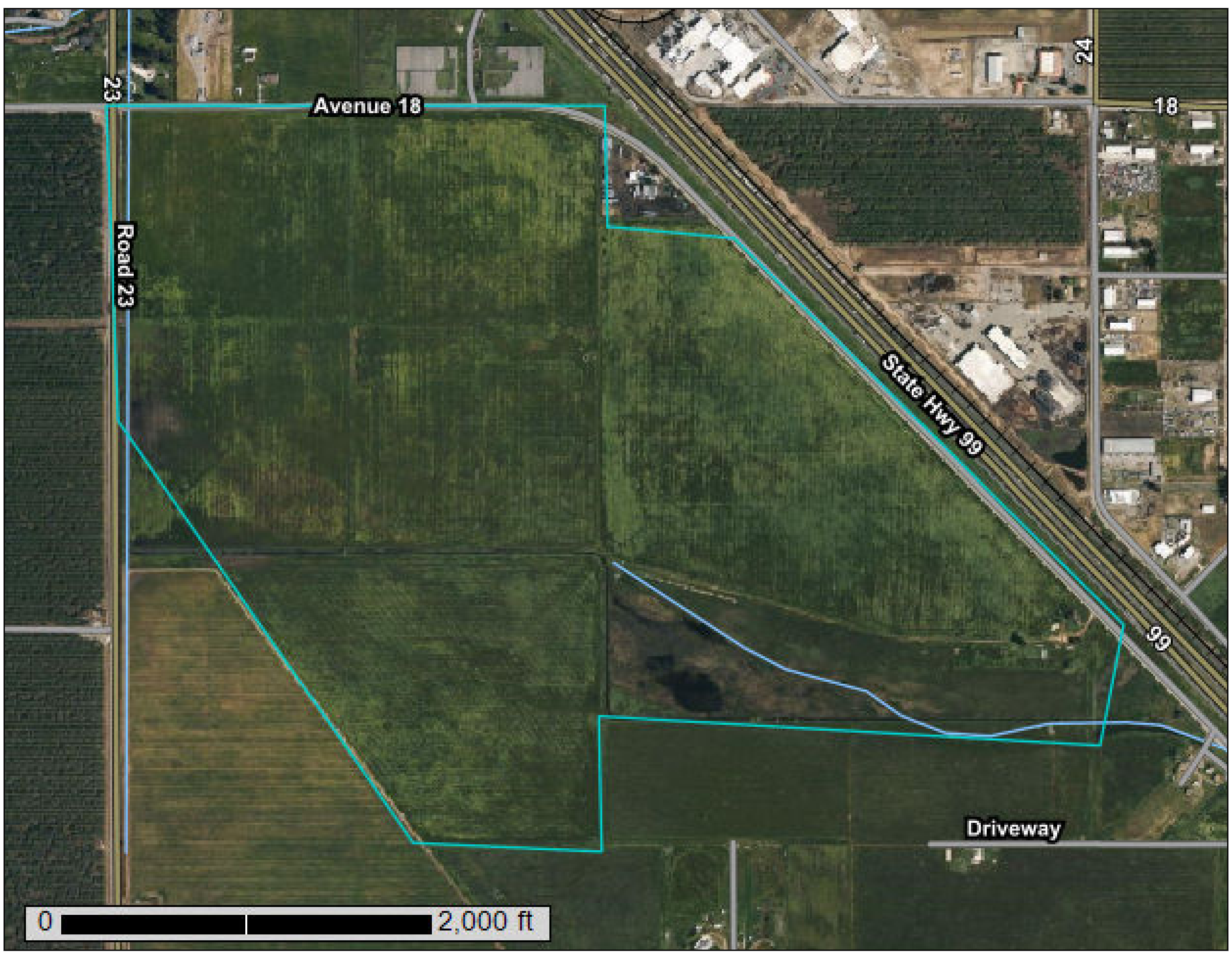
NRCS

Natural Resources Conservation Service

A product of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local participants

Custom Soil Resource Report for

Madera Area, California



January 27, 2021

Preface

Soil surveys contain information that affects land use planning in survey areas. They highlight soil limitations that affect various land uses and provide information about the properties of the soils in the survey areas. Soil surveys are designed for many different users, including farmers, ranchers, foresters, agronomists, urban planners, community officials, engineers, developers, builders, and home buyers. Also, conservationists, teachers, students, and specialists in recreation, waste disposal, and pollution control can use the surveys to help them understand, protect, or enhance the environment.

Various land use regulations of Federal, State, and local governments may impose special restrictions on land use or land treatment. Soil surveys identify soil properties that are used in making various land use or land treatment decisions. The information is intended to help the land users identify and reduce the effects of soil limitations on various land uses. The landowner or user is responsible for identifying and complying with existing laws and regulations.

Although soil survey information can be used for general farm, local, and wider area planning, onsite investigation is needed to supplement this information in some cases. Examples include soil quality assessments (http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/health/) and certain conservation and engineering applications. For more detailed information, contact your local USDA Service Center (https://offices.sc.egov.usda.gov/locator/app?agency=nrcs) or your NRCS State Soil Scientist (http://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/contactus/?cid=nrcs142p2_053951).

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

The National Cooperative Soil Survey is a joint effort of the United States Department of Agriculture and other Federal agencies, State agencies including the Agricultural Experiment Stations, and local agencies. The Natural Resources Conservation Service (NRCS) has leadership for the Federal part of the National Cooperative Soil Survey.

Information about soils is updated periodically. Updated information is available through the NRCS Web Soil Survey, the site for official soil survey information.

The U.S. Department of Agriculture (USDA) prohibits discrimination in all its programs and activities on the basis of race, color, national origin, age, disability, and where applicable, sex, marital status, familial status, parental status, religion, sexual orientation, genetic information, political beliefs, reprisal, or because all or a part of an individual's income is derived from any public assistance program. (Not all prohibited bases apply to all programs.) Persons with disabilities who require alternative means for communication of program information (Braille, large print, audiotape, etc.) should contact USDA's TARGET Center at (202) 720-2600 (voice and TDD). To file a complaint of discrimination, write to USDA, Director, Office of Civil Rights, 1400 Independence Avenue, S.W., Washington, D.C. 20250-9410 or call (800) 795-3272 (voice) or (202) 720-6382 (TDD). USDA is an equal opportunity provider and employer.

Contents

How Soil Surveys Are Made

Soil surveys are made to provide information about the soils and miscellaneous areas in a specific area. They include a description of the soils and miscellaneous areas and their location on the landscape and tables that show soil properties and limitations affecting various uses. Soil scientists observed the steepness, length, and shape of the slopes; the general pattern of drainage; the kinds of crops and native plants; and the kinds of bedrock. They observed and described many soil profiles. A soil profile is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed or from the surface down to bedrock. The unconsolidated material is devoid of roots and other living organisms and has not been changed by other biological activity.

Currently, soils are mapped according to the boundaries of major land resource areas (MLRAs). MLRAs are geographically associated land resource units that share common characteristics related to physiography, geology, climate, water resources, soils, biological resources, and land uses (USDA, 2006). Soil survey areas typically consist of parts of one or more MLRA.

The soils and miscellaneous areas in a survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil and miscellaneous area is associated with a particular kind of landform or with a segment of the landform. By observing the soils and miscellaneous areas in the survey area and relating their position to specific segments of the landform, a soil scientist develops a concept, or model, of how they were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil or miscellaneous area at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-vegetation-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. Soil taxonomy, the system of taxonomic classification used in the United States, is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

The objective of soil mapping is not to delineate pure map unit components; the objective is to separate the landscape into landforms or landform segments that have similar use and management requirements. Each map unit is defined by a unique combination of soil components and/or miscellaneous areas in predictable proportions. Some components may be highly contrasting to the other components of the map unit. The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The delineation of such landforms and landform segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, onsite investigation is needed to define and locate the soils and miscellaneous areas.

Soil scientists make many field observations in the process of producing a soil map. The frequency of observation is dependent upon several factors, including scale of mapping, intensity of mapping, design of map units, complexity of the landscape, and experience of the soil scientist. Observations are made to test and refine the soil-landscape model and predictions and to verify the classification of the soils at specific locations. Once the soil-landscape model is refined, a significantly smaller number of measurements of individual soil properties are made and recorded. These measurements may include field measurements, such as those for color, depth to bedrock, and texture, and laboratory measurements, such as those for content of sand, silt, clay, salt, and other components. Properties of each soil typically vary from one point to another across the landscape.

Observations for map unit components are aggregated to develop ranges of characteristics for the components. The aggregated values are presented. Direct measurements do not exist for every property presented for every map unit component. Values for some properties are estimated from combinations of other properties.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses and under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

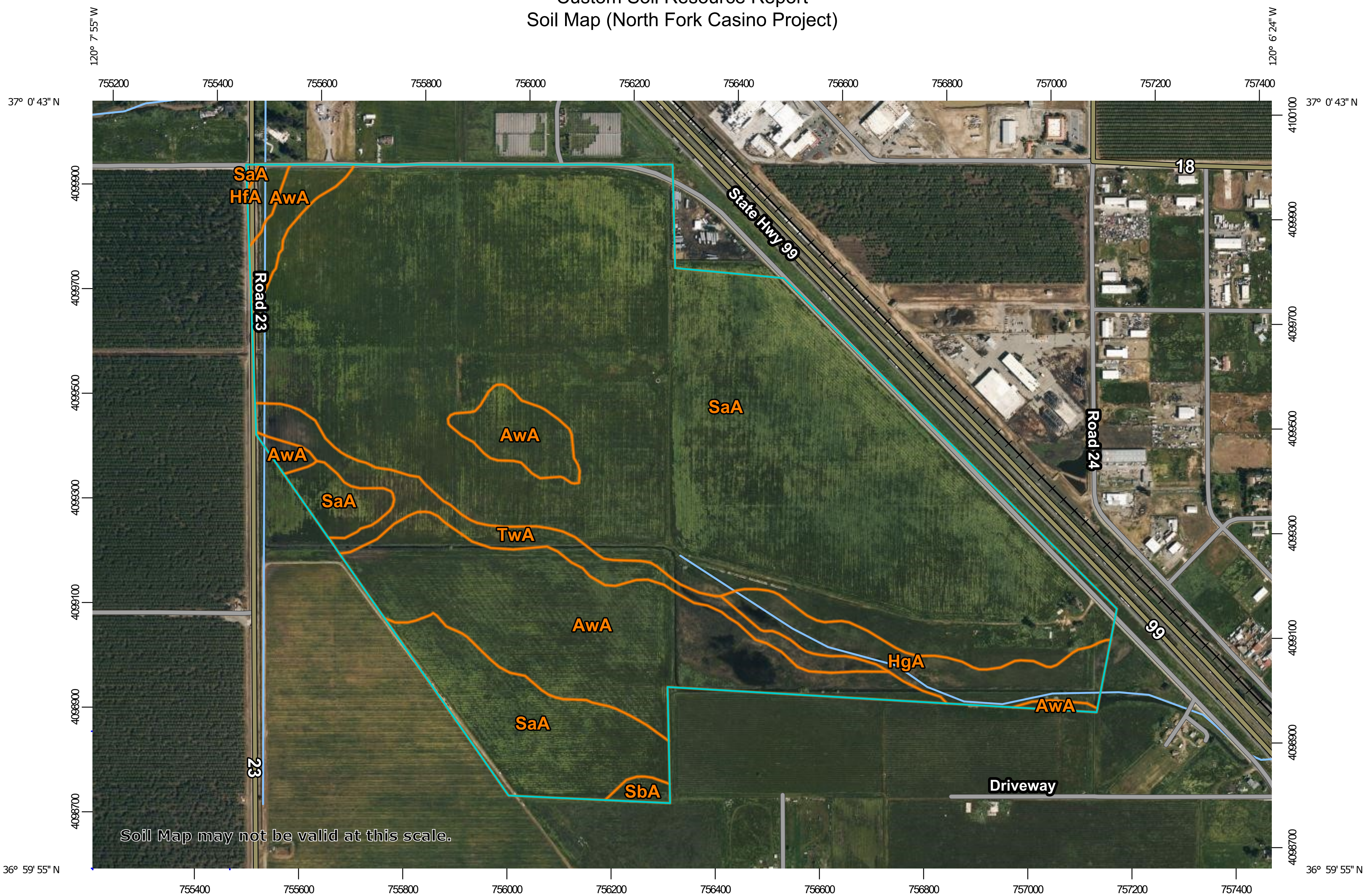
Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot predict that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Soil Map

The soil map section includes the soil map for the defined area of interest, a list of soil map units on the map and extent of each map unit, and cartographic symbols displayed on the map. Also presented are various metadata about data used to produce the map, and a description of each soil map unit.

Custom Soil Resource Report
Soil Map (North Fork Casino Project)



Map Scale: 1:10,300 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0, 150, 300, 600, 900

Feet: 0, 500, 1000, 2000, 3000

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 10N WGS84

MAP LEGEND

Area of Interest (AOI)

Area of Interest (AOI)

Soils

Soil Map Unit Polygons

Soil Map Unit Lines

Soil Map Unit Points

Special Point Features

Blowout

Borrow Pit

Clay Spot

Closed Depression

Gravel Pit

Gravelly Spot

Landfill

Lava Flow

Marsh or swamp

Mine or Quarry

Miscellaneous Water

Perennial Water

Rock Outcrop

Saline Spot

Sandy Spot

Severely Eroded Spot

Sinkhole

Slide or Slip

Sodic Spot

Spoil Area

Stony Spot

Very Stony Spot

Wet Spot

Other

Special Line Features

Water Features

Streams and Canals

Transportation

Rails

Interstate Highways

US Routes

Major Roads

Local Roads

Background

Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:20,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Madera Area, California
Survey Area Data: Version 14, Jun 1, 2020

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Mar 18, 2019—Apr 12, 2019

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend (North Fork Casino Project)

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
AwA	Atwater loamy sand, moderately deep and deep over hardpan, 0 to 3 percent slopes	55.9	17.5%
HfA	Hanford sandy loam, 0 to 3 percent slopes	1.7	0.5%
HgA	Hanford sandy loam, moderately deep and deep over hardpan, 0 to 3 percent slopes	12.9	4.0%
SaA	San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17	234.2	73.4%
SbA	San Joaquin-Alamo complex, 0 to 3 percent slopes	1.1	0.4%
TwA	Tujunga loamy sand, 0 to 3 percent slopes	13.4	4.2%
Totals for Area of Interest		**319.3**	**100.0%**

Map Unit Descriptions (North Fork Casino Project)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions, along with the maps, can be used to determine the composition and properties of a unit.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

Most minor soils have properties similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting, or similar, components. They may or may not be mentioned in a particular map unit description. Other minor components, however, have properties and behavioral characteristics divergent enough to affect use or to require different management. These are called contrasting, or dissimilar, components. They generally are in small areas and could not be mapped separately because of the scale used. Some small areas of strongly contrasting soils or miscellaneous areas are identified by a special symbol on the maps. If included in the database for a given area, the contrasting minor components are identified in the map unit descriptions along with some characteristics of each. A few areas of minor components may not have been observed, and consequently they are not mentioned in the descriptions, especially where the pattern was so complex that it was impractical to make enough observations to identify all the soils and miscellaneous areas on the landscape.

The presence of minor components in a map unit in no way diminishes the usefulness or accuracy of the data. The objective of mapping is not to delineate pure taxonomic classes but rather to separate the landscape into landforms or landform segments that have similar use and management requirements. The delineation of such segments on the map provides sufficient information for the development of resource plans. If intensive use of small areas is planned, however, onsite investigation is needed to define and locate the soils and miscellaneous areas.

An identifying symbol precedes the map unit name in the map unit descriptions. Each description includes general facts about the unit and gives important soil properties and qualities.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer, slope, stoniness, salinity, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Alpha silt loam, 0 to 2 percent slopes, is a phase of the Alpha series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are complexes, associations, or undifferentiated groups.

A *complex* consists of two or more soils or miscellaneous areas in such an intricate pattern or in such small areas that they cannot be shown separately on the maps. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas. Alpha-Beta complex, 0 to 6 percent slopes, is an example.

An *association* is made up of two or more geographically associated soils or miscellaneous areas that are shown as one unit on the maps. Because of present or anticipated uses of the map units in the survey area, it was not considered practical or necessary to map the soils or miscellaneous areas separately. The pattern and relative proportion of the soils or miscellaneous areas are somewhat similar. Alpha-Beta association, 0 to 2 percent slopes, is an example.

An *undifferentiated group* is made up of two or more soils or miscellaneous areas that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils or miscellaneous areas in a mapped area are not uniform. An area can be made up of only one of the major soils or miscellaneous areas, or it can be made up of all of them. Alpha and Beta soils, 0 to 2 percent slopes, is an example.

Some surveys include *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example.

Madera Area, California

AwA—Atwater loamy sand, moderately deep and deep over hardpan, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hk3z
Elevation: 500 feet
Mean annual precipitation: 15 inches
Mean annual air temperature: 61 degrees F
Frost-free period: 250 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Atwater and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Atwater

Setting

Landform: Dunes
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from granite

Typical profile

H1 - 0 to 24 inches: loamy sand
H2 - 24 to 42 inches: sandy loam
H3 - 42 to 60 inches: cemented

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: 42 to 60 inches to duripan
Drainage class: Well drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Low (about 4.1 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 4e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Delhi

Percent of map unit: 5 percent
Hydric soil rating: No

San joaquin

Percent of map unit: 5 percent
Hydric soil rating: No

Whitney

Percent of map unit: 3 percent
Hydric soil rating: No

Unnamed

Percent of map unit: 2 percent
Landform: Depressions
Hydric soil rating: Yes

HfA—Hanford sandy loam, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hk7t
Elevation: 150 to 900 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 280 days
Farmland classification: Prime farmland if irrigated

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanford

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile

H1 - 0 to 12 inches: sandy loam
H2 - 12 to 36 inches: fine sandy loam
H3 - 36 to 60 inches: stratified gravelly loamy sand to gravelly sandy loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): High (1.98 to 5.95 in/hr)
Depth to water table: More than 80 inches

Frequency of flooding: Rare
Frequency of ponding: None
Available water capacity: Moderate (about 7.1 inches)

Interpretive groups

Land capability classification (irrigated): 1
Land capability classification (nonirrigated): 4c
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

San joaquin

Percent of map unit: 5 percent
Hydric soil rating: No

Ramona

Percent of map unit: 5 percent
Hydric soil rating: No

Greenfield

Percent of map unit: 5 percent
Hydric soil rating: No

HgA—Hanford sandy loam, moderately deep and deep over hardpan, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hk7v
Elevation: 150 to 900 feet
Mean annual precipitation: 10 to 20 inches
Mean annual air temperature: 63 degrees F
Frost-free period: 250 to 280 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Hanford and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Hanford

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Talf
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from igneous rock

Typical profile

H1 - 0 to 12 inches: sandy loam

H2 - 12 to 36 inches: fine sandy loam
H3 - 36 to 60 inches: cemented

Properties and qualities
Slope: 0 to 3 percent
Depth to restrictive feature: 36 to 60 inches to duripan
Drainage class: Well drained
Runoff class: Very low
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: Rare
Frequency of ponding: None
Available water capacity: Low (about 4.7 inches)

Interpretive groups
Land capability classification (irrigated): 3s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: B
Hydric soil rating: No

Minor Components

Greenfield
Percent of map unit: 5 percent
Hydric soil rating: No

Madera
Percent of map unit: 5 percent
Hydric soil rating: No

San joaquin
Percent of map unit: 5 percent
Hydric soil rating: No

SaA—San Joaquin sandy loam, 0 to 3 percent slopes, MLRA 17

Map Unit Setting
National map unit symbol: 2vncw
Elevation: 90 to 520 feet
Mean annual precipitation: 9 to 17 inches
Mean annual air temperature: 62 to 64 degrees F
Frost-free period: 240 to 300 days
Farmland classification: Not prime farmland

Map Unit Composition
San joaquin and similar soils: 90 percent
Minor components: 10 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Joaquin

Setting

Landform: Fan remnants, terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

Ap - 0 to 9 inches: sandy loam
Bt1 - 9 to 15 inches: sandy clay loam
2Bt2 - 15 to 21 inches: clay
2Bkqm - 21 to 37 inches: cemented material
2C - 37 to 79 inches: loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches; 19 to 25 inches to duripan
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 8 to 12 inches
Frequency of flooding: None
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Sodium adsorption ratio, maximum: 4.0
Available water capacity: Very low (about 2.1 inches)

Interpretive groups

Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Snelling

Percent of map unit: 5 percent
Landform: Fan remnants, terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve, tread
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: No

Alamo

Percent of map unit: 4 percent
Landform: Fan remnants, terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve, tread
Microfeatures of landform position: Open depressions, open depressions
Down-slope shape: Linear
Across-slope shape: Linear

Hydric soil rating: No

Unnamed, hydric

Percent of map unit: 1 percent
Landform: Open depressions on fan remnants, terraces
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Interfluve, tread
Microfeatures of landform position: Open depressions
Down-slope shape: Linear
Across-slope shape: Linear
Hydric soil rating: Yes

SbA—San Joaquin-Alamo complex, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hk9x
Elevation: 50 to 500 feet
Mean annual precipitation: 10 to 22 inches
Mean annual air temperature: 61 to 63 degrees F
Frost-free period: 250 to 275 days
Farmland classification: Not prime farmland

Map Unit Composition

San joaquin and similar soils: 60 percent
Alamo and similar soils: 25 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of San Joaquin

Setting

Landform: Fan remnants
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Tread
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Alluvium derived from granite

Typical profile

H1 - 0 to 11 inches: sandy loam
H2 - 11 to 19 inches: clay
H3 - 19 to 23 inches: indurated
H4 - 23 to 60 inches: stratified sandy loam to loam

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches; 19 to 23 inches to duripan
Drainage class: Moderately well drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)

Depth to water table: More than 80 inches
Frequency of flooding: None
Frequency of ponding: None
Available water capacity: Very low (about 1.3 inches)

Interpretive groups
Land capability classification (irrigated): 4s
Land capability classification (nonirrigated): 4s
Hydrologic Soil Group: D
Hydric soil rating: No

Description of Alamo

Setting
Landform: Fan remnants
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Dip
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Clayey alluvium derived from igneous, metamorphic and sedimentary rock

Typical profile
H1 - 0 to 12 inches: clay
H2 - 12 to 22 inches: clay
H3 - 22 to 30 inches: indurated
H4 - 30 to 60 inches: sandy loam

Properties and qualities
Slope: 0 to 1 percent
Depth to restrictive feature: 22 to 30 inches to duripan
Drainage class: Poorly drained
Runoff class: Very high
Capacity of the most limiting layer to transmit water (Ksat): Very low (0.00 to 0.00 in/hr)
Depth to water table: About 0 inches
Frequency of flooding: OccasionalNone
Frequency of ponding: None
Maximum salinity: Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)
Available water capacity: Low (about 3.3 inches)

Interpretive groups
Land capability classification (irrigated): 3w
Land capability classification (nonirrigated): 4w
Hydrologic Soil Group: D
Hydric soil rating: No

Minor Components

Cometa
Percent of map unit: 5 percent
Hydric soil rating: No

Rocklin
Percent of map unit: 5 percent
Hydric soil rating: No

Alamo

Percent of map unit: 4 percent
Landform: Depressions
Hydric soil rating: Yes

Unnamed, ponded

Percent of map unit: 1 percent
Landform: Depressions
Hydric soil rating: Yes

TwA—Tujunga loamy sand, 0 to 3 percent slopes

Map Unit Setting

National map unit symbol: hkbs
Elevation: 10 to 1,500 feet
Mean annual precipitation: 10 to 25 inches
Mean annual air temperature: 59 to 64 degrees F
Frost-free period: 250 to 350 days
Farmland classification: Farmland of statewide importance

Map Unit Composition

Tujunga and similar soils: 85 percent
Minor components: 15 percent
Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Tujunga

Setting

Landform: Alluvial fans
Landform position (two-dimensional): Toeslope
Landform position (three-dimensional): Rise
Down-slope shape: Linear
Across-slope shape: Linear
Parent material: Sandy alluvium derived from granite

Typical profile

H1 - 0 to 11 inches: loamy sand
H2 - 11 to 24 inches: stratified sand to loamy sand
H3 - 24 to 60 inches: stratified gravelly sand to gravelly loamy sand

Properties and qualities

Slope: 0 to 3 percent
Depth to restrictive feature: More than 80 inches
Drainage class: Somewhat excessively drained
Runoff class: Negligible
Capacity of the most limiting layer to transmit water (Ksat): High to very high (5.95 to 19.98 in/hr)
Depth to water table: More than 80 inches
Frequency of flooding: OccasionalNone

Frequency of ponding: None
Available water capacity: Low (about 3.9 inches)

Interpretive groups

Land capability classification (irrigated): 3e
Land capability classification (nonirrigated): 6e
Hydrologic Soil Group: A
Hydric soil rating: No

Minor Components

Delhi

Percent of map unit: 5 percent
Hydric soil rating: No

Dinuba

Percent of map unit: 5 percent
Hydric soil rating: No

Hanford

Percent of map unit: 5 percent
Hydric soil rating: No

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ATTACHMENT E

CULTURAL RESOURCES STUDY

CULTURAL RESOURCES STUDY

NORTH FORK RANCHERIA OF MONO INDIANS 2020 MODIFIED PROJECT, MADERA COUNTY, CALIFORNIA

FEBRUARY 2021

PREPARED FOR:

North Fork Rancheria of Mono Indians
P.O. Box 929
North Fork, CA 93643

PREPARED BY:

Analytical Environmental Services
1801 7th Street, Suite 100
Sacramento, CA 95811

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CULTURAL RESOURCES STUDY

NORTH FORK RANCHERIA OF MONO INDIANS, 2020 MODIFIED PROJECT, MADERA COUNTY, CALIFORNIA

EXECUTIVE SUMMARY

In 2004, the North Fork Rancheria of Mono Indians contracted with Analytical Environmental Services (AES) for the preparation of a cultural resources study for the Fee-to-Trust land acquisition of a proposed 305-acre parcel and subsequent development of a casino and hotel resort in Madera County, California (Madera site, Original Project). The Original Project was approved in 2012 and the 305-acre Madera site was taken into federal trust in 2013. Since then, the scope of development has been altered. These alterations include removal of the hotel and parking garage as project components, addition of on and off-site water and wastewater pipeline, and a rotation of the overall project footprint (2020 Modified Project). This report supplements the Madera site survey effort in order to address new impact areas, specifically sewer, water, and traffic improvements that have been added outside the boundaries of the 305- acre Madera site.

All cultural resources work for the Original Project was performed in compliance with Section 106 of the National Historic Preservation Act (NHPA) as amended, and its implementing regulations found at 36 Code of Federal Regulations Part 800. The 2020 Modified Project improvements lie outside the lands taken into federal trust, and are therefore subject to the requirements of California Public Resources Code Section 21084.1 and California Environmental Quality Act Guidelines Section 15064.5.

A record search for the Madera site was completed on February 5, 2004, at the Southern San Joaquin Valley Information Center (SSJVIC), of the California Historical Resources Information System (CHRIS) located at California State University, Bakersfield. Results of the record search indicated that no portions of the Madera site had previously been surveyed and no cultural resources had been previously recorded within the 305-acre project site or within 1 mile. In January 2021, a new SSJVIC record search was completed for the 2020 Modified Project sewer and water improvements corridors, affected intersections, and a road-widening corridor.

AES completed a field survey of the Madera site in 2005 (AES, 2007) and identified one resource, the Daulton Farm. The Daulton Farm was recorded but recommended not eligible for listing on the National Register of Historic Places. The California State Historic Preservation Office concurred with that recommendation on May 25, 2007 (**Attachment A**). The 2007 survey report noted that the southern half of the Madera site was marshland and overflow from Schmidt Creek, that the northern half was agricultural land, and that the presence of resources associated with Schmidt Creek indicated an elevated potential for cultural resources to be uncovered during project construction.

AES completed a field survey on January 25-26, 2021 for the 2020 Modified Project sewer and water improvements corridors, intersections, and road widening corridor. No cultural resources were identified. Based on the accumulated findings, AES recommends a finding of *No Historic Properties Affected* for the 2020 Modified Project.

PREPARER'S QUALIFICATIONS

Charlane Gross, M.A., RPA conducted the archaeological survey and wrote this report. Ms. Gross has been a professional archaeologist for over 30 years and meets the Secretary of the Interior's Standards for Archaeology. Ms. Gross' experience includes work that has been completed in compliance with local ordinances, the National Environmental Policy Act, and Section 106 requirements. Her professional affiliations include the Society for California Archaeology and the Register of Professional Archaeologists.

STATEMENT OF CONFIDENTIALITY

As nonrenewable resources, archaeological sites can be significantly impacted by disturbances that can affect their cultural, scientific, and artistic values. Disclosure of this information to the public may be in violation of both federal and state laws. To discourage damage resulting from vandalism and artifact looting, cultural resources locations should be kept confidential and report distribution restricted. Applicable U.S. laws include, but are not be limited to, Section 304 of the National Historic Preservation Act (16 USC 470w-3) and the Archeological Resources Protection Act of 1979, as amended (PL 96-95; 93 Stat. 721; 16 USC 47Oaa et seq.). California state laws that apply include, but are not be limited to, Government Code Sections 6250 et seq. and 6254 et seq.

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CULTURAL RESOURCES STUDY

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APPENDICES

1.0 INTRODUCTION

In 2004, the North Fork Rancheria of Mono Indians contracted with Analytical Environmental Services (AES) for the preparation of a cultural resources study for the Fee-to-Trust land acquisition (Original Project) of a proposed 305-acre parcel (Madera site) and subsequent development of a casino and hotel resort in unincorporated Madera County, California. The Original Project was approved in 2012 and the 305-acre Madera site was taken into federal trust in 2013. Since then, the scope of development has been modified (2020 Modified Project). This report supplements the original Madera site survey to address off-site additions to the original project design. There have been some changes to the layout of buildings and infrastructure on the Madera site, however all are within the area previously surveyed and therefore are not addressed in this report.

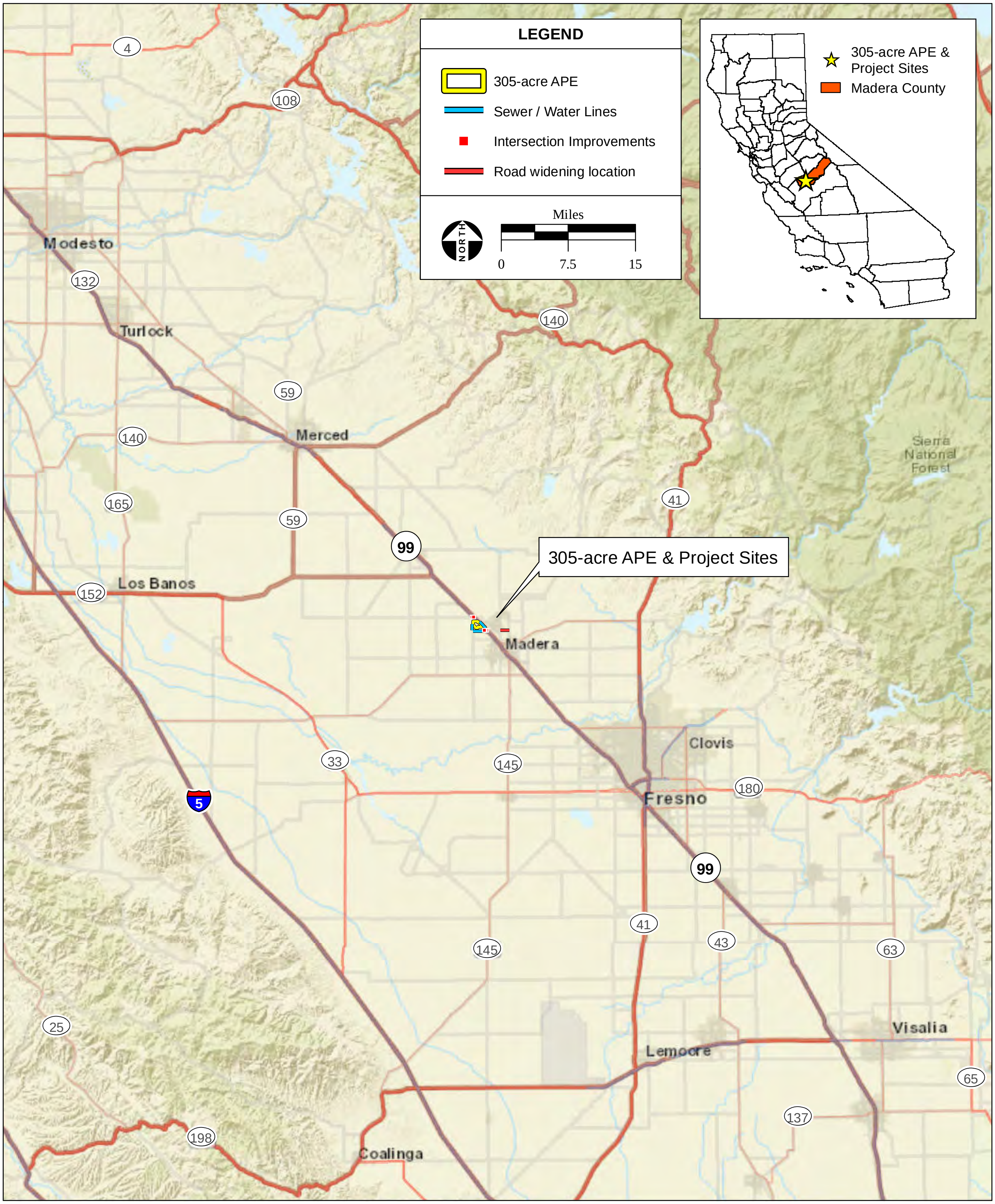
The 2020 Modified Project addresses modifications to intersections where traffic levels will increase to accommodate patrons once the casino is built and opened, the development of off-site water and sewer infrastructure extending west and south of the Madera site, and the potential widening of a mile of roadway to accommodate increased traffic generated by operation of the casino.

PROPERTY DESCRIPTION AND AREA OF POTENTIAL EFFECTS

The project site is located in southwest Madera County, immediately north City of Madera, on the west side of State Route 99 (SR-99), in Sections 1, 4, 12 and 20 as depicted on the Berenda and Madera 7.5' topographic quadrangles (**Figures 1** and **2**). The Madera site Area of Potential Effects (APE) included the entire 305-acre project site, allowing for all ground-disturbing activities, staging, storage, and lay-down areas. The APE has been expanded to accommodate 2020 Modified Project additions, though these additions are being analyzed under CEQA.

From the intersection of Road 23/Avenue 17, the new off-site water and/or sewer lines run northward along Road 23 approximately 360 feet before crossing into the Madera site. They also run eastward along Avenue 17 (Madera Avenue) for 6540 feet to Golden State Boulevard, where they connect to existing infrastructure. An additional 4900 feet of water lines will run northward along the western side of Golden State Boulevard, connecting the casino to existing infrastructure. It is assumed that the sewer and water lines will be placed within the road rights-of-way on Road 23, Avenue 17, and Golden State Boulevard though actual placement has yet to be determined. Therefore, a corridor extending 20 feet from each road edge on the sewer/water line path is also considered to be part of the APE (**Figure 3**).

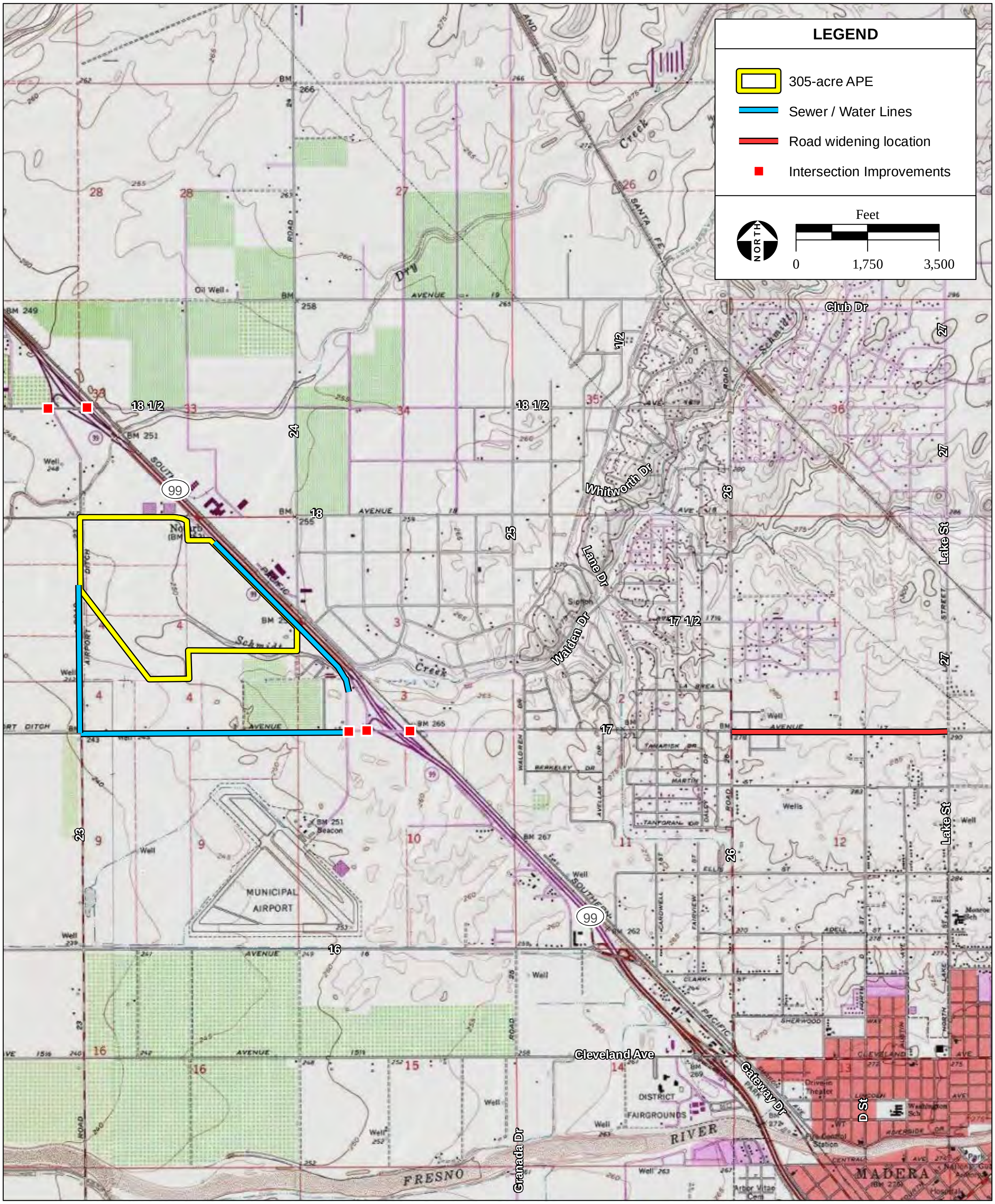
Specific modifications at three traffic intersections (SR-99 at Avenue 18 ½, SR-99 at Avenue 17, and Golden State Boulevard at Avenue 17) have not been determined and may include signalization, added lanes, restriping, or other traffic flow improvements. Because these modifications have not yet been specified, it is presumed that the APE for each of these traffic intersections extends up to 200 feet in any direction.



SOURCE: ESRI, 2021; AES, 2/2/2021

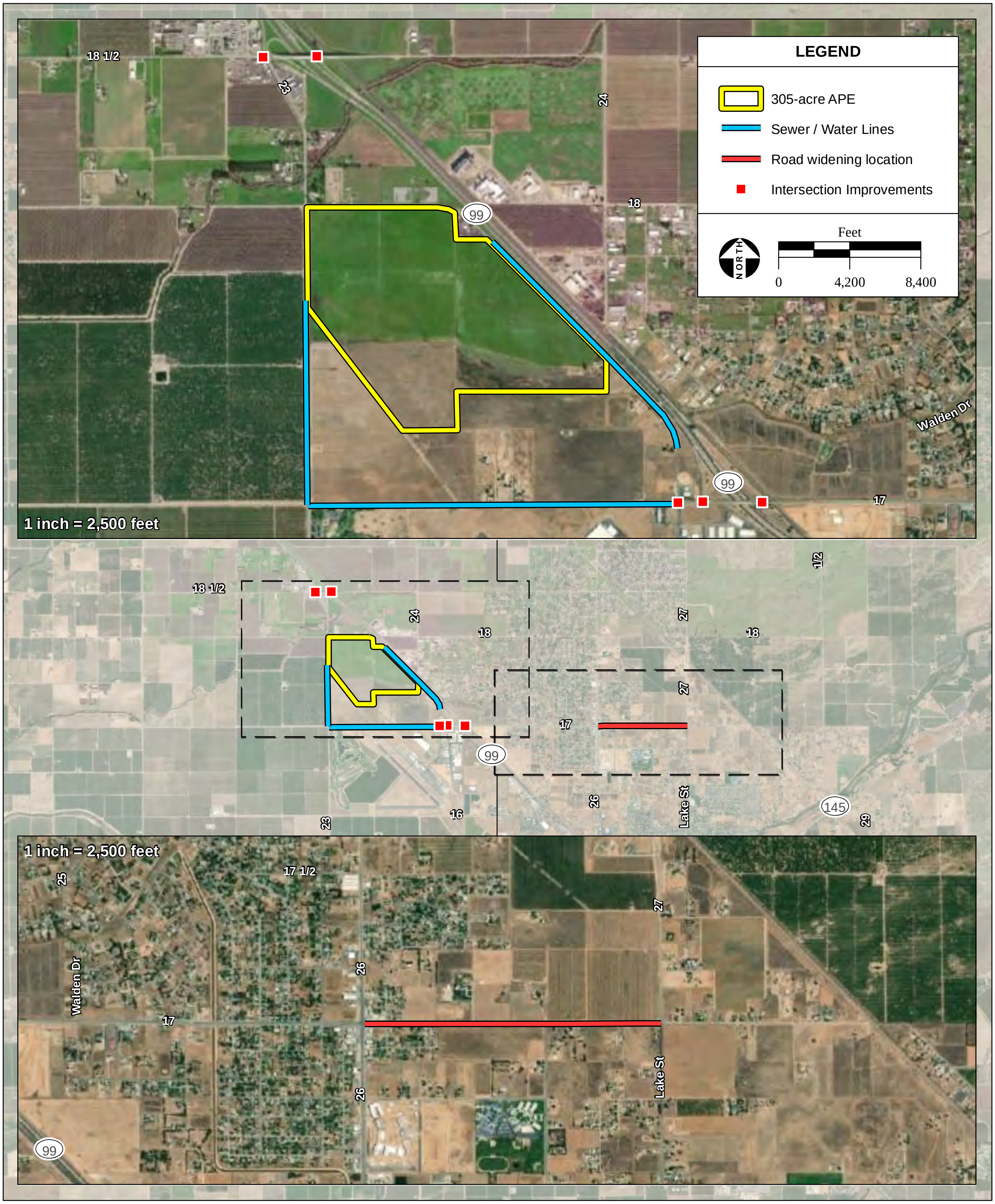
North Fork Cultural Cultural Resources Study / 204502 ■

Figure 1
Regional Location



SOURCE: "Berenda, CA" USGS 7.5 Minute Topographic Quadrangle, T10S R17E, Sections 4, 5, 32, 33;
"Kismet, CA" USGS 7.5 Minute Topographic Quadrangle, T10S R17E, Sections 3, 4;
"Bonita Ranch, CA" USGS 7.5 Minute Topographic Quadrangle, T11S R17E, Sections 4, 5, 9;
"Madera, CA" USGS 7.5 Minute Topographic Quadrangle, T11S R17E, Sections 1, 3, 4, 9, 10, 12;
Mt. Diablo Baseline and Meridian; ESRI, 2021; AES, 2/2/2021

Figure 2
Site and Vicinity



SOURCE: Maxar aerial photograph, 7/24/2019; ESRI, 2021; AES, 2/2/2021

Figure 3
Aerial Photograph

The final proposed traffic modification related to operation of the casino is the widening of Avenue 17 between Road 26 and Road 27 from two lanes to four lanes. Because Avenue 17 already includes road shoulders, it is presumed that a 20-foot wide corridor on either side of Avenue 17 is sufficient to accommodate road widening construction, and was also added to the APE. It is presumed that construction impacts will not exceed 8 feet below ground surface.

2.0 REGULATORY SETTING

Cultural resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, and/or scientific importance. Numerous laws, regulations, and statutes at the federal level govern archaeological and historic resources deemed to have scientific, historic, or cultural value. The pertinent regulatory framework, as it applies to the Proposed Project, is summarized below.

NATIONAL HISTORIC PRESERVATION ACT

Section 106 of the National Historic Preservation Act (NHPA) as amended, and its implementing regulations found in 36 CFR Part 800, require federal agencies to identify cultural resources that may be affected by actions involving federal lands, funds, or permitting. The significance of the resources must be evaluated using established criteria outlined in 36 CFR 60.4, as described below. If a resource is determined to be a *historic property*, Section 106 of the NHPA requires that effects of the federal undertaking on the resource be determined. A historic property is defined as:

> "…any prehistoric or historic district, site, building, structure or object included in, or eligible for inclusion in the National Register of Historic Places, including artifacts, records, and material remains related to such a property…" (NHPA Sec. 301[5])

Section 106 of the NHPA prescribes specific criteria for determining whether a project would adversely affect a historic property, as defined in 36 CFR 800.5. An impact is considered adverse when prehistoric or historic archaeological sites, structures, or objects that are listed, or eligible for listing, in the NRHP are subjected to the following:

- Physical destruction of or damage to all or part of the property;
- Alteration of a property;
- Removal of the property from its historic location;
- Change of the character of the property's use or of physical features within the property's setting that contribute to its historic significance;
- Introduction of visual, atmospheric, or audible elements that diminish the integrity of the property's significant historic features;
- Neglect of a property that causes its deterioration; and

- Transfer, lease, or sale of the property out of federal control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property's historic significance.

If the historic property will be adversely affected by development, then prudent and feasible measures to avoid or reduce adverse impacts must be taken. The State Historic Preservation Officer (SHPO) must be provided an opportunity to review and comment on these measures prior to project implementation.

NATIONAL REGISTER OF HISTORIC PLACES

The eligibility of a resource for listing in the NRHP is determined by evaluating the resource using criteria defined in 36 CFR 60.4 as follows:

A. That are associated with events that have made a significant contribution to the broad patterns of our history;
B. That are associated with the lives of persons significant in our past;
C. That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or
D. That have yielded, or may be likely to yield, information important to prehistory or history.

Sites younger than 50 years, unless of exceptional importance, are not eligible for listing in the NRHP. In addition to meeting at least one of the criteria listed above, the property must also retain enough integrity to enable it to convey its historic significance. The National Register recognizes seven aspects or qualities that, in various combinations, define integrity (NPS, 1990). These seven elements of integrity are: location, design, setting, materials, workmanship, feeling, and association. To retain integrity a property will always possess several, and usually most, of these aspects.

While most historic buildings and many historic archaeological properties are significant because of their association with important events, people, or styles (criteria A, B, and C), the significance of most prehistoric and some historic-period archaeological properties is usually assessed under criterion D. This criterion stresses the importance of the information contained in an archaeological site, rather than its intrinsic value as a surviving example of a type or its historical association with an important person or event. It places importance not on physical appearance but rather on information potential.

NATIVE AMERICAN GRAVES PROTECTION AND REPATRIATION ACT

The Native American Graves Protection and Repatriation Act (NAGPRA) is a federal law passed in 1990. NAGPRA provides a process for museums and federal agencies to return certain Native American cultural items -- human remains, funerary objects, sacred objects, or objects of cultural patrimony -- to lineal descendants, and culturally affiliated Indian tribes and Native Hawaiian organizations. NAGPRA includes provisions for unclaimed and culturally unidentifiable Native American cultural items, intentional and inadvertent discovery of Native American burials and cultural items on Federal and tribal lands, and penalties for noncompliance and illegal trafficking.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

CEQA requires that, for projects financed by or requiring the discretionary approval of public agencies in California, the effects that a project has on historical and unique archaeological resources be considered (Public Resources Code [PRC] Section 21083.2). Historical resources are defined as buildings, sites, structures, or objects, each of which may have historical, architectural, archaeological, cultural, or scientific importance (PRC Section 50201). The CEQA Guidelines (Section 15064.5) define three cases in which a property may qualify as a historical resource for the purpose of CEQA review:

- The resource is listed in or determined eligible for listing in the California Register of Historical Resources (CRHR).
- The resource is included in a local register of historic resources, as defined in PRC Section 5020.1(k), or is identified as significant in a historical resources survey that meets the requirements of PRC Section 5024.1(g) (unless the preponderance of evidence demonstrates that the resource is not historically or culturally significant).
- The Lead Agency determines that the resource may be a historical resource as defined in PRC Section 5020.1(j), 5024.1, or significant as supported by substantial evidence in light of the whole record. Section 5024.1 defines eligibility requirements and states that a resource may be eligible for inclusion in the CRHR if it:

    A. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
    B. Is associated with the lives of persons important in our past;
    C. Embodies the distinctive characteristics of a type, period, region, or method of construction, represents the work of an important creative individual, or possesses high artistic values; or
    D. Has yielded, or may be likely to yield, information important in prehistory or history.

Resources must retain integrity to be eligible for listing on the CRHR. Resources that are listed in or eligible for listing in the National Register of Historic Places (NRHP) are considered eligible for listing in the CRHR, and thus are significant historical resources for the purposes of CEQA (PRC Section 5024.1(d)(1)).

ASSEMBLY BILL 52

Assembly Bill (AB 52) mandates early tribal consultation prior to and during CEQA review for those tribes that have formally requested, in writing, notification on projects subject to AB 52, i.e., projects that have published Notices of Preparation for Environmental Impact Reports or Notices of Intent to adopt Negative Declarations or Mitigated Negative Declarations since July 1, 2015. AB 52 establishes a new category of Tribal Cultural Resources (TCR) for which only tribes are experts; these resources may not necessarily be visible or archaeological, but could be religious or spiritual in nature. Significant impacts to a TCR are considered significant effects on the environment.

3.0 CULTURAL RESOURCES EFFORTS

2007 STUDY

Cultural, ethnographic, and historic setting sections were developed by AES (2007) previously and have not been repeated here, as there are no significant changes. Instead, the following is a summary of the studies and results completed for the Original Project, as approved in 2012.

Efforts in 2004-2005 included a background record search at the Southern San Joaquin Valley Information Center (SSJVIC), a Native American outreach program, and a survey of the 305-acre Madera site. The SSJVIC review found that none of the 305-acre project site had been surveyed for cultural resources. An aerial photograph taken in 1950 depicted a small group of structures mid-site, as well as the Daulton Farm complex in the southeast corner. The photograph also showed that the southern half of the APE was marshland and overflow from Schmidt Creek and the northern half was agricultural land.

A Native American outreach program was also conducted, including: contacting the Native American Heritage Commission (NAHC) to ask for a search of the Sacred Lands File and for a list of groups or individuals who might have information regarding cultural resources within the APE. The NAHC reported that the Sacred Lands File search was negative and identified one person, Katherine Erolinda Perez, Chairperson of the North Valley Yokuts Tribe. In February 2004, AES mailed a letter to Ms. Perez describing the Original Project. No response was received from Ms. Perez. A pedestrian survey was also completed in 2005 utilizing transects spaced 25 meters apart. Archaeologists found that there was a combination of thick ground cover and standing water over the Madera site. The only resource identified consisted of the remains of the Daulton Farm, located in the central and southeastern portions of the Madera site.

The Daulton Farm consisted of the remnants of a farm complex intermixed with a modern prefab residential dwelling, Quonset hut, and farming features in their original agricultural setting. The primary structures related to the historical period of the site included a barn and shed, both built circa 1953. Personal communication with the current tenant indicated the farm was one of several owned by members of the Daulton family, early prominent local citizens. However, because the barn and associated structures were not directly associated with the main Daulton Ranch located 10.5 miles northeast of the Madera site,as: 1) the integrity of the site had been altered by the removal of the residence and addition of newer structures, 2) the Daulton family was only locally prominent, and 3) the lack of information potential, the Daulton Farm was recommended not eligible for listing on the NRHP. The State Historic Preservation Officer concurred with the finding on May 25, 2007 (SHPO, 2007; **Attachment A**).

2020 MODIFIED PROJECT

A new SSJVIC cultural resource record search was completed for the 2020 Modified Project (File No. 21-039), focusing on the sewer/water and traffic improvements locations (**Attachment B**). Any coverage of the 305-acre Madera site is considered coincidental as there have been no changes in land use since the 2004 SSJVIC record search and 2005 field survey. The only resource noted near any of the Proposed Project locations is P-20-2308, the Madera Canal Lateral 6.2. Madera Canal Lateral 6.2 is adjacent to the sections of Road 23 and Avenue 17 where water and sewer improvements will be located.

Lateral 6.2 has been significantly changed from its original proposed alignment, and its profile has been significantly changed through new construction, neglect, and erosion. Documentation presented in the site record form suggests that the Madera Canal Lateral 6.2 is not eligible for listing on the National Register of Historic Places or the California Register of Historical Resources.

Previous archaeological studies have included the northeastern corner of the SR-99 at Avenue 18 ½ intersection, the eastern half of the SR-99 at Avenue 17 intersection, and crossed Road 23 going into the 305-acre Madera site. Another survey included the Avenue 17 from Road 26 to Road 27 corridor, and one survey include part of the Madera Municipal Airport, extending to the southern edge of Avenue 17 where water/sewer improvements are proposed. None of these surveys resulted in the identification of cultural resources.

The field survey for the 2020 Modified Project was completed on January 25 and 26, 2021. It included an examination of: both sides of Road 23 from Avenue 17 to the point where the line turns eastward to connect to the casino; Avenue 17 from Golden State Boulevard to Road 23; northwards along Golden State Boulevard from Avenue 17 to the southeastern corner of the 305-acre Original Project site; Avenue 17 from Road 26 to Road 27; and 200 feet in each direction from the three traffic intersections (SR-99 at Avenue 18 ½, SR-99 at Avenue 17, and Golden State Boulevard at Avenue 17). All surveys included a single pedestrian transect.

The water/sewer corridors were occasionally restricted by fencing or clearly demarcated private property (e.g. orchard rows). They generally included an approximately 5-foot wide road shoulder covered in imported fill or gravel, with no native surface visibility. Most of the available ground surfaces were thickly covered in spring grasses, with some dirt clods visible, remnants of the last time the properties were plowed/ripped. Overall ground surface visibility averaged less than 1 percent within all sections of the water/sewer improvements corridors. Similarly, the corridor along Avenue 17 from Road 26 to Road 27 included shoulders covered in imported materials, thick seasonal grasses and indications of private property (fences, trees, driveways, etc.). Natural ground surface visibility was less than 1 percent overall. No cultural resources were identified during the survey of these areas.

The SR-99 at Avenue 18 ½ and SR-99 at Avenue 17 intersections were artificially elevated to allow for passage of roads and railroad tracks, and modern development occupied many of the intersection corners.

All areas within the intersection vicinities had been altered, but were inspected. Some paths and field roads offered limited ground surface visibility, but seasonal grasses obscured the view; overall ground surface visibility averaged less than 2 percent. Golden State Boulevard at Avenue 17 was more level, though the road prism was raised to adjust for the elevations needed for the approach to the SR-99 overpass. There was a combination of thick seasonal grasses and development that also limited ground surface visibility to less than 2 percent. No cultural resources were identified at any of the intersections.

4.0 FINDINGS AND CONCLUSIONS

The only cultural resources identified in any phase of the various cultural resource investigations consisted of remnants of the Daulton Farm, which is not eligible for listing on the NRHP (SHPO, 2007).

While no prehistoric archaeological deposits or site indicators were observed, there is always the possibility for accidental discovery of subsurface deposits during future ground disturbing activities. The 2007 survey report noted that the southern half of the 305-acre Madera site was marshland and overflow from Schmidt Creek and that the presence of Schmidt Creek indicated an elevated potential for cultural resources. Most of the 2020 Modified Project is not located in proximity to water or other resources that would have attracted prehistoric exploitation, and therefore the bulk of the 2020 Modified Project is considered to have a low potential to uncover resources during construction.

However, if resources of any kind are uncovered during construction, construction in the vicinity of the find should halt immediately. Federal regulations must be followed if the discovery is made on land that has been taken into federal trust (Madera site), and CEQA regulations must be followed for discoveries made outside the trust property, where sewer, water, intersection, and other traffic improvements will be made (2020 Modified Project).

If human remains are encountered during ground-disturbing activities related to the Proposed Project, work must halt in the vicinity of the find and the Madera County Coroner must be notified immediately. If the remains are prehistoric and located on property that is held in federal trust, the provisions of NAGPRA would apply. However, discovery of human remains outside of federal trust land would be subject to Section 15064.5 (e) (1) of the CEQA Guidelines and California Health and Safety Code Section 7050.5. No further ground disturbance should occur in the vicinity until the appropriate requirements have been satisfied.

5.0 REFERENCES

AES, 2007. *Cultural Resources Study, North Fork Rancheria of Mono Indians*. Report prepared for Bureau of Indian Affairs.

State Office of Historic Preservation (SHPO), 2007. Concurrence letter for proposed transfer of 305 acres into federal trust and finding of No Historic Properties Affected.

ATTACHMENTS

ATTACHMENT A

SHPO CONCURRENCE

STATE OF CALIFORNIA – THE RESOURCES AGENCY ARNOLD SCHWARZENEGGER, *Governor*

OFFICE OF HISTORIC PRESERVATION
DEPARTMENT OF PARKS AND RECREATION
P.O. BOX 942896
SACRAMENTO, CA 94296-0001
(916) 653-6624 Fax: (916) 653-9824
calshpo@ohp.parks.ca.gov

2007 MAY 29 PM 3 52

PACIFIC REGIONAL OFFICE

May 25, 2007

In Reply Refer To: BIA070502C

Amy Dutschke
Acting Regional Director
United States Department of the Interior
Bureau of Indian Affairs
Pacific Regional Office
2800 Cottage Way
Sacramento, California 95825

Re: Proposed Fee-to-trust Conveyance of 305 Acres for Gaming by the North Fork Band of Mono Indians, Madera County, California

Dear Ms. Dutschke:

Pursuant to 36 CFR Part 800 (as amended 8-05-04) regulations implementing Section 106 of the National Historic Preservation Act, the Bureau of Indian Affairs (BIA), Pacific Regional Office, is seeking my comments on its determination of effects that this undertaking will have on historic properties. The proposed project includes the conveyance of 305 acres for subsequent gaming purposes by the North Fork Band of Mono Indians, located in Madera County, California. In addition to your letter of April 27, 2007, you have submitted the following report in support of this undertaking: *Cultural Resources, North Fork Casino, North Fork Rancheria of Mono Indians Fee-to-Trust and Casino/Hotel Project (Analytical Environmental Services, October 2006).* After reviewing your letter and the supporting documentation, I have the following comments:

1) I concur that the Area of Potential Effects (APE) has been properly determined and documented pursuant to 36 CFR Parts 800.4 (a)(1) and 800.16 (d) and that the Efforts to Identify Historic Properties within the APE have been appropriate pursuant to 36 CFR Part 800.4.

2) I further concur that the finding of No Historic Properties Affected is appropriate pursuant to 36 CFR Part 800.4(d)(1) and that the documentation supporting this finding has been provided pursuant to 36 CFR Part 800.11(d).

3) Be advised that under certain circumstances, such as unanticipated discovery or a change in project description, the BIA may have additional future responsibilities for this undertaking under 36 CFR Part 800.

Thank you for seeking my comments and for considering historic properties in planning your project. If you require further information, please contact Stephen Bryne, Associate State Archeologist, at phone 916-653-8902 or email sbryne@parks.ca.gov.

BIA070502C 5/25/2007

Sincerely,

Susan K Stratton for

Milford Wayne Donaldson, FAIA
State Historic Preservation Officer

ATTACHMENT B

RECORD SEARCH RESULTS

California
Historical
Resources
Information
System

Fresno
Kern
Kings
Madera
Tulare

Southern San Joaquin Valley Information Center
California State University, Bakersfield
Mail Stop: 72 DOB
9001 Stockdale Highway
Bakersfield, California 93311-1022
(661) 654-2289
E-mail: ssjvic@csub.edu
Website: www.csub.edu/ssjvic

2/1/2021

Charlane Gross
AES
1801 7th Street, Suite 100
Sacramento, CA 95811

Re: North Fork Casino - 204502
Records Search File No.: 21-039

The Southern San Joaquin Valley Information Center received your record search request for the project area referenced above, located on the Berenda, Bonita Ranch, Kismet, & Madera USGS 7.5' quads. The following reflects the results of the records search for the project area and the requested radius:

As indicated on the data request form, the locations of resources and reports are provided in the following format: ☒ custom GIS maps ☒ GIS data

Resources within project area:	P-20-002308
Resources within requested radius:	None
Reports within project area:	MA-00018, 00035, 00036, 00389, 01201, 01321
Reports within requested radius:	MA-00083, 00266, 01001, 01002, 01026, 01217

Resource Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Resource Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Resource Digital Database Records:	☐ enclosed	☒ not requested	☐ nothing listed
Report Database Printout (list):	☒ enclosed	☐ not requested	☐ nothing listed
Report Database Printout (details):	☐ enclosed	☒ not requested	☐ nothing listed
Report Digital Database Records:	☐ enclosed	☒ not requested	☐ nothing listed
Resource Record Copies:	☒ enclosed	☐ not requested	☐ nothing listed
Report Copies:	☐ enclosed	☒ not requested	☐ nothing listed
OHP Built Environment Resources Directory:	☒ enclosed	☐ not requested	☐ nothing listed
Archaeological Determinations of Eligibility:	☐ enclosed	☐ not requested	☒ nothing listed
CA Inventory of Historic Resources (1976):	☐ enclosed	☐ not requested	☒ nothing listed

Caltrans Bridge Survey: Not available at SSJVIC; please see https://dot.ca.gov/programs/environmental-analysis/cultural-studies/california-historical-bridges-tunnels

Ethnographic Information: Not available at SSJVIC

Historical Literature: Not available at SSJVIC

Historical Maps: Not available at SSJVIC; please see http://historicalmaps.arcgis.com/usgs/

Local Inventories: Not available at SSJVIC

GLO and/or Rancho Plat Maps: Not available at SSJVIC; please see http://www.glorecords.blm.gov/search/default.aspx#searchTabIndex=0&searchByTypeIndex=1 and/or http://www.oac.cdlib.org/view?docId=hb8489p15p;developer=local;style=oac4;doc.view=items

Shipwreck Inventory: Not available at SSJVIC; please see https://www.slc.ca.gov/shipwrecks/

Soil Survey Maps: Not available at SSJVIC; please see http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx

Please forward a copy of any resulting reports from this project to the office as soon as possible. Due to the sensitive nature of archaeological site location data, we ask that you do not include resource location maps and resource location descriptions in your report if the report is for public distribution. If you have any questions regarding the results presented herein, please contact the office at the phone number listed above.

The provision of CHRIS Data via this records search response does not in any way constitute public disclosure of records otherwise exempt from disclosure under the California Public Records Act or any other law, including, but not limited to, records related to archeological site information maintained by or on behalf of, or in the possession of, the State of California, Department of Parks and Recreation, State Historic Preservation Officer, Office of Historic Preservation, or the State Historical Resources Commission.

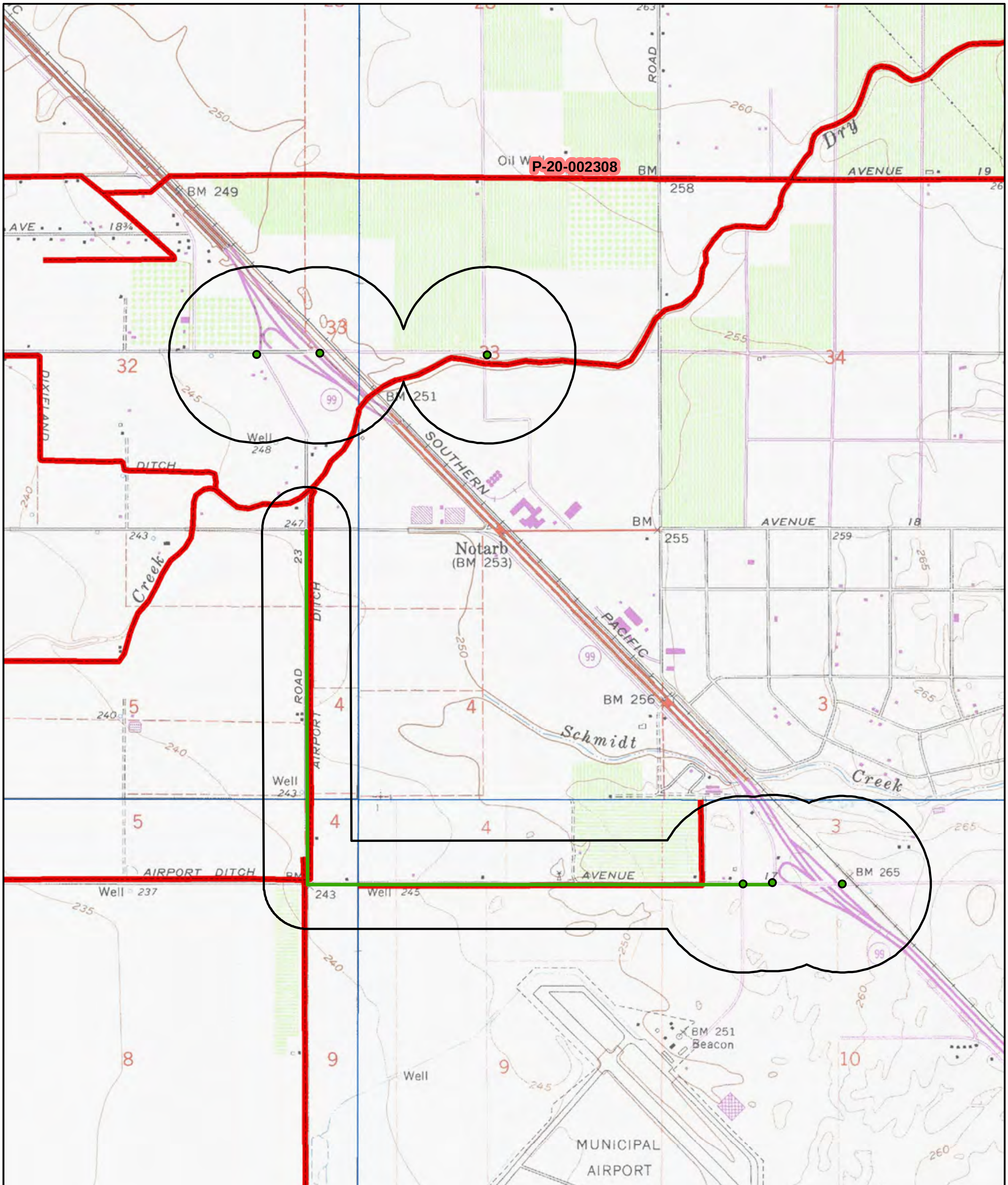
Due to processing delays and other factors, not all of the historical resource reports and resource records that have been submitted to the Office of Historic Preservation are available via this records search. Additional information may be available through the federal, state, and local agencies that produced or paid for historical resource management work in the search area. Additionally, Native American tribes have historical resource information not in the CHRIS Inventory, and you should contact the California Native American Heritage Commission for information on local/regional tribal contacts.

Should you require any additional information for the above referenced project, reference the record search number listed above when making inquiries. Invoices for Information Center services will be sent under separate cover from the California State University, Bakersfield Accounting Office.

Thank you for using the California Historical Resources Information System (CHRIS).

Sincerely,

Celeste M. Thomson
Coordinator



May depict confidential cultural resource locations.
Do not distribute.

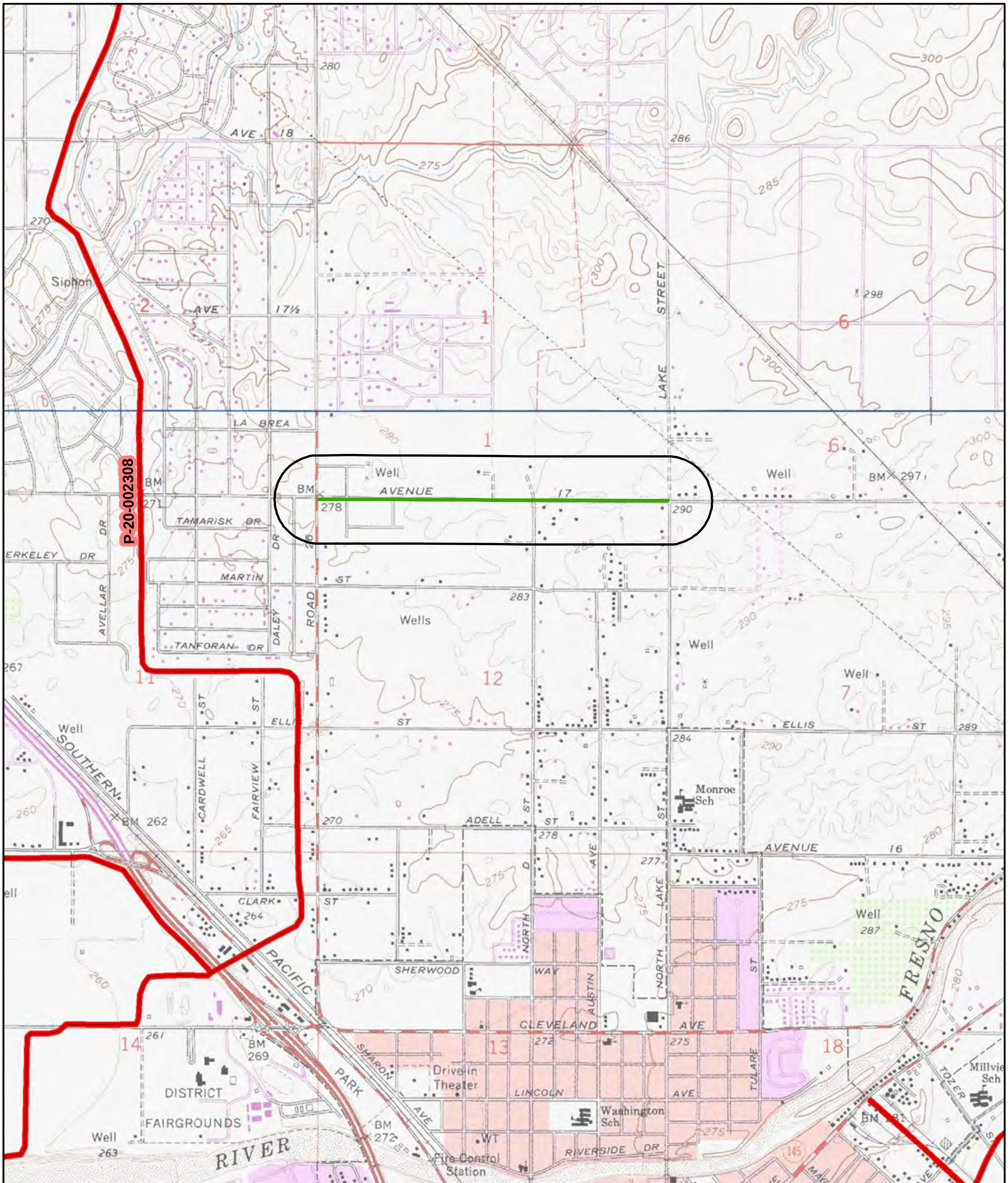
Project Area
Record Search radius

0 0.125 0.25 0.5 Miles

0 0.175 0.35 0.7 Kilometers

N

SSJV Information Center Record Search 21-039
Requester: Charlane Gross, AES
Project Name: North Fork Casino - 204502
USGS 7.5' Quad(s): Berenda, Bonita Ranch, Kisment, Madera
County: Madera
Resources Only



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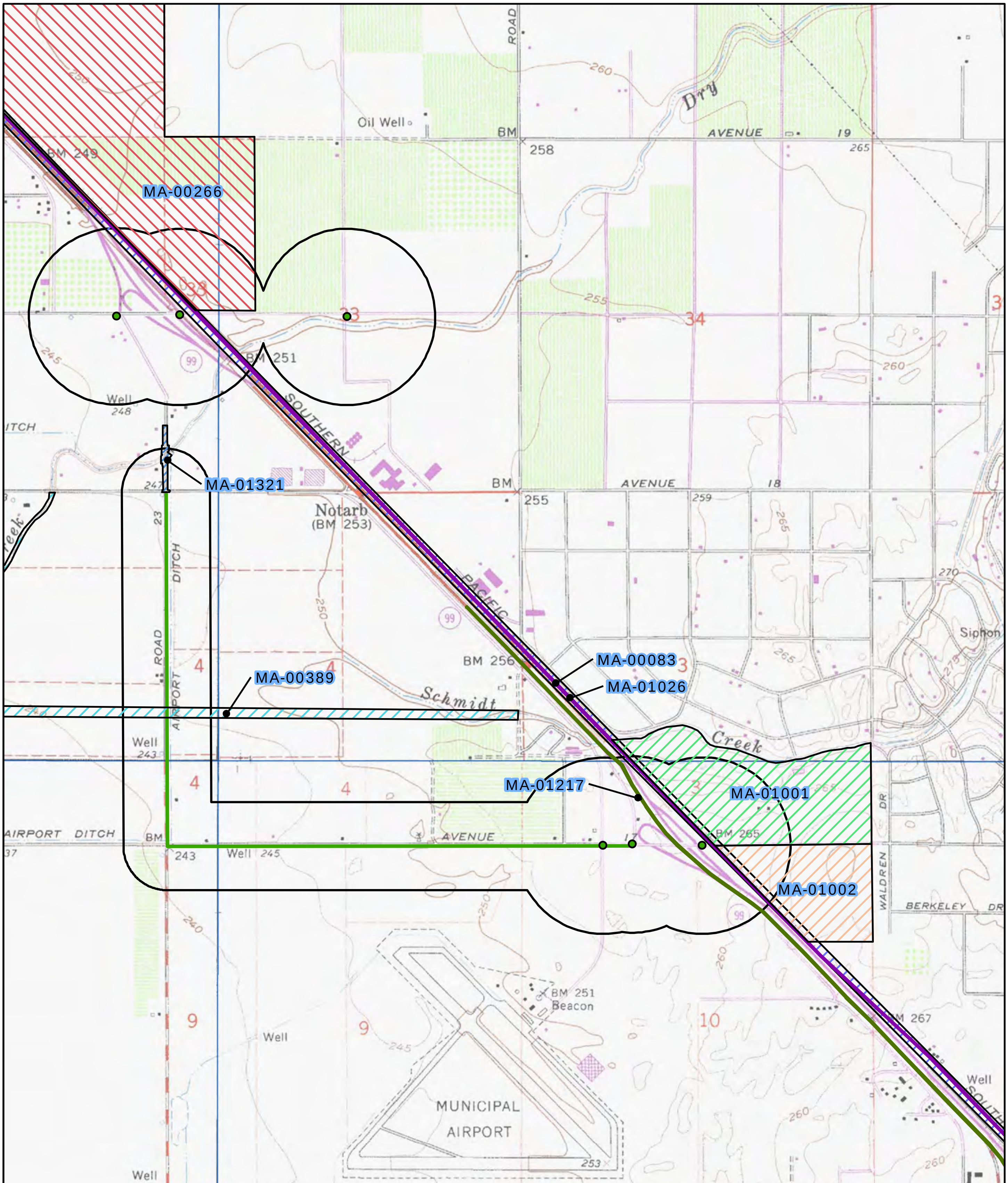
SSJV Information Center Record Search 21-039
Requester: Charlane Gross, AES
Project Name: North Fork Casino - 204502
USGS 7.5' Quad(s): Kisment, Madera
County: Madera
Resources Only



May depict confidential cultural resource locations. Do not distribute.

0 0.125 0.25 0.5 Miles

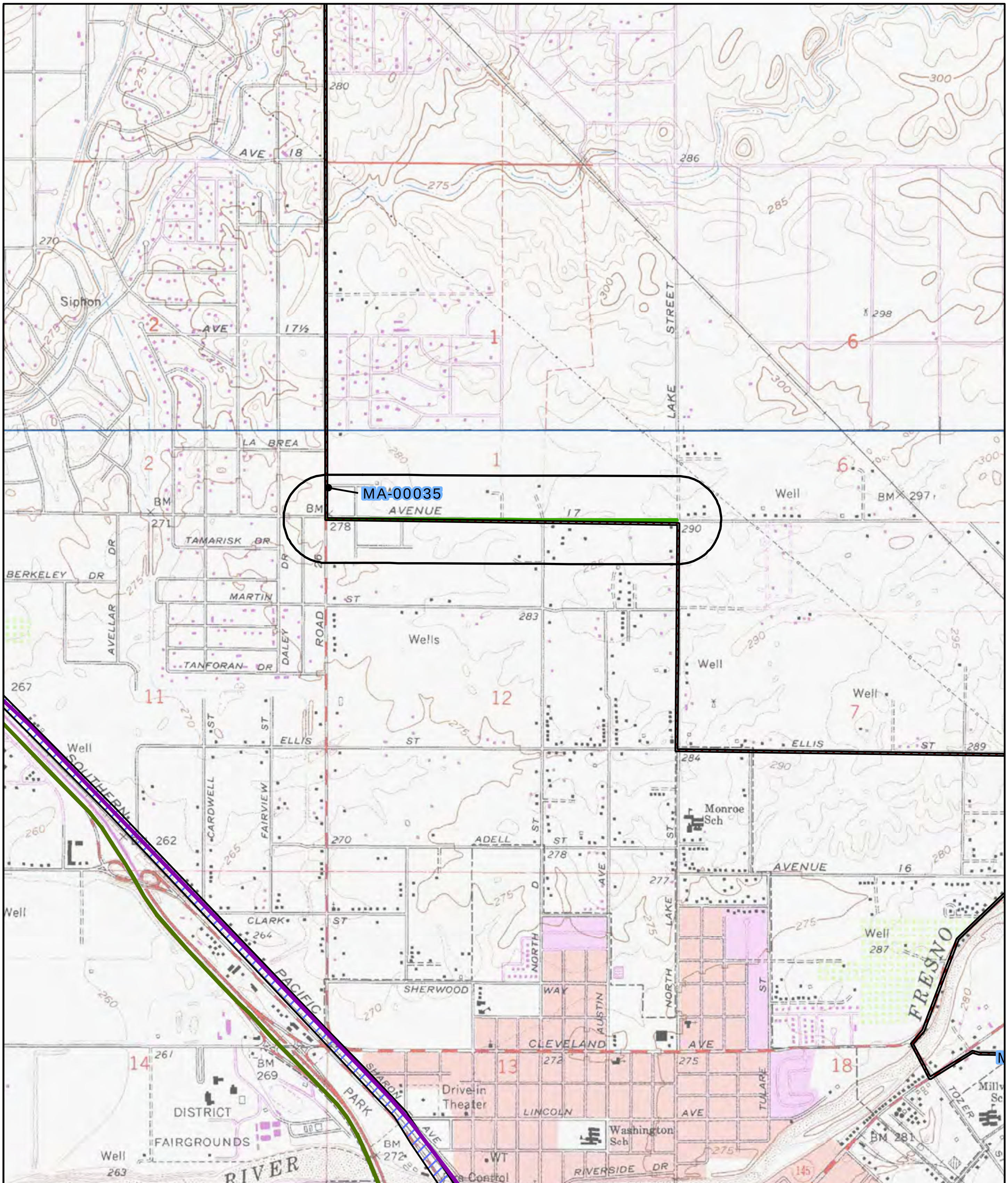
0 0.175 0.35 0.7 Kilometers

N

Project Area

Record Search radius

SSJV Information Center Record Search 21-039
Requester: Charlane Gross, AES
Project Name: North Fork Casino - 204502
USGS 7.5' Quad(s): Berenda, Bonita Ranch, Kisment, Madera
County: Madera
Reports Only



May depict confidential cultural resource locations. Do not distribute.

Project Area

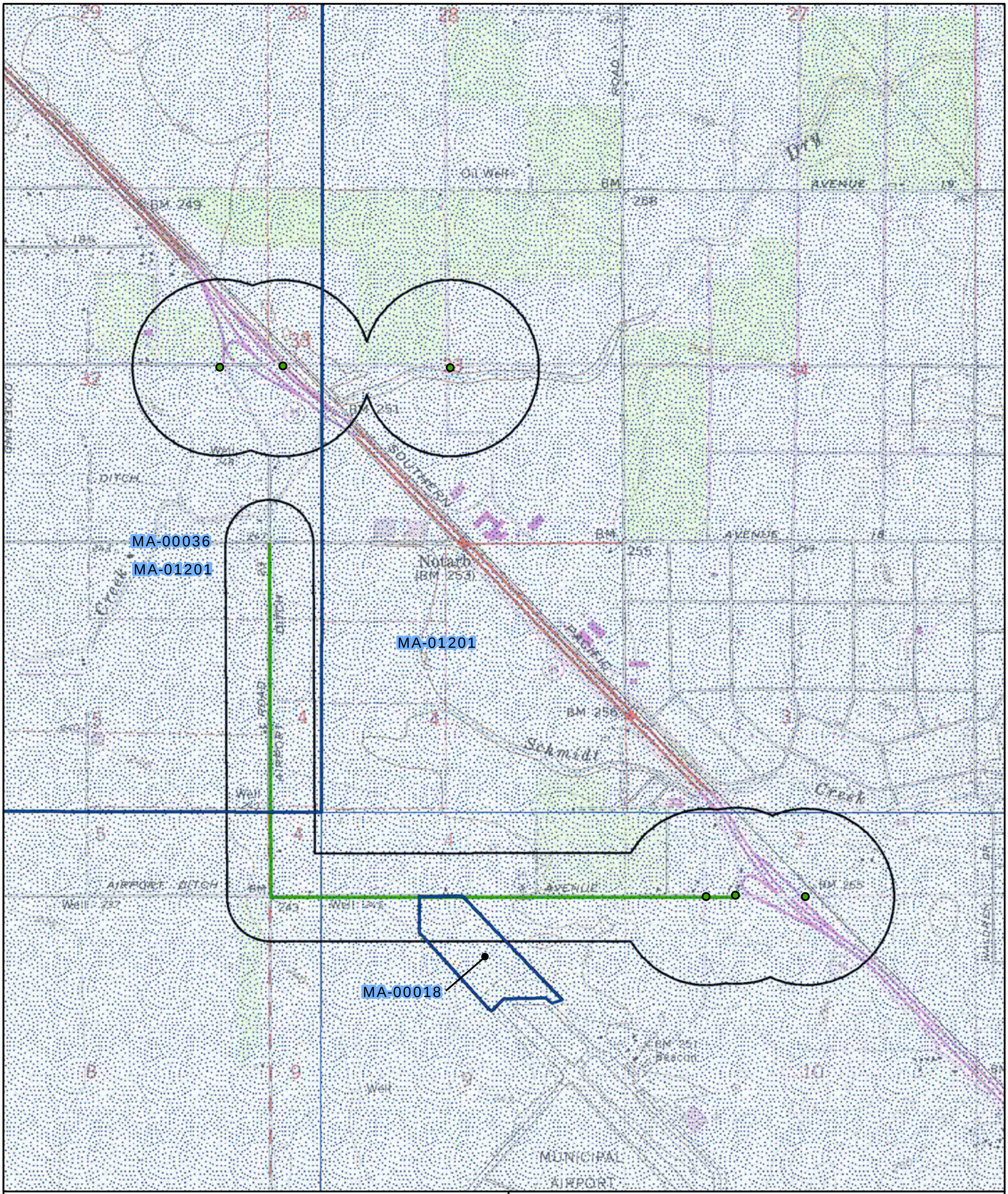
Record Search radius

0 0.125 0.25 0.5 Miles

0 0.175 0.35 0.7 Kilometers

N

SSJV Information Center Record Search 21-039
Requester: Charlane Gross, AES
Project Name: North Fork Casino - 204502
USGS 7.5' Quad(s): Kisment, Madera
County: Madera
Reports Only



May depict confidential cultural resource locations.
Do not distribute.

0 0.125 0.25 0.5 Miles

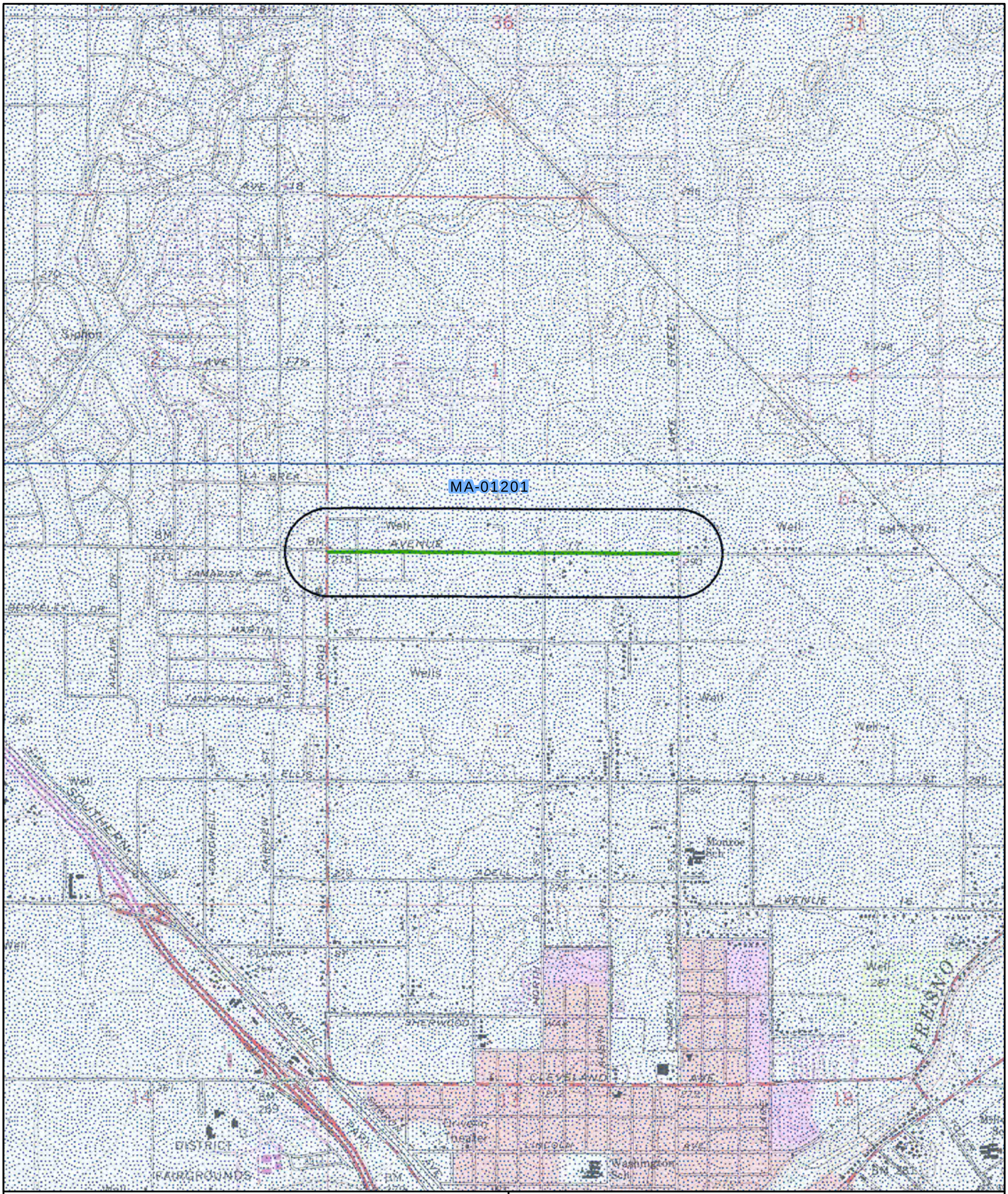
0 0.175 0.35 0.7 Kilometers

N

Project Area

Record Search radius

SSJV Information Center Record Search 21-039
Requester: Charlane Gross, AES
Project Name: North Fork Casino - 204502
USGS 7.5' Quad(s): Berenda, Bonita Ranch, Kisment, Madera
County: Madera
"Other" Reports Only



May depict confidential cultural resource locations.
Do not distribute.

0 0.125 0.25 0.5 Miles

0 0.175 0.35 0.7 Kilometers

N

Project Area

Record Search radius

SSJV Information Center Record Search 21-039
Requester: Charlane Gross, AES
Project Name: North Fork Casino - 204502
USGS 7.5' Quad(s): Kisment, Madera
County: Madera
"Other" Reports Only

Report List

SSJVIC Record Search 21-039

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
MA-00018	NADB-R - 1141169	1996	Wadell, Robert P. and Voight, William G.	Draft Environmental Assessment Expanded Initial Study, Madera Municipal Airport Runway Extension	Wadell Engineering Corporation	
MA-00018A		1995	Becker, Eric S.	Removal Action Workplan, Madera Municipal Airport, Madera, California	Kleinfelder, Inc.	
MA-00018B		1996	Voight, William G.	Madera Municipal Airport Runway Extension Project, Biological Assessment	Wadell Engineering Corporation	
MA-00035	IC Record Search Nbr - 96-517; NADB-R - 1141300	1996	Jensen, Sean M.	Archaeological Inventory Survey for the Tracy to Fresno Longhaul Fiberoptics Data Transmission Line, Portions of Fresno, Madera, Merced, Stanislaus, and San Joaquin Counties, California	Jensen and Associates	
MA-00036	BLM - Permit No. CA-95-01-0004; NADB-R - 1141258	1995	Self, William	Class I Overview, Santa Fe Pacific Pipeline Partners, L.P., Proposed Concord to Colton Pipeline Project	William Self Associates	
MA-00083	NADB-R - 1140863	1995	Hatoff, Brian, Voss, Barb, Waechter, Sharon, Wee, Stephen, and Benté, Vance	Cultural Resources Inventory Report for the Proposed Mojave Northward Expansion Project	Woodward-Clyde Consultants	20-002122
MA-00266		1987	Chavez, David	Cultural Resources Investigations for the Madera County Women's Prison Project, Madera County, California	David Chavez and Associates	
MA-00389		1981	True, D.L.	Archaeological Investigations in Madera County, California: Dry Creek-Schmidt Creek Watershed Project	US Soil Conservation Service	
MA-01001		2005	Windmiller, Ric	Madera Town Center: Archaeological Resources Inventory, Madera, Madera County, California	Individual Consultant	
MA-01002		2006	Windmiller, Ric	CAT 17 Archaeological Resources Inventory, Madera, Madera County, California	Individual Consultant	
MA-01026	Submitter - SWCA Cultural Resources Report Database No. 06-507; Submitter - SWCA Project No. 10715-180	2006	Arrington, Cindy, Bass, Bryon, Brown, Joan, Corey, Chris, and Hunt, Kevin	Cultural Resources Final Report of Monitoring and Findings for the Qwest Network Construction Project, State of California	SWCA Environmental Consultants	
MA-01026A		2000	SWCA Environmental Consultants	Qwest Fiber Optic Project Cultural Resources Protocols	SWCA Environmental Consultants	

Report List

SSJVIC Record Search 21-039

Report No.	Other IDs	Year	Author(s)	Title	Affiliation	Resources
MA-01201		2010	Meyer, Jack, Young, D. Craig, and Rosenthal, Jeffrey	Volume I: A Geoarchaeological Overview and Assessment of Caltrans Districts 6 and 9 - Cultural Resources Inventory of Caltrans District 6/9 Rural Conventional Highways - EA 06-0A7408 TEA Grant	Far Western	
MA-01201A		2010	Meyer, Jack, Young, D. Craig, and Rosenthal, Jeffrey S.	Volume II: Appendices A Geoarchaeological Overview and Assessment of Caltrans District 6 and 9 - Cultural Resources Inventory of Caltrans District 6/9 Rural Conventional Highways - EA 06-0A7408 TEA Grant	Far Western Anthropological Research Group, Inc.	
MA-01217	Caltrans - 06-MAD-99 PM 7.5/15.1 EA 06-47090	2014	Miller, Michelle	Archaeological Survey Report for the Madera 99 Widening Project 06-MAD-99 Madera County, California	California Department of Transportation	
MA-01321	Other - 13-494; Submitter - PN: 2599-002	2014	Sikes, Nancy E.	Historic Property Survey Report for the Road 23 at Dry Creek Bridge Replacement Project, Madera County, California	Cogstone Resources Management Inc.	
MA-01321A		2014	Sikes, Nancy E.	Archaeological Survey Report for the Road 23 at Dry Creek Bridge Replacement Project, Madera County, California	Cogstone Resource Management Inc.	

Resource List

SSJVIC Record Search 21-039

Primary No.	Trinomial	Other IDs	Type	Age	Attribute codes	Recorded by	Reports
P-20-002308	CA-MAD-002649H	Resource Name - Madera Canal; Madera Irrigation District; MID; Resource Name - MID Lateral 6.2 Segments; OTIS Resource Number - 676884	Structure	Historic	AH06; AH08; HP20	1992 (Unknown, JRP Historical Consulting Services); 2000 (Karana Hattersley-Drayton, Caltrans); 2005 (G. Roark, C. Fish, Jones & Stokes); 2005; 2009 (Joseph Freeman and Rebecca Flores, JRP Historical Consulting, LLC); 2013 (Mark Kile, Culturescape); 2014 (R. Scott Baxter, ESA); 2016 (Brandon Patterson, Garcia and Associates); 2016 (K. Asselin, Applied EarthWorks, Inc.); 2016 (Mark Kile, Culturescape); 2016 (Mark Kile, Culturescape); 2016 (HDR EOC, Inc., HDR EOC, Inc.); 2016 (Katherine Anderson, ESA)	MA-01203, MA-01254, MA-01257, MA-01266, MA-01267, MA-01287

*Resource Name or # MID Lateral 6.2 Segments

*Recorded by: Katherine Anderson | ESA
2600 Capitol Ave, Ste 200
Sacramento, CA 95816

*Date: 12/2016 ☐ Continuation ■ Update

P1. Other Identifier: MID Lateral 6.2 Segments (3)

***P2. Location:** ☐ Not for Publication ■ Unrestricted *a. County: **Fresno**
and **(P2b and P2c or P2d. Attach a Location Map as necessary.)**
*b. USGS 7.5' Quad: **Herndon** Date: 1981 T **11S**; R **18E** ; ¼ of ¼ of Sec **13, 25**; **M.D.** B.M.
e. Other Locational Data: alignment intersects along an unnamed road intersecting Road 32 between Avenue 9 and Avenue 10, within Section 13, along Road 32 between the unnamed road and Avenue 9, and south of Avenue 8 and west of Road 33

P8. Recorded by: Katherine Anderson | ESA , 2600 Capitol Ave. Ste 200, Sacramento, CA 95816

***P9. Date Recorded:** 12/20/2016

***P3a. Description:** Three segments of the MID Lateral 6.2 Canal are present within the APE: MID Lateral 6.2-9.2 (a 1,500-foot segment south of Avenue 8, within Section 25), MID Lateral 6.2-13.4 (a 2,500-foot segment at the northeast corner of Avenue 9 and Road 32, in Section 13), and MID Lateral 6.2 (a 1,500-foot segment off an unnamed road intersecting Road 32 between Avenue 9 and Avenue 10, within Section 13). All these segments are in Madera County, north of the San Joaquin River and East of Highway 99. The segment at MID Lateral 6.2 is part of the canal that connects to the Madera Canal at a point approximately 14 miles to the northeast of the project APE. MID Laterals 6.2-9.2 and 6.2-13.4 are both distributary canals connecting to MID Lateral 6.2 at a diversion point near Road 32.

Within the project APE, MID Lateral 6.2 is an earthen trapezoidal canal, measuring approximately 1500 feet long, approximately 20 feet deep, 40 feet wide at the top, and 20 feet wide at the base (Figure 1). The unlined canal has moderately sloping sides, with evidence of some irregular cobble stone rip rap scattered along the alignment and a concrete culvert under Road 32. The canal is flanked by raised dirt access roads measuring approximately 15 feet wide.

MID Lateral 6.2-9.2 within the project APE is an earthen distributary canal, with an asymmetrical trapezoidal/U-shape, measuring approximately 1500 feet long, approximately 8 feet deep, 20 feet wide at the top, and 10 feet wide at the base (Figure 2). The unlined canal has steeply sloping sides and is flanked by a dirt maintenance road to the north and a paved private driveway to the south. The south slope is slightly steeper than the north, due to the construction of the modern paved driveway that parallels the canal.

MID Lateral 6.2-13.4 within the APE is a shallow earthen distributary canal, with a roughly trapezoidal shape, measuring approximately 1,500 feet long, 3 feet deep, 20 feet wide at the top and 4 feet wide at the base (Figure 3). The canal sides have shallow slopes, and show signs of neglect with vegetation growing from the walls and base, as well as evidence of dumping and trash accumulation.

***B10. Significance:** The Madera Canal and MID distribution system was originally designed with and reliant on sizable lateral canals to distribute water from the canal to the lower lying agricultural properties within the County. The original design included 14 laterals canals extending from the Madera Canal between Friant Reservoir and the Chowchilla River. As the canals extend from the Madera Canal, divisions and offshoots create a network of canals covering much of the County. Each canal extend for tens of miles, totaling hundreds of miles throughout the county.

The majority of the three segments of MID Lateral 6.2 within the HSR project APE do not reflect their original planned locations (Figure 1). MID Lateral 6.2-9.2 shows a relatively similar east/west orientation as the original plan, but MID Lateral 6.2-13.4 is significantly different from the proposed southeast/northwest alignment. MID Lateral 6.2, the largest and most directly connected segment of canal to the Madera Canal within the APE, shows significant change from its original proposed alignment (the planned southeast/northwest alignment through Section 13 is significantly different from the actual east/west orientation of the canal through the middle of Section 13). The further from the Madera Canal, the less the canal alignments reflect the planned design. At its nearest point, the canal within the APE is approximately 14 miles from the Madera Canal, and does not closely reflect the original plan design.

Laterals 6.2-9.2 and 6.2-13.4 have both been significantly modified from their original design, through either modification or neglect. The design of MID Lateral 6.2-9.2 has been modified through the construction of the modern driveway south of the canal, changing its profile shape. The slope and physical integrity of MID Lateral 6.2-13.4 has been significantly impacted through neglect and erosion, with the canal not reflecting its original design or trapezoidal shape. The segment of MID Lateral 6.2 in the APE has vegetation lining the bottom and slopes of the canal, shows some signs of erosion along the slopes, but overall retains sufficient integrity of to reflect its physical integrity as originally constructed.

Water conveyance features are usually considered for their significant associations with historic events (NRHP Criterion A and CRHR Criterion 1), with a significant resource including a main canal from the first water conveyance system of its kind in the region, or an essential component of a water-conveyance system that transformed local agricultural or industrial development in

*Recorded by: Katherine Anderson | ESA
2600 Capitol Ave, Ste 200
Sacramento, CA 95816

*Date: 12/2016 ☐ Continuation ■ Update

the area. While the MID Lateral 6.2 Canal is associated with the Madera Canal and the mid-century development of Madera County and its agricultural irrigation network, archival research does not indicate that the segments of the MID Lateral 6.2 Canal within the APE rise to a level of significance for its associations. The MID Lateral 6.2, as well as its distributary canals, is one of many canals constructed in support of the Madera Canal, well after the Madera Canal's original construction. The canal was one of many lateral irrigation canals constructed as part of the Madera Canal, which allowed for the irrigation of much of the County. It reflects typical mid-century construction techniques and design, although the final alignment is noticeably different from the original design. The segments of MID Lateral 6.2 in the HSR APE are not unique in their associations with the Madera Canal, and are symptomatic of typical patterns of growth and expansion, and therefore, are not recommended as eligible under NRHP Criterion A or CRHR Criterion

As detailed above, water-conveyance systems were constructed by companies and/or individuals in order to irrigate land holdings for agricultural pursuits. Therefore, the relevant association would be with their land holdings rather than the water-conveyance system that enabled them to successfully develop their agricultural business. The segments of MID Lateral 6.2 in the HSR APE, therefore, are not recommended eligible under NRHP Criterion B and CRHR Criterion 2.

The segments of the MID Lateral 6.2 Canal within the HSR APE represent typical irrigation canals and do not reflect an innovative design, form, or function, nor is the canal known to be associated with the work of a master engineer. They not display distinctive characteristics of a type, period, or method of construction and therefore, are not recommended eligible under NRHP Criterion C or CRHR Criterion 3. Lastly, this property type does not appear to have the potential to yield more information and therefore, is not recommended eligible under NRHP Criterion D or CRHR Criterion 4.

None of the earlier evaluations by JRP (1992), Applied Earthworks (2006), or ECORP (2015) consider the MID Lateral 6.2 Canal as a contributor to the larger irrigation district. The MID Lateral 6.2 Canal was neither the earliest nor most significant lateral canal as part of the Madera Canal or CVP. Within the HSR project APE, it is a typical, non-distinct irrigation canal within Madera County, and does not rise to distinction as an individual resource or as a potential contributor to a historic district. Additionally, as described above, canal segments 6.2-9.2 and 6.2-13.4 no longer retain sufficient integrity to reflect their historic associations as either an individual resource or as a contributor to a historic district. Segment 6.2 retains sufficient integrity, but does not meet the eligibility requirements of Criteria 1/A through 4/D for listing in the National or California Registers.

This property does not appear to meet the criteria for listing in the NRHP or the CRHR.

P5a. Photo or Drawing

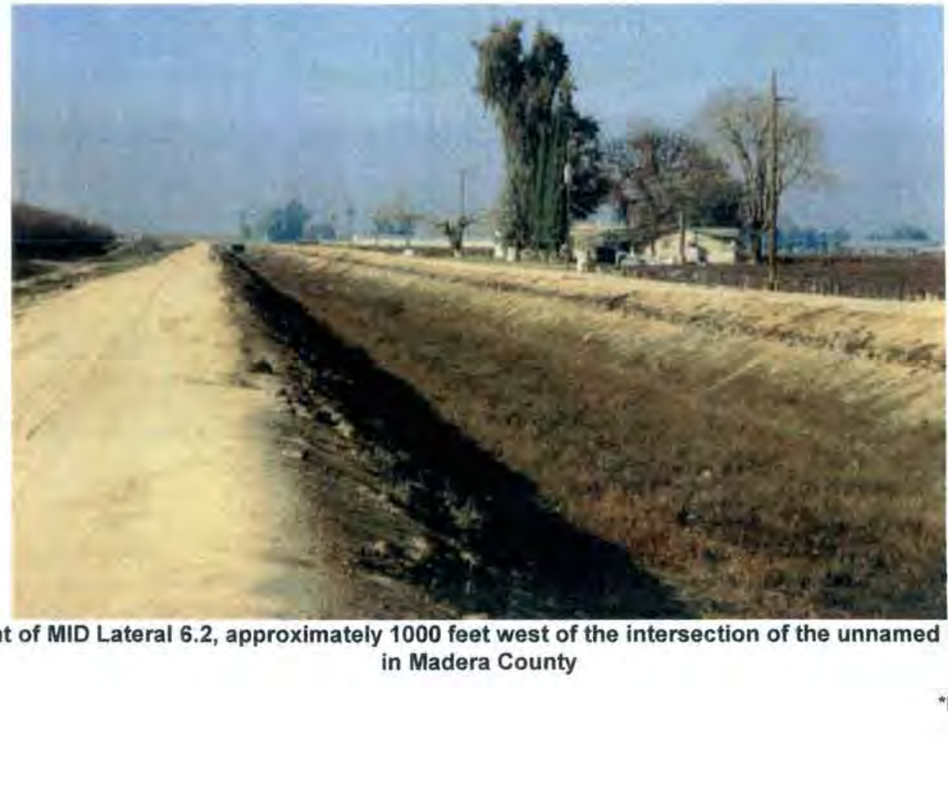


Figure 1 Segment of MID Lateral 6.2, approximately 1000 feet west of the intersection of the unnamed road and Road 32 in Madera County

***Resource Name or # MID Lateral 6.2 Segments**

***Recorded by:** Katherine Anderson | ESA
2600 Capitol Ave, Ste 200
Sacramento, CA 95816

***Date:** 12/2016 ☐ Continuation ■ Update

Figure 2 Segment of MID Lateral 6.2-9.2, south of Avenue 8 in Madera County

Figure 3 Segment of MID Lateral 6.2-13.4, near the intersection of Avenue 9 and Road 32 in Madera County

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

UPDATE

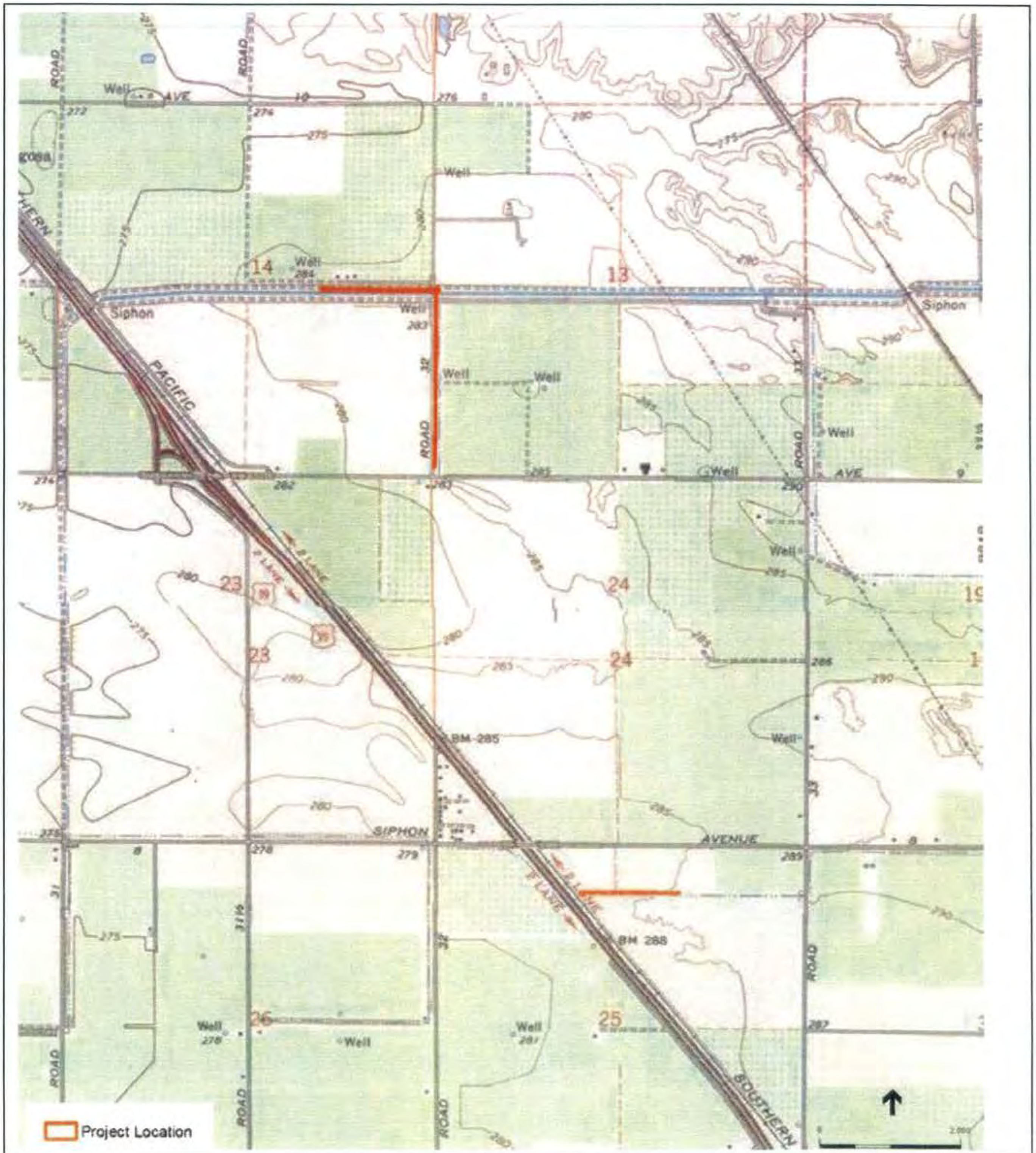
Primary # P- 20-002308
HRI#

LOCATION MAP

Trinomial CA-MAD-2649H

***Resource Name or #: MID Lateral 6.2**

***Map Name: Segment of MID Lateral 6.2 within HST APE** ***Scale: 1:24k** ***Date of Map: 1981**



UPDATE

State of California The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-20-002308
HRI #
Trinomial CA-MAD-1221/H
NRHP Status Code 6Z

Other Listings ______
Review Code ______ Reviewer ______ Date ______

Page 1___ **of** 27 ***Resource Name or #:** (Assigned by recorder) **UPDATE**

P1. Other Identifier: This does not supersede the original record

***P2. Location:** X **Not for Publication** **Unrestricted**

***a. County** Madera

***b. USGS 7.5' Quad** see contiuation **Date** T MD **B.M.**

c. Address NA City Madera Zip

d. **UTM** See continuation (NAD 83 Conus96)

e. **Other Locational Data :See continuation**

***P3a. Description:** This is a list of 14 additional control points for the Madera Irrigation District

***P3b. Resource Attributes: (list attributes and codes)** AH8 Dams,

P4. Resources Present: ☐* Building ☐ Structure ☐ Object ☐Site ■Element of a District ☐ Other (Isolates, **etc.)**

P5a.

P5b. Description of Photo: Overview of Hargrove flume gate (south)

***P6. Date Constructed/Age and source:**
☐ Historic☐ Prehistoric ■ Both

***P7. Owner and Address:**
Madera Irrigation
Road 28 1/4
Madera, Ca

***P8. Recorded by:**
Culturescape
6182 Carter Rd.
Mariposa ca.

***P9. Date Recorded:** 11/22/16

***P10. Survey Type:** reconnaissance

***P11. Report Citation:** Cultural Resource Inventory for Madera Irrigation D Water Conservation District
16-SCAO-170 Madera Irrigation District Lateral 24.2-17.0 Pipeline Improvement Project
16-SCAO-171 Madera Irrigation District Water Conservation and Canal Automation Improvement Project

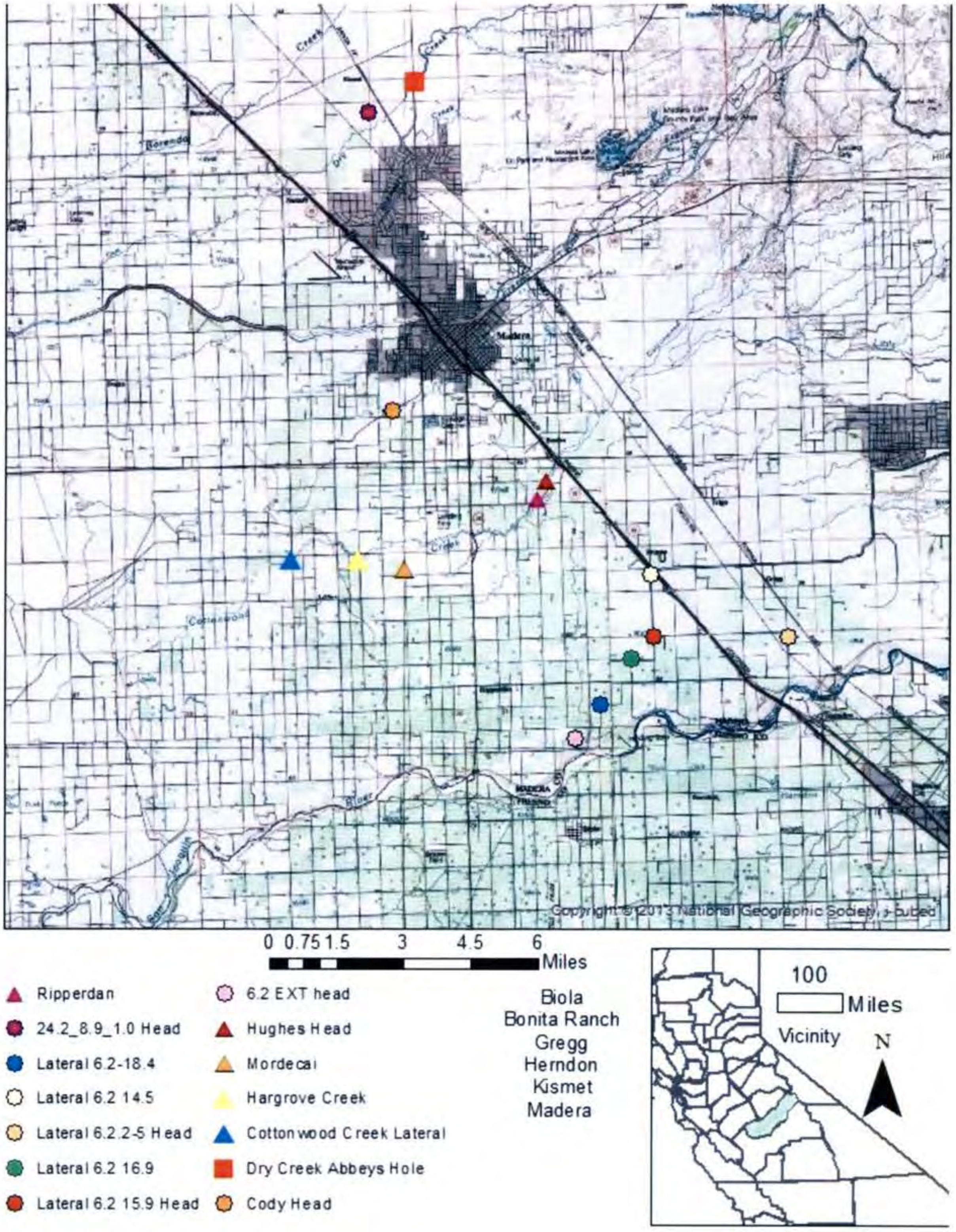
***Attachments:** ☐NONE ■ Location Map ■ Continuation Sheet ☐Building, ■ Structure, and Object Record ☐Archaeological Record ☐District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐Photograph ☐ Other (List): ______

UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #P-20-002308
Trinomial CA-MAD-002649H
NRHP 6Z

Page 2 **of** 27
***Resource Name or Temp:** Madera Irrigation District
***Map Name:** Location
Scale:
Date: 12/2/2016

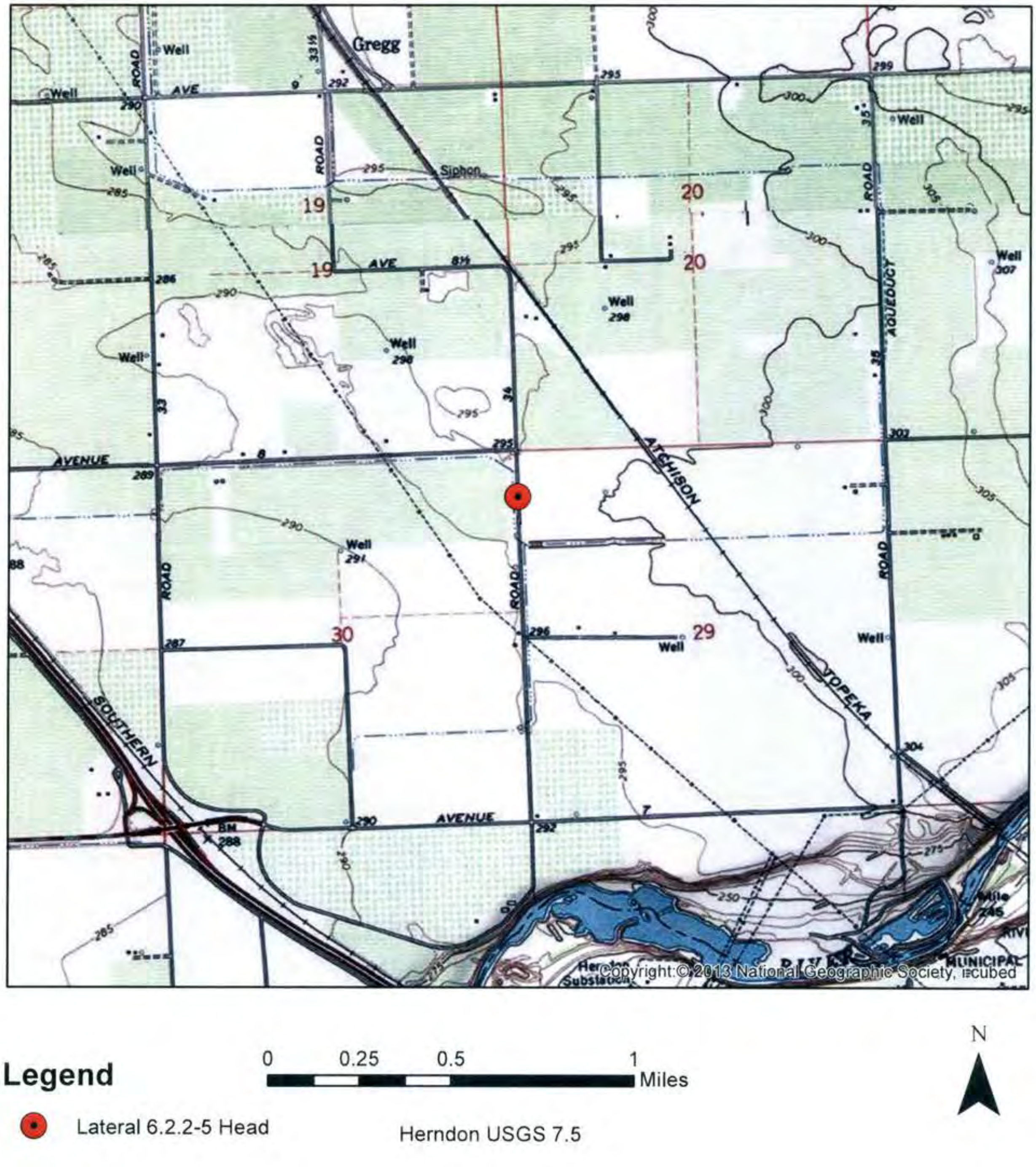


State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

*Map Name:Herndon

Primary # P-20-002308
Trinomial CA-MAD 2649H
NRHP 6Z
*Resource Name or Temp:Madera Irrigation District
Scale: 1:24,000 Date:11/27/2016

UPDATE



State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP
Page 4 of 27
*Map Name:Bonita Ranch

Primary #P-20-002308
Trinomial CA-MAD 2649H
NRHP 6Z
*Resource Name or Temp:Madera Irrigation District
Scale: 1:24,000 Date:11/27/2016

UPDATE

Legend

32_2_9.9_6.5 Head

0 0.25 0.5 1 Miles

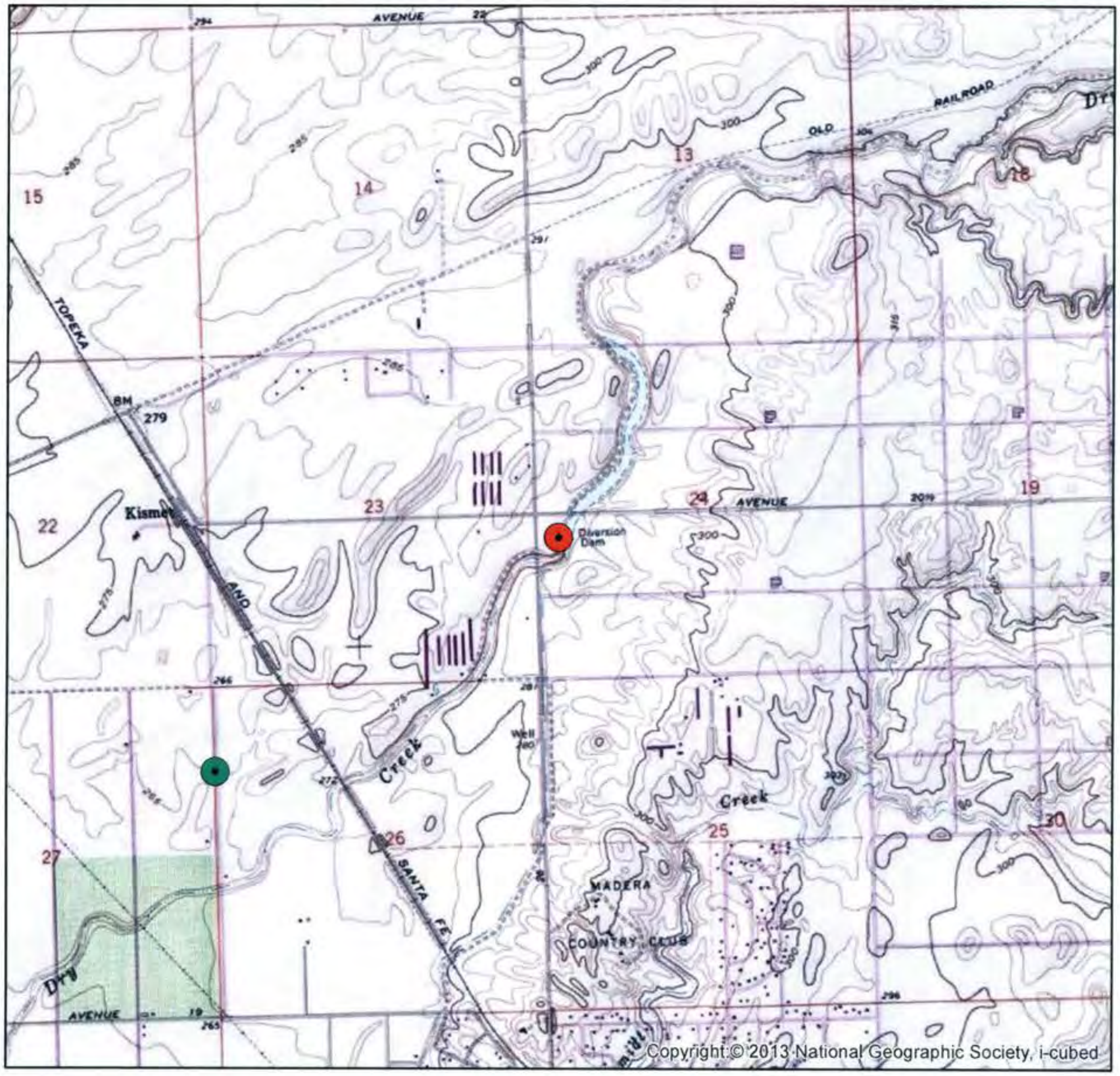
Bonita Ranch USGS 7.5

N

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP
Page 5 of 27
*Map Name:Kismet

Primary #P-20-002308
Trinomial CA-M A-2649H
NRHP 6Z
*Resource Name or Temp:Madera Irrigation District
Scale: 1:24,000 Date:11/27/2016

UPDATE



Legend

- 6.2 8.9_1.0
- Dry Creek Abbeys Hole

0 0.25 0.5 1 Miles

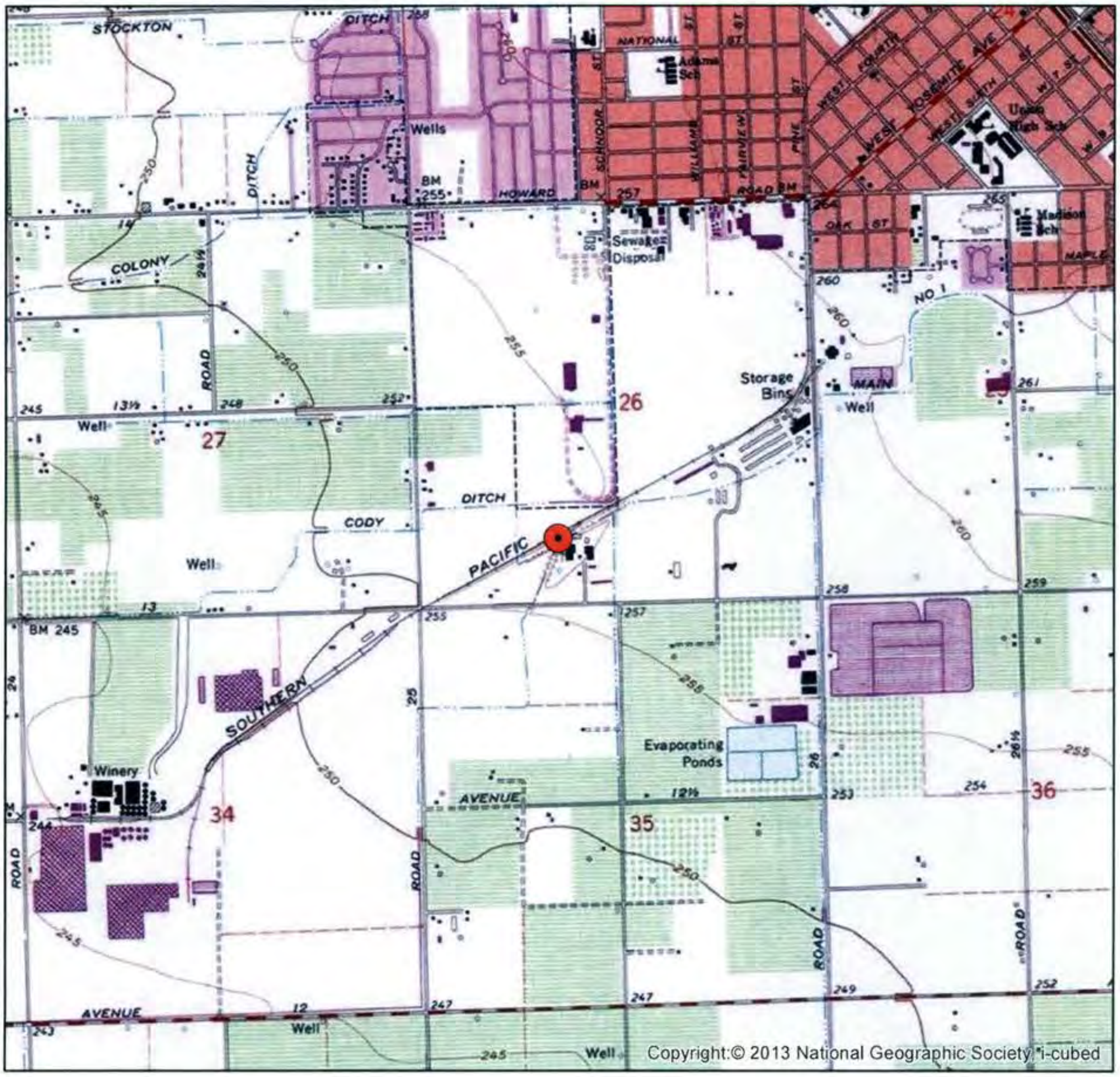
Kismet USGS 7.5

N

*Map Name: Madera

Primary # P-20-002308
Trinomial CA-MA-2649H
NRHP 4X, 6Z
*Resource Name Madera Irrigation District
Scale: 1:24,000 Date: 11/27/2016

UPDATE



0 0.15 0.3 0.6 0.9 1.2 Miles

N

Legend

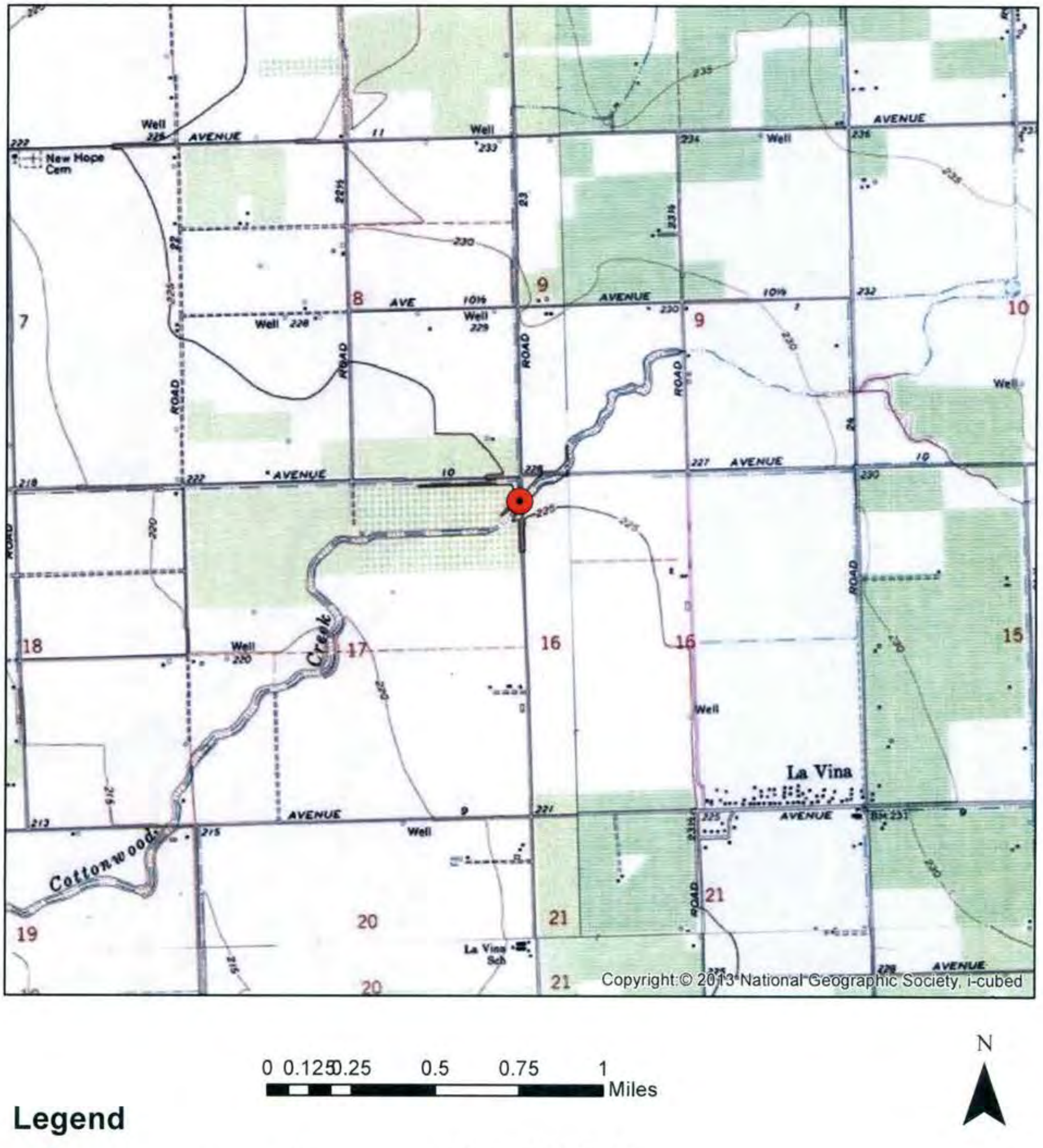
Cody Head

Madera USGS 7.5

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP
Page 7 of 27
*Map Name: Madera

Primary # P-20-002308
Trinomial CA-MA -2649H
NRHP 6Z
*Resource Name Madera Irrigation District
Scale: 1:24,000 Date: 11/27/2016

UPDATE



Legend

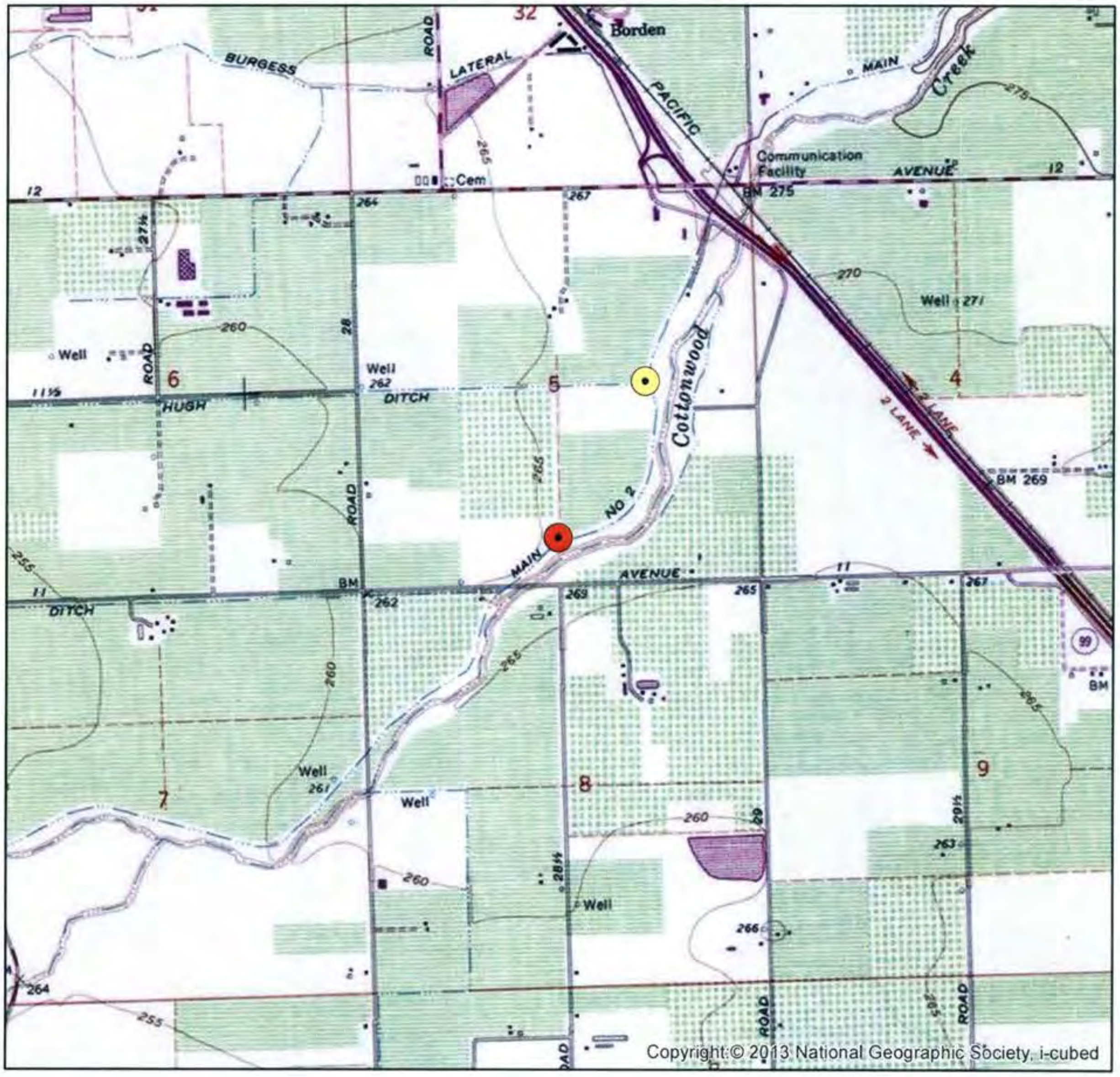
Cottonwood Creek Lateral

~~Madera~~ USGS 7.5
BONITA RANCH

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP
Page 8 of 27
*Map Name:Madera

Primary # P-20-002308
Trinomial CA-MAD - 2649H
NRHP 6Z
*Resource Name :Madera Irrigation District
Scale: 1:24,000 Date:11/27/2016

UPDATE



Legend

Ripperdan

Hughes Head

0 0.25 0.5 1 Miles

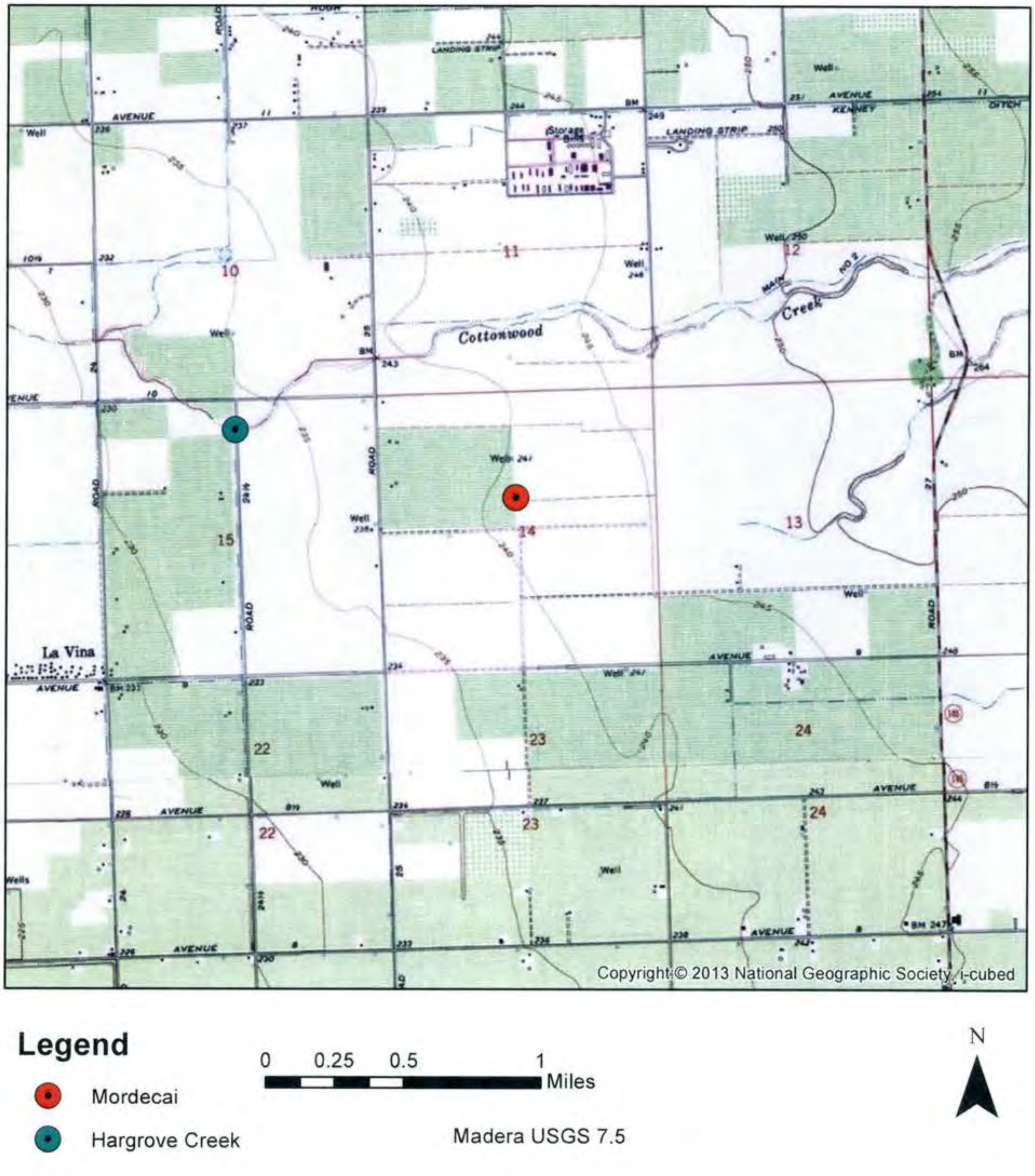
Madera USGS 7.5

N

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP
Page 9 of 27
*Map Name:Madera

Primary # P-20-002308
Trinomial CA-MAD - 2649H
NRHP 6Z
*Resource Name Madera Irrigation District
Scale: 1:24,000
Dat e :11/27/2016

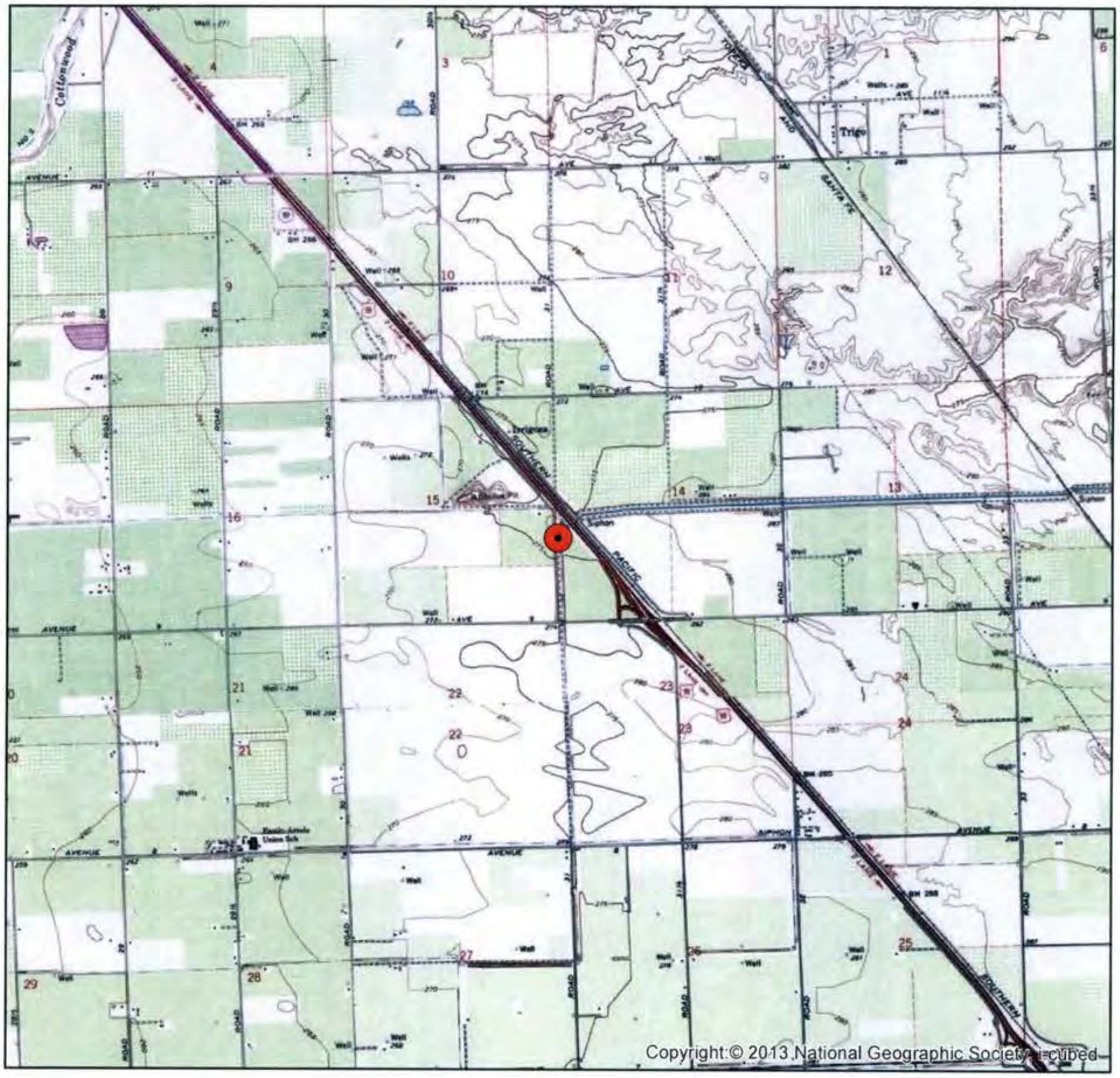
UPDATE



State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP
Page10 of 27
*Map Name:Gregg

Primary # P-20-002308
Trinomial CA-MAD- 2649H
NRHP 6Z
*Resource Name Madera Irrigation District
Scale: 1:24,000
Date:11/27/2016

UPDATE



Legend

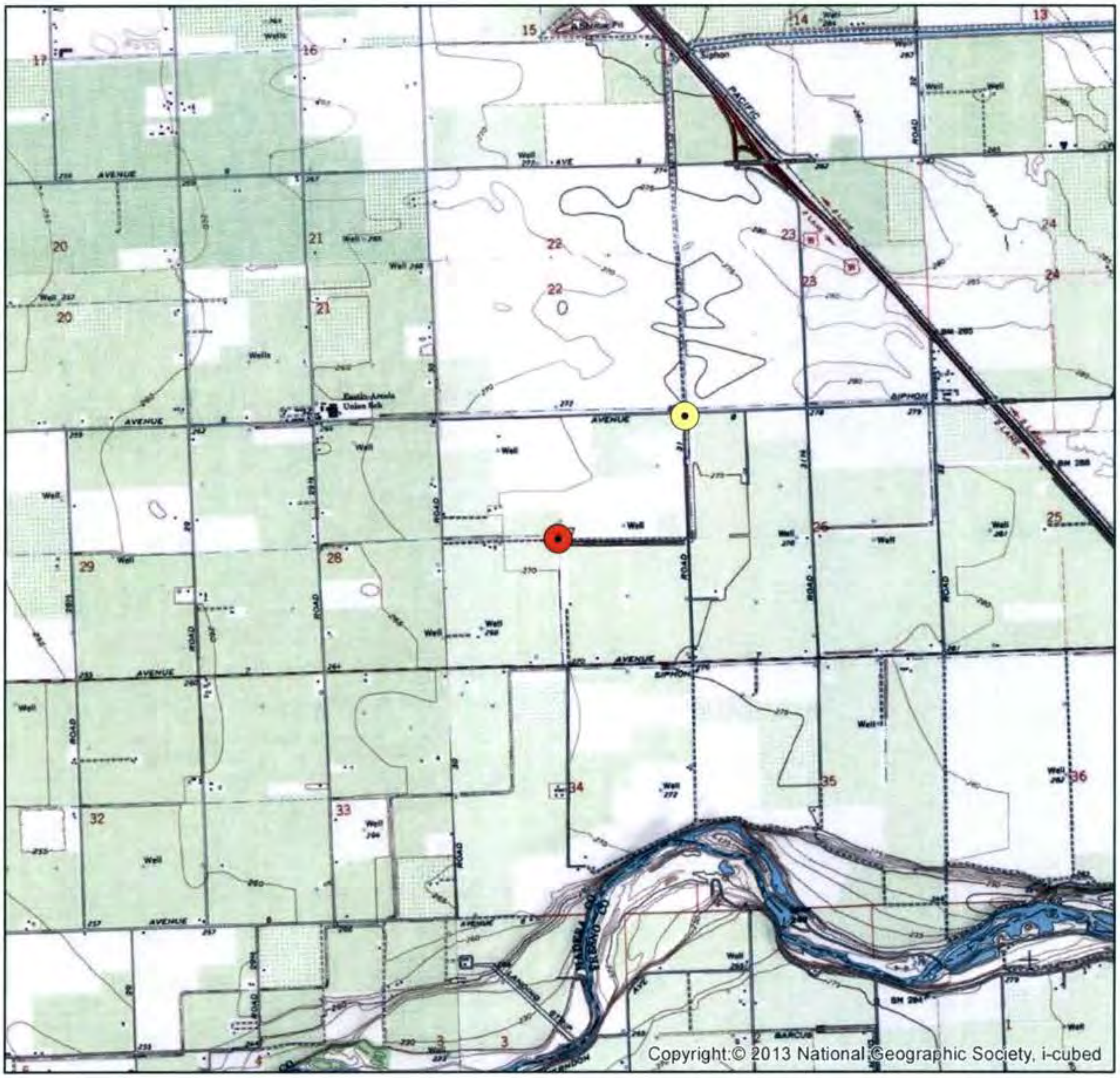
Lateral 6.2 14.5

Gregg USGS 7.5

UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP
Page11 of 27
*Map Name:Herndon

Primary # P-20-002308
Trinomial CA-MAD -2649H
NRHP 6Z
*Resource Name Madera Irrigation District
Scale: 1:24,000 Date:11/27/2016



Legend

Lateral 6.2 16.9

Lateral 6.2 15.9 Head

0 0.25 0.5 1 Miles

N

Herndon USGS 7.5

UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP
Page12 of 27
*Map Name: Biola

Primary # P-20-002308
Trinomial CA-MAD -2649H
NRHP 6Z
*Resource Name Madera Irrigation District
Scale: 1:24,000
Date:11/27/2016

Legend

Lateral 6.2-18.4

6.2 EXT head

0 0.25 0.5 1 Miles

N

Biola USGS 7.5

UPDATE

Temporary Number/Resource Name:

P2b USGS 7.5 Quad, d UTM)

Biola: Biola:
T12 S R18E Sec 33 6 Lateral 6.2-18.4 Head 10s 767002 mE 4081746 mN
T13 S R18E Sec 4 Lateral 6.2 Ext. Head10s 766138 mE 4080515 mN

Bonita Ranch:
T11S R 16E Sec 10, (15 and 22, pipeline)
T12S R 17E Sec 17 Cottonwood Creek 10s 759928 mE 4086581 mN

Gregg:
T12S 18E Sec 15 Lateral 6.2-14.5 Head 10s 768842 mE 4086462 mN

Herndon:
T12S R18E Sec 22, 27 Lateral 6.2-15.9 Head 0s 768940 mE 4084239 mN; 6.2-16.9 Head10s 768144 mE 4083384m N
T12S R19E Sec. 29 Lateral 6.2-9.2-5.0 (Head 10s 773762 me 4083987 mN

Kismet:
T10S R 17E Sec 24, 27 Dry Creek Abbey's Hole 10s 760312m E 4103995 mN,
Lateral 24.2-8.9-1.0 Head 10s 758619 mE 4102850 mN

and Madera
T11S R17E Sec 26 Cody Head 10s 759520 mE 4092257 mN
T12S R17E Sec 14, 15, Mordecai 10s 759928 mE 4086581 mN, Hargrove Head10s 758286 mE 4086937 mN
T12S R18E Sec 8 Hughes Head 10 s764515 mE 4088925 mN

P3e Other Locational Data)

Location #1 Cody (Head 10s 759520 mE 4092257 mN) (Figure 10-12): This is located in a vacant lot north of Avenue 13 (Pecan Avenue). The valve connects to a siphon at this point while the remaining lateral remains an open canal. The area has been recently tilled and visibility was 100%. No prehistoric cultural remains were located.

Location # 2 (Cottonwood Creek Lateral Head 10s 755859 mE 4087036 mN)(Figure 13-15). This is located at the corner of Avenue 10 and Road 23. It is a slat gate configuration. Cottonwood Creek is to the east with grape vineyards in the remaining directions. The area had No cultural materials were observed. The concrete breast wall appeared modern as did the mechanism.

Location # 3 Lateral 6.2-14.5 (Figure 16-18) (Head 10s 768842 mE 4086462 mN): This gate is located along a canal just west of Highway 99 to the north side of a large canal. The valve leads to buried siphon under Road 31. New material was noted along the levee and fresh sand had been placed on the access road along the top of the canal. No cultural materials were located.

Location #4 Lateral 6.2-15.9 (Figure 19-21) (Head 10s 768940 mE 4084239 mN): is located at the intersection of Road 31 and Avenue 8. This is a complex series of valves with 15.9 being located in the enclosed space nearest Avenue 8 at the corner. The area had 100% visibility and no cultural materials were located.

Location #5 Lateral 6.2-16.9 (Figure 22-24) (Head10s 768144 mE 4083384 mN): This is located on private land and is surrounded on three sides by grapes with the northwest field fallow. New bolts were noted on the guard and there was apparent concrete patch on the top of the frame indicating that this may have had a different valve at some point. This is a shear valve. The area had 1005 visibility with no cultural materials noted.

Location # 6 Lateral 6.2-18.4 (Figure 25-27) (Head 10s 767002 mE 4081746 mN): This is located within a new almond orchards with an established grape orchard to the southeast. The area has 100% visibility. The gate valve is a shear gate and there is evidence of maintenance. No cultural materials were located along the levee surrounding the valve.

Location # 7 Dry Creek (Figure 28-32) (Abbey's Hole 10s 760312m E 4103995 mN): Is located on Dry Creek in part of the original development of the Madera Flume and Irrigation Company. The dam structure displays modern features including the sheet steel plates that have rebar welded to them to enable lifting. The top concrete slab is a monolithic pour that has a welded tube steel safety rail imbedded in the concrete. A second portion of the railing appears to have been added later and is incorporated into the existing gate. There was excellent visibility surrounding the flume gate.

UPDATE

There was a developed almond orchard surrounding the structure and the access road is modern and appears well maintained. There is an area on the north of the structure that has been used for illegal dumping. No cultural materials were observed.

Location # 8 Hughes (Figure 33-35) (Head 10 s764515 mE 4088925 mN): Hughes Head is located within an almond orchard to the west of Cottonwood Creek. It uses a shear valve and the concrete buttress appears modern. No cultural materials were observed.

Location #9 Lateral 6.2 Ext. (Figure 36-38) (Head10s 766138 mE 4080515 mN): This is located on Road 29 ½ south of Avenue 6. There are Grapes planted to the east and there are Pistachios to the west. The valve was not accessible. The area had 100% visibility with no cultural artifacts located.

Location #10 Lateral 32.2-9.9-6.5 (Figure 39-41) (Head10s 747332 mE 4098108 mN): This is located along Avenue 17 south of Berenda Creek. The area has fairly new almond trees planted on three sides with open field to the south. The area had excellent visibility. Both sides of the canal were examined. No cultural materials were located.

Location #11 Hargrove (Figure 42-44) (Head10s 758286 mE 4086937 mN): This is located along Road 24 ½ at Cottonwood Creek. This particular flume gate belongs to the original Madera Flume and Irrigation Company. It should be noted that this has been raised 16' as evidenced by the cold joint concrete cap and new slats that have been added. It is difficult to assess if this was from the original; however it is apparent it has under gone extensive repair as noted by the cold joint on the right buttress.

Location #12 Mordecai (10s 759928 mE 4086581 mN: This is located on private land in the middle of a well-established almond orchard. This lateral was part of the original Madera Flume and Canal Company and has since been converted to pipe line. The valve was enclosed and inaccessible. Visibility was 100%.

Location #13 Lateral 24.2-8.9-1.0 (Head 10s10s 758619 mE 4102850 mN): This is located within new almond orchards, flume gate appears to be modern and the concrete appears to have been supported by freshly mounded dirt on the wing walls with evidence of equipment (tire tracks visible in the photo). The area had 100% visibility and no prehistoric cultural materials were observed.

Location #14 Lateral 6.2-9.2-5.0 (Head 10s 773762 me 4083987 mN)(Figures 47-49). This is located on the east side of Road 34 with an almond orchard to the south and a horse ranch to the north there is an orange to the southwest and an almond orchard to the northwest. The area had excellent visibility. Both sides of the canal were examined. No cultural artifacts were located.

UPDATE

State of California — The Resources Agency **Primary #** P-20-002308
DEPARTMENT OF PARKS AND RECREATION **HRI #/Trinomial** CA-MAD-2649H

BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code 6Z**

 Resource Name or No.: Madera Irrigation District

B1. Historic Name: NA

B2. Common Name: Shear Gates **B3. Original Use:** water control **B4. Present Use:** Water control

***B5. Architectural Style: Irrigation Multi-purpose system**

***B6. Construction History:** Unknown. Estimated between 1935 and 1963

***B7. Moved?:** ■ No ☐ Yes ☐ Unknown Date: Original Location:

***B8. Related Features: None**

B9. a. Architect: NA **b. Builder:** Unknown

***B10. Significance:** Central Valley Irrigation Project 1935-1960's Area: Madera Irrigation District
Period of Significance: 1935-1951 Property Type: water control location Applicable Criteria: 6Z
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

B11. Additional Resource Attributes): AH6, Water conveyance

***B12. References:**

Department of the Interior, Bureau of Reclamation
2013 Friant Division Project http://www.usbr.gov/projects/Project.jsp?proj_Name=Friant%20Division%20Project
Accessed November 5, 2013

Kile, M. C.
2014 Cultural Resource Inventory for the Madera ID Water Conservation 13-MPRO-191
MID Job#27-13-2 Submitted to Madera County Irrigation District

B13. Remarks: This is an example of shear gates located at 13 control point locations of the Madera Irrigation District. For the location data of each, see Continuation sheet

***B14. Evaluator:** Mark Kile
Culturescape 6182 Carter Rd. Mariposa Ca. 95338
Date of Evaluation: 12/3/2016

This space reserved for official comments.

UPDATE

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code 6Z

Resource Name or No.: Madera Irrigation District

B1. Historic Name: Hargrove Head

B2. Common Name: Parshall Flume **B3. Original Use:** water control **B4. Present Use:** Water control

***B5. Architectural Style:** IR

***B6. Construction History:** Unknown. Estimated between 1935 and 1958

***B7. Moved:** ■ No ☐ Yes ☐ Unknown Date: Original Location:

***B8. Related Features: None**

B9. a. Architect: NA **b. Builder:** Unknown

***B10. Significance:** Central Valley Irrigation Project 1939-1960's Area: Madera Irrigation District
Period of Significance: 1935-1951 Property Type: water control location Applicable Criteria: 6Z

This was constructed as part of the Central Valley Project that focused on improving irrigation throughout the Central Valley. The completion of this project resulted in the Madera Irrigation District becoming the largest in the Central Valley.

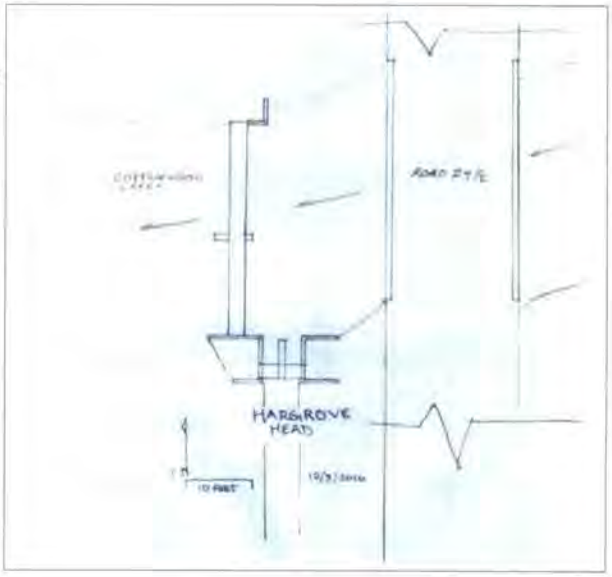
B11. Additional Resource Attributes): AH6, Water conveyance

***B12. References:**

Department of the Interior, Bureau of Reclamation
2013 Friant Division Project http://www.usbr.gov/projects/Project.jsp?proj_Name=Friant%20Division%20Project Accessed November 5, 2013

Kile, M. C.
2014 Cultural Resource Inventory for the Madera ID Water Conservation 13-MPRO-191 MID Job#27-13-2 Submitted to Madera County Irrigation District

B13. Remarks: This is an example of a Parshall flume with a panel gate at Hargrove Head of the Madera Irrigation District. This has been recently modified with an additional concrete cap. For the location data of each, see Continuation sheet



***B14. Evaluator:** Mark Kile
Culturescape 6182 Carter Rd. Mariposa Ca. 95338
Date of Evaluation: 12/3/2016

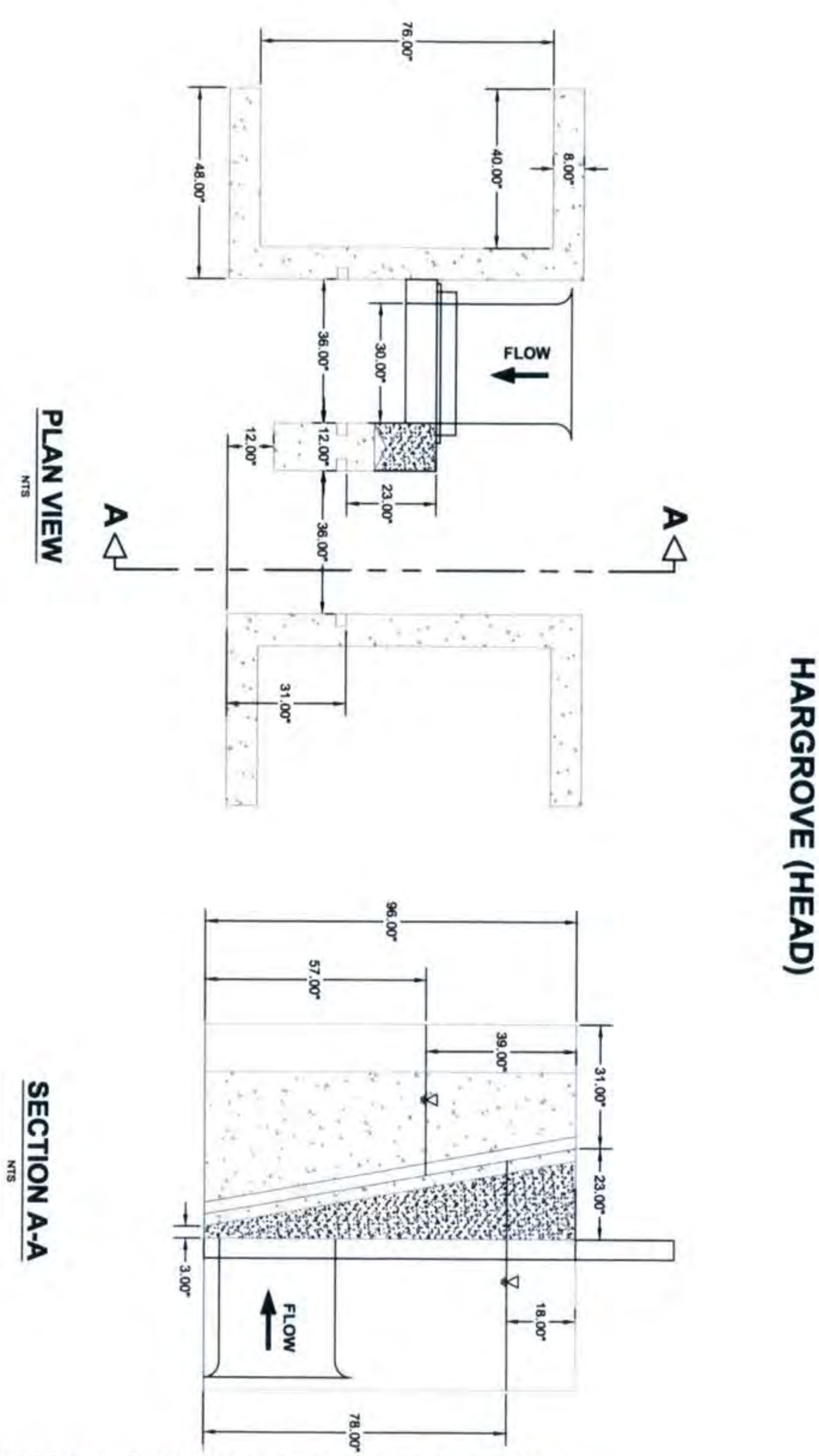
This space reserved for official comments.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary #P-20-002308
HRI #/Trinomial CA-MAD-2649H
NRHP 6Z

■ Continuation ☐ Update

Temporary Number/Resource Name: Madera Irrigation District



F:\ENGINEERING\Grants\2016\R16-FOA-DO-004 WaterSMART applications\Dwg\HargroveHead.dwg, 12/8/2016 11:18:58 AM

UPDATE

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code 6Z,

Resource Name or No.: Madera Irrigation District

B1. Historic Name: Dry Creek Dry Creek Diversion Dam Abbeys Hole

B2. Common Name: diversion dam **B3. Original Use:** diversion dam **B4. Present Use:** remains active

***B5. Architectural Style:** Industrial small diversion check dam

***B6. Construction History (construction date, alterations, and dates of alterations):** engineering drawings in 1953.The integrity appears good with some additional railing added along the upstream portion. It is unclear whether the weir gates are original or have been replaced. Maintenance has occurred with new paint and a top coat applied to the concrete deck.

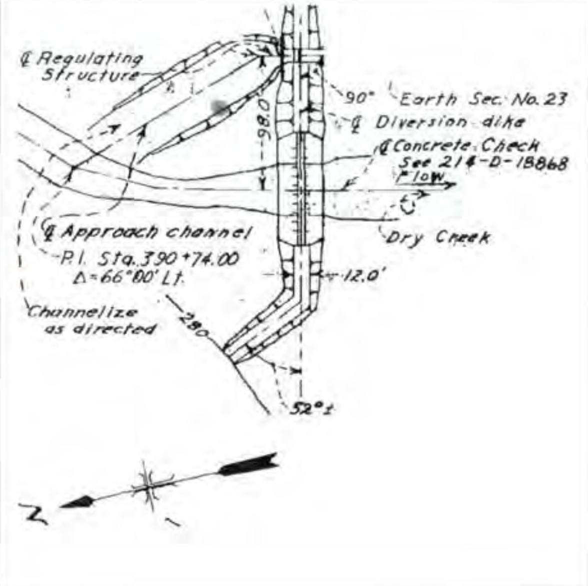
***B7. Moved?:** ■ No ☐ Yes ☐ Unknown Date: Original Location:

***B8. Related Features:**

B9. a. Architect: K.B. Keener chief designing engineer for the Bureau of Reclamation. Keener was born in 1888 and received his BS from Ohio in 1910. He was heavily involved in the design of the Grand Coulee Dam on the Columbian River and the Shasta Dam in northern California. The Dry Creek Diversion dam was designed late in his career as he retired in the 1950's. **b. Builder:** Unknown/ Bureau of Reclamation

***B10. Significance:** Central Valley Irrigation Project 1939-1960's Area: Madera Irrigation District
Period of Significance: 1939-1960s Property Type: Diversion Dam Applicable Criteria: 3B,
This structure appears to warrant eligibility according to Criteria B in that it is associated with K.B. Keener, as the Chief Engineer for the project. It is also significant according to Criteria A as a part of the development of the MID as part of the CVP project. This dam was constructed as part of the Central Valley Project that focused on improving irrigation throughout the Central Valley. The completion of this project resulted in the Madera Irrigation District becoming the largest in the central Valley.

B11. Additional Resource Attributes (list attributes and codes):
HP



***B12. References:** Hager, W. H.,

2015 *Hydraulicians in the USA 1800-2000, A biographical dictionary of Leaders Hydraulic Engineering and Fluid Mechanics.* CRC Press, Taylor and Francis Group, London.

Department of the Interior, Bureau of Reclamation 2013 Friant Division Project http://www.usbr.gov/projects/Project.jsp?proj_Name=Friant%20Division%20Project Accessed November 5, 2013

B13. Remarks: The sketch map is taken from the 1953 engineering drawing

***B14. Evaluator:** M. C. Kile
Culturescape
6182 Carter Rd. Mariposa Ca 95338
Date of Evaluation: 12/6/2016

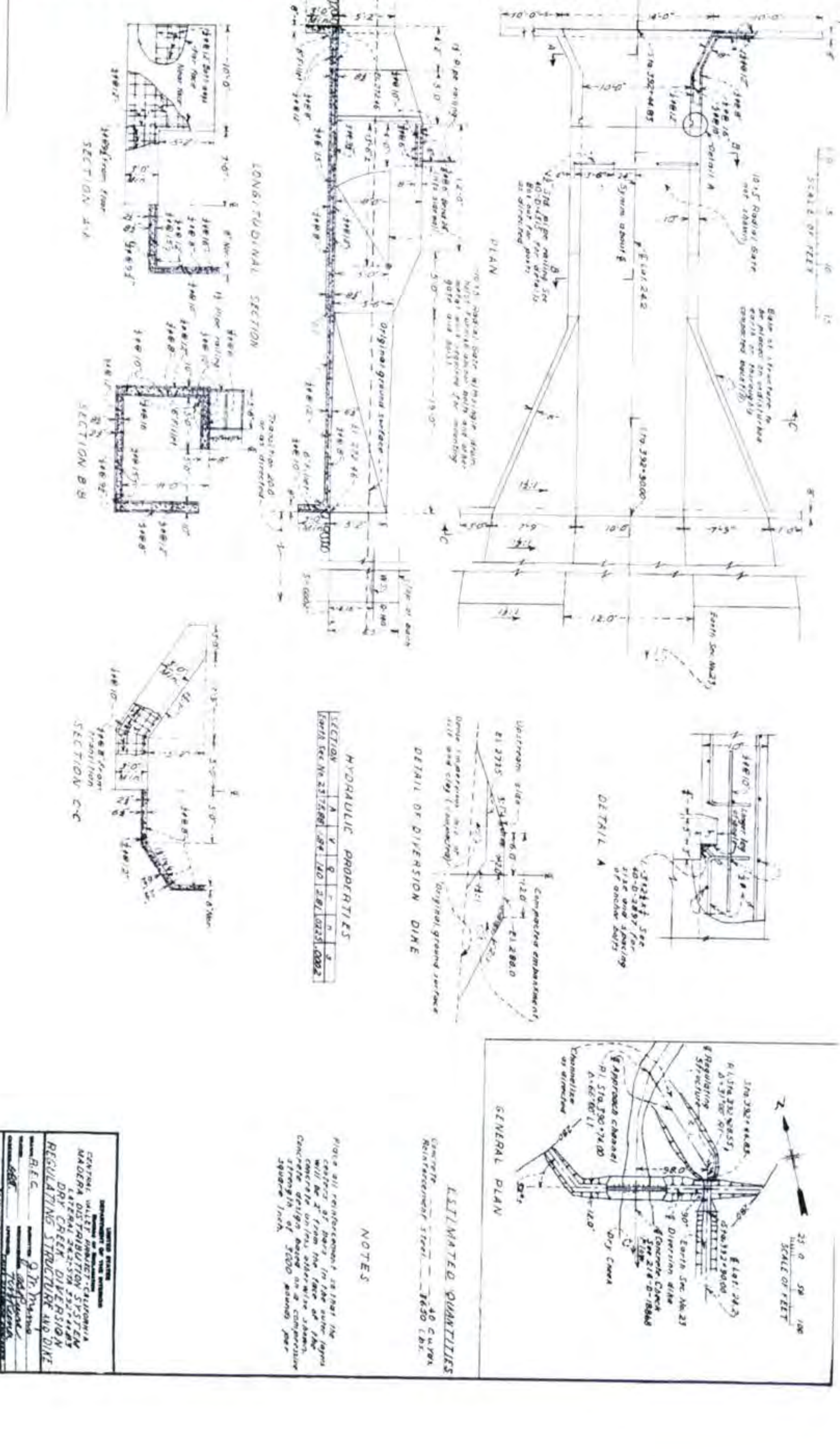
This space reserved for official comments.

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-20-002308
HRI #/Trinomial CA-MAD-2649H
NRHP 6Z

■ Continuation ☐ Update

Temporary Number/Resource Name: Madera Irrigation District Dry Creek Diversion dam



UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PHOTOGRAPH RECORD

Primary # P-20-002308
Trinomial CA-MAD-2649H
NHRP 6Z

Project Name or No.: Madera Irrigation District

Card/Disk/Directory:
Year: Camera Type:
Lens Size:
Megapixels/Resolution: 8
Digital Files Kept at:

Date	Time	Subject	Fig	Acs no.	Dir
11/22/16		Cody Head overview west	1	IMG-0572	west
11/22/16		Cottonwood Creek Lateral Head overview east	2	IMG-0571	east
11/22/16		Lateral 6.2 14.5 Head east	3	IMG-0615	east
11/22/16		Lateral 6.2 15.9 overview west	4	IMG-0549	west
11/22/16		Lateral 6.2-16.9 Head on the right overview northwest	5	IMG-0541	northwest
11/22/16		Lateral 6.2-18.4 overview NW	6	IMG-0528	northwest
11/22/16		Dry Creek Abbeys Hole Lateral 24.2 Head overview south	7	IMG-0588	south
11/22/16		Hughes Head west	8	IMG-0619	west
11/22/16		Lateral 6.2 EXT Head west	9	IMG-0536	west
11/22/16		Lateral 32.2-9.9-6.5 overview west	10	IMG-0578	west
11/22/16		Hargrove Head overview south	11	IMG-0566	south
11/22/16		Mordecai overview north	12	IMG-0560	north
11/22/16		Lateral 24.2-8.9-1.0 overview east	13	IMG-0582	east
11/22/16		Lateral 6.2-9.2 5.0 overview east	14	IMG-0524	east

UPDATE

■ Continuation ☐ Update

Temporary Number/Resource Name: Madera Irrigation Water control points

Figure 1 *Cody Head overview* *view to the west* *IMG-0572*

Figure 2 *Cottonwood Creek Lateral Head overview View to the east*

UPDATE

■ Continuation ☐ Update

Temporary Number/Resource Name: Madera Irrigation Water control points

Figure 3 Lateral 6.2 14.5 Head east IMG-0615

Figure 4 Lateral 6.2 15.9 overview west IMG-0549

UPDATE

■ Continuation ☐ Update

Temporary Number/Resource Name: Madera Irrigation Water control points

Figure 5 Lateral 6.2-16.9 Head on the right overview northwest IMG-0541

Figure 6 Lateral 6.2-18.4 overview NW IMG-0528

■ Continuation ☐ Update

Temporary Number/Resource Name: Madera Irrigation Water control points

Figure 7 *Dry Creek Abbeys Hole Lateral 24.2 Head overview view to the south* *IMG-0588*

Figure 1 *Hughes Head view to the west* *IMG-0619*

■ Continuation ☐ Update

Temporary Number/Resource Name: Madera Irrigation Water control points

Figure 2 *Lateral 6.2 EXT Head* *west* *IMG-0536*

Figure 10 *Lateral 32.2-9.9-6.5 overview* *west* *IMG-0578*

Figure 11 *Hargrove Head overview view to the south* *IMG-0566*

Figure 12 *Mordecai overview north* *IMG-0560*

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-20-002308
HRI #/Trinomial CA-MAD-2649H
NRHP 6Z

■ Continuation ☐ Update

Temporary Number/Resource Name: Madera Irrigation Water control points

Figure 13 *Lateral 24.2-8.9-1.0 overview view to the east* *IMG-0582*

Figure 14 *Lateral 6.2-9.2 5.0 overview east* *IMG-0524*

UPDATE

State of California The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-020-002308
HRI #
Trinomial CA-MAD-2649H
NRHP Status Code 6Z

Other Listings ______
Review Code ______ Reviewer ______ Date ______

 ***Resource Name or #:** Madera Irrigation District **Update**

P1. Other Identifier: (Lateral 24.2-17.0) this record serves to update P-20-00 2308/3105 recorded by Asselin et al.2016 Segments were not evaluated Primary Numbers conflict with regard to MID/Madera Canal

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted**

*a. **County** Madera

*b. **USGS 7.5' Quad** Bonita Ranch **Date** T 11 S; **R** 16 E North line, NE ¼ Section 22 MD **B.M.**

c. Address NA City Madera Zip

d. **UTM** 1) west end 10s 747460 mE 4094857 mN; 2) 10s 748647 mE 4094892 mN at south bend east side 3) 749070 mE 4094507 mN (NAD 83 Conus96)

e. **Other Locational Data:** This is located along Avenue 15 beginning at Road 18 and continues east for 3/4s of a mile ¼ mile before Road 19 where it turns south through an existing almond orchard for 625 feet before turning east and trends east southeast to Road 19 approximately 1000 feet south of Avenue 15 where it continues approximately 400 feet before entering a pipeline and crosses under Road 19 at this point.

f. ***P3a.Description:** This resource is approximately 6500' of Lateral 24.0-17.0, an irrigation canal that is part of the Madera Irrigation District expansion completed after intial construction of the Central Valley Project and was constructed after 1951. The canal has undergone extensive maintenance and modifications throughout its history continuing with major modifications until at least1965. The Canal is approximately 6 feet deep and 15 feet wide.

***P3b. Resource Attributes: (list attributes and codes)** AH6, Water conveyance, HP20 Canal,

P4. Resources Present: ☐* Building ☐ Structure ☐ Object ☐Site ■Element of a District ☐ Other (Isolates, **etc.)**

P5a.

P5b. Description of Photo: Overview canal feature from GPS point 2

***P6.Date Constructed/Age and source:**
■ Historic ☐ Prehistoric ☐ Both

1949-1965

***P7. Owner and Address:**
Madera Irrigation
Road 28 1/4,
Madera, Ca

***P8. Recorded by:**
Culturescape
6182 Carter Rd.
Mariposa ca.

***P9.Date Recorded:** 111/22/2016

***P10.Survey Type:** reconnaissance

***P11. Report Citation**: Cultural Resource Inventory for Madera ID Water Conservation 16-SCAO-170 Madera Irrigation District Lateral 24.2-17.0 Pipeline Improvement Project 16-SCAO-171 Madera Irrigation District Water Conservation and Canal Automation Improvement Project

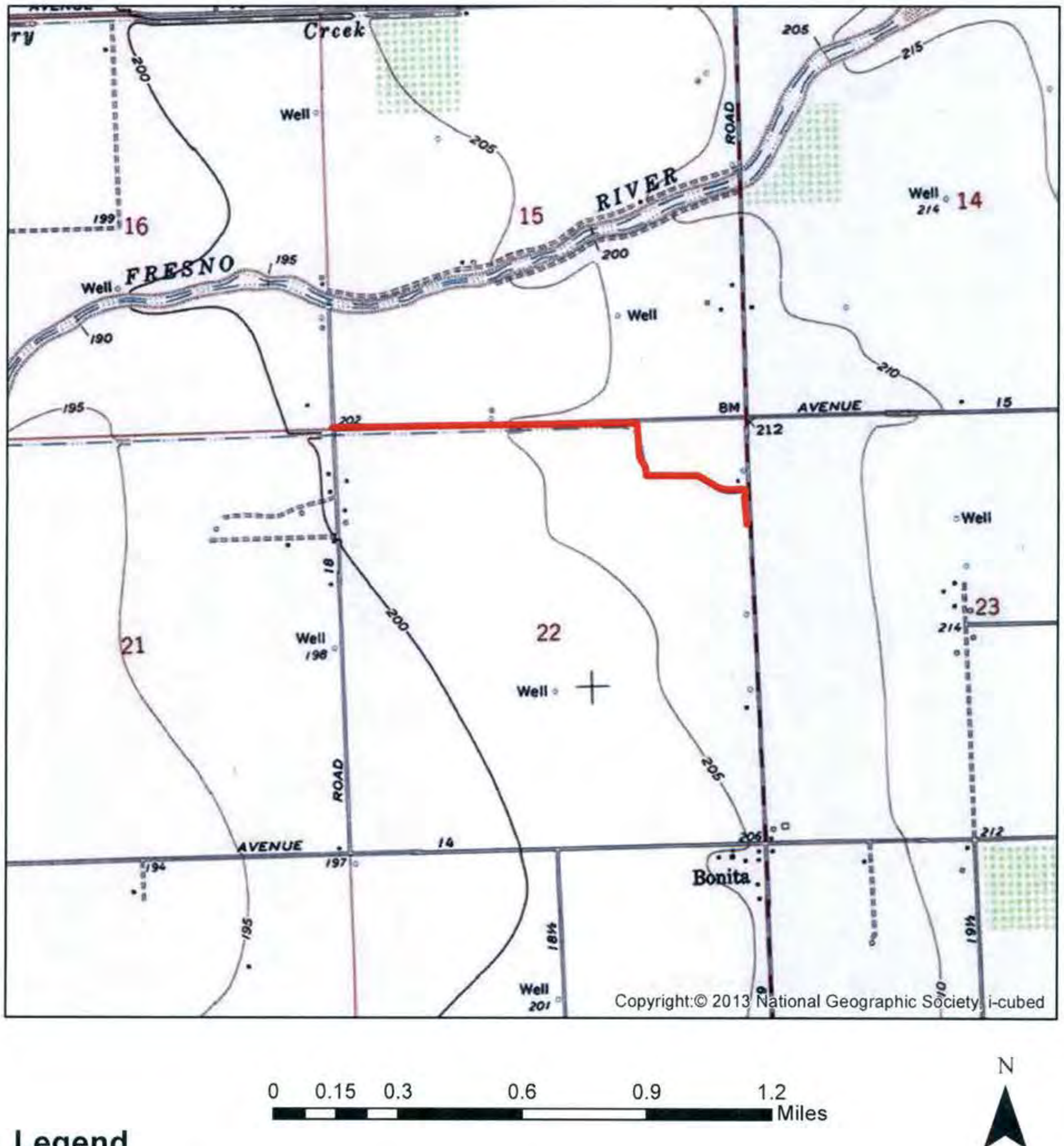
Attachments: ☐NONE ■ Location Map ☐Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ■ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ■Photograph ☐ Other (List): ______

UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

*Map Name:Bonita Ranch

Primary # P-20-00 2308
Trinomial CA-MAD-00 2649H
NRHP 6Z
*Resource Name or Temp:Madera Irrigation District Lateral 24,2-17.0
Scale: 1:24,000 Date:11/27/2016



Legend

24.2-17.0 Pipeline

Bonita Ranch USGS 7.5

UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary #P-20-002308
CA-MAD-2649H
NRHP 6Z

Resource Name or No.: Madera Irrigation District

L1. Historic and/or Common Name: Lateral 24.2-17.0

L2a. Portion Described: ☐ Entire Resource ■ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: GPS Point 2 south bend at Avenue 15 10s 748647 mE 4094892 mN

L3. Description: distribution canal

L4. Dimensions:

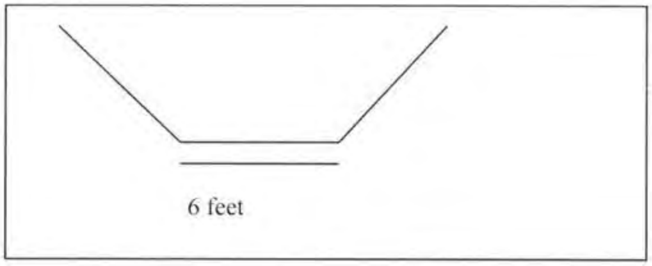
a. Top Width: 15 feet

b. Bottom Width: 6 feet

c. Height or Depth: 6 feet

d. Length of Segment: 6500'

L4e. Sketch or Cross Section **Facing:** east



L5. Associated Resources: None

L6. Setting: along Avenue 15 and through an established almond orchard, Madera County

L7. Integrity Considerations: The canal has undergone maintenance and modifications

L8b. Description of Photo:

East along Avenue 15 with a modern breast dam

L9. Remarks: None

L10. Form Prepared By: M. C. Kile, Culturescape 6182 Carter Rd. Mariposa, Ca 95338

L11. Date: 12/3/2016

UPDATE

State of California — The Resources Agency **Primary #P-20-002308**
DEPARTMENT OF PARKS AND RECREATION **Trinomial CA-MAD-002649H**
PHOTOGRAPH RECORD
NRHP 6Z

 Project Name or No.: Madera Irrigation Lateral 24.2-17.0

Card/Disk/Directory: **Year: Camera Type: Sureshot** **Lens Size:**

Megapixels/Resolution: 8 **Digital Files Kept at:** 6182 Carter Rd Mariposa

Date	Time	Subject	Fig	Acs no.	Dir
11/22/16	1:00	Lateral 24.2-17.0 canal midsection west	1	IMG-0594	
11/22/16		Lateral 24.2-17.0 canal midsection east	2	IMG-0595	
11/22/16	1:05	Lateral 24.2-17.0 canal siphon west	3	IMG-0596	
11/22/16		Lateral 24.2-17.0 canal west end west	4	IMG-0597	
11/22/16		Lateral 24.2-17.0 canal slat dam east	5	IMG-0598	
11/22/16		Lateral 24.2-17.0 canal handwork north	6	IMG-0599	
11/22/16	1:30	Lateral 24.2-17.0 canal siphon ne corner east	7	IMG-0600	
11/22/16		Lateral 24.2-17.0 canal siphon ne corner north		IMG-0601	
11/22/16		Lateral 24.2-17.0 Canal second leg south	8	IMG-0602	
11/22/16		Lateral 24.2-17.0 at central east bend north		IMG-0603	
11/22/16		Lateral 24.2-17.0 at central east bend south		IMG-0604	
11/22/16		Lateral 24.2-17.0 at central east bend east	9	IMG-0605	
11/22/16		Lateral 24.2-17.0 at central east bend west		IMG-0606	
11/22/16		Lateral 24.2-17.0 at central parking area west		IMG-0607	
11/22/16		Lateral 24.2-17.0 at central parking area east	10	IMG-0608	
11/22/16		Lateral 24.2-17.0 at southeast end south		IMG-0609	
11/22/16		Lateral 24.2-17.0 at southeast end slat gate	11	IMG-0610	
11/22/16		Lateral 24.2-17.0 at southeast end north	12	IMG-0611	
11/22/16		Lateral 24.2-17.0 at slat dam north		IMG-0612	
11/22/16		Lateral 24.2-17.0 at southeast end south		IMG-0613	
11/22/16		Lateral 24.2-17.0 abandoned service station west British Petroleum?		IMG-0614	

UPDATE

Temporary Number/Resource Name: Madera Irrigation District Lateral 24.2-17.0

Figure 1 11/22/16 1:00 Lateral 24.17.0 canal midsection west IMG-0594

Figure 2 Lateral 24.2-17.0 canal midsection east IMG-0595

UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-20-002308
HRI #/Trinomial CA-MAD-2649H
NRHP 6Z

■ Continuation ☐ Update

Temporary Number/Resource Name: Madera Irrigation District Lateral 24.2-17.0

Figure 3 Lateral 24.2- 17.0 canal siphon at access road west IMG-0596

Figure 4 Lateral 24.2-17.0 canal west end at Road 18 west IMG-0597

UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-20-002308
HRI #/Trinomial CA-MAD-2649H
NRHP 6Z

■ Continuation ☐ Update

Temporary Number/Resource Name: Madera Irrigation District Lateral 24.2-17.0

Figure 5 **Lateral 24.2-17.0 canal slat dam east** **IMG-0598**

Figure 6 **Lateral 24.2-17.0 canal handwork north** **IMG-0599**

UPDATE

Temporary Number/Resource Name: Madera Irrigation District Lateral 24.2-17.0

Figure 7 Lateral 24.17.0 canal siphon ne corner GPS point 2 east IMG-0600

Figure 8 Lateral 24.2-17.0 canal second leg GPS point 2 south IMG-0602

Temporary Number/Resource Name: Madera Irrigation District Lateral 24.2-17.0

Figure 9 Lateral 24.2-17.0 canal control point at central east bend east IMG-0605

Figure 10 Lateral 24.17.0 canal at central parking area with recent canal maintenance east IMG-0608

UPDATE

Temporary Number/Resource Name: Madera Irrigation District Lateral 24.2-17.0

Figure 11 Lateral 24.2-17.0 canal at southeast end with slat gate east IMG-0610

Figure 12 Lateral 24.2-17.0 canal at southeast end along Road 19 north IMG-0611

UPDATE

State of California— The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H
NRHP Status Code

Other Listings
Review Code **Reviewer** **Date**

 ***Resource Name or #:** CA-MAD-2649H

P1. Other Identifier: Madera Canal

P2. Location: ☒ **Not for Publication** ☐ **Unrestricted**
***a. County:** Madera **and** (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad:** Raynor Creek **Date:** 1983 T9S **R**17E N/A **¼ of** N/A **¼ of Sec** 26 M.D.**B.M.**
c. Address: 25555-25577 Avenue 26 City: Chowchilla Zip: 93610
d. UTM: Zone: 11S; NAD83; northern extent: 759184 mE/ 4112947 mN (G.P.S.) to
southern extent: 759184 mE/ 4112916 mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation: 322 ft.
From CA-99 in Chowchilla travel east on Avenue 26 for approximately 9.4 miles to reach the canal crossing.

***P3a. Description:**(Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The resource is a 100 foot segment section of the Madera Canal. The canal is earthen-lined with a bottom width of approximately 20 feet and a depth of approximately 9 feet and has a designed flow capacity of 1,000 cfs. The Madera Canal was constructed as part of the Central Valley Project (CVP) which was devised by the state of California in 1933. However, due to the Great Depression funds were not available for the project undertaking and in 1935 the CVP was taken over by the US Department of the Interior Bureau of Reclamation. The CVP encompasses numerous canals and dams throughout Central California. Central to this resource is the construction of the Friant Dam, completed in 1945, which diverts water from the San Joaquin River into the Madera Canal enabling irrigation within the eastern portion of the Central Valley. The construction of the Madera Canal coincided with the construction of the Dam but took a great deal longer to complete in its entirety. The section segment in this record was completed in 1947 and has remained largely unaltered with the exception of canal maintenance.

***P3b. Resource Attributes:** HP20. Canal/aqueduct, AH6. Water conveyance system
***P4. Resources Present:** ☐Building ☐Structure ☐Object ☒Site ☐District ☐Element of District ☐Other(Isolates, etc.)

P5b. Description of Photo: Overview of the Madera canal at Avenue 26, facing north.

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both

***P7. Owner and Address:**
US Department of the Interior
Bureau of Reclamation
1243 n. Street
Fresno, CA 93727

***P8. Recorded by:**
HDR EOC, Inc. 8690 Balboa Avenue, Suite 200, San Diego, CA 92123

***P9. Date Recorded:** 2016-12-15

***P10. Survey Type:** Intensive Survey

***P11. Report Citation:** Michael Connolly and Wayne Glenny 2017. *Cultural Resources Report: Avenue 26 and Road 29 Rehabilitation Project CA FLAP MAD 26(1), Madera County, California.* Prepared by HDR, Inc. for the Federal Highway Administration, Central Federal Lands Highway Division.

***Attachments:**☐NONE ☒Location Map ☒Sketch Map ☒Continuation Sheet ☐Building, Structure, and Object Record ☒Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

ARCHAEOLOGICAL SITE RECORD

***Resource Name or #:** CA-MAD-2649H

***A1. Dimensions: a. Length:** 100 feet (N/ S) × **b. Width:** 20-30 feet (E/ W)
Method of Measurement: ☐ Paced ☐ Taped ☐ Visual estimate ■ Other: GIS
Method of Determination (Check any that apply.): ☐ Artifacts ■ Features ☐ Soil ☐ Vegetation ☐ Topography ☐ Cut bank ☐ Animal burrow ☐ Excavation ☐ Property boundary ☐ Other (Explain):

Reliability of Determination: ■ High ☐ Medium ☐ Low Explain: The canal is easily identifiable in the field and on historic and modern maps.

Limitations (Check any that apply): ☐ Restricted access ☐ Paved/built over ☐ Site limits incompletely defined ☐ Disturbances ☐ Vegetation ☐ Other (Explain):

A2. Depth: 9 feet ☐ None ☐ Unknown Method of Determination: Official Specifications

***A3. Human Remains:** ☐ Present ■ Absent ☐ Possible ☐ Unknown (Explain):

***A4. Features** (Number, briefly describe, indicate size, list associated cultural constituents, and show location of each feature on sketch map.): No other features are associated with this segment of the canal.

***A5. Cultural Constituents** (Describe and quantify artifacts, ecofacts, cultural residues, etc., not associated with features.): No artifacts, ecofacts and/ or cultural residues are associated with this segment of the canal.

***A6. Were Specimens Collected?** ■ No ☐ Yes (If yes, attach Artifact Record or catalog and identify where specimens are curated.)

***A7. Site Condition:** ☐ Good ■ Fair ☐ Poor (Describe disturbances.): The canal is earthen-lined and subject to erosion and deposition of sediment.

***A8. Nearest Water** (Type, distance, and direction.): The resource is a water source.

***A9. Elevation:** 322 ft.

A10. Environmental Setting (Describe culturally relevant variables such as vegetation, fauna, soils, geology, landform, slope, aspect, exposure, etc.): The resource is located on the east central portion of the Central Valley within agricultural lands; vegetation consists of grasses. Soils mainly consist of 10YR 6/ 3 pale brown and 5YR 4/ 6 yellowish red sandy loam.

A11. Historical Information: The Madera Canal was constructed by the US department of the Interior Bureau of Reclamation for the Central Valley Project in the mid 20th century. Work on the Central Valley Project began in 1935 and ended during the 1970s; however, the canal segment in this record was completed in 1947 and has been in use ever since. The Madera Canal brings water from the San Joaquin River to the eastern portion of the Central Valley enabling irrigation and facilitating agricultural output.

***A12. Age:** ☐ Prehistoric ☐ Protohistoric ☐ 1542-1769 ☐ 1769-1848 ☐ 1848-1880 ☐ 1880-1914 ■ 1914-1945 ■ Post 1945 ☐ Undetermined **Describe position in regional prehistoric chronology or factual historic dates if known:** 1947

A13. Interpretations (Discuss data potential, function[s], ethnic affiliation, and other interpretations):
The earthen-lined segment of the Madera Canal is typical of canal construction in the region. The Madera Canal is one of the smallest of the Central Valley Project canals but is significant in its relation to the project which increased the agricultural output of California bolstering the economy of the region and providing sustenance for the state and nation as well as other counties. – Please see Continuation for a full evaluation.

A14. Remarks: N/A

A15. References (Documents, informants, maps, and other references): - Please see Continuation for references.

A16. Photographs (List subjects, direction of view, and accession numbers or attach a Photograph Record.):
Original Media/Negatives Kept at: HDR, 8690 Balboa Ave, Suite 200, San Diego, CA 92123

***A17. Form Prepared by:** M. Connolly **Date:** 2016-12-15
Affiliation and Address: HDR, 8690 Balboa Ave, Suite 200, San Diego, CA 92123

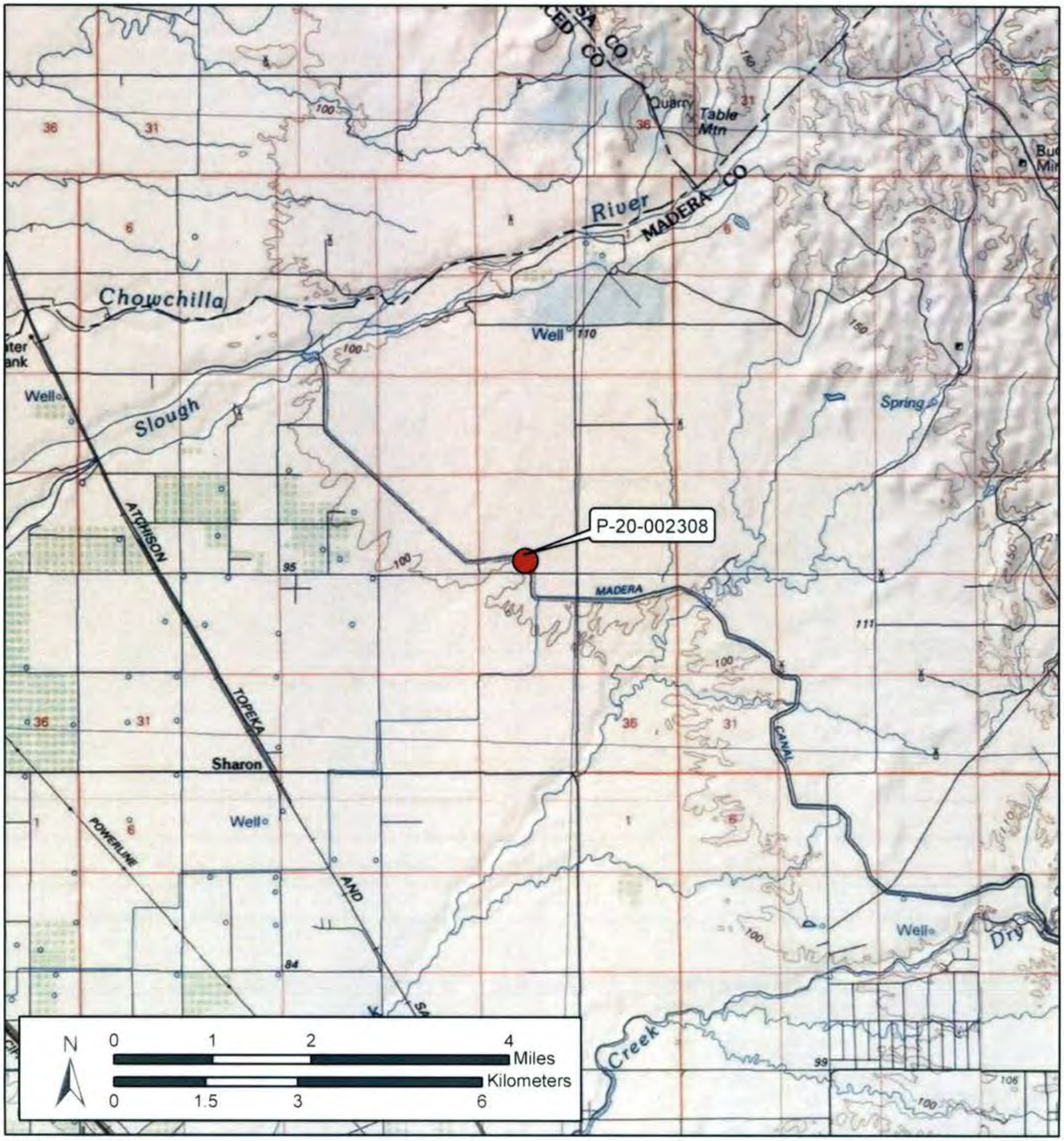
UPDATE

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # P-20-002308
HRI#
Trinomial:

*Resource Name or #: CA-MAD-2649H

*Map Name: Merced, CA 30x 60 min Quadrangle *Scale: 1:100,000 *Date of Map: 1983



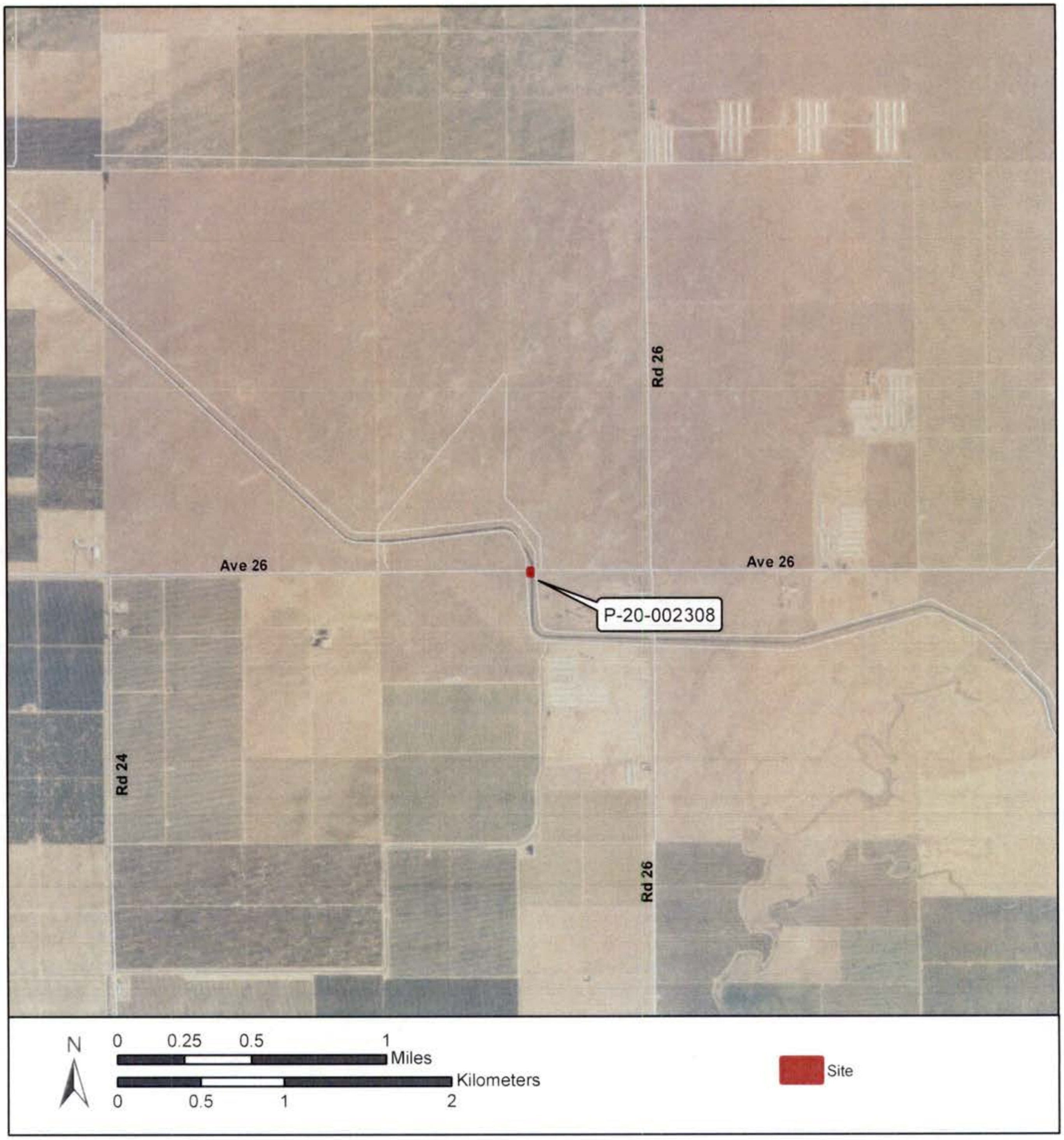
*Required information

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary # P-20-002308
HRI#
Trinomial:

*Resource Name or #: CA-MAD-2649H

*Drawn By: HDR *Scale: 1:32,000 *Date of Map: 2017

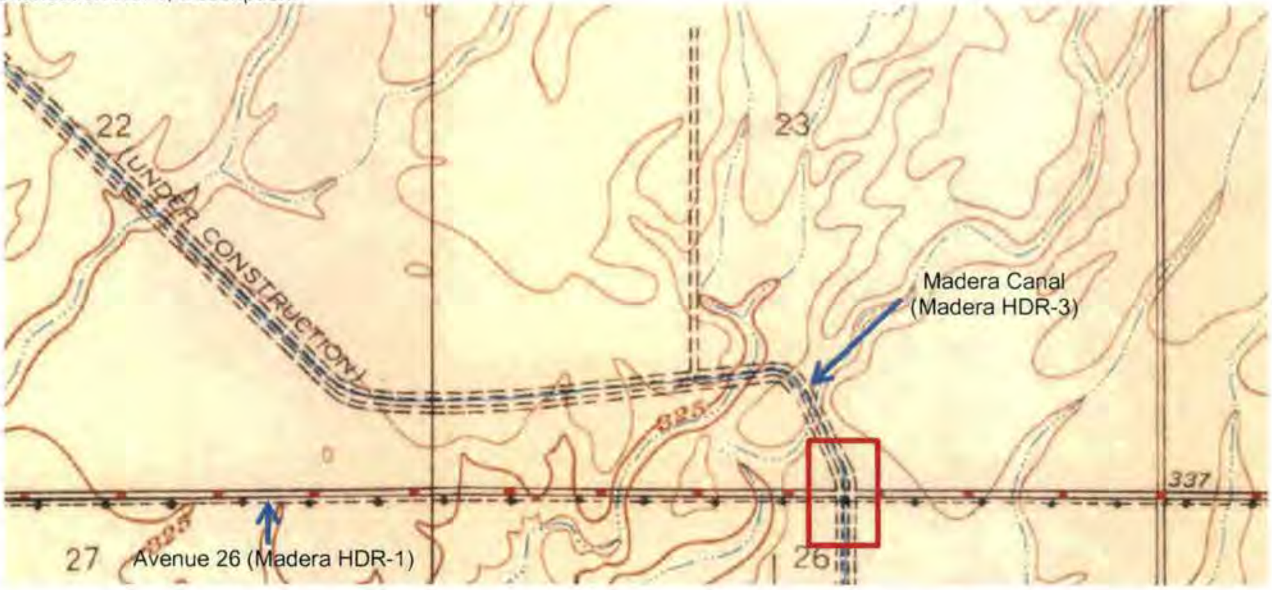


UPDATE

*Resource Name or # CA-MAD-2649H

*Recorded by: HDR-EOC *Date: 2016-12-15 ☒ Continuation ☐ Update

Continuation No. 1, Description:



Above is an excerpt from a 1947 topographic map depicting the Madera Canal just before it was completed which is indicated by the "Under Construction" label. Avenue 26 (Madera HDR-1) is depicted on the bottom of the map and crosses the canal. The area outlined in red is the section segment discussed in this record.

Evaluation: Currently, the US Department of the Interior's Bureau of Reclamation is evaluating P-20-002308 for the NRHP as a component of the CVP (USDOI 2013). The resource does not qualify for the NRHP under Criteria B and D, or the CRHR under Criteria 2 and 4 because it is not associated with any significant personages at a state or national level, and is unlikely to yield information important to history or prehistory. However, the resource does qualify for the NRHP under Criterion A and the CRHR under Criterion 1 for its relation to the CVP which was a major federal undertaking resulting in the expansion of agriculture in the Central Valley of California which bolstered the economy. Effects of the project resonated at the state and national levels due to the increase in food production and economic output. The resource also qualifies for the NRHP under Criterion C and the CRHR under Criterion 3 for its engineering significance as part of a unique irrigation system.

Integrity of location, design, setting, materials, workmanship, and association are all intact. This segment of the Madera Canal has not been altered since it was completed in 1947 other than routine maintenance such as dredging. Integrity of feeling is largely subjective and does not seem to be present unless the historicity of the canal is known to the observer. To date, a final determination of eligibility has not been reached but P-20-002308 is recommended eligible for the NRHP and CRHR based on the criteria mentioned above and the overall presence of historic integrity.

References:

Applied Earthworks
2005 Tesoro Viejo Specific Plan EIR

Hayes, Derek
2007 Historical Atlas of California, University of California Press, Berkeley.

Hoover, Mildred; Hero Rensch, Ethel Rensch, and William Abeloe. Revised by Douglas Kyle.
2002 Historic Spots in California. Stanford University Press. Stanford, CA.

JRP Historical Consulting Services and the California Department of Transportation
2000 Water Conveyance Systems in California: Historic Context, Development, and Evaluation Procedures. http://www.dot.ca.gov/ser/downloads/cultural/CanalsDitches.pdf. Accessed on 30 December 2016.

US Department of the Interior Bureau of Reclamation
2013 Exchange of recaptured San Joaquin River Restoration Program Flows from Madera Irrigation District and Chowchilla Water District to Red Top. https://www.usbr.gov/mp/nepa/document. Accessed on 30 December 2016.

P-20-002308
CA-MAD-2649H

Supplement

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **PRIMARY RECORD**		Primary # HRI # Trinomial NRHP Status Code	
	Other Listings Review Code	Reviewer	Date

Page 1 **of** 17 **Resource Name or #**

P1. Other Identifier: Madera Irrigation District (MID)

***P2. Location: a. County:** Madera ☒ **Not for Publication** ☐ **Unrestricted**

b. USGS 7.5' Quad: Biola, CA **Date:** 1963(PI1978) T 12S, R 18E; Mt. Diablo **B.M.**
Gravelly Ford, CA 1963(PI1978) T 13S, R 17E;
Herndon, CA 1964 T 12S, R 18E; T 12S, R 19E

c. Address: --

d. UTM: See Linear Feature Records for specific UTMs

e. Other Locational Data: All of these laterals are in southern Madera County, between Road 34 in the east, Avenue 8 in the north, Avenue 4 to the south, and Road 22 to the west.

***P3a. Description:** Multiple segments of laterals that are part of the Madera Irrigation District. All of the segments recorded as part of this record are part of the water conveyance system surrounding Lateral 6.2, which diverts water from the Madera Canal and delivers it to southern Madera County. Archival USGS topographic maps and aerial photographs indicate that these laterals were built between 1947 and 1963.

***P3b. Resource Attributes:** HP 20 Canal

***P4. Resources Present:** ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other:

***P5a. Photograph or Drawing:**

P5b. Description of Photo: Overview of Lateral 6.2 at Avenue 7, facing east.

***P6. Date Constructed/Age and Sources:** ☐ Prehistoric ☒ Historic ☐ Both

***P7. Owner and Address:**
Madera Irrigation District
Madera, California

***P8. Recorded By:** K. Asselin
Applied EarthWorks, Inc.
1391 W. Shaw Ave., Suite C
Fresno, CA 93711

***P9. Date Recorded:** 3/1 and 3/2/2016

***P10. Survey Type:** ☒ Intensive ☐ Reconnaissance ☐ Other
Describe:

***P11. Report Citation:**
Asselin, Katie, Randy Baloian, Aubrie Morlet, Michael Mirro, Jennifer Whiteman, Josh Tibbet, and Mary Baloian
2016 *Cultural Resource Inventory and Evaluation for the Central Valley Power Connect Project, Fresno, Kings, and Madera Counties, California.* Applied EarthWorks, Inc., Fresno, California. Prepared for Pacific Gas and Electric Company, San Francisco, California.

***Attachments:** ☐ NONE ☒ Location Map ☐ Sketch Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☒ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list):

Supplement

P-20-002308
CA-MAD-2649H

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary #
HRI #/Trinomial

 Resource Name or #:

L1. Historic and/or Common Name: MID Lateral 6.2

L2a. Portion Described: ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: UTM (NAD83), Zone 11N:
234064 **mE** / 4083420 **mN** (northern end of segment)
232813 **mE** / 4082034 **mN** (southern end of segment)

L3. Description: Part of the Madera Irrigation District, Lateral 6.2 diverts water from the Madera Canal and brings it to southern Madera County. Lateral 6.2 is an earthen canal, with earthen berms that are raised approximately 3 feet above the surrounding surface. The berms on the northern or western sides (depending on orientation) are wide enough to provide access as a road. Features observed within the recorded segment included concrete culverts at the major road crossings, turnouts and associated checks.

L4. Dimensions: **L4e. Sketch or Cross Section** ☐ attached ☒ none **Facing:**

a. Top Width: 60 ft. (berm to berm); 30 ft. (top of canal)
b. Bottom Width: 6 ft.
c. Height or Depth: 8 ft.
d. Length of Segment: 9,402 ft. (1.80 miles)

L5. Associated Resources: The head of Lateral 6.2-16.9, also recorded as part of the MID, appears to connect to this recorded segment.

L6. Setting: Rural; Southern Madera County

L7. Integrity Considerations: No apparent alterations.

L8a. Photo, Map, or Drawing:

L8b. Description of Photo, Map, or Drawing: Lateral 6.2 at Road 31, facing west.

L9. Remarks: --

L10. Form Prepared By: Katie Asselin

L11. Date: March 3, 2016

Supplement

P-20-002308
CA-MAD-2649

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary #
HRI #/Trinomial

 Resource Name or #:

L1. Historic and/or Common Name: MID Lateral 6.2 Extension

L2a. Portion Described: ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: UTM (NAD83), Zone 11N:
219779 **mE** / 4079778 **mN** (west end of segment)
220161 **mE** / 4079763 **mN** (east end of segment)

L3. Description: Part of the Madera Irrigation District, Lateral 6.2 Extension diverts water from the Lateral 6.2 canal in southern Madera County. This lateral is a V-shaped earthen ditch, with a concrete culvert at the western end of this recorded segment, where it appears to terminate and tie into Lateral 6.2-16.9WW. There are small earthen berms on either side of the lateral; however, it is not raised above the surrounding surface. There were no other features observed along the length of this recorded segment.

L4. Dimensions:
a. Top Width: 12 ft.
b. Bottom Width: 2 ft.
c. Height or Depth: 3 ft.
d. Length of Segment: 1,252 ft.

L4e. Sketch or Cross Section ☐ attached ☒ none **Facing:**

L5. Associated Resources: This appears to be the terminus of this lateral, where is ties into Lateral 6.2-16.9WW.

L6. Setting: Rural; Southern Madera County

L7. Integrity Considerations: No apparent alterations.

L8a. Photo, Map, or Drawing:

L8b. Description of Photo, Map, or Drawing: Overview of Lat. 6.2 Extension, from western end of recorded segment, facing east.

L9. Remarks: --

L10. Form Prepared By: Katie Asselin

L11. Date: March 3, 2016

Supplement

P-20-002308
CA-MAD-2649

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary #
HRI #/Trinomial

Resource Name or #:

L1. Historic and/or Common Name: MID Lateral 6.2-9.2-5.0

L2a. Portion Described: ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: UTM (NAD83), Zone 11N:
238067 **mE** / 4082640 **mN** (southern end of segment #1)
238157 **mE** / 4082808 **mN** (northeastern end of segment #1)
233582 **mE** / 4082505 **mN** (eastern end of segment #2)
233225 **mE** / 4082522 **mN** (western end of segment #2; Terminus)

L3. Description: Part of the Madera Irrigation District, Lateral 6.2-9.2-5.0 is part of a conveyance system surrounding Lateral 6.2, which delivers water to southern Madera County from the Madera Canal. Segment #1 of Lateral 6.2-9.2-5.0 is an earthen canal with berms on either side that raise the canal approximately 3 ft. above the surrounding surface. Features observed in this recorded segment included a turnout and drain pipe where the segment turns to from the south to the east, and a concrete culvert at the southern end of the recorded segment.

Segment #2 of Lateral 6.2-9.2-5.0 is V-shaped, earthen canal that is raised approximately 3 ft. above the surrounding surface. The dimensions of this segment are a bit smaller (see below); however, this appears to correspond with the western end of this segment being the terminus of this lateral where it ties back into Lateral 6.2.

L4. Dimensions:

Segment #1
a. Top Width: 45 ft. (berm to berm); 18 ft. (top of canal)
b. Bottom Width: 5 ft.
c. Height or Depth: 5 ft.
d. Length of Segment: 815 ft.

Segment #2
a. Top Width: 30 ft. (berm to berm); 12 ft. (top of canal)
b. Bottom Width: 2 ft.
c. Height or Depth: 5 ft.
d. Length of Segment: 1,252 ft

L4e. Sketch or Cross Section ☐ attached **Facing:** ☒ none

L5. Associated Resources: The western end on Segment #2 appears to be the terminus of this lateral, where it ties back into Lateral 6.2, also recorded at part of the MID.

L6. Setting: Rural; Southern Madera County

L7. Integrity Considerations: No apparent alterations.

L8a. Photo, Map, or Drawing:

L8b. Description of Photo, Map, or Drawing: Overview Lat. 6.2-9.2-5.0 from the southern end of the recorded segment, facing north.

L9. Remarks: --

L10. Form Prepared By: Katie Asselin

L11. Date: March 3, 2016

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CA-MAD-2649 H

Supplement

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary #
HRI #/Trinomial

 Resource Name or #:

L1. Historic and/or Common Name: MID Lateral 6.2-9.2-7.4

L2a. Portion Described: ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: UTM (NAD83), Zone 11N:
235657 **mE** / 4083378 **mN** (northeastern end of segment)
234871 **mE** / 4083318 **mN** (western end of segment)

L3. Description: Part of the Madera Irrigation District, Lateral 6.2-9.2-7.4 is part of a conveyance system surrounding Lateral 6.2, which delivers water to southern Madera County from the Madera Canal. Lateral 6.2-9.2-7.4 is an earthen V-shaped canal with earthen berms on either side. It is level with the surrounding fields and the southern berm is wider and supports an access road. Features observed in this segment include concrete culverts, turnouts and checks.

L4. Dimensions:
a. Top Width: 40 ft.
b. Bottom Width: 3 ft.
c. Height or Depth: 5 ft.
d. Length of Segment: 2,537 ft.

L4e. Sketch or Cross Section ☐ attached ☒ none **Facing:**

L5. Associated Resources: --

L6. Setting: Rural; Southern Madera County.

L7. Integrity Considerations: No apparent alterations.

L8a. Photo, Map, or Drawing:

L8b. Description of Photo, Map, or Drawing: Overview Lateral 6.2-9.2-7.4, from the western end of the recorded segment, facing east.

L9. Remarks: --

L10. Form Prepared By: Katie Asselin

L11. Date: March 3, 2016

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State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary #
HRI #/Trinomial

 Resource Name or #:

L1. Historic and/or Common Name: MID Lateral 6.2-16.9

L2a. Portion Described: ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: UTM (NAD83), Zone 11N:
233207 **mE** / 4083370 **mN** (east end of segment)
233064 **mE** / 4083385 **mN** (west end of segment)

L3. Description: Part of the Madera Irrigation District, Lateral 6.2-16.9 diverts water from Lateral 6.2 in southern Madera County. It is an earthen canal that is raised 2 ft. on the north side of the recorded segment and is level with a paved access road that parallels the ditch on the south side. This appears to be the head of the lateral where it diverts water from Lateral 6.2. The only feature observed was a concrete culvert at the eastern end of the recorded segment.

L4. Dimensions:
a. Top Width: 25 ft.
b. Bottom Width: 5 ft.
c. Height or Depth: 5 ft.
d. Length of Segment: 475 ft.

L4e. Sketch or Cross Section ☐ attached ☒ none **Facing:**

L5. Associated Resources: Lateral 6.2, also recorded as part of the MID.

L6. Setting: Rural; Southern Madera County

L7. Integrity Considerations: No apparent alterations.

L8a. Photo, Map, or Drawing:

L8b. Description of Photo, Map, or Drawing: Overview Lateral 6.2-16.9 from western end of recorded segment, facing east.

L9. Remarks: --

L10. Form Prepared By: Katie Asselin

L11. Date: March 3, 2016

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State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary #
HRI #/Trinomial

 Resource Name or #:

L1. Historic and/or Common Name: MID Lateral 6.2-16.9WW

L2a. Portion Described: ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: UTM (NAD83), Zone 11N:
219787 **mE** / 4080669 **mN** (northern end of segment)
220510 **mE** / 4078837 **mN** (southern end of segment)

L3. Description: Part of the Madera Irrigation District, Lateral 6.2-16.9WW is of the conveyance system surrounding Lateral 6.2 canal, which diverts water from the Madera Canal and brings it to southern Madera County. Lateral 6.2-16.9WW is an earthen V-shaped canal that is not raised above the surrounding surface. Features observed within the recorded segments included concrete culverts at the major road crossings, turnouts and associated checks, and a concrete Parshall flume.

At the Parshall flume (UTM NAD83, Zone 11N: 219772mE/4078958mN), the characteristics of the canal are the same, but the dimensions of the canal change to16 ft. wide at the top by 3 ft. wide at the bottom by 5 ft. deep. These dimensions are retained as the canal continues to the east and then turns south to the end of this recorded segment.

L4. Dimensions:
a. Top Width: 12ft.
b. Bottom Width: 1 ft.
c. Height or Depth: 5 ft.
d. Length of Segment: 8,343 ft. (1.6 miles)

L4e. Sketch or Cross Section ☐ attached ☒ none **Facing:**

L5. Associated Resources: Lateral 6.2 Extension appears to tie into Lateral 6.2-16.9WW at their junction on the north side of Avenue 5.

L6. Setting: Rural; Southern Madera County.

L7. Integrity Considerations: No apparent alterations.

L8a. Photo, Map, or Drawing:

L8b. Description of Photo, Map, or Drawing: Overview of Lateral 6.2-16.9WW, from northern end of recorded segment, facing south.

L9. Remarks: --

L10. Form Prepared By: Katie Asselin

L11. Date: March 3, 2016

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State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary #
HRI #/Trinomial

Resource Name or #:

L1. Historic and/or Common Name: MID Lateral 6.2-18.4

L2a. Portion Described: ☐ Entire Resource ☒ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: UTM (NAD83), Zone 11N:
230791 **mE** / 4081805 **mN** (western end of segment)
231186 **mE** / 4081795 **mN** (eastern end of segment)

L3. Description: Part of the Madera Irrigation District, Lateral 6.2-18.4 is part of a conveyance system surrounding Lateral 6.2, which delivers water to southern Madera County from the Madera Canal. Lateral 6.2-18.4 is an earthen canal with earthen berms, raised approximately 2 ft. above the surrounding fields. The southern berm has been widened and improves as an access road. A concrete culvert was observed at the western end of the recorded segment and there is a turnout and check at the eastern end of the recorded segment.

L4. Dimensions:

a. Top Width: 50 ft. (berm to berm); 25 ft. (top of canal)

b. Bottom Width: 6 ft.

c. Height or Depth: 6 ft.

d. Length of Segment: 1,288 ft.

L4e. Sketch or Cross Section ☐ attached ☒ none **Facing:**

L5. Associated Resources: --

L6. Setting: Rural; Southern Madera County

L7. Integrity Considerations: No apparent alterations.

L8a. Photo, Map, or Drawing:

L8b. Description of Photo, Map, or Drawing: Overview Lateral 6.2-18.4 from the eastern end of the recorded segment, facing west.

L9. Remarks: --

L10. Form Prepared By: Katie Asselin

L11. Date: March 3, 2016

Supplement

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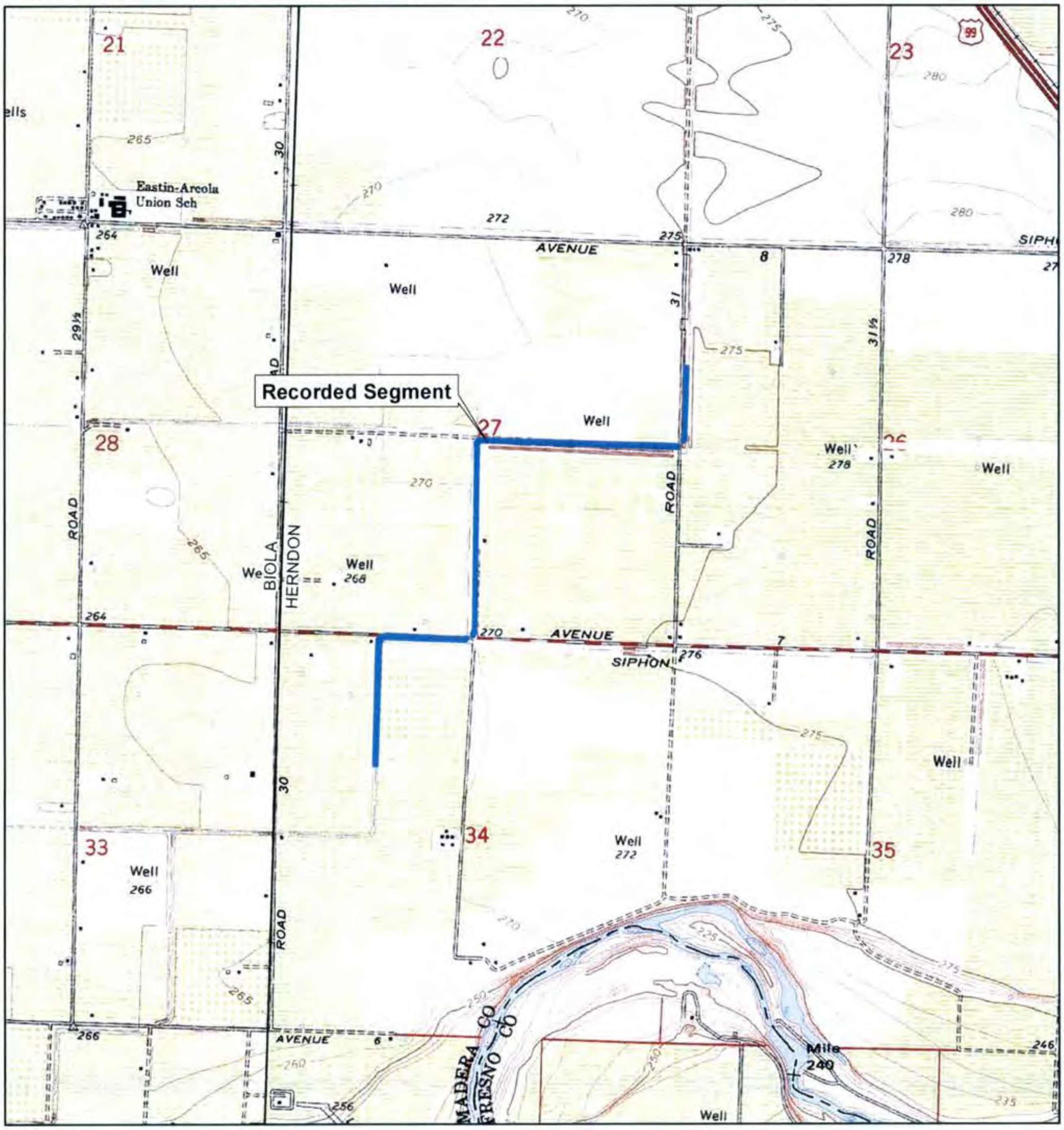
CA-MAD-2649H

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

 Resource Name or #: Madera Irrigation District; 6.2 (Recorded Segment) **Scale:** 1:24,000

Map Name: Herndon, CA, USGS 7.5' quadrangle(s) **Date:** 1964



SCALE 1:24,000

TRUE NORTH

Supplement

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CA-MAD-2649H

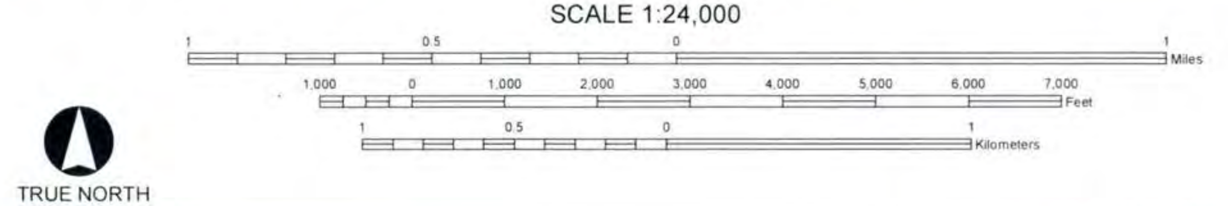
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

 Resource Name or #: Madera Irrigation District; 6.2 Extension (Recorded Segment) **Scale:** 1:24,000

Map Name: Gravelly Ford, CA, USGS 7.5' quadrangle(s) **Date:** 1963 (PI1978)

SCALE 1:24,000



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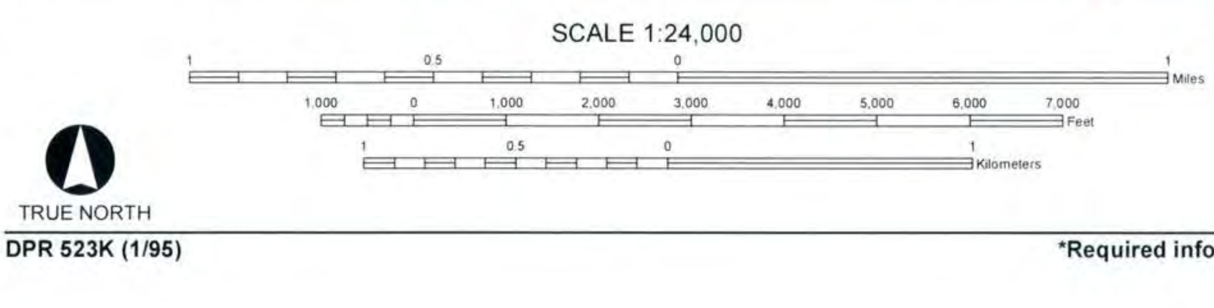
Supplement

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

 Resource Name or #: Madera Irrigation District; 6.2-9.2-5.0 (Recorded Segment #1) **Scale:** 1:24,000

Map Name: Herndon, CA, USGS 7.5' quadrangle(s) **Date:** 1964



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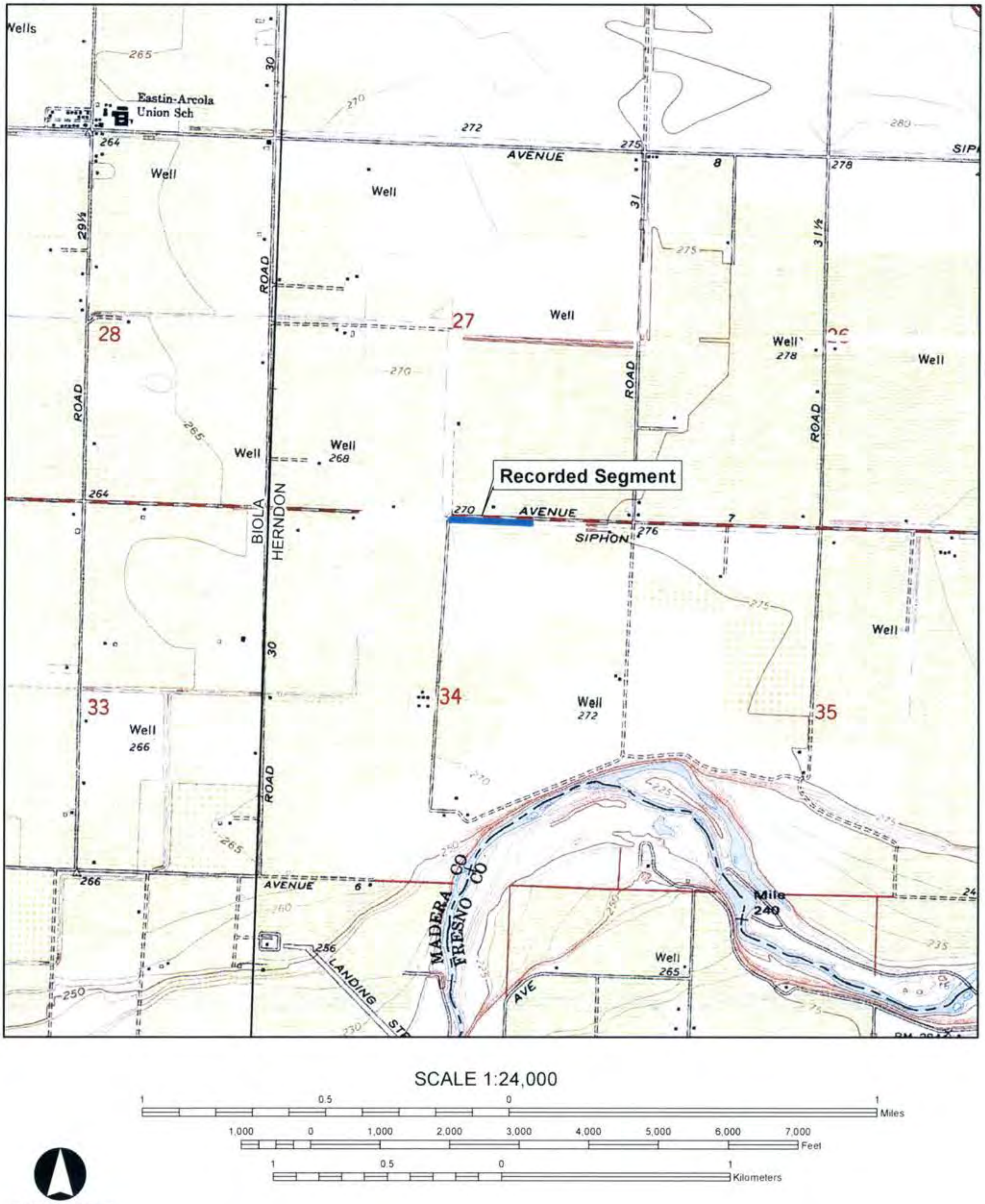
CA-MAD-2649H

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

 Resource Name or #: Madera Irrigation District; 6.2-9.2-5.0 (Recorded Segment #2) **Scale:** 1:24,000

Map Name: Herndon, CA, USGS 7.5' quadrangle(s) **Date:** 1964



Supplement

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CA-MAD-2649H

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

Resource Name or #: Madera Irrigation District; 6.2-9.2-7.4 (Recorded Segment)

Scale: 1:24,000

Map Name: Herndon, CA, USGS 7.5' quadrangle(s)

Date: 1964

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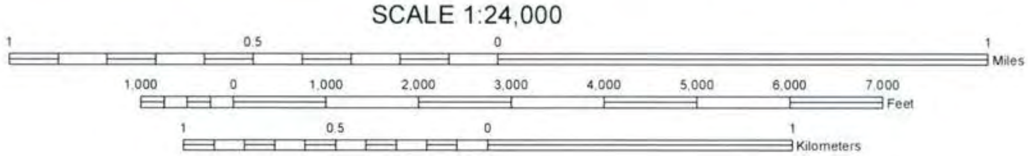
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

Page 15 **of** 17 **Resource Name or #:** Madera Irrigation District; 6.2-16.9 (Recorded Segment) **Scale:** 1:24,000

Map Name: Herndon, CA, USGS 7.5' quadrangle(s) **Date:** 1964

SCALE 1:24,000



TRUE NORTH

DPR 523K (1/95) *Required information

P-20-002308
CA-MAD-2649H

Supplement

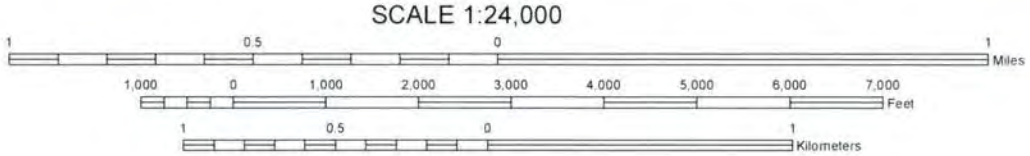
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

Page 16 **of** 17 **Resource Name or #:** Madera Irrigation District; 6.2-16.9WW (Recorded Segment) **Scale:** 1:24,000

Map Name: Gravelly Ford, CA, USGS 7.5' quadrangle(s) **Date:** 1963 (PI1978)

SCALE 1:24,000



TRUE NORTH

Supplement

P-20-002308
CA-MAD-2649H

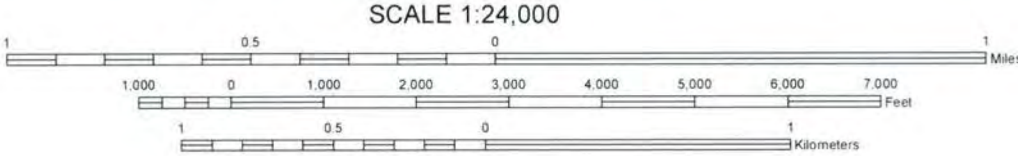
State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #
HRI#
Trinomial

 Resource Name or #: Madera Irrigation District; 6.2-18.4 (Recorded Segment) **Scale:** 1:24,000

Map Name: Biola, CA, USGS 7.5' quadrangle(s) **Date:** 1963 (PI1978)

SCALE 1:24,000



TRUE NORTH

Supplement

State of California - The Resources Agency DEPARTMENT OF PARKS AND RECREATION **PRIMARY RECORD**	Primary # P-20-002308 HRI # Trinomial: CA-MAD-2649H NRHP Status Code
Other Listings Review Code	Reviewer Date

*Resource Name or #: Madera Canal, Lateral 24.2 Segment (GANDA-MAD-01)

P1. Other Identifier:

***P2. Location:** ☒ **Not for Publication** ☐ **Unrestricted** ***a. County** Madera

***b. USGS 7.5' Quad** Bonita Ranch **Date** 1978 **T**11S ; **R**17E ; SE ¼ SE ¼ of **Sec** 7; Mount Diablo **B.M.**

c. Address: Avenue 16 between 21 and 22 1/2 **City:** Madera **Zip:** 93637

d. UTM: Zone 10; *NAD 83 CONUS* :753880mE/409690mN (East canal end, inlet structure and culvert)

e. Other Locational Data: This resource is located 0.5 miles west of the Avenue 16 and Road 22 1/2 intersection in Madera County, CA. The culvert and inlet structure at the eastern end of the canal segment is located approximately 50 feet north of the roadside.

***P3a. Description:**

This historic-era resource, the Madera Canal, Lateral 24.2 is a 500 foot long segment of earthen canal that is associated with the Central California Valley Water Project. The resource includes a concrete culvert, inlet structure, sluice gate, and an ancillary gate with concrete housing are located at the eastern end of the canal segment near the site boundary. The canal segment is v-shaped in cross-section and has been mechanically excavated to approximately 6 feet deep below the surface. The base of the canal has been loosely bedded with rounded sedimentary cobbles and small rounded pea gravels. The canal's structural components include a pre-cast concrete box culvert and outlet structure, consisting of apron, head, and wing walls, as well as a sliding sluice gate. The exact age of the culvert and outlet structure is unknown, yet the presence of recently fitted metal hardware, as well as fragments of demolished concrete located immediately adjacent to the structure, may indicate a later, post-1950's origin. An ancillary gate structure and concrete housing is located eight feet north of the culvert's northern head wall. The gate structure appears older in age, possessing weathered and slightly rusted metal hardware, a coarser concrete structure, and has been painted white and labeled with the number "11" painted in black on a yellow background.

***P3b. Resource Attributes:** HP20. Canal/aqueduct, AH6. Water conveyance system.

***P4. Resources Present:** ☐Building ☒Structure ☐Object ☐Site ☐District ☐Element of District ☐Other (Isolates, etc.)

P5a. Photograph:

P5b. Description of Photo:
Overview of culvert and ancillary gate located near eastern boundary of site area, facing east.

***P6. Date Constructed/Age and Sources:** ☒Historic ☐Prehistoric ☐Both

***P7. Owner and Address:**
Unknown

***P8. Recorded by:** Brandon Patterson
Garcia and Associates
1512 Franklin Street,
Suite 100 Oakland, CA 94612

***P9. Date Recorded:** January 25, 2016

***P10. Survey Type:** Intensive pedestrian

***P11. Report Citation:** Cox, Beatrice, 2016. Cultural Resources Inventory Report Pacific Gas and Electric Company Aerial Transmission Line Project Madera Canal Lateral 24.2 Project, Madera County, California (15-SCAO-239), Garcia and Associates, San Anselmo, CA.

***Attachments:** ☐NONE ☒Location Map ☒Sketch Map ☒Continuation Sheet ☐Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☒Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other

Supplement

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H

 Resource Name or #: Madera Canal, Lateral 24.2 Segment (GANDA-MAD-01)

L1. Historic and/or Common Name: Madera Canal, Lateral 24.2 Segment

L2a. Portion Described: ☐ Entire Resource ☐ Segment ☐ Point Observation **Designation:**

b. Location of point or segment: (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map)

UTM: Zone 10; *NAD 83 CONUS* : 753880mE/4096690mN (East canal end, inlet structure and culvert)

This resource is located 0.5 miles west of the Avenue 16 and Road 22 1/2 intersection in Madera County, CA. The culvert and inlet structure at the eastern end of the canal segment is located approximately 50 feet north of the roadside.**L3. Description:** (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)

The resource is a 500 feet long segment of earthen canal. The canal segment measures approximately 20 feet wide at road surface by approximately 6 to 8 feet wide at maximum depth. The culvert was installed with approximately 2 feet depth of cover. A concrete culvert, inlet structure, sluice gate, and an ancillary gate with concrete housing are located at the eastern end of the canal segment near the site boundary. The canal segment is v-shaped in cross-section and has been mechanically excavated to approximately 6 feet deep below the surface. The base of the canal has been loosely bedded with rounded sedimentary cobbles and small rounded pea gravels. The canal's structural components include a precast concrete box culvert and outlet structure, consisting of apron, head, and wing walls, and a sliding sluice gate. An ancillary gate structure and concrete housing is located eight feet north of the culvert's northern head wall. Lateral 24.2 is linked to the Madera Canal, a major canal associated with the Central Valley Water Project water conveyance system, conceived in the 1920s and currently consists of 500 miles of major canals, laterals, structures and facilities. The 39.5 mile long Madera Canal was completed in 1945, to facilitate the conveyance of the Fresno River waters from Millerton Lake through the Friant Dam located approximately 25 miles east of the city of Madera, to agricultural lands west of the city via pipelines or open canal (Cox 2016; Madera Irrigation District Map *www.madera.id.org*; 2016 Friant Division Project *www.usbr.gov*).

L4. Dimensions: (In feet for historic features and meters for prehistoric features)

- **a. Top Width:** 20 feet
- **b. Bottom Width:** 8 feet
- **c. Height or Depth:** 6 feet
- **d. Length of Segment:** 500 feet

L5. Associated Resources: Concrete culvert and outlet structure, as well as smaller ancillary gate and concrete housing.

L6. Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.)

The environmental setting surrounding the site area mainly consists of flat rural agricultural lands intersected by a developed water conveyance system. Local vegetation consists of nut tree orchards and wine grape vineyards, as well as various non-native intrusive grasses and shrubs. The overall landscape is characterized as flat and semi-flat, the slope varying between 0 to 5 percent. The soil consisted of a light brown silty clay loam with small rounded sedimentary rocks and gravels.

L8a. Photograph, Map or Drawing

L7. Integrity Considerations:

A portion of the canal segment extending west of the site area has been completely removed due to the recent expansion of a neighboring private winery, bottling, and distribution facility.

L8b. Description of Photo, Map, or Drawing (View, scale, etc.)

Overview of canal segment with culvert and outlet structure in foreground, facing west.

L9. Remarks: None.

L10. Form Prepared by: (Name, affiliation, and address)

Brandon Patterson
Garcia and Associates
1512 Franklin Street,
Suite 100 Oakland, CA 94612

L11. Date: January 25, 2015

Supplement

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

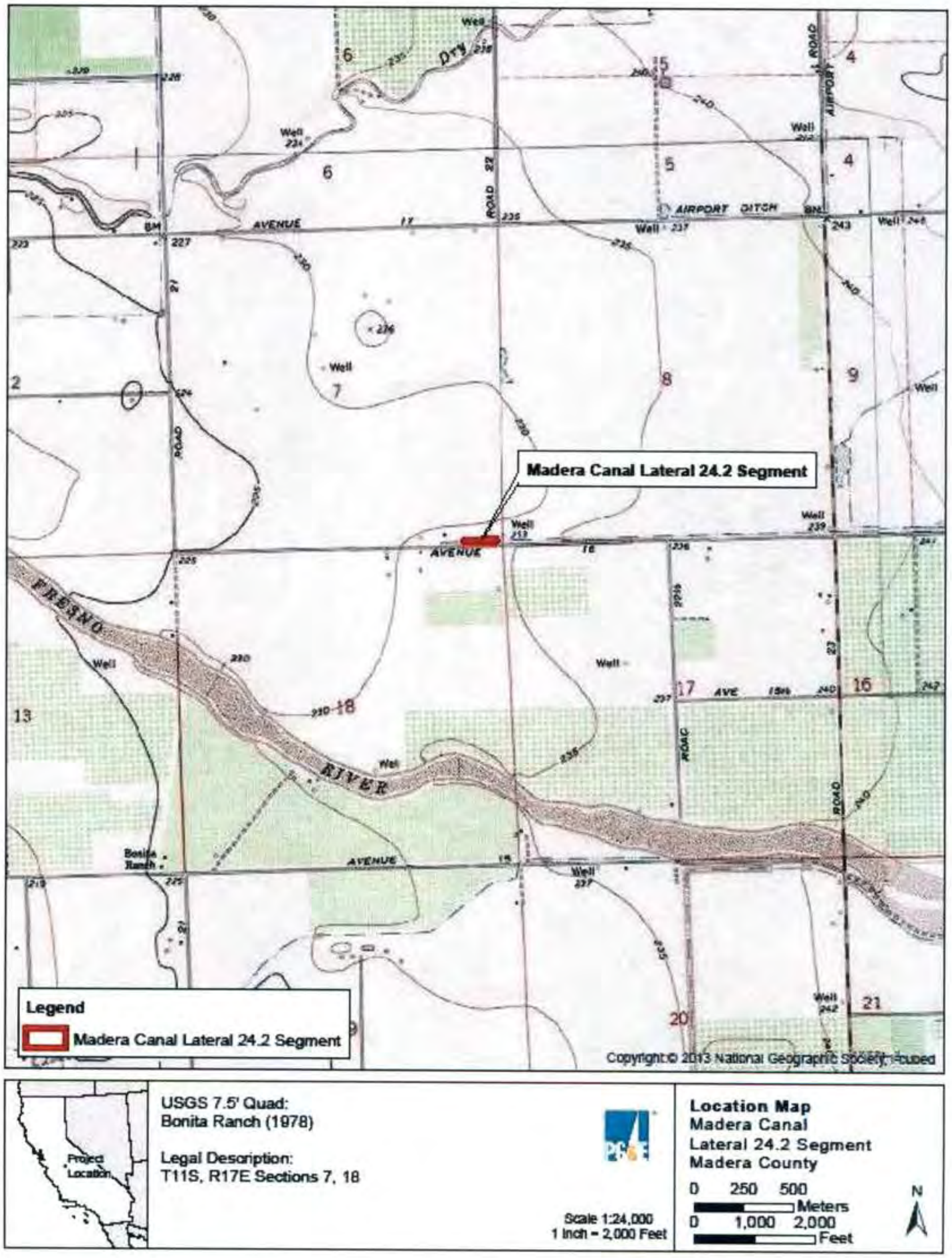
Primary # P-20-002308
HRI#
Trinomial CA-MAD-2649 H

Page 3 of 5

*Resource Name or #: Madera Canal, Lateral 24.2 Segment (GANDA-MAD-01)

*Map Name: USGS 7.5' Quad: Bonita Ranch *Scale: 1:24,000 *Date of Map: 1978

DPR 523J (1/95) *Required information



Supplement

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary # P-20-002308
HRI#
Trinomial CA-MAD-2649H

Page 4 of 5

***Resource Name or #** Madera Canal, Lateral 24.2 Segment (GANDA-MAD-01)

***Drawn By:** B. Patterson

***Date:** January 25, 2016

DPR 523K (1/95)

*Required information

Supplement

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary#: P-20-002308
HRI#:
Trinomial: CA-MAD-2649 H

*Resource Name or #: Madera Canal, Lateral 24.2 Segment (GANDA-MAD-01)

*Recorded by: B. Patterson *Date: January 25,2016 ☒ Continuation ☐ Update

P5a. Photographs:

Overview of canal segment and structural components, facing east.

Overview of canal segment, facing west.

Close-up of culvert and ancillary gate, facing west.

Close-up of ancillary gate and concrete housing, facing north.

Supplement P-20-002308
CA-MAD-2649H

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #:
HRI #:
Trinomial:
NRHP Status Code:
Other Listings:
Review Code: **Reviewer:**

☐ Update or Supplement
Date:

*Resource Name or Number (Assigned by Recorder): APN 035-030-017-#1
P1. Other Identifier: MID Big Main Canal

*P2. Location: ☒ Not for Publication ☐ Unrestricted *a. County: Madera
*b. USGS 7.5' Quad: Madera, CA Date: 1978 (photorevised 1981); T11S R18E SW¼ of SE¼ of Sec. 8 M.D.B.M.
c. Address: N/A City: Madera
d. UTM: (Give more than one for large and/or linear resources) Zone: 10S; 764681mE/4097020mN
☐ UTM Coordinates determined with Global Positioning System
e. Other Locational Data (e.g., parcel #, directions to resource, elevation, etc., when appropriate
The canal section is located at the northeastern margin of the town of Madera. From where State Hwy 145 crosses the BN&SF railroad grade travel southeast along the west side of the railroad for approximately 200 feet. At this point the canal crosses the railroad and the project area.

*P3a. Description (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries):
This resource is a short section of the Madera Irrigation District (MID) Big Main Canal within assessor's parcel APN 035-030-017. It is an earthen, V-shaped canal with a flat bottom. Broken up concrete has been dumped along the banks of the canal to prevent erosion. At the time the canal was recorded it was dry. (see Linear Feature Record and Continuation Sheets for more information)

*P3b. Resource Attributes (List Attributes and Codes): HP20. Canal

*P4. Resources Present: ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5a. Photograph or Drawing (Photograph required for buildings, structures, and objects.)

P5b. Description of ☒ Photo ☐ Drawing (View, date, accession#): View of canal facing southeast. BN&SF railroad grade in back ground.

*P6. Date Constructed/Age and Sources ☐ Prehistoric ☒ Historic ☐ Both:
Circa 1922 or earlier.

*P7. Owner and Address:
Madera Irrigation District
12152 Road 28 ¼
Madera, CA 93637

*P8. Recorded by (Name, affiliation, address):
R. Scott Baxter
ESA
2600 Capitol Ave, Suite 200
Sacramento, CA 95816

*P9. Date ☒ Recorded ☐Updated:
2 May 2014

*P10. Type of Study (Describe):
Cultural Resources Inventory

*P11. Report Citation (Cite survey report and other sources, or enter "none."):
California High-Speed Rail Authority and Federal Railroad Administration (Authority and FRA), 2014, California High-Speed Train Project, Merced to Fresno Section, Draft Archaeological Survey Report Addendum No. 5.

*Attachments: ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record ☒ Linear Feature Record ☐ Archaeological Record ☐ District Record ☐ Bedrock Grinding Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List):

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary #:
HRI #:
Trinomial

Resource Name or Number (Assigned by recorder): APN 035-030-017-#1

L1. Historic and/or Common Name: MID Big Main Canal

L2a. Portion Described: ☐ **Entire Resource** ☐ **Segment** ☒ **Point Observation** **Designation:**

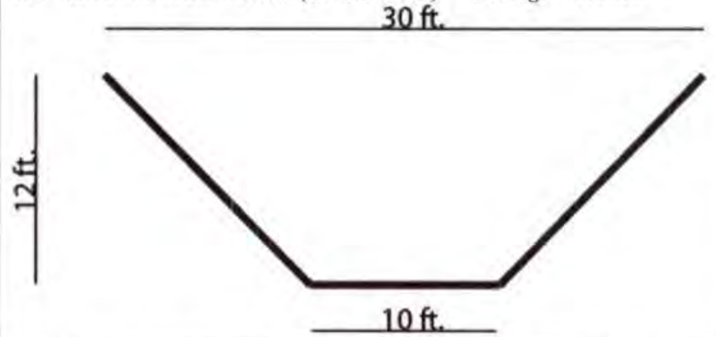
b. Location of Point or Segment (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map):
The canal is located at the northeastern margin of the town of Madera. From where State Hwy 145 crosses the BN&SF railroad grade travel southeast along the west side of the railroad for approximately 200 feet. At this point the canal crosses the railroad and the project area in APN 035-030-017.

L3. Description (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate):
The MID Big Main Canal is an earthen, V-shaped structure with a flat bottom and banks that have been reinforced with concrete rubble. The canal appears on the 1922 and 1947 (labeled as Madera Canal) Madera, CA 7.5' U.S.G.S. Quadrangles, with a partial earthen dam shown on the Fresno River diverting water to the canal (Figures 1 and 2). The canal is also shown on the 1963 Madera Quadrangle (labeled as the Main Canal) with a complete dam shown on the Fresno River. (See continuation sheets)

L4. Dimensions (In feet for historic features, and meters for prehistoric features):

a. Top Width: 30 feet
b. Bottom Width: 10 feet
c. Height or Depth: 12 feet
d. Length of Segment: 60 feet

L4e. Sketch of Cross-Section (include scale) **Facing:** Northeast



L5. Associated Resources:
The BN&SF crosses the canal immediately east of the segment recorded.

L6. Setting (Describe natural features, landscape characteristics, slope, etc., as appropriate.):
This segment of the canal is situated in a semi-rural area, alternating between pasture/farm land and residential structures. The surrounding landforms and vegetation communities are all completely altered from their natural state.

L7. Integrity Considerations:
See discussion on continuation sheet (page 5)

L8a. Photograph, Map, or Drawing

L8b. Description of ☒ **Photo** ☐ **Map** ☐ **Drawing (View, scale, etc.):**
View of ditch looking southwest from near BN&SF railroad grade.

L9. Remarks:

L10. Form Prepared by (Name, Affiliation, and Address):
R. Scott Baxter
ESA
2600 Capitol Ave, Suite 200
Sacramento, CA 95816

L11. Date: 2 May 2014

CONTINUATION SHEET

(Cont'd from page 2)

The precursor to the MID was the Madera Canal Irrigation Company (MCIC) incorporated in 1888 under the original Wright act in order to construct a series of canals transporting water from the Fresno River to agricultural interests in the region. The MCIC irrigated the Adobe Ranch, 10 miles east of the town of Madera, along with some 10,000 or 15,000 acres of land in and near the Howard & Wilson Colony southerly from the same town (Mead, 1901). An 1891 map of Madera identifies the canal as the Fresno River Ditch, with the Madera Irrigation District Canal to the north, extending southeast from the Fresno River

The district encompassed 280,000 acres around the Fresno River and supplied water to farms surrounding the county seat and westward. E. W. Chapman, C. S. Campbell Johnson and W. H. Howard acted as the chief directors of this irrigation company. Opposition to the district developed early from large landowners lower down on the San Joaquin who objected to the proposed use of the river, and from landowners who were satisfied with the methods of farming they were then following. Inadequate water supply, legal losses resulting from the claims of local large landowners, and a lack of funding for maintenance and operations led to the MCIC disorganizing in 1893 and dissolving April 18, 1896 (Adams, 1929).

In the early decades of the twentieth century, many private irrigation systems in the San Joaquin Valley were acquired by irrigation districts formed by local residents. The most common absorption occurred when local citizens formed an irrigation district covering the area and then purchased the commercial canals within it (JRP & Caltrans, 2000). By 1914, renewed interest in irrigating the region resulted in the establishment of an irrigation bureau to divert water from the San Joaquin River, as well as the possibility of storage at Millerton on the San Joaquin above Friant. The irrigation bureau filed a preliminary engineering report June 21, 1917, which indicated the practicability of a project watering 250,000 acres by storage on the San Joaquin (California Department of Engineering, 1917).

The first development recommended by the report was construction of Millerton Dam, together with the canal systems to part capacity. With the reports of the engineer submitted, and the feasibility of a large project established, the local irrigation bureau proposed the formation of an irrigation district. On November 3, 1919, they presented their petition to the board of supervisors of Madera County. At the organization election January 2, 1920, the district was formed by a vote of 1642 to 47, indicating the popularity of the movement to develop a water supply. Engineering reports outlined the project estimated to cost $28,000,000, which included approximately $14,000,000 for Millerton Dam and power plant, $8,610,000 for canals and laterals, $1,000,000 for pumping plants, and $100,000 for the purchase of the system of Madera Canal and Irrigation Company (Adams, 1929). Immediately following its formation, the MID was subjected to litigation from Miller & Lux, who opposed diversion of water from the San Joaquin River. As a result of the legal conflict, the two groups established the San Joaquin River

Water Storage District in an effort to provide compromise. The two groups never truly reached agreement, and the storage district was dissolved in 1929 (Adams, 1929).

Significance

The MID Big Main Canal's association with early corporate irrigation efforts and agricultural development in Madera County had a broad-reaching impact on the community at the local level, and therefore is recommended as potentially eligible under Criterion A. However, archival research failed to identify any individual member of the MCIC or MID who gained notoriety or prominence due to their association with this section of the Big Main Canal, so it is recommended that the resource would not be considered eligible under Criterion B.

Furthermore, as an earthen structure typical for its age and use, the canal section does not appear to embody the characteristics of a distinctive type, period, or method of construction, or represent the work of a master architect or builder, and is therefore recommended as ineligible under Criterion C. Finally, the canal section does not appear to have the potential to yield information important to an understanding of the prehistory or history of the local area, the state, or the nation, and is accordingly considered ineligible under Criterion D.

Integrity

Repairs and improvements to the MID Big Main Canal within APN 035-030-017 have significantly altered the character of the resource since initial construction, modifying its original course, shape, and materials. In addition, the nature of the surrounding environment has changed from primarily rural to modern residential and light commercial usage. As such, it is recommended that the portions of the MID Big Main Canal within APN 035-030-017 do not possess integrity of location, design, setting, materials, workmanship, or feeling. Despite the degree of physical alteration to the resource, however, the canal section still possesses integrity of association—-it was originally constructed in order to provide an adequate water supply to the surrounding farm communities, a function that it still serves. Nevertheless, this portion of the MID Big Main Canal does not retain sufficient integrity to convey its significance, and therefore it is recommended that the canal is not eligible for inclusion in the NRHP.

Recommendation

It is recommended that the portion of the MID Big Main Canal within APN 035-030-017 is ineligible for inclusion to the NRHP.

Supplement P-20-002308 CA-MAD-2649H

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary#
HRI #
Trinomial

CONTINUATION SHEET

Property Name: MID Big Main Canal

References Cited

Adams, Frank, 1929. *Irrigation Districts in California.* Bulletin 21. Reports of the Division of Engineering and Irrigation, California Department of Public Works. California State Printing Office, Sacramento.

California Department of Engineering, 1917. *Fifth Biennial Report of the Department of Engineering of the State of California December 1, 1914 to November 30, 1916*

ICF, 2009. *Madera Irrigation District Water Supply Enhancement Project Cultural Resources Inventory and Evaluation*. Prepared for the Madera Irrigation District. July 2009.

JRP Historical Consulting Services and California Department of Transportation (JRP and CalTrans) 2000 *Water Conveyance Systems in California: Historic Context and Evaluation Procedures*. California Department of Transportation, Sacramento, California.

Mead, Elwood and William Ellsworth Smythe, 1901. *Report of Irrigation Investigations in California* By United States. Office of Experiment Stations.

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary #:
HRI#
Trinomial:

Page 6 of 6 ***Resource Name or Number (Assigned by recorder):** APN 035-030-017-#1
***Map Name:** Madera, CA ***Scale:** 1:24,000 ***Date of Map:** 1978 (photorevised 1981)

Supplement

State of California X The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H
NRHP Status Code

Other Listings
Review Code | Reviewer | Date

Page 1 of 38 | ***Resource Name or #:** (Assigned by recorder) Madera ~~Canal~~ IRRIGATION DISTRICT

P1. Other Identifier:
***P2. Location:** X **Not for Publication** **Unrestricted**
***a. County** Madera **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad Berenda Date** 1961 PR 1987 T 10S; **R**16, 17E **Sec** 19, 30, 14, 15, 16; MD **B.M. See cont.**
c. Address NA City Madera Zip
d. UTM: Zone 10s (NAD 83)
Location #13 Lateral 32.9-9.9 Head: 4105466 mN 750367 mE;
Location #15 Lateral 32.2-9.9W-0.1 Head: 4105453 mN 750146 mE
Location #16 Lateral 32.2-9W-1.0 Head: 4105409 mN 748758 mE
These can be accessed along maintained county roads * See continuation

***P3a. Description:**
These are irrigation gate valves that are distributed within the Madera Canal system and contribute to the entire district. They are non-unique and ubiquitous throughout the canal system located at distribution points of the canal. These have been recorded as a singular item of the canal system. There are 20 locations that have been listed in this report and this represents a partial recording of these valves.

***P3b. Resource Attributes:** HP20 Canals, AH6 Water Conveyance

P4. Resources Present: ☐* Building ☐ Structure ☐ Object ☐Site ■ Element of a District ☐ Other (Isolates, **etc.)**

P5b.Description of Photo: #13 Lateral 32.2-9.9 Head Overview west 11/02/14

***P6.Date Constructed/Age and source:**
■ Historic ☐ Prehistoric ☐ Both

***P7. Owner and Address:**
Madera Irrigation District
12152 Road 28 ¼
Madera, Ca. 93637

***P8. Recorded by:** (Name, affiliation, and address Mark Kile
Culturescape
6182 Carter Rd
Mariposa Ca 95338

***P9. Date Recorded:** 1/4/2013
11/2/2013

***P10. Survey Type:** (Describe)
Pedestrian

***P11. Report Citation**: Cultural Resource Inventory for Madera ID Water Conservation 13-MPRO-191 MID Job # 27-13-2

***Attachments:** ☐ NONE ■ Location Map ■ Continuation Sheet ☐ Building, Structure, and Object Record
☐Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record
☐ Artifact Record ■Photograph ☐ Other (List):

Supplement

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # P-20-002308
HRI #/Trinomial CA-MAD-2649H

■ Continuation ☐ Update

Temporary Number/Resource Name: MID Canal

P2b. **UTM 10S**

USGS 7.5' Quad Berenda Date 1961 PR 1987 T 10S; R16,17E Sec 19, 30,14,15,16; MD B.M.

Location #17 Lateral 32.2-9.9W-1.5 Head:	4105349 mN 747958 mE
Location #18 Lateral 32.2-9.9W-2.0 Head:	4105329 mN 747129 mE
Location # 20 Downstream Lateral 32.2 Basin:	4103021 mN 750455 mE
Location #21 Lateral32.2 Basin Pump Station:	4103049 mN 750457 mE
Location #14 Lateral 32.2-13.2 Head:	4101484 mN 752013 mE

USGS 7.5' Quad Bonita Ranch 1963 (PI 1978) T11S, R 17E Sec. 20, 24, 32 MDBM

Location #10 Lateral 24.2-17.0 Head:	4095027 mN 754842 mE
Location #11 Lateral 24.2-17.0-2.3 Head:	4094070 mN 751535 mE
Location #12 Lateral 24.2-19.5 Head:	4091058 mN 754945 mE

USGS 7.5 Quad Kismet 1961 (PR1987) T10S, R17E Sec. 24, 26, MDBM

Location # 2 Lateral 24.3 Head:	4103991 mN 760341 mE
Location # 7 Lateral 24.2-8.9 Head:	4101939 mN 759729 mE
Location # 8 Lateral 24.2-9.0 Head:	4101698 mN 759729 mE

USGS Quad Madera 1963 (PR 1981) T11S, R 17E, Sec 14, 24, 34 MDBM

Location #9 Lateral 24.2-13.2 Head:	4096292 mN 759958 mE

UTM 11S

USGS 7.5' Quad Gregg 1965 (PR 1978) T12S, R18 E Sec. 14, 15 MDBM

Location #22 Lateral 6.2-14.5 Head:	4086366 mN 234125 mE
Location #25 Lateral 6.2-9.2 Head:	4086517 mN 234916 mE

USGS 7.5' Quad Gregg 1965 (PR 1978) T12S, R19 E Sec. 9 MDBM

Location #26 Lateral 6.2-9.2 Head:	4087285 mN 242131 mE

USGS 7.5' Quad Herndon T12S, R19 E Sec. 21, 29 MDBM

Location #23 Lateral 6.2-9.2-5.0:	4083591 mN 238875 mE
Location #24 Lateral 6.2-9.2-3.2 Head:	4084769 mN 240518 mE

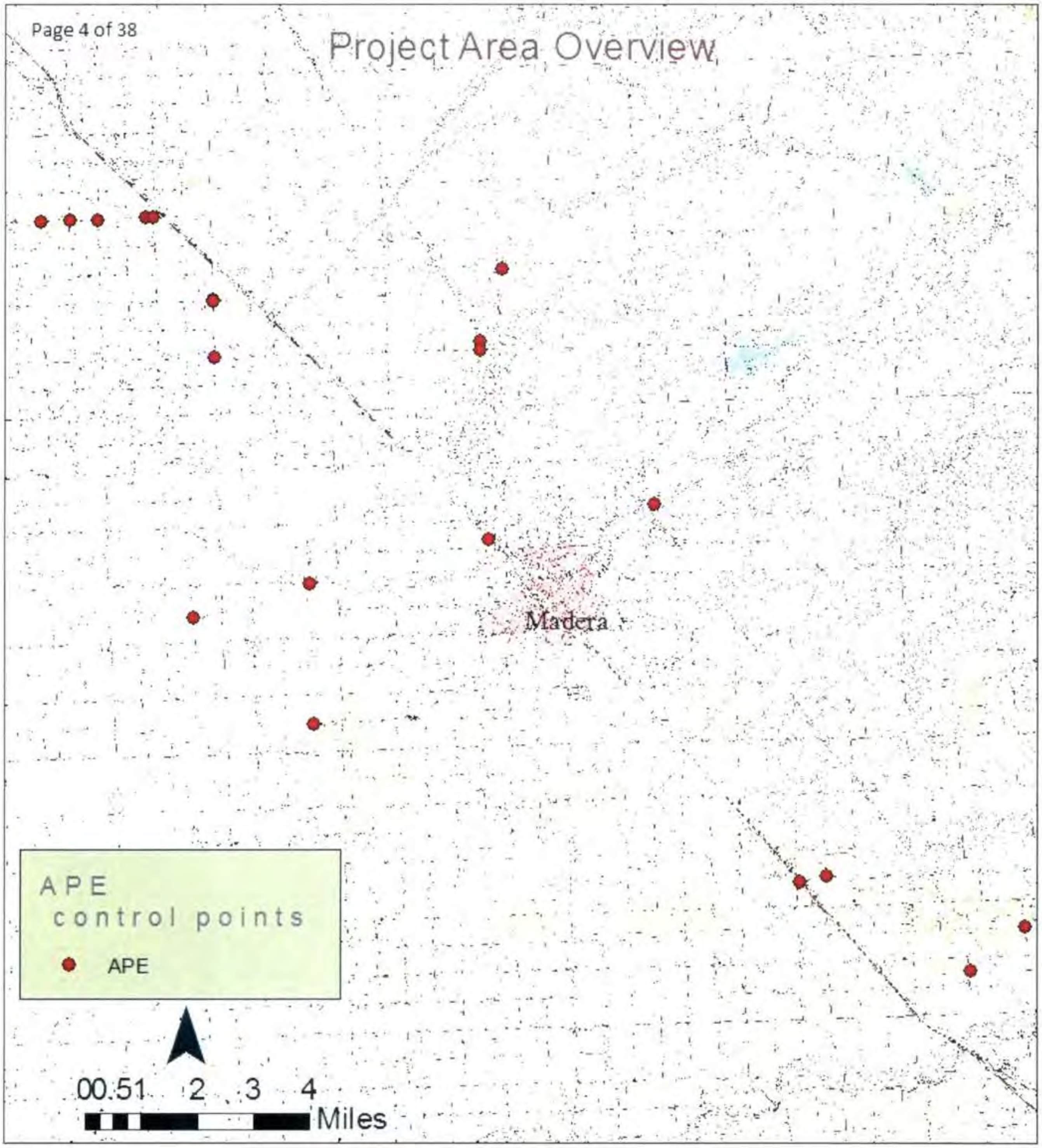
P-20-002308
CA-MAD-2649H

Project Vicinity

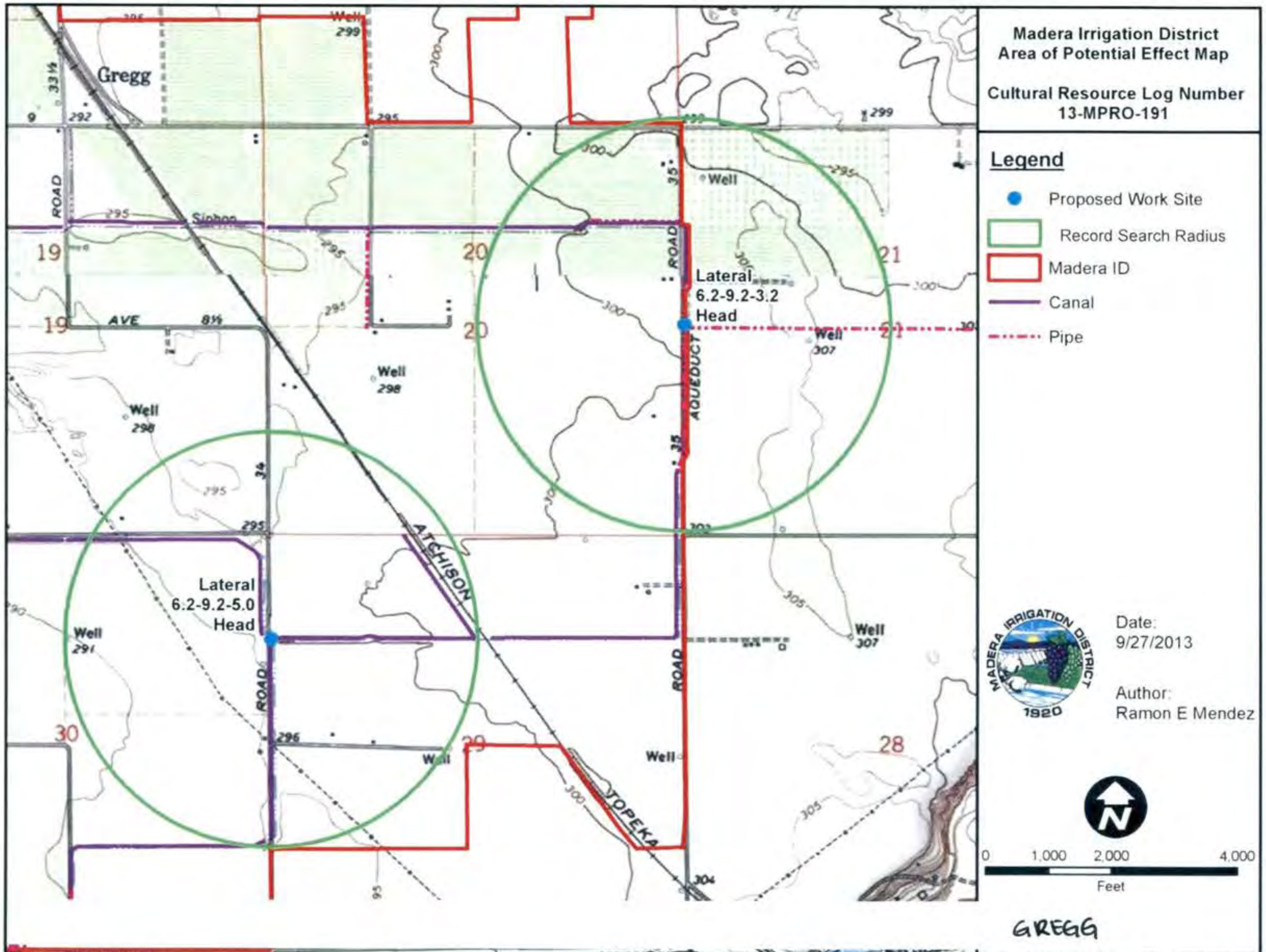
Figure 2 Project Vicinity

Supplement

P-20-002308
CA-MAD-2649H



Madera Irrigation District Project 13-MPRO
Watersmart Grant Improvements
Madera Canal control points



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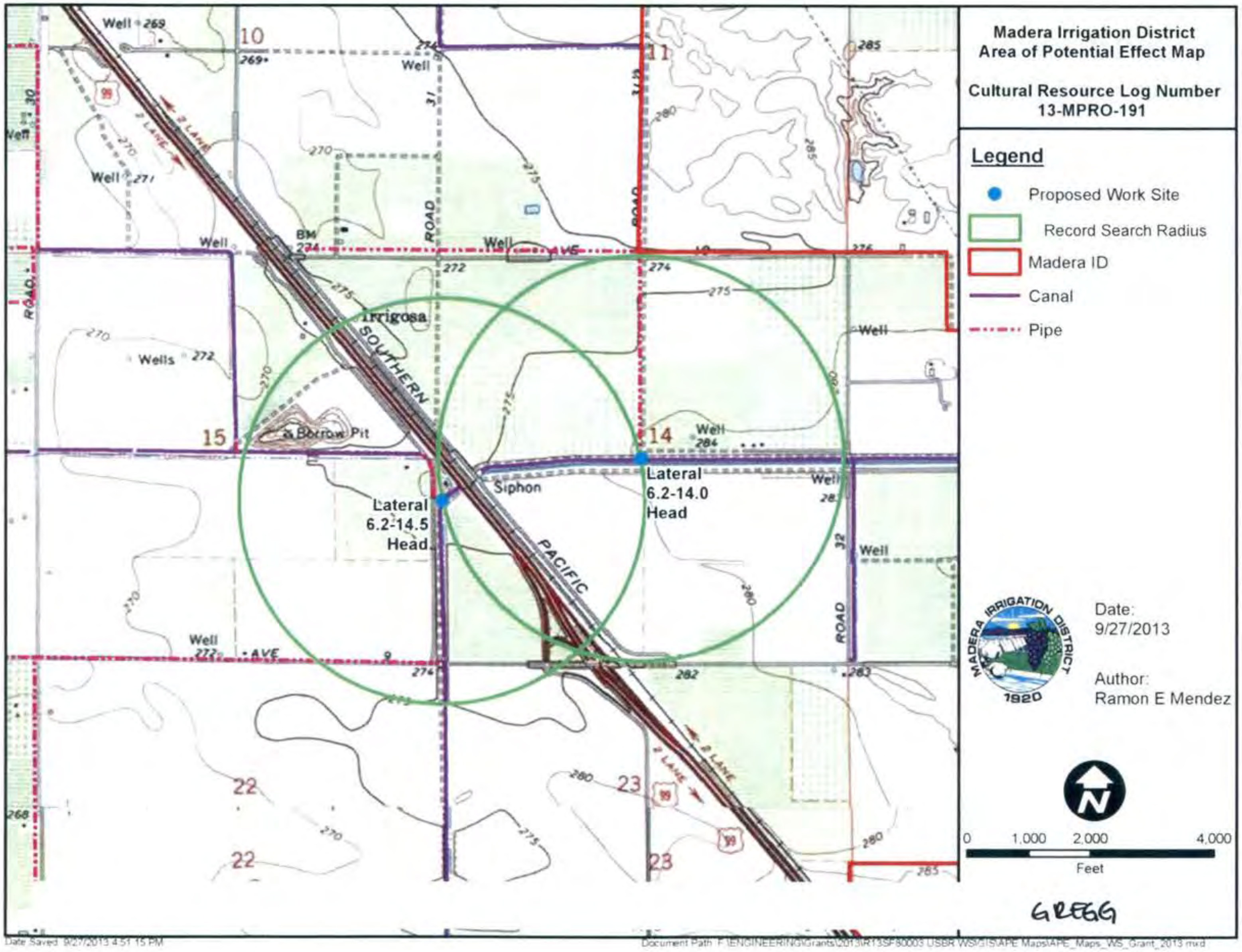
CA-MAD-2649H



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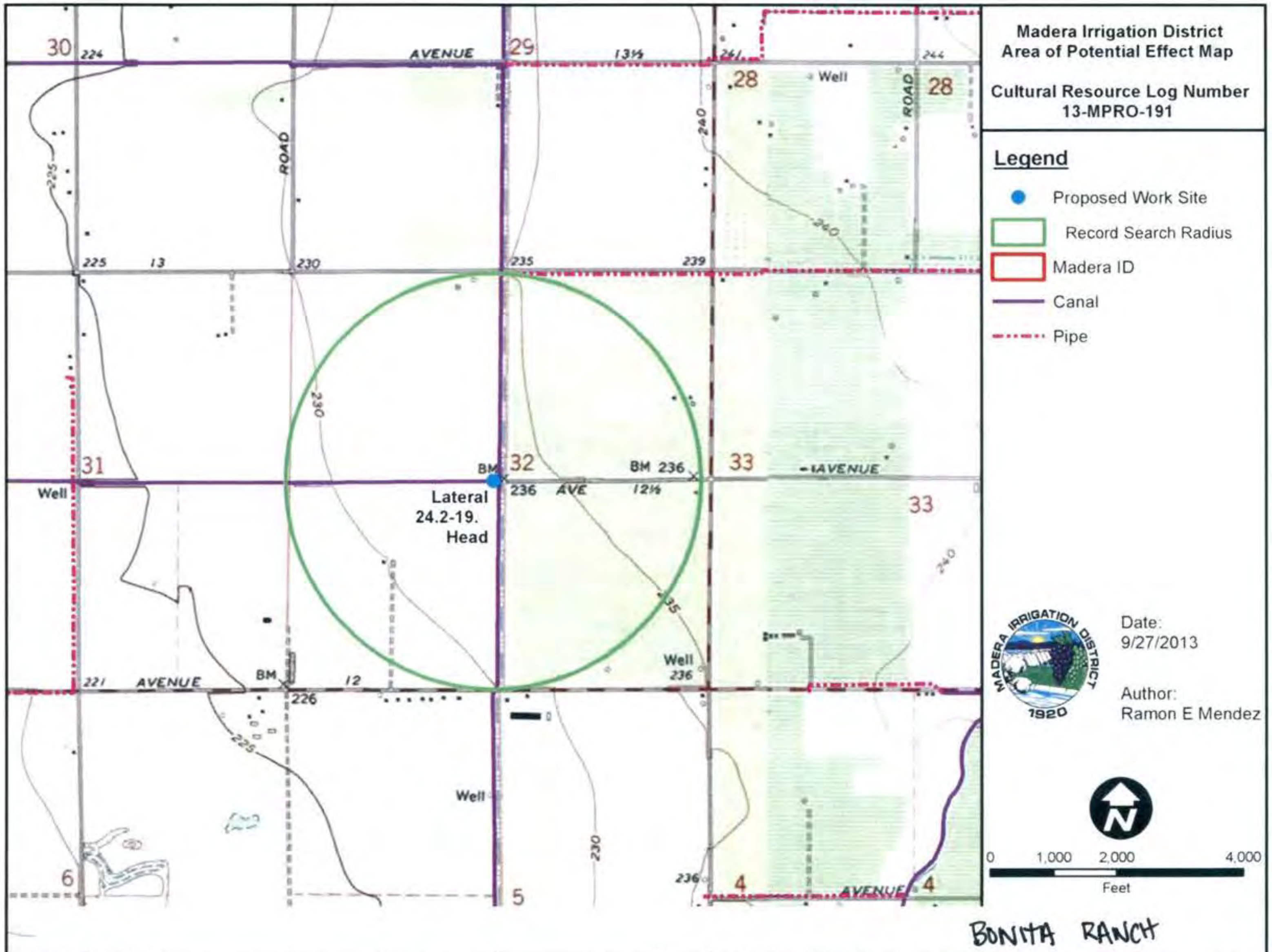
CA-MAD-2649H



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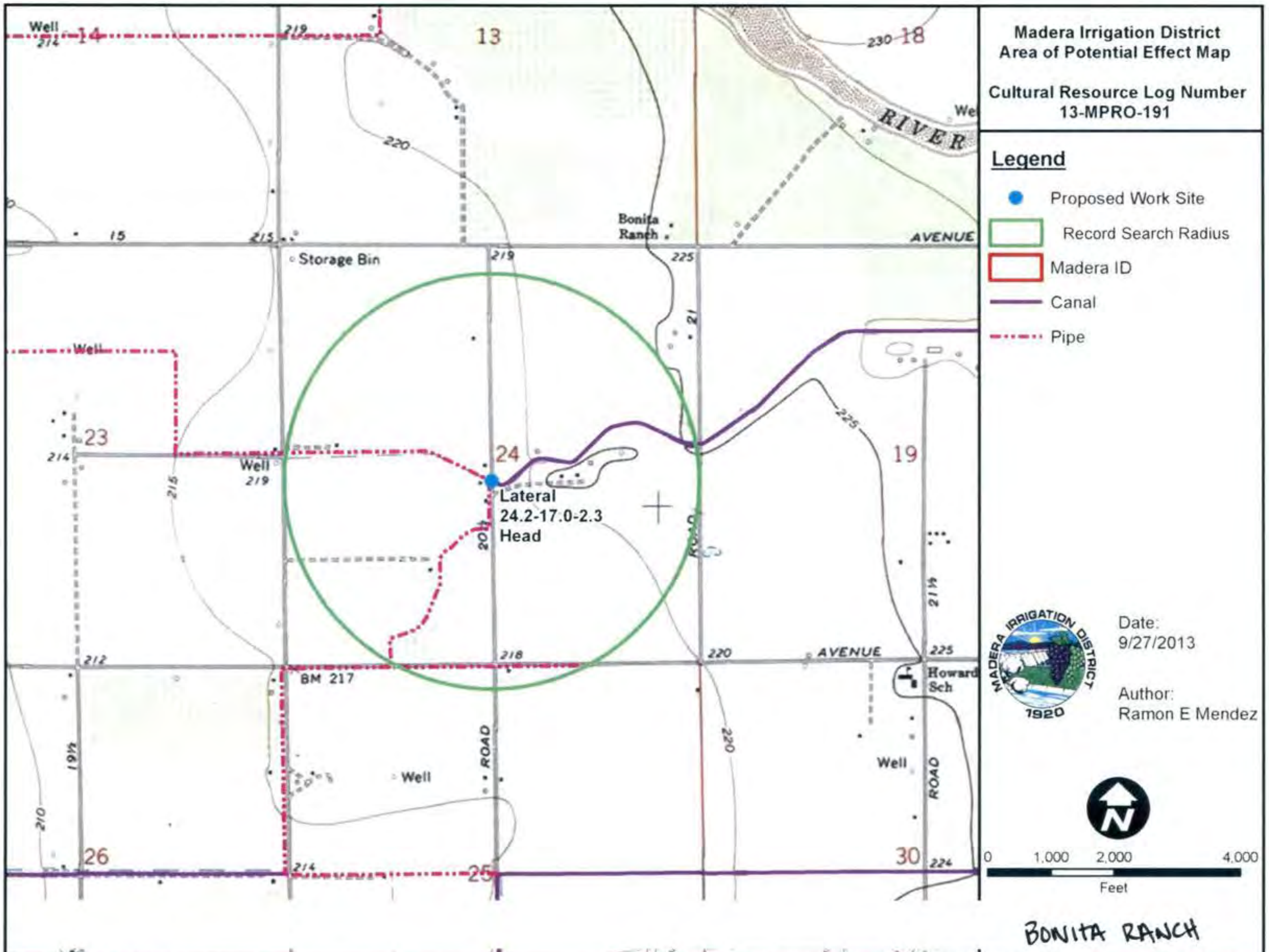
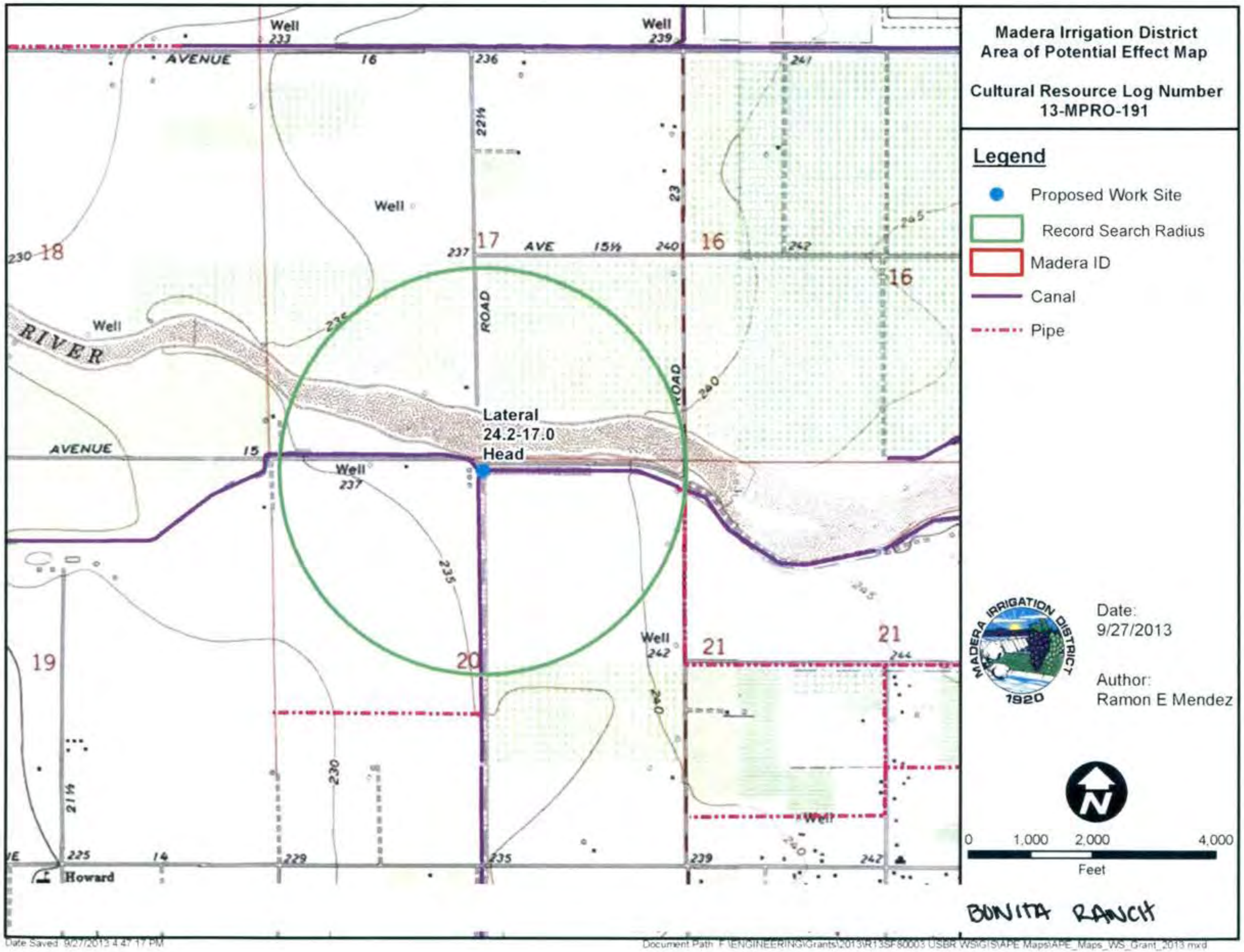
CA-MAD-2649H



Supplement
P-20-002308
CA-MAD-2649H



Supplement
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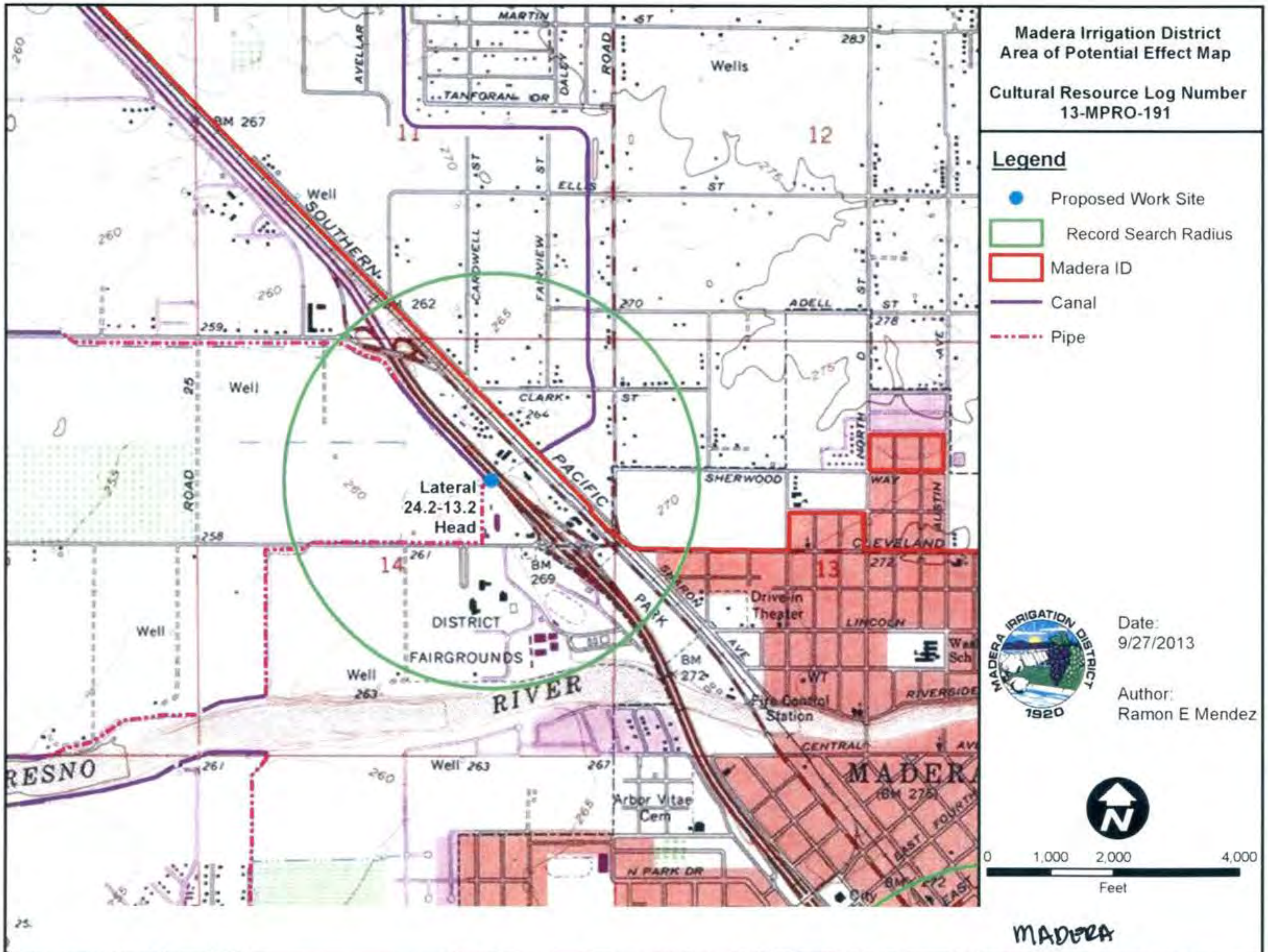
CA-MAD-2649H



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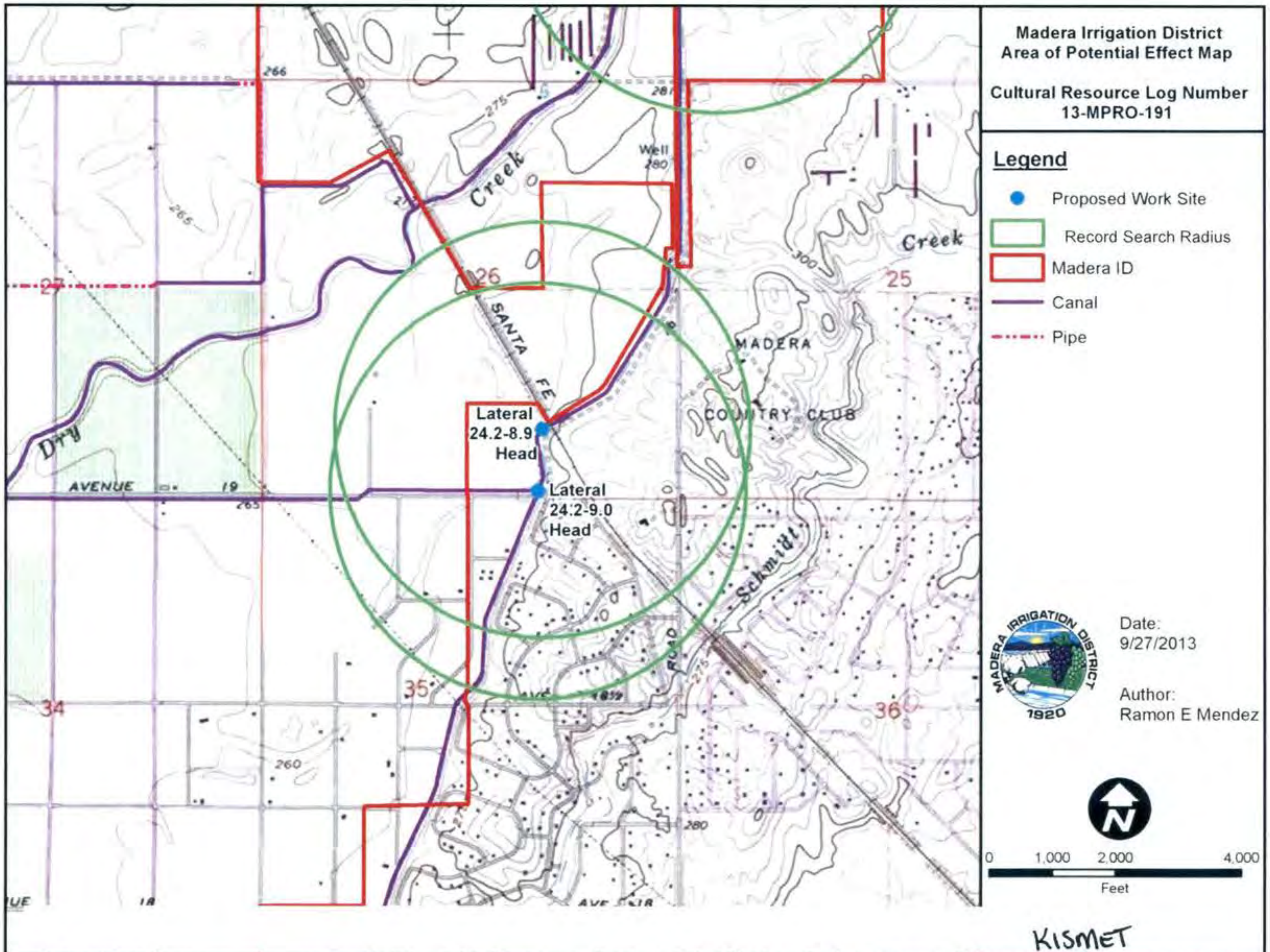

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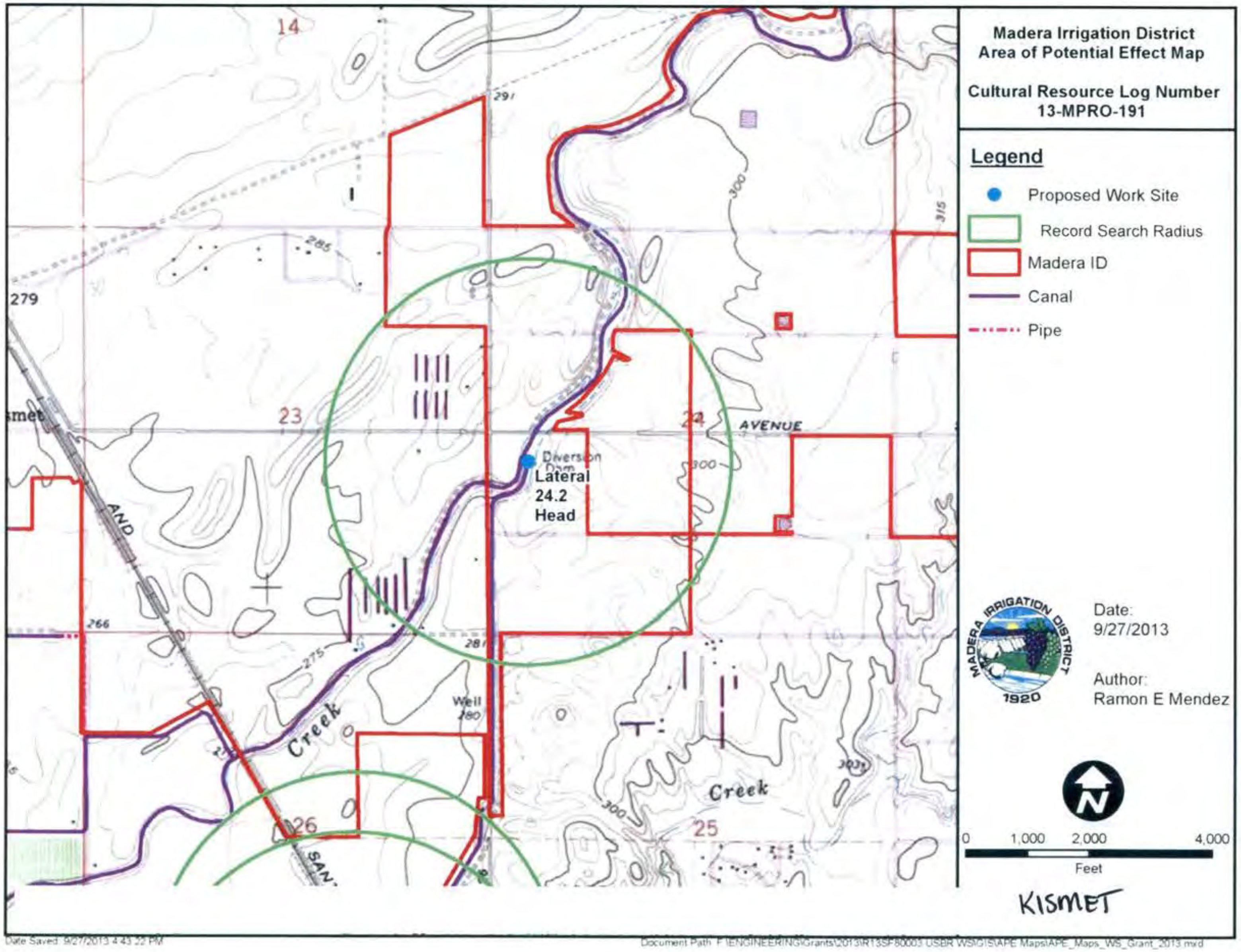

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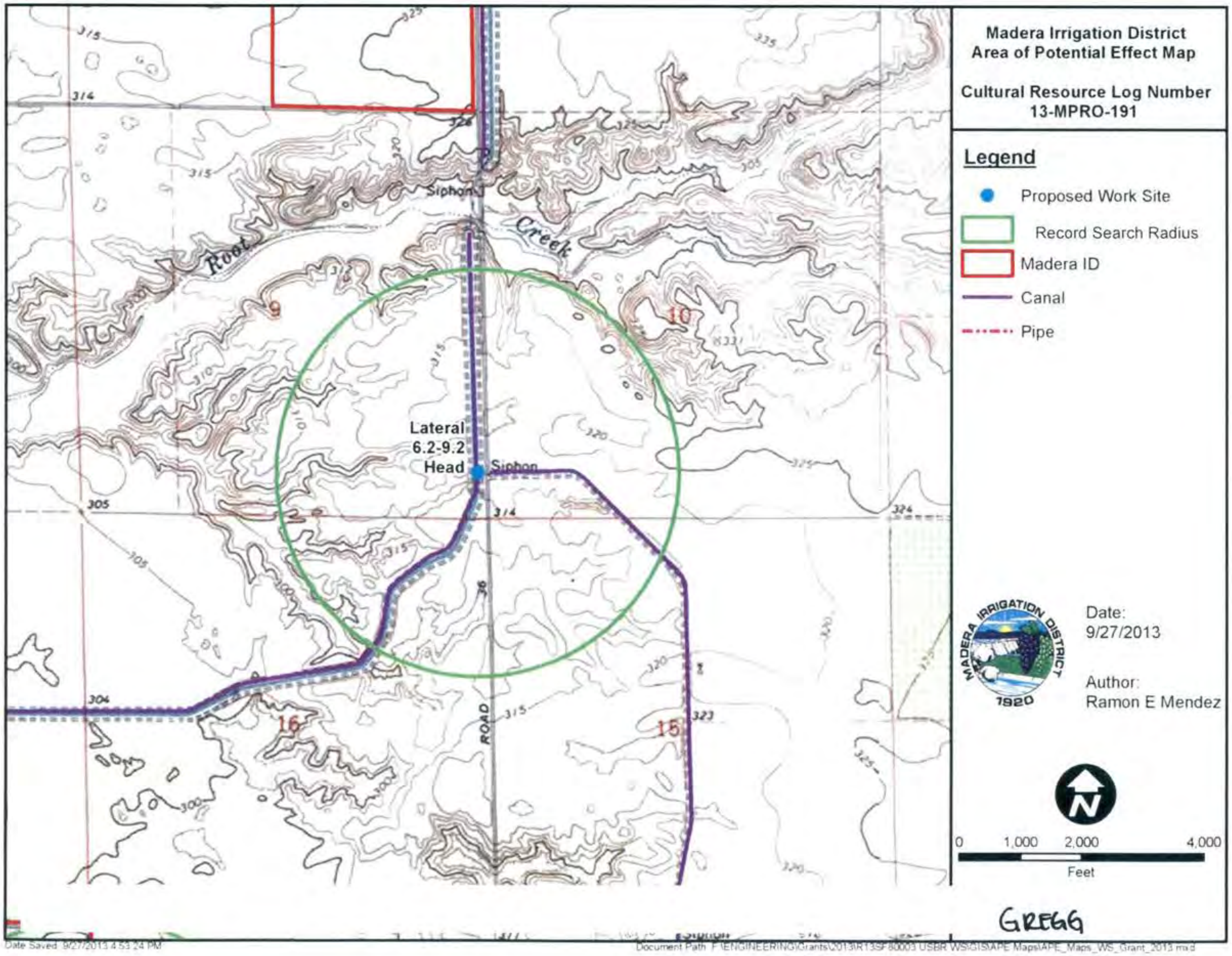

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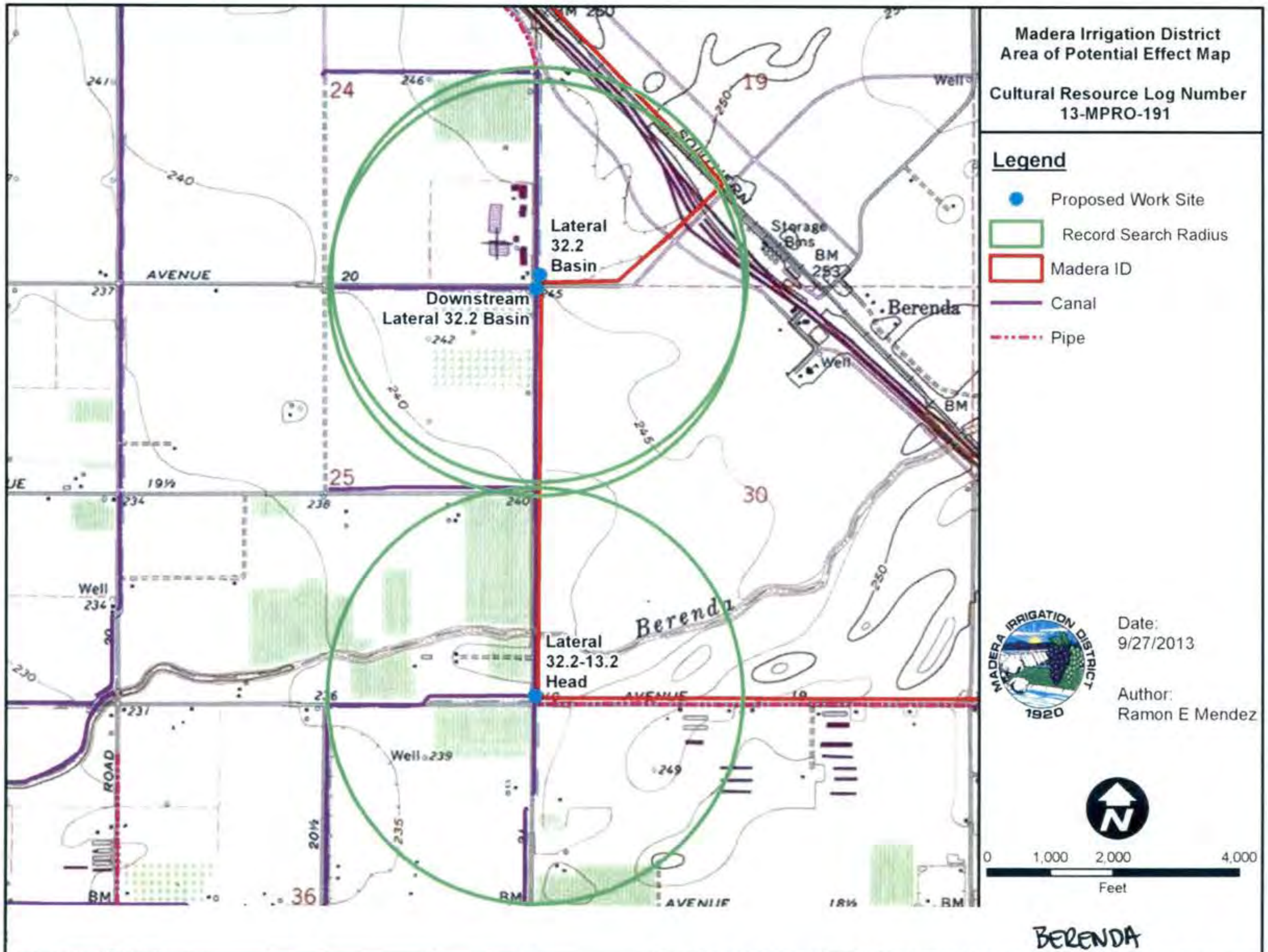

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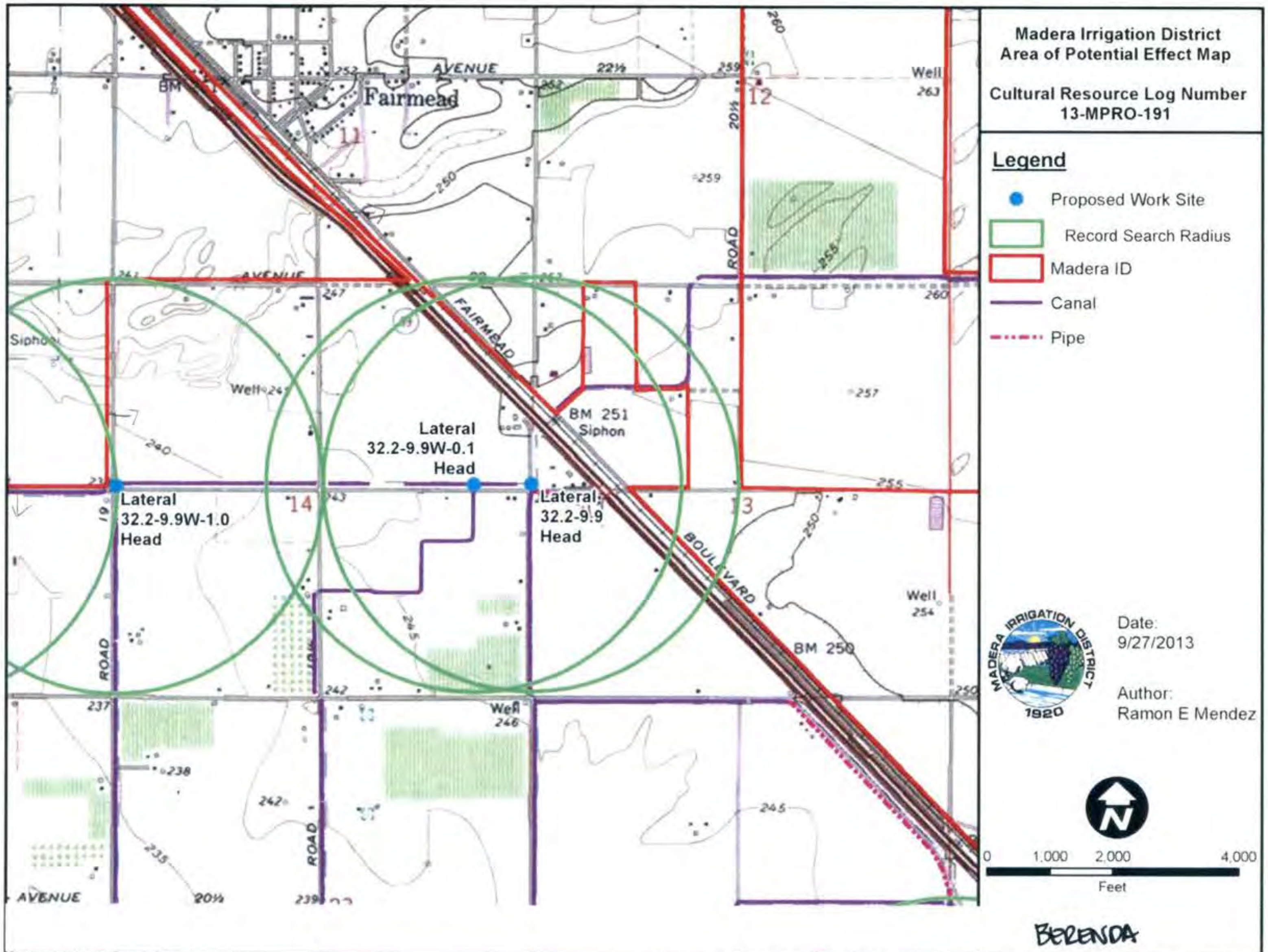

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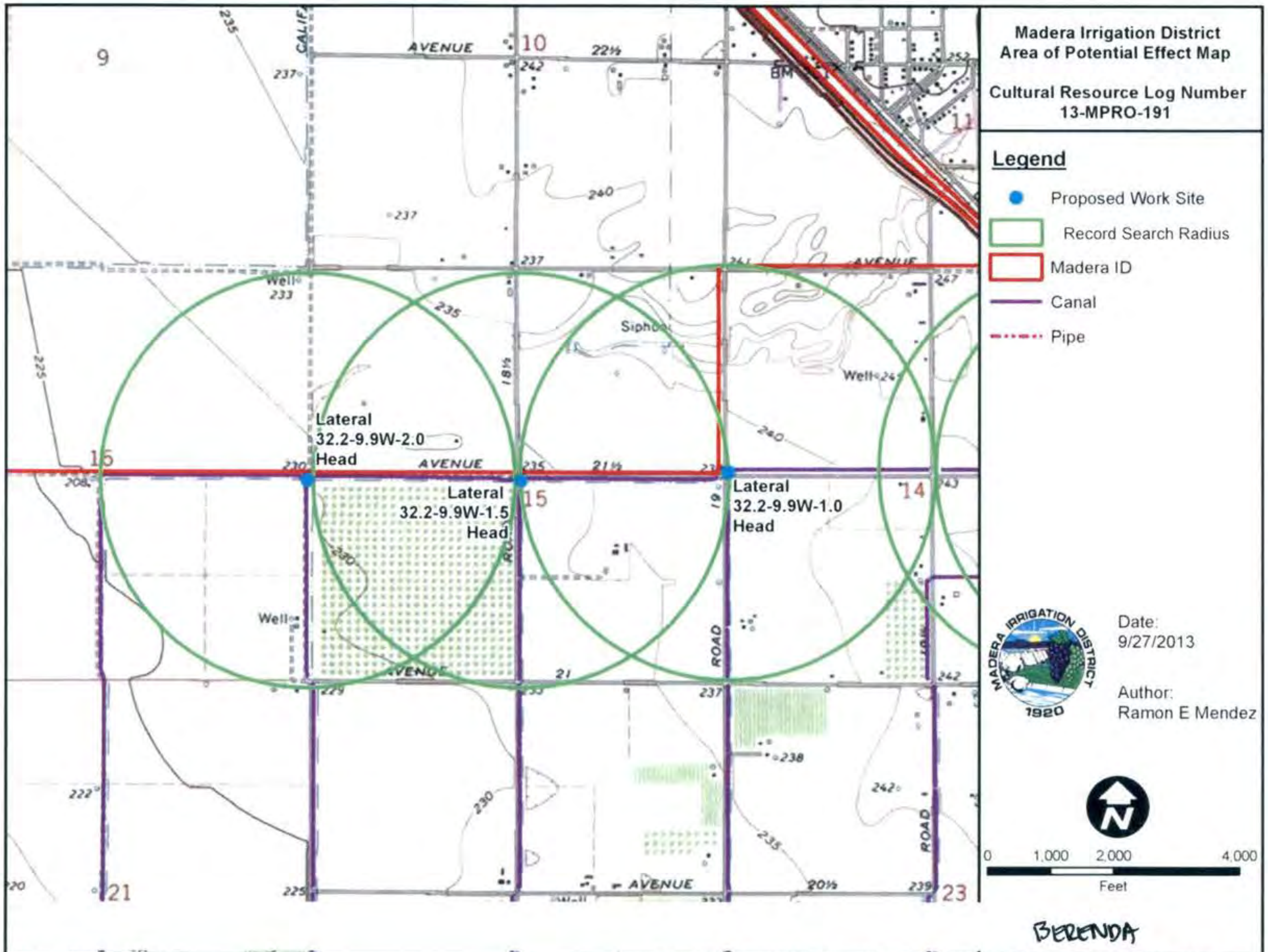

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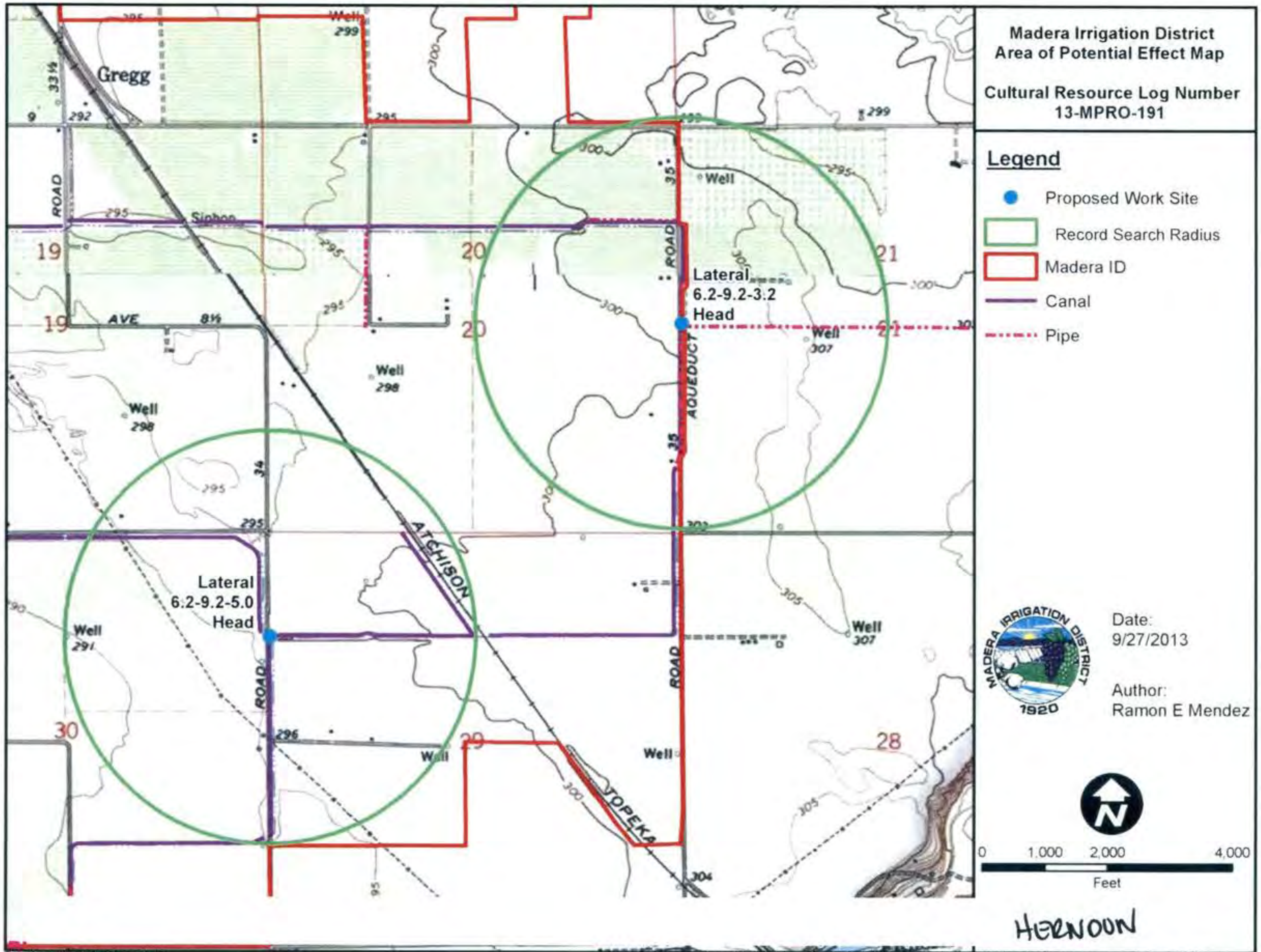

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CA-MAD-2649H

Supplement
P-20-002308
CA-MAD-2649H

Date	Time	Subject	Figure	Accession Number	Direction
11/2/13	8:36	#13 Lateral 32.2-9.9 Head Overview	1	IMG-0027	west
11/2/13	8:40	#13 Lateral 32.2-9.9 Head Overview	2	IMG-0028	210°
11/2/13	8:50	#15 Lateral 32.2-9.9 W-0.1Head	3	IMG-0029	south
11/2/13		#15 Lateral 32.2-9.9 W-0.1Head	4	IMG-0030	south
11/2/13	9:53	#16 Lateral 32.2-9.9 W-1.0 Head Overview	5	IMG-0031	226°
11/2/13		#16 Lateral 32.2-9.9 W-1.0 Head Detail	6	IMG-0032	south
11/2/13	10:08	#17 Lateral 32.2-9.9 W-1.5 Head Overview	7	IMG-0033	190°
11/2/13		#17 Lateral 32.2-9.9 W-1.5 Head Detail	8	IMG-0034	
11/2/13	10:30	#18 Lateral 32.9-9.9 W-2.0 Head Overview	9	IMG-0035	300°
11/2/13		#18 Lateral 32.9-9.9 W-2.0 Head Detail	10	IMG-0036	
11/2/13		#18 Trash pile Overview	11	IMG-0037	220°
11/2/13	10:45	#21 Lateral 32.2 Basin Pump Station Overview	12	IMG-0038	210°
11/2/13		#21 Lateral 32.2 Basin Pump Station Detail	13	IMG-0039	
11/2/13	10:50	#20 Downstream Lateral 32.2 Basin Overview	14	IMG-0040	50°
11/2/13		#14 Lateral 32.2-13.2 Head Overview	15	IMG-0041	west
11/2/13		#14 Lateral 32.2-13.2 Head Detail	16	IMG-0042	
11/2/13	11:15	#11 Lateral 24.3-17.0-2.3 Head Overview	17	IMG-0043	306°
11/2/13		#11 Lateral 24.3-17.0-2.3 Head detail	18	IMG-0044	
11/2/13	11:34	#10 Lateral 24.2-17.0 Head Overview	19	IMG-0045	316°
11/2/13		#10 Lateral 24.2-17.0-Head Detail	20	IMG-0046	
11/2/13	12:06	#12 Lateral 24.2-19.5 Head Overview	21	IMG-0047	west
11/2/13		#12 Lateral 24.2-19.5 Head Detail	22	IMG-0048	
11/2/13		#22 Lateral 6.2-14.0 Head Detail	23	IMG-0049	
11/2/13		#22 Lateral 6.2-14.0 Head Overview	24	IMG-0050	314°
11/2/13		#25 Lateral 6.2-14.0 Head Overview	25	IMG-0051	north
11/2/13		#25 Lateral 6.2-14.0 Head Overview	26	IMG-0052	north
11/2/13	1:34	#23 Lateral 6.2-9.2-5.0 Head Overview	27	IMG-0053	south
11/2/13		#23 Lateral 6.2-9.2-5.0 Head Detail	28	IMG-0054	
11/2/13		#24 Lateral 6.2-9.2-3.2 Head Overview	29	IMG-0055	332°
11/2/13		#24 Lateral 6.2-9.2-3.2 Head Detail	30	IMG-0056	
11/2/13	2:30	#26 Lateral 6.2-9.2 Head Overview	31	IMG-0057	east
11/2/13		#26 Lateral 6.2-9.2 Head Detail	32	IMG-0058	
11/2/13	3:45	#9 Lateral 24.2-13.2 Head Overview	33	IMG-0062	east
11/2/13		#9 Lateral 24.2-13.2 Head Overview	34	IMG-0063	north
11/2/13	4:00	#8 Lateral 24.2-9.0 Head Overview	35	IMG-0064	262°
11/2/13	4:30	#7 Lateral 24.2-8.9 Head Overview	36	IMG-0065	north
11/2/13		#7 Lateral 24.2-8.9 Head Detail	37	IMG-0066	
11/2/13	5:00	#2 Lateral 24.2 Head Overview	38	IMG-0067	north
11/2/13		#2 Lateral 24.2 Head Overview	39	IMG-0068	286°
11/2/13		#2 Lateral 24.2 Head original slat holders°	40	IMG-0069	76°

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Figure 1 11/2/13 8:36 #13 Lateral 32.2-9.9 Head Overview 14 IMG-0027 west

Figure 2 11/2/13 8:40 #13 Lateral 32.2-9.9 Head Overview 15 IMG-0028 210°

Figure 3 11/2/13 8:50 #15 Lateral 32.2-9.9 W-0.1Head 16 IMG-0029 south

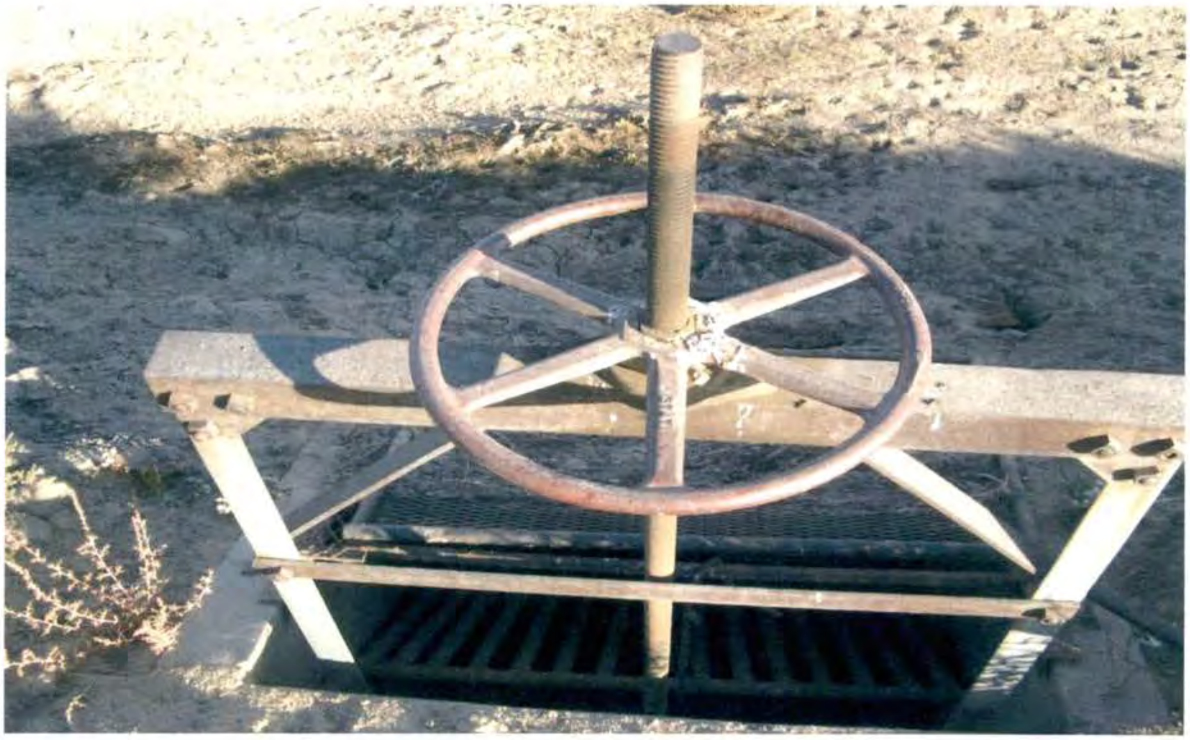

Figure 4 11/2/13 #15 Lateral 32.2-9.9 W-0.1Head 17 IMG-0030 south

Supplement

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Figure 5 11/2/13 9:53 #16 Lateral 32.2-9.9 W-1.0 Head Overview 18 IMG-0031 226°

Figure 6 11/2/13 #16 Lateral 32.2-9.9 W-1.0 Head Detail 19 IMG-0032 south

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Figure 7 11/2/13 10:08 #17 Lateral 32.2-9.9 W-1.5 Head Overview 20 IMG-0033 190°

Figure 8 11/2/13 #17 Lateral 32.2-9.9 W-1.5 Head Detail 21 IMG-0034

Figure 9 11/2/13 10:30 #18 Lateral 32.9-9.9 W-2.0 Head Overview 22 IMG-0035 300°

Figure 10 11/2/13 #18 Trash pile Overview 23 IMG-0036 220°

Figure 11 11/2/13 #18 Lateral 32.9-9.9 W-2.0 Head Detail 24 IMG-0037

Figure 12 11/2/13 10:45 #21 Lateral 32.2 Basin Pump Station Overview 25 IMG-0038 210°

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Figure 13 11/2/13 #21 Lateral 32.2 Basin Pump Station Detail 26 IMG-0039

Figure 14 11/2/13 10:50 #20 Downstream Lateral 32.2 Basin Overview 27 IMG-0040 50°

Figure 15 11/2/13 #14 Lateral 32.2-13.2 Head Overview 28 IMG-0041 west

Figure 16 11/2/13 #14 Lateral 32.2-13.2 Head Detail 29 IMG-0042

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Figure 17 11/2/13 11:15 #11 Lateral 24.3-17.0-2.3 Head Overview 30 IMG-0043 306°

Figure 18 11/2/13 #11 Lateral 24.3-17.0-2.3 Head detail 31 IMG-0044

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Figure 19 11/2/13 11:34 #10 Lateral 24.2-17.0 Head Overview 32 with slat holder visible IMG-0045 316°

Figure 20 11/2/13 #10 Lateral 24.2-17.0-Head Detail 33 IMG-0046

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Figure 21 11/2/13 12:06 #12 Lateral 24.2-19.5 Head Overview 34 IMG-0047 west

Figure 22 11/2/13 #12 Lateral 24.2-19.5 Head Detail 35 IMG-0048

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Figure 23 11/2/13 #22 Lateral 6.2-14.0 Head Detail 36 IMG-0049

Figure 24 11/2/13 #22 Lateral 6.2-14.0 Head Overview 37 IMG-0050 314°

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Figure 25 11/2/13 #25 Lateral 6.2-14.0 Head Overview 38 IMG-0051 north

Figure 26 11/2/13 #25 Lateral 6.2-14.0 Head Overview 39 IMG-0052 north

Supplement
P-20-002308
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Figure 27 11/2/13 1:34 #23 Lateral 6.2-9.2-5.0 Head Overview 40 IMG-0053 south

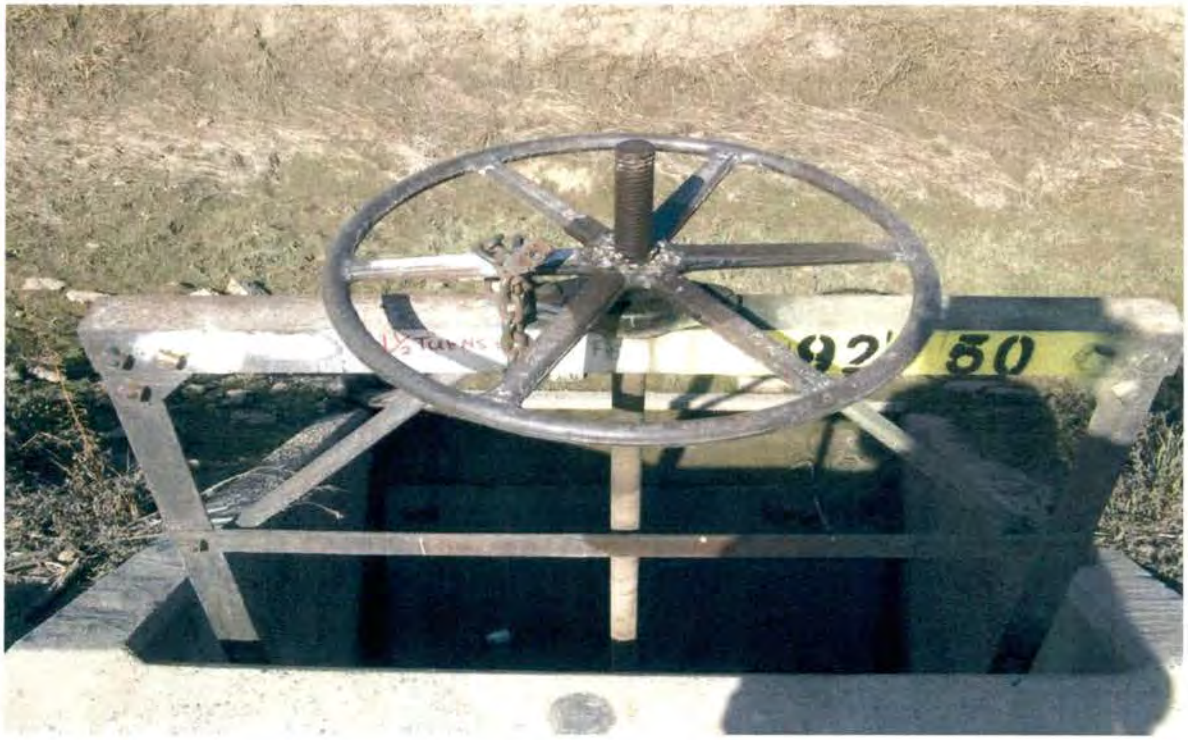

Figure 28 11/2/13 #23 Lateral 6.2-9.2-5.0 Head Detail 41 IMG-0054

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Figure 29 11/2/13 #24 Lateral 6.2-9.2-3.2 Head Overview 42 IMG-0055 332°

Figure 30 11/2/13 #24 Lateral 6.2-9.2-3.2 Head Detail 43 IMG-0056

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Figure 31 11/2/13 2:30 #26 Lateral 6.2-9.2 Head Overview 44 IMG-0057 east

Figure 32 11/2/13 #26 Lateral 6.2-9.2 Head Detail 45 IMG-0058

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Figure 33 11/2/13 3:45 #9 Lateral 24.2-13.2 Head Overview 49 IMG-0062 east

Figure 34 11/2/13 #9 Lateral 24.2-13.2 Head Overview 50 IMG-0063 north

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Figure 35 11/2/13 4:00 #8 Lateral 24.2-9.0 Head Overview 51 IMG-0064 262°

Figure 36 11/2/13 4:30 #7 Lateral 24.2-8.9 Head Overview 52 IMG-0065 north

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Figure 37 11/2/13 #7 Lateral 24.2-8.9 Head Detail 53 IMG-0066

Figure 38 11/2/13 5:00 #2 Lateral 24.2 Head Overview 54 IMG-0067 north

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Figure 39 11/2/13 #2 Lateral 24.2 Head Overview 55 IMG-0068 286°

Figure 40 11/2/13 #2 Lateral 24.2 Head original slat holders° 56 IMG-0069 76°

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State of California X The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code

Other Listings
Review Code Reviewer Date

Page 1 of 16 ***Resource Name or #:** (Assigned by recorder) Fresno River Big Main Canal
P1. Other Identifier:
***P2. Location:** X **Not for Publication** **Unrestricted**
***a. County** Madera **and** (P2c, P2e, and P2b or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad Madera Date** 1963 PR 1981 T 11S; **R** 17E **Sec** 24, 34; MD **B.M. see below**
c. Address NA City Madera Zip
d. UTM: Zone 10s (NAD 83)
Location #5 Roberts Head: 4094059 mN 762019 mE
Location #6 Butin Head: 4090367 mN 758169 mE
USGS Quad Madera 1963 (PR 1981) T11S, R 18E, Sec 17, 28 MDBM
Location # 3 Main I Head: 4096290 mN 764418 mE
Location #19 Main II Head 4092203 mN 766640 mE
USGS Quad Madera 1963 (PR 1981) T12S, R 18E, Sec 4 MDBM
Location #4 Main II@ Bishel weir: 4089755 mN 765095 mE
These can be accessed along maintained county roads

***P3a. Description:**
These are irrigation gate valves that are distributed within the Big Main system and contribute to the entire district. They are non-unique and ubiquitous throughout the canal system located at distribution points of the canal. These have been recorded as a singular item of the canal system. There are 5 locations that have been listed in this report and this represents a partial recording of these valves.

***P3b. Resource Attributes:** HP20 Canals, AH6 Water Conveyance

P4. Resources Present: ☐* Building ☐ Structure ☐ Object ☐Site ■ Element of a District ☐ Other (Isolates, **etc.)**

P5b. Description of Photo: (view, date, accession #) Overview of Butin Head 10/4/2013 110° IMG-1

***P6.Date Constructed/Age and source:**
■ Historic ☐ Prehistoric ☐ Both

***P7.Owner and Address:**
Madera Irrigation District

***P8.Recorded by:** Mark Kile
Culturescape
6182 Carter Rd
Mariposa Ca. 95338

***P9. Date Recorded:** 11/2/2013

***P10.Survey Type:** (Describe) Pedestrian

***P11. Report Citation**: Cultural Resource Inventory for Madera ID Water Conservation 13-MPRO-191 MID Job # 27-13-2

***Attachments:** ☐ NONE ■ Location Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record ☐Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ■Photograph ☐ Other (List):

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Project Vicinity

Madera Irrigation Project13-MPRO
WaterSmart Grant Improvements

Figure 2 Project Vicinity

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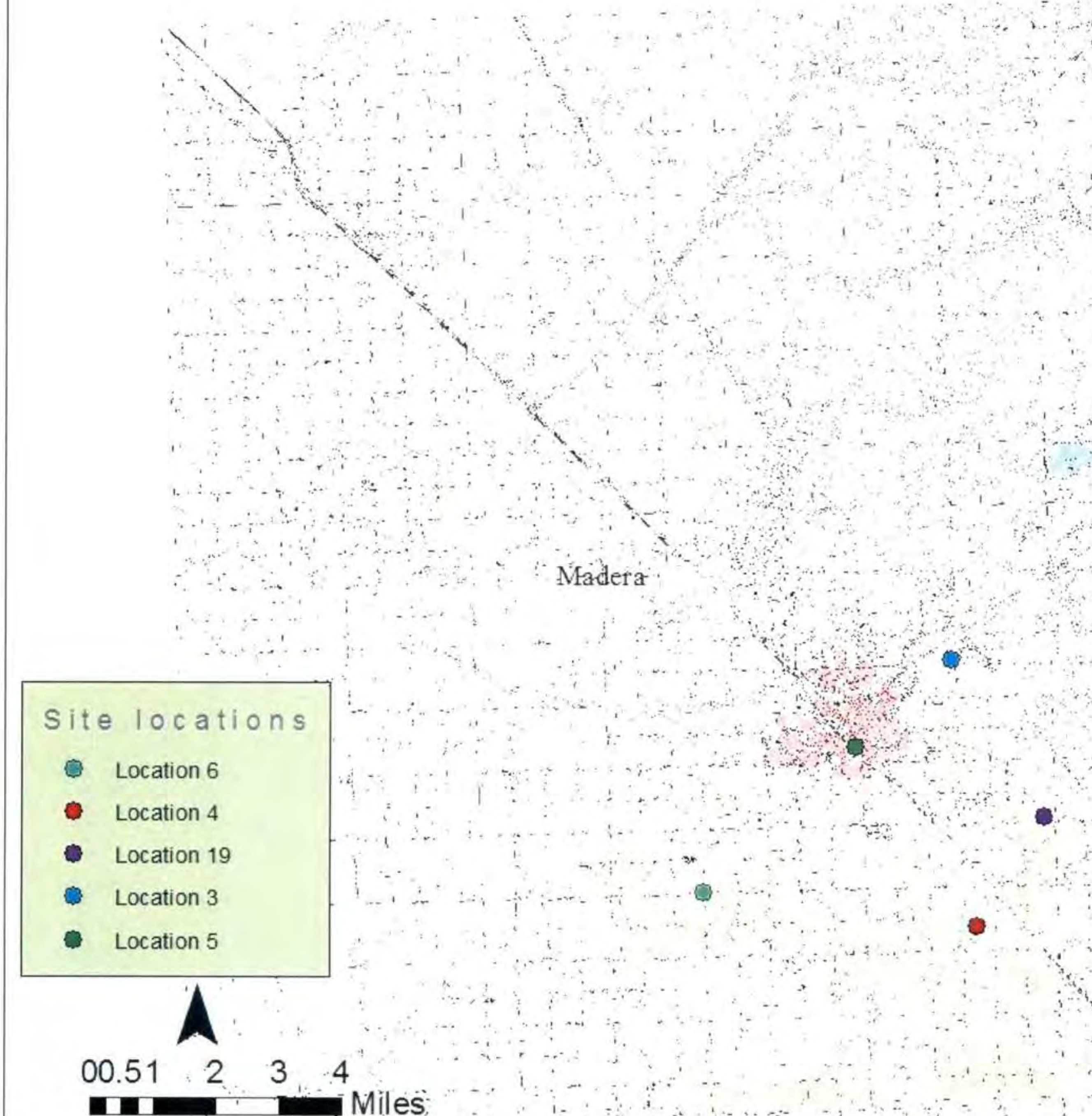
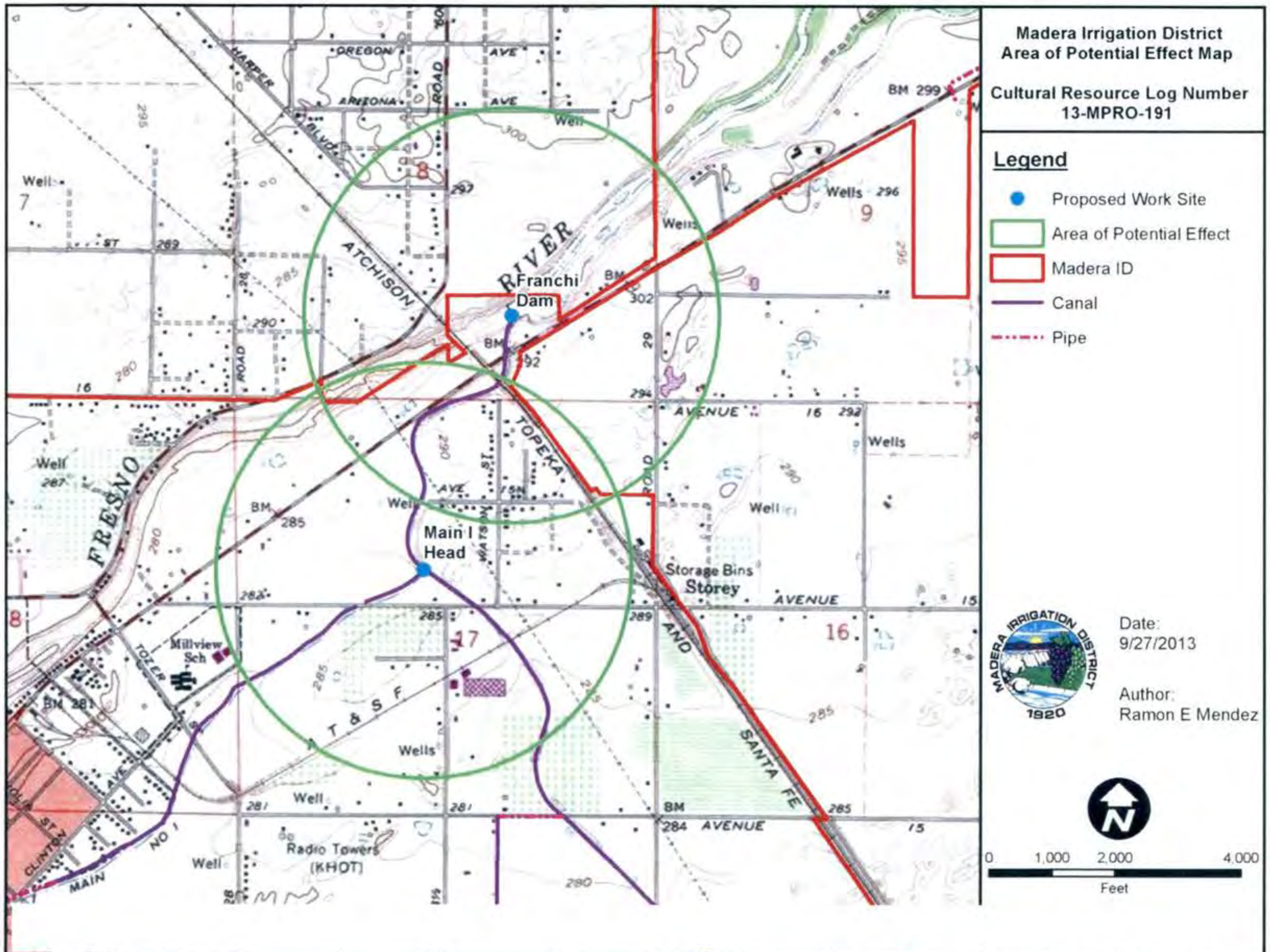
Project Area Overview



Madera Irrigation District Project 13-MPRO
Watersmart Grant Improvements
Big Main System



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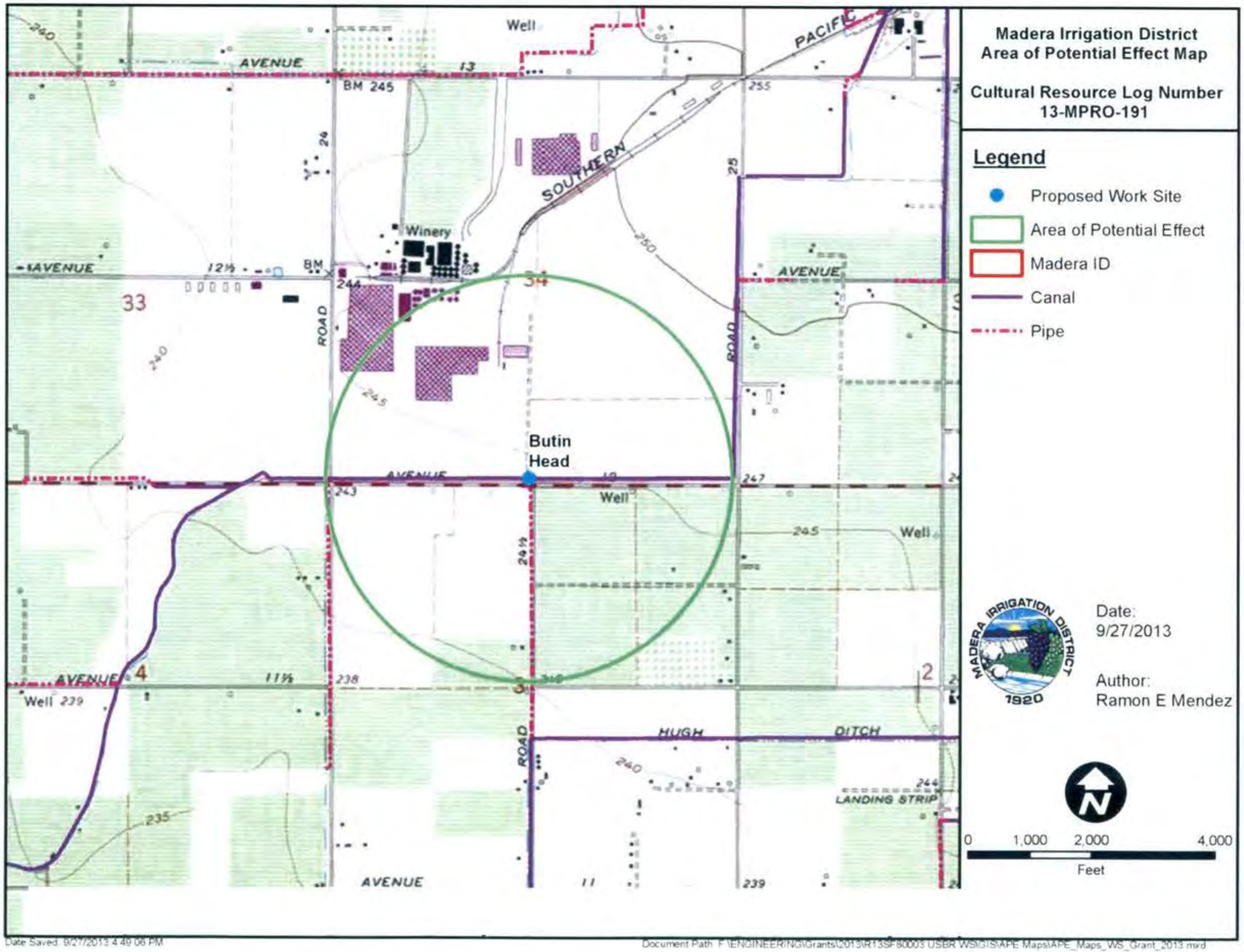

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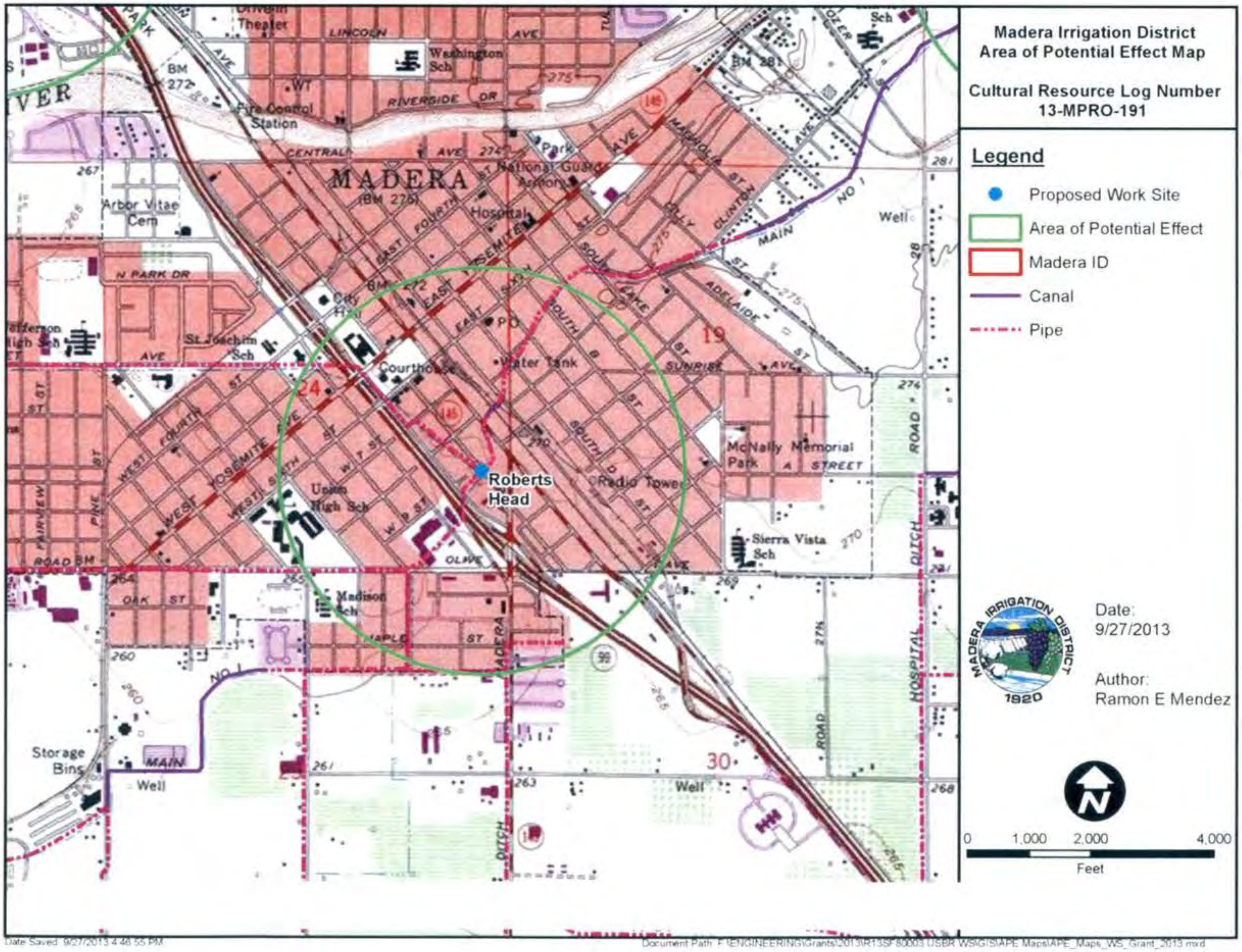

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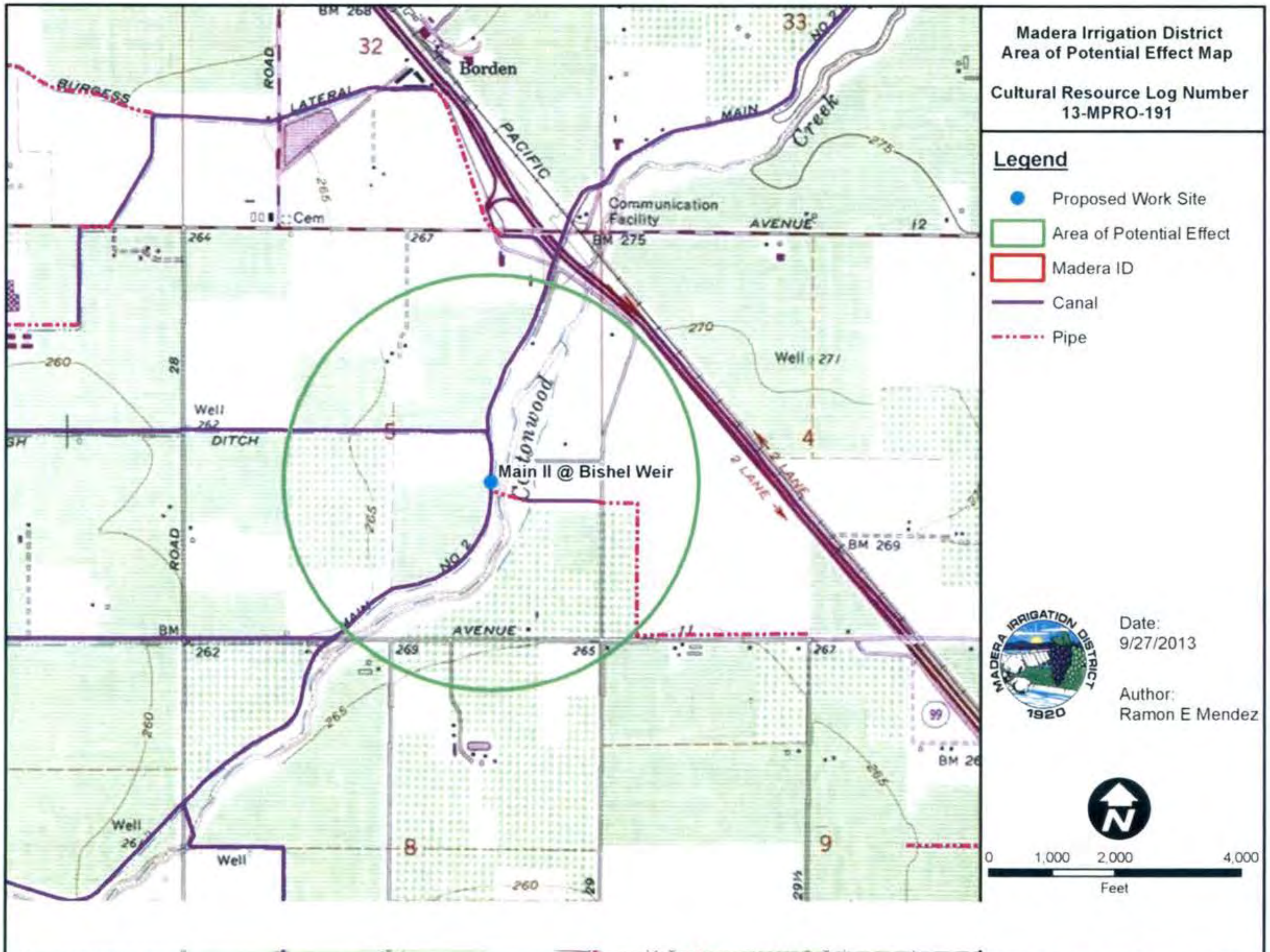

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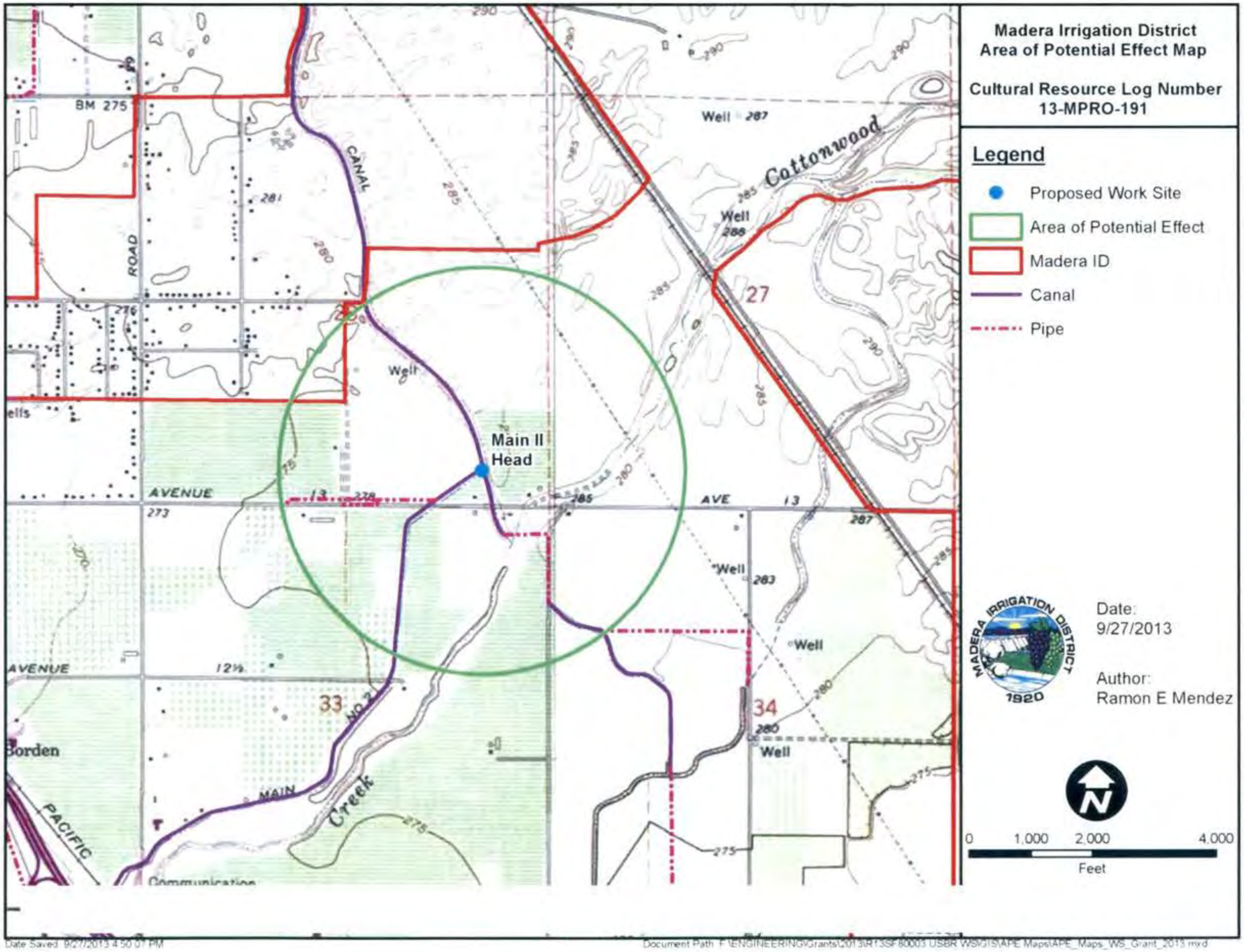

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Date	Time	Subject	Figure	Accession Number	Direction
10/4/13	3:30	#6 Butin Head Overview Gate valve	1	IMG-0001	110°
10/4/13	3:30	#6 Butin Head Detail of Modification	2	IMG-0002	NA
10/4/13	3:45	#6 Butin Head Canal Overview	3	IMG-0003	West
10/4/13	4:15	#4 Main II @ Bishel Weir Gate Valve Overview	4	IMG-0004	West
10/4/13	4:20	#4 Main II @ Bishel Weir Gate Valve Detail	5	IMG-0005	detail
10/4/13	4:25	#19 Main Head II Overview	6	IMG-0006	West
10/4/13	4:45	#19 Main Head II Overview	7	IMG-0007	40°
10/4/13	4:50	#19 Main Head II Overview	8	IMG-0008	south
10/4/13	4:55	#19 Main Head II Overview newer valve gate	9	IMG-0009	West
10/4/13	5:00	#3 Main I Head Overview	10	IMG-0010	North
10/4/13	5:30	#3 Main I Head dates in wing wall "1989"	11	IMG-0011	detail
10/4/13	5:35	#3 Main I Head dates in wing wall "1959"	12	IMG-0012	detail
10/4/13	5:37	#3 Main I Head Overview	13	IMG-0013	60°
11/2/13		#5 Roberts Head Overview	14	IMG-0061	130°

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Figure 1 10/4/13 3:30 #6 Butin Head Overview Gate valve Figure 1 IMG-0001 110°

Figure 2 10/4/13 3:30 #6 Butin Head Detail of Modification 2 IMG-0002 NA

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Figure 3 10/4/13 3:45 #6 Butin Head Canal Overview 3 IMG-0003 West

Figure 4 10/4/13 4:15 #4 Main II @ Bishel Weir Gate Valve Overview 4 IMG-0004 West

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Figure 5 10/4/13 4:20 #4 Main II @ Bishel Weir Gate Valve Detail 5 IMG-0005 detail

Figure 6 10/4/13 4:25 #19 Main Head II Overview 6 IMG-0006 East

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Figure 7 10/4/13 4:45 #19 Main Head II Overview 7 IMG-0007 40°

Figure 8 10/4/13 4:50 #19 Main Head II Overview 8 IMG-0008 south

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Figure 9 10/4/13 4:55 #19 Main Head II detail of valve on left 9 IMG-0009 West

Figure 10 10/4/135:00 #3 Main I Head Overview 10 IMG-0010 North

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Figure 11 10/4/13 5:30 #3 Main I Head dates in wing wall "1989" 11 IMG-0011 detail

Figure 12 10/4/13 5:35 #3 Main I Head dates in wing wall "1959" 12 IMG-0012 detail

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Figure 13 10/4/13 5:37 #3 Main I Head Overview 13 IMG-0013 60°

Figure 14 11/2/13 #5 Roberts Head Overview 48 IMG-0061 130°

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H
NRHP Status Code 7
Other Listings
Review Code Reviewer Date

***Resource Name or #:** Madera Canal (UPDATE)

P1. Other Identifier: Friant Madera Canal

*** P2. Location:** ☐ Not for Publication ☑ Unrestricted ***a. County:** Madera

*** b. USGS Quad:** Multiple see Linear Records; T11S R19E, Sec. 1; MDBM

c. Address:

d. UTM: Zone 11; 247279 mE/ 4099590 mN NAD27 Datum

e. Other Locational Data:

The resource, Madera Canal, is located north of the city of Fresno and was recorded at three locations during this survey: on State Route (SR) 41 between GIS-based post mile 6.97 and 6.98 (Location No. 1); at GIS-based post mile 5.43 (Location No. 2) and on SR 145 between GIS-based post miles 22.82 and 22.85 (JRP Segment A). All segments are located approximately one meter from the edge-of-pavement, and partially within the highway right-of-way. See Linear Feature Records for site-specific locational data and driving directions.

P2.b: Quads: Lanes Birdge (1964; photoinspected 1973), Little Table Mtn (1962; photorevised 1981).

*** P3a. Description:**

The Madera Canal was previously recorded in 1995 (Hatoff 1995). For this survey, two previously recorded segments of the canal were recorded along SR 41 ("Location No. 1" and "Location No. 2") and a new, previously undocumented segment was recorded along SR 145 ("JRP Segment A"). Location No. 1 and Location No. 2 generally appear the same as previously recorded; all segments are discussed in further detail on the attached Linear Feature Records. A brief historical summary is provided on the Continuation Sheet.

*** P3b. Resource Attributes:** HP20 (Canal)

*** P4. Resources Present:** ☐ Building ☑ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

***P5b. Description of Photo:**
Photograph 1. P-20-002308-Location 1, 11, SE -- 8548; facing southeast, showing Location No. 1, SR 41 at right.

***P6. Date Constructed/Age & Sources:**
☑ Historic ☐ Prehistoric ☐ Both
1940-1945 (Harding 1960; Taylor 1967)

***P7. Owner and Address:**
Bureau of Reclamation; Caltrans, 2015 E. Shields Avenue, Ste. 100 Fresno, CA 93726

***P8. Recorded by:**
Joseph Freeman and Rebecca Flores, JRP Historical Consulting, LLC, 1490 Drew Ave, Suite 110, Davis, CA 95618

***P9. Date Recorded:** 1/28/2009

***P10. Survey Type:**
Reconnaissance

*** P11. Citation:** Leach-Palm et al. 2010. Cultural Resources Inventory of Caltrans District 6 Rural Conventional Highways in Fresno, Kern, Kings, Madera, and Tulare Counties. Submitted to Caltrans District 6, Fresno, CA.

*** Attachments:** ☐ None ☑ Location Map ☑ Sketch Map ☑ Continuation Sheet ☐ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☑ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other:

***Resource Name or #:** Madera Canal (UPDATE)

L1. Historic and/or Common Name: Madera Canal

L2a. Portion Described: ☐ Entire Resource ☑ Segment ☐ Point Observation **Designation:** Location No. 1

L2b. Location of Point or Segment:

From the Fresno city limits sign at the San Joaquin River, drive 6.9 miles north on SR 41 to post mile marker 7.0 (segment datum). The canal segment is located 75 meters at a bearing of 347 degrees south of the marker and between GIS-based post mile 6.97 and 6.98.

USGS Quad: Lanes Bridge (1964, photoinspected 1973); T11S, R20E, Sec. 16; MDBM

L3. Description:

This is an update of a previously recorded segment (Hatoff 1995). At this location, the Madera Canal is a concrete-lined channel that crosses under Bridge No. 41-0039 carrying SR 41. The canal has steep sides with earthen berms that rise above the concrete sidewalls. The berms are level with the surrounding terrain. West of the highway are pipelines that cross the canal. The dimensions taken during this survey were at a different location than the previous recording; the top width recorded the distance between the tops of the two berms.

Segment UTMs: 251282mE/ 4095984mN to 251324mE/ 4095960mN

L4. Dimensions:

- **a. Top Width:** 25 feet
- **b. Bottom Width:** 8 feet
- **c. Height or Depth:** approximately 30 feet
- **d. Length of Segment:** approximately 200 feet

L5. Associated Resources:

Bridge No. 41-0039
Pipelines running across bridge and over canal on the west side of the highway

L4e. Sketch of Cross-Section: **Facing:** West

Not to scale

L6. Setting:

The canal is located at the western edge of the foothills in the San Joaquin Valley, among flat farm and ranch land.

L7. Integrity Considerations:

The canal retains high intergrity.

L8b. Description of Photo, Map, or Drawing

P-20-002308-Location 1, 13, SE -- 8550; facing southeast along Location No. 1, SR 41 at right.

L9. Remarks:

L10. Form Prepared By:

J. Freeman, JRP Historical Consulting, LLC, 1490 Drew Ave, Suite 110, Davis CA 95618

L11. Date: 1/28/2009

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H

***Resource Name or #:** Madera Canal (UPDATE)

L1. Historic and/or Common Name: Madera Canal

L2a. Portion Described: ☐ Entire Resource ☑ Segment ☐ Point Observation **Designation:** Location No. 2

L2b. Location of Point or Segment:

From the Fresno city limits sign at the San Joaquin River, drive 5.5 miles north on SR 41 to Avenue 14 (segment datum). The canal segment is located 300 feet at a bearing of 344 degrees south of Avenue 14 at GIS-based post mile 5.43.
USGS Quad: Lanes Bridge (1964, photoinspected 1973); T11S R20E, Sec. 21; MDBM
Segment UTMs: 251185mE/ 4093493mN to 251245mE/ 4093491mN

L3. Description:

This is an update of a previously recorded segment (Hatoff 1995). At this location, the Madera Canal is an earthen-lined canal with riprap and concrete lining the north side where it crosses under SR 41 through a reinforced concrete culvert. The south side of the canal is earthen with concrete wingwalls extending out from the culvert. The canal has steep sides with earthen berms that are level with the surrounding terrain. East of the highway the canal drops approximately 20 feet into a drop basin. Approximately 75 feet beyond the highway are control gates on the canal. The dimensions taken during this survey were at a different location than the previous recording; the top width recorded the distance between the tops of the two berms.

L4. Dimensions:

a. Top Width: 35 feet
b. Bottom Width: 15 feet
c. Height or Depth: approximately 20 feet
d. Length of Segment: approximately 200 feet

L5. Associated Resources:

Concrete culvert with a drop basin

L4e. Sketch of Cross-Section: **Facing:** West

Not to scale

L6. Setting:

The canal is located at the western edge of the foothills along the San Joaquin Valley floor.

L7. Integrity Considerations:

The canal retains high intergrity.

L8b. Description of Photo, Map, or Drawing

P-20-002308-Location 2, 12, NW -- 8537; Location No. 2, facing southeast to ward SR 41 (center).

L9. Remarks:

L10. Form Prepared By:

J. Freeman, JRP Historical Consulting, LLC, 1490 Drew Ave, Suite 110, Davis CA 95618

L11. Date: 1/28/2009

LINEAR FEATURE RECORD

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H

*Resource Name or #: Madera Canal (UPDATE)

L1. Historic and/or Common Name: Maderal Canal

L2a. Portion Described: ☐ Entire Resource ☑ Segment ☐ Point Observation **Designation:** JRP Segment A

L2b. Location of Point or Segment:

From the intersection of SR 41 and SR 145, north of Fresno, drive 2.6 miles along SR 145. JRP Segment A is located between GIS-based post mile 22.82 and 22.85 on SR 145.
USGS Quad: Little Table Mountain (1962, photorevised 1981); T11S R19E, Sec. 1; MDBM
Segment UTMs: 247188mE/ 4099818mN to 247228mE/ 4099764mN

L3. Description:

This is a newly recorded segment. At this location, the Madera Canal is an unlined canal with steep walls and berms that are level with the surrounding landscape. The canal crosses under Bridge No. 41-0019 at a 45-degree angle. Dirt and gravel access roads, approximately ten feet wide, run along the berms on both sides of the canal. The walls on both sides of the highway are reinforced with placed rocks, and vegetation is growing along the walls of the southeast side of the canal.

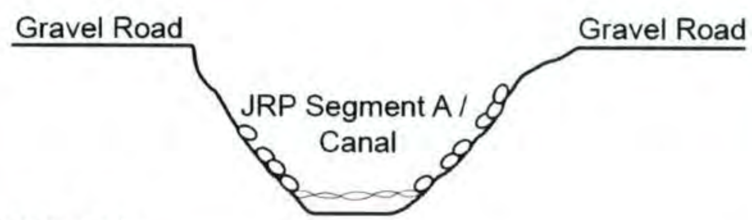
L4. Dimensions:

- **a. Top Width:** 60 feet
- **b. Bottom Width:** 8-10 feet
- **c. Height or Depth:** approximately 30 feet
- **d. Length of Segment:** approximately 200 feet

L5. Associated Resources:

Bridge No. 41-0019

L4e. Sketch of Cross-Section: **Facing:** Southeast



Not to scale

L6. Setting:

The canal is located along the San Joaquin Valley floor, surrounded by flat farm and ranch land.

L7. Integrity Considerations:

The canal retains high integrity.

L8b. Description of Photo, Map, or Drawing

P-20-002308, JRP Segment A, 05, SE -- 8670; facing southeast, SR 145 on the left side.

L9. Remarks:

L10. Form Prepared By:

J. Freeman, JRP Historical Consulting, LLC, 1490 Drew Ave, Suite 110, Davis CA 95618

L11. Date: 1/28/2009

***Resource Name or #:** Madera Canal (UPDATE)

***Recorded By:** J. Freeman and R. Flores, JRP Historical Consulting, LLC ***Date:** 1/28/2009 ☑ Continuation ☐ Update

P3a. Description (continued):

The Bureau of Reclamation built the Madera Canal between 1940 and 1945 as part of the federal Central Valley Project. The canal was originally conceived as part of the State Water Plan in 1930 that included a dam and reservoir at Friant. The Madera Irrigation District (MID) quickly purchased the dam site in hopes of partnering with the state. But the state, in the midst of the Great Depression, lacked the requisite resources and turned the project over to the federal government's Bureau of Reclamation. MID and the Bureau entered into a contract on May 24, 1939, in which the government agreed to pay the District $300,000 for ownership of the Friant dam site and water rights on the San Joaquin River. The federal government built the Madera Canal to deliver water from Friant Reservoir to the district (Harding 1960: 189-191; MAID Annual Report 1982: 6; Taylor 1967: 57, 59). Work on Friant Dam and the Madera Canal began in 1940 and continued throughout World War II. Four years later the dam was completed, along with most of the canal sections. MID became the first irrigation district to receive water under the Central Valley Project in mid 1944 (Harding 1960: 100; Taylor 1967: 60-61). The Madera Canal extends 37 miles north from Friant Dam.

References:

Harding, S. T. Water In California. Palo Alto, California: N-P Publications, 1960.

Hatoff, Brian. "(Draft) Cultural Resources Inventory Report for the Proposed Mojave Northward Expansion Project." Woodward-Clyde Consultants, 1995.

Madera Irrigation District. "History of Madera Irrigation District," from 1982 Annual Report: Madera Irrigation District. [Copy supplied by Madera Irrigation District.]

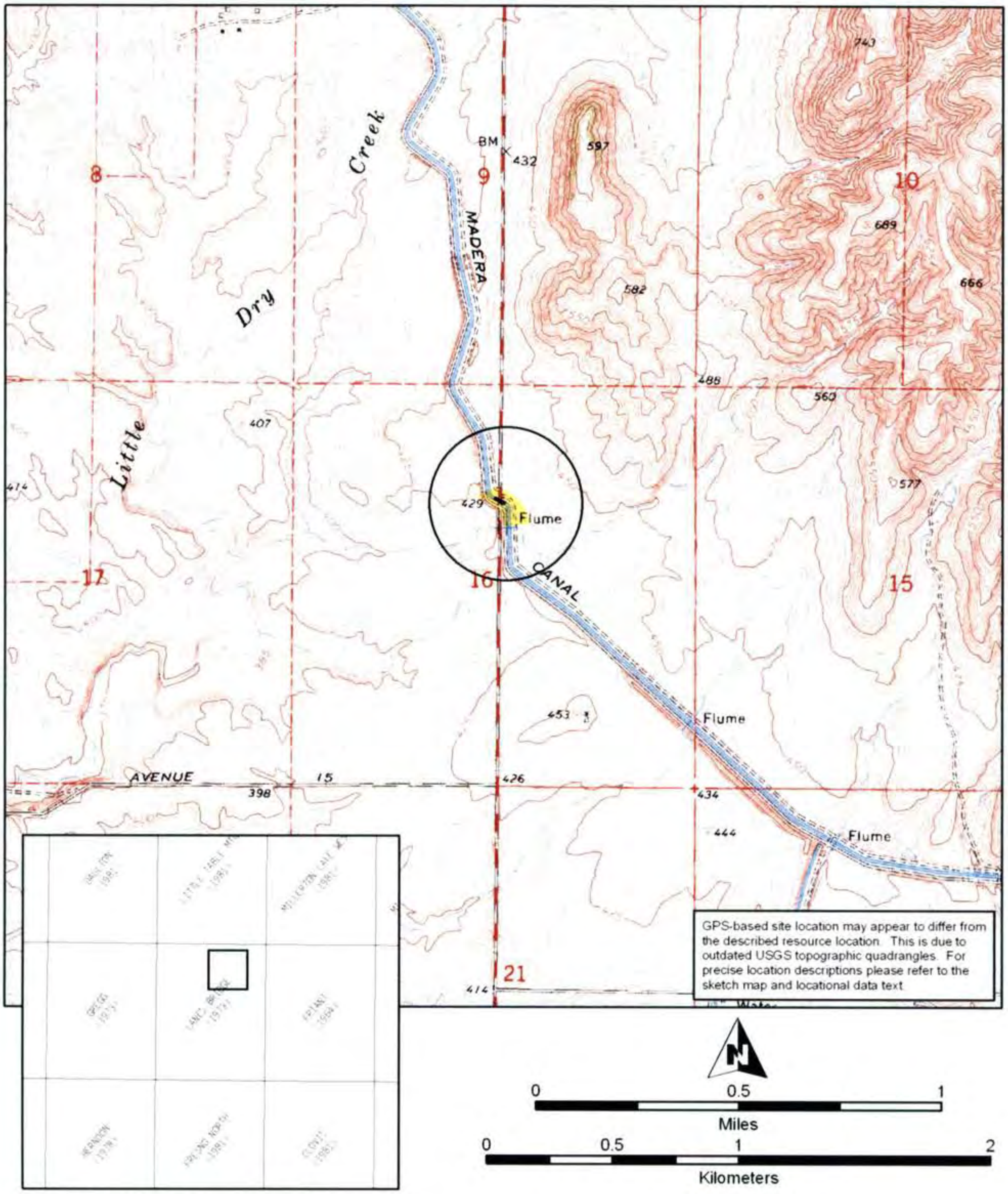
Taylor, Gary C. "Economic Planning of Water Supply Systems," Giannini Foundation Research Report No. 291. California Agricultural Experiment Station, Division of Agricultural Sciences, University of California, 1967.

LOCATION MAP

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H

***Resource Name or #:** Madera Canal (UPDATE)

***Map Name:** Lanes Bridge (1973) ***Year:** 1973



Key to USGS 7.5' quads depicted

SCALE 1:24,000

Location Map for Location No. 1

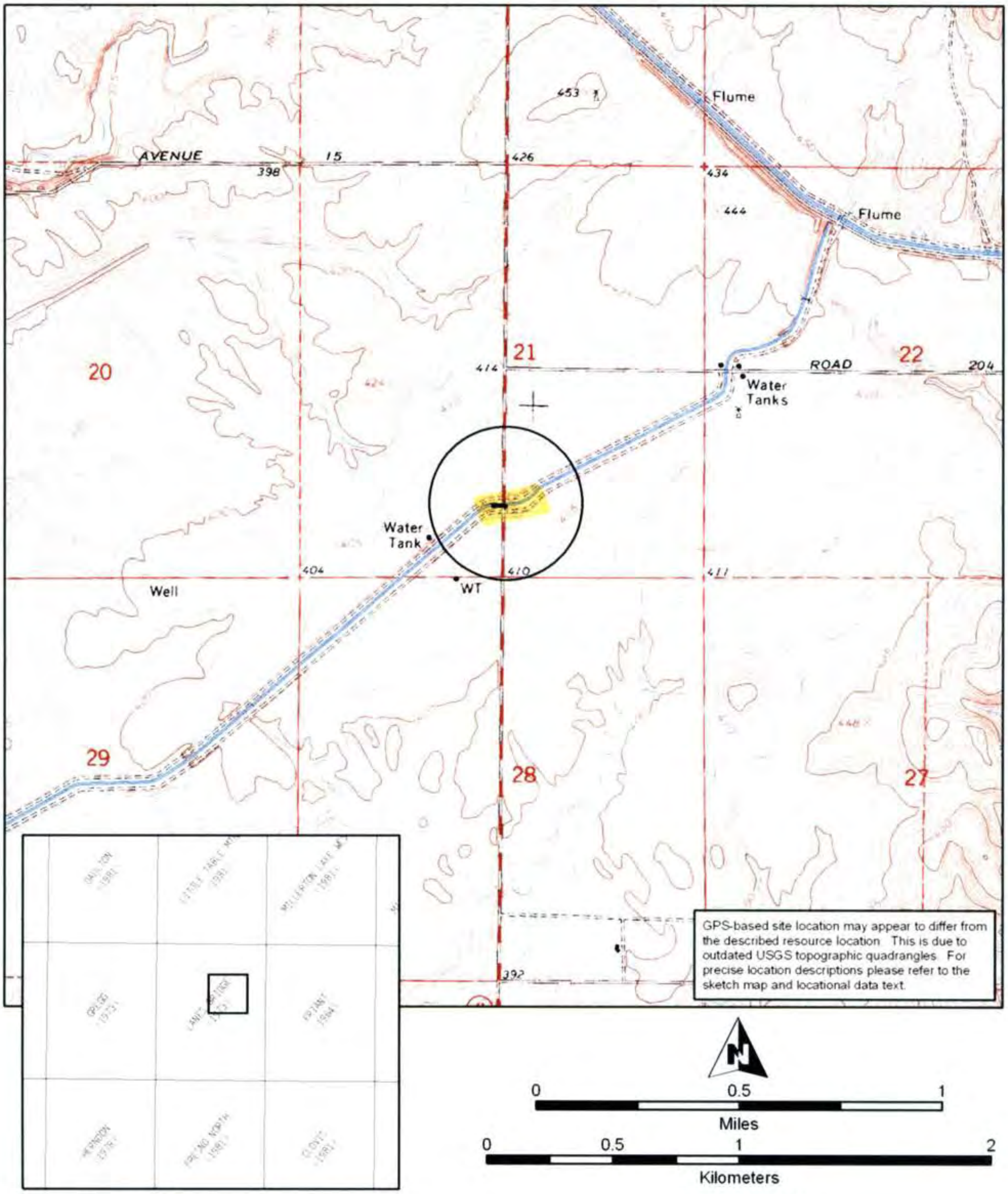
State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H

***Resource Name or #:** Madera Canal (UPDATE)

***Map Name:** Lanes Bridge (1973)

***Year:** 1973



Key to USGS 7.5' quads depicted

SCALE 1:24,000

Location Map for Location No.2

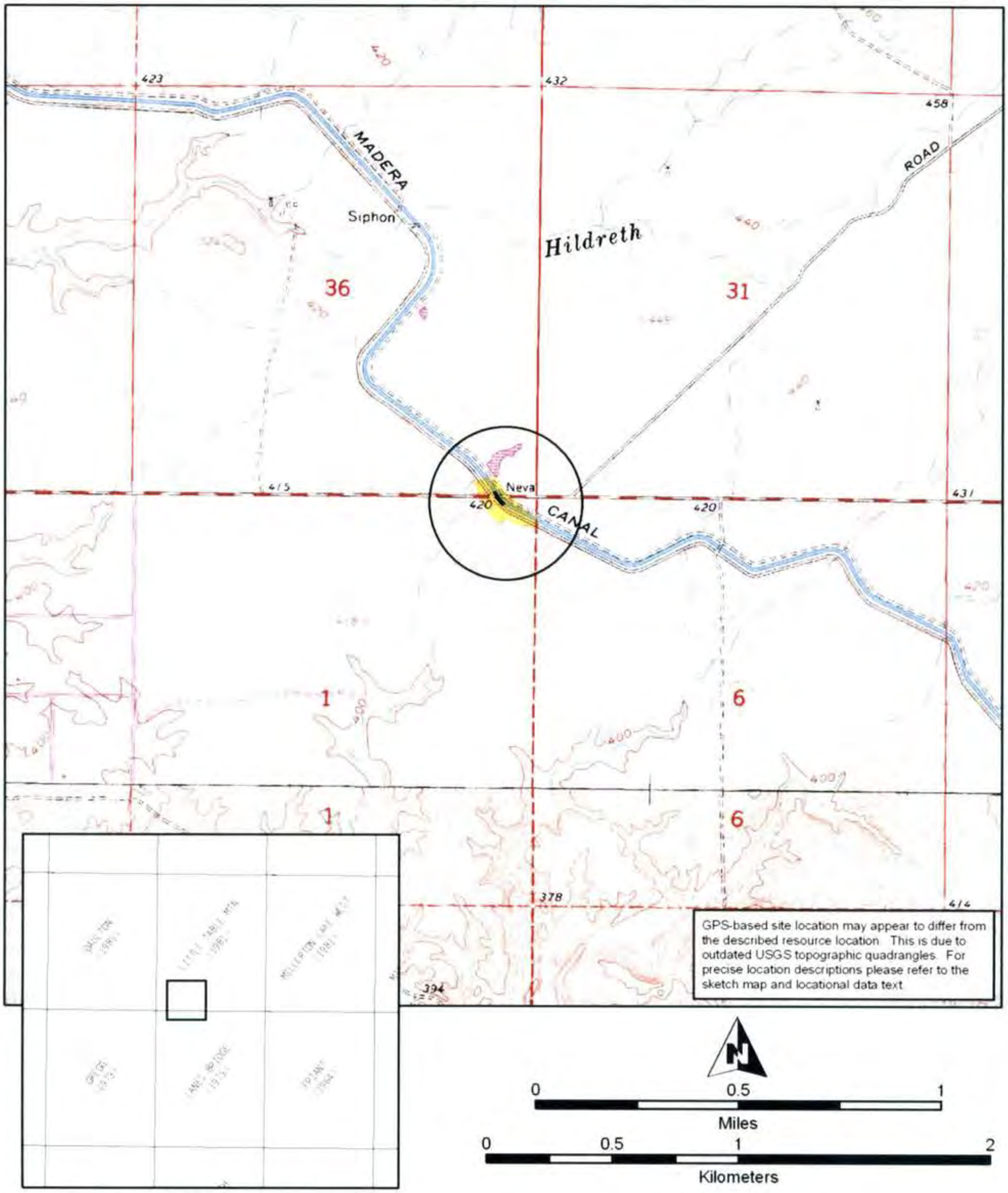
*Required Information

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H

***Resource Name or #:** Madera Canal (UPDATE)

***Map Name:** Little Table Mountain (1981) ***Year:** 1981



Key to USGS 7.5' quads depicted

SCALE 1:24,000

Location Map for JRP Segment A

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H

*Resource Name or #: Madera Canal (UPDATE)

*Drawn By: Far Western and JRP Historical Consulting, LLC

*Date: 01/28/2009

Sketch map is based on previous records and 2009 GPS data collected within the highway right-of-way.
Sketch Map for Location No. 1

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H

***Resource Name or #:** Madera Canal (UPDATE)

***Drawn By:** Far Western and JRP Historical Consulting, LLC

***Date:** 01/28/2009

Sketch map is based on previous records and 2009 GPS data collected within the highway right-of-way.
Sketch Map for Location No. 2

State of California - The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
SKETCH MAP

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H

***Resource Name or #:** Madera Canal (UPDATE)

***Drawn By:** Far Western and JRP Historical Consulting, LLC

***Date:** 01/28/2009

Sketch map is based on previous records and 2009 GPS data collected within the highway right-of-way.
Sketch Map for JRP Segment A

*Required Information

P-20-002308
Supplement CA-MAD-2649H

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code
Other Listings
Review Code Reviewer Date

***Resource Name or #** Main No. 1 Canal

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Madera
and (P2b and P2c or P2d. Attach a Location Map as necessary.)
***b. USGS 7.5' Quad** Bonita Ranch **Date** PR1978 **T** 12S ; **R** 17E ; ¼ **of Sec** 9; **B.M.**
c. Address City Zip
d. UTM: (give more than one for large and/or linear resources) Zone 10; 755,869 mE/ 4,087,138mN
e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)
UTMs are for Main No. 1 Canal at Cottonwood Creek

***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)
The Main No. 1 canal is an earthen ditch that trends SW/NE from the Fresno River to Cottonwood Creek.

***P3b. Resource Attributes:** (List attributes and codes) HP20 Canal/aqueduct

***P4. Resources Present:** ☐ Building ■ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #)

***P6. Date Constructed/Age and Sources:**
■ Historic ☐ Prehistoric ☐ Both
1872

***P7. Owner and Address:**
Madera Irrigation District
12152 Road 28 ¼
Madera, CA 93637-9199

***P8. Recorded by:** (Name, affiliation, address)
G. Roark, C. Fish. Jones & Stokes
2600 V Street, Sacramento, CA
95818-1914

***P9. Date Recorded:** March 2005

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** Evaluation for the Madera Irrigation District Water Supply Enhancement Project, Madera County, California. Sacramento, CA. Prepared for Madera Irrigation District, Madera, CA.

***Attachments:** NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ■ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list)

Supplement P-20-002308 CA-MAD-2649H

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
BUILDING, STRUCTURE, AND OBJECT RECORD

Primary #
HRI # CA

***NRHP Status Code** 6

***Resource Name or #** (Assigned by recorder) Main No. 1 Canal

B1. Historic Name: Main No. 1 Canal
B2. Common Name: Main No. 1 Canal
B3. Original Use: Irrigation B4. Present Use: Irrigation
***B5. Architectural Style:** n/a
***B6. Construction History:** (Construction date, alteration, and date of alterations)
The main No. 1 Canal was constructed prior to 1872

***B7. Moved?** ■ **No** ☐ **Yes** ☐ **Unknown Date:** **Original Location:**
***B8. Related Features:**

B9. Architect: Alfred Poett, Engineer b. Builder: Madera Canal & Irrigation Company
***B10. Significance: Theme** Early agriculture and development **Area** Madera
Period of Significance 1870-1920 **Property Type** Canal **Applicable Criteria** n/a
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)
The Main No.1 Canal is a component in the Madera Canal & Irrigation Company (MC&IC) system, which MID purchased for distributing water in 1949 (Madera Irrigation District 1981:6). The addition of the MC&IC canal system gave MID access to Fresno River and San Joaquin River water, increasing its service capabilities (Barnes 1963:3). The MC&IC portion of MID irrigation system is associated with the early development of irrigation in the Madera region, which promoted the cultivation of new and diverse crops. The period of significance for Main No. 1 Canal is therefore 1870-1949, the former date marking the approximate construction of the MC&IC system and the latter marking purchase of the canal by MIMD.

Because of the system's association with early irrigation and agricultural development, the Main No. 1 Canal meets the Criterion A of the NRHP at the local level of significance. Main No. 1 Canal cannot, however, be considered eligible for listing in the NRHP because MID and MC&IC have modified the canal through regular maintenance and redesign since 1949, compromising its historic integrity. These modifications resulted in a water conveyance structure that does not resemble its historic antecedent but looks like a modern canal. As a modern canal, the Main No.1 Canal does not physically convey its historical significance. Main No. 1 Canal, therefore, does not appear to be eligible for listing in the NRHP.

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:**

Barnes, H. 1963a. History of Use of Fresno River Water for Irrigation. The Madera County Historian 3(1):1-5,7. On file, California Room, California State Library, Sacramento.

Madera Irrigation District. 1981. Madera Irrigation District Sixth Annual report. On file, Madera Irrigation District, Madera, California.

B13. Remarks:

***B14. Evaluator:** Gabriel Roark. Jones & Stokes. 2600 V Street, Sacramento, CA 95818-1914

***Date of Evaluation:** March 2005

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LINEAR FEATURE RECORD

Primary # ____________________
HRI # ____________________
Trinomial

Page 3 of 4 ***Resource Name or #** (Assigned by recorder) Main No. 1 Canal
***Recorded by** G. Roark *Date March 2005 ☐ Continuation ☐ Update

L1. Historic and/or Common Name:

L2a. Portion Described: 9 Entire Resource 9 Segment 9 Point Observation **Designation:**

b. Location of point or segment: (Provide UTM coordinates, legal description, and any other useful locational data. Show the area that has been field inspected on a Location Map.) See Primary Record

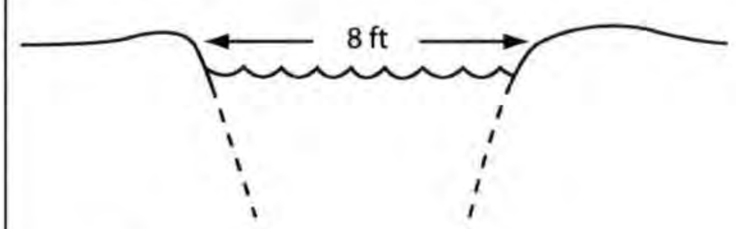
L3. Description: (Describe construction details, materials, and artifacts found at this segment/point. Provide plans/sections as appropriate.)

Earthen canal with modern concrete improvements. Bottom width and depth are indeterminate due to being filled with water.

L4. Dimensions: (In feet for historic features and meters for prehistoric features)
- **a. Top Width** 7-9 feet
- **b. Bottom Width** N/A
- **c. Height or Depth** N/A
- **d. Length of Segment** N/A

L5. Associated Resources:
Main No. 2 Canal

L4e. Sketch of Cross-Section



Facing: North

L6. Setting: (Describe natural features, landscape characteristics, slope, etc., as appropriate.):

L7. Integrity Considerations:

L8b. Description of Photo, Map, or Drawing (View, scale, etc.)
L9. Remarks: None

L10. Form Prepared by: (Name, affiliation, and address)
Gabriel Roark
Jones & Stokes
2600 V Street
Sacramento, CA 95818

L11. Date: March 3, 2005

Supplement

P-20-002308
CA-MAD-2649H

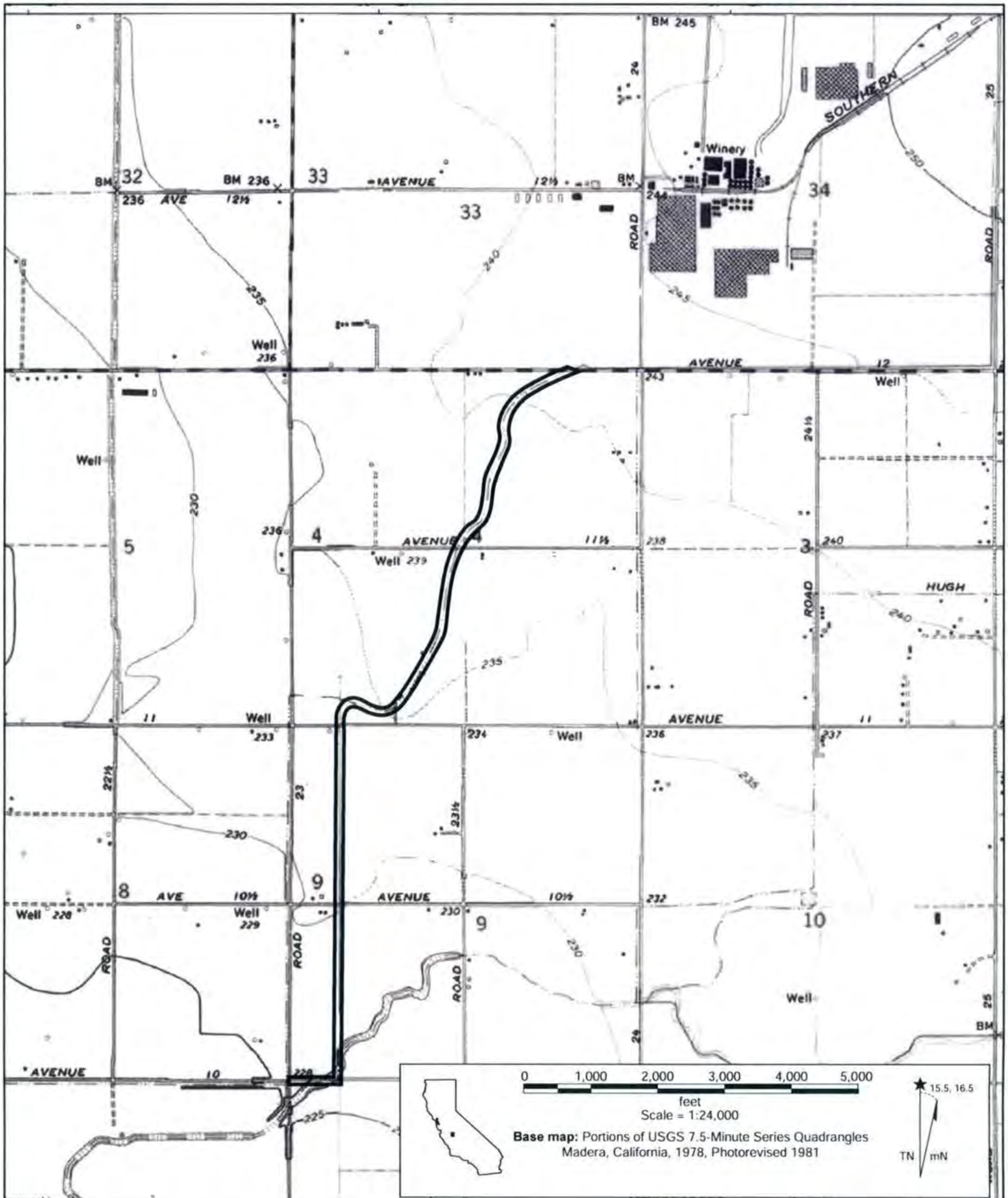
State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

SKETCH MAP

Primary #
HRI #
Trinomial

Page 4 **of** 4 ***Resource Name or #:** (assigned by recorder) Main No.1 Canal

***Drawn By:** J.Durnan ***Scale:** 1:24,000 ***Date of Map:** July 24, 2009



DPR 523K (1/95)

*Required information

UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary # P-20-002308
HRI #
Trinomial CA-MAD-2649H
NRHP Status Code 7

Page 1 of 2

Other Listings
Review Code | Reviewer | Date

P1. Temporary Number/Resource Name: Madera Canal and Lateral 6.2

P2. Location: a. County: Madera ☒ **Not for Publication** ☐ **Unrestricted**

b. USGS 7.5' Quad: Lanes Bridge, CA. **Date** 1964, photoinspected 1973 T 11S , R 20E; Section 15, 16, 21, 22, 23 Mount Diablo **B.M.**

c. Address:

d. UTM: Zone 11 0252620 **mE /** 4094390**mN** (at the intersection of the Madera Canal with Lateral 6.2)

e. Other Locational Data: From the intersection of Highway 41 and Road 204, proceed east on Road 204 for approximately 0.56 miles to the east side of the Madera Canal Lateral 6.2. Turn left onto a dirt road and follow the lateral north approximately 0.49 miles to its juncture with the Madera Canal.

P3a. Description: The Madera Canal is 35.9 mile long canal that carries water northerly from Friant Dam through Madera County before terminating at a slough on the Chowchilla River. The distribution of water for irrigation is handled through laterals of the canal. The Madera Canal intersects the northeastern border of the Tesoro Viejo project area at T 11S, R 20E, Section 23 UTM 0254040 mE/ 4094560 mN and exits the northwestern limit at Highway 41 at Bridge 41-39 (this location point has been previously recorded). Lateral 6.2 intersects the main canal at T 11S, R 20E, Section 22 UTM 025620 mE/ 4094390 mN and exits the project area at its southwestern border at Highway 41, post mile 5.3 (this location point has been previously recorded).

P3b. Resource Attributes: (List attributes and codes) HP20 (Canal)

P4. Resources Present: ☐ Building ☒ Structure ☐ Object ☐ Site ☐ District ☐ Element of District ☐ Other:

P5. Photograph or Drawing: Digital PR-1, DSCN0025. Overview of Madera Canal facing west.

P6. Date Constructed/Age:
☐ Prehistoric
☒ Historic
☐ Both

P7. Owner and Address:
Tesoro Viejo, Inc.
7020 N. Van Ness Blvd.
Fresno, CA 93711

P8. Recorded by:
Applied EarthWorks, Inc.
5090 N. Fruit Ave. #101
Fresno, CA 93711

P9. Date Recorded:
30 March 2005

P10. Survey Type:
☐ Intensive
☒ Reconnaissance
☐ Other
Describe:

P11. Report Citation: Baloian, Mary Clark, Randy M. Baloian, Michael J. Moratto and Barry A. Price
2006 *Cultural Resources Survey and Evaluation on the Sumner Peck Ranch for the Tesoro Viejo Project, Madera County, California.* Applied EarthWorks, Inc., Fresno, California. Submitted to Tesoro Viejo, Inc., Fresno, California.

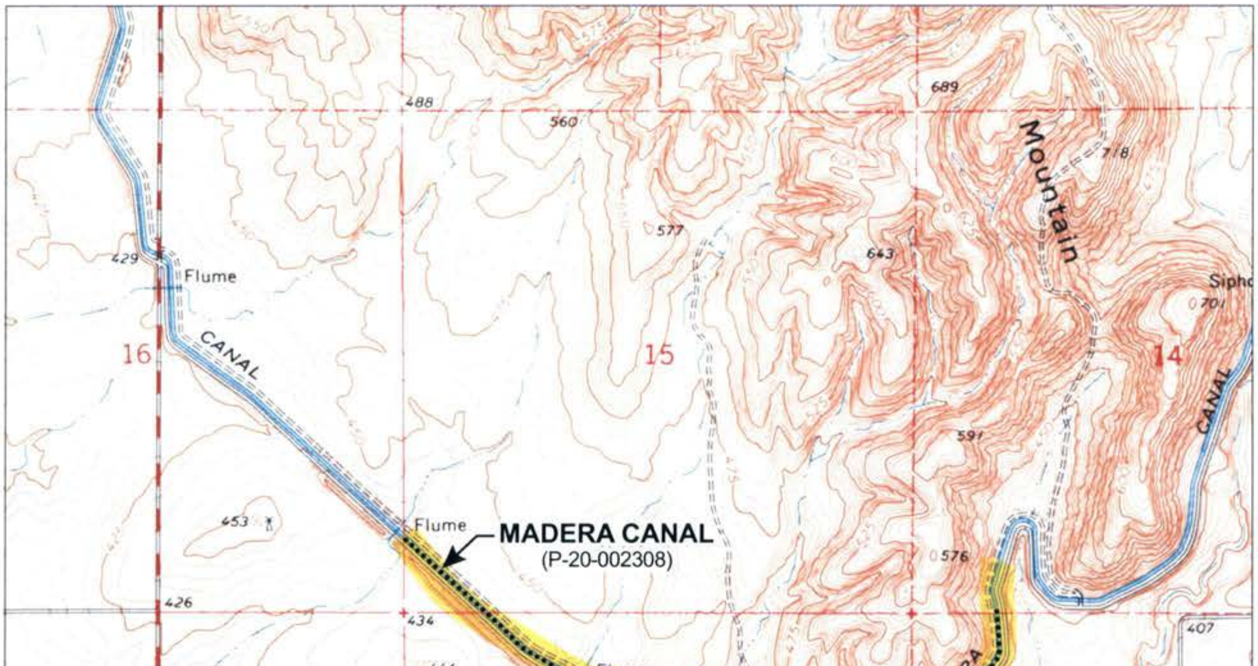
Attachments: ☐ NONE ☒ Location Map ☐ Site/Sketch Map ☐ Continuation Sheet ☐ Building, Structure, and Object Record ☐ Archaeological Record ☐ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (list):

UPDATE

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
LOCATION MAP

Primary # P-20-002308
HRI #/Trinomial CA-MAD-2649H

Temporary Number/Resource Name:



Confidential: Not for Public Distribution

Prepared by Applied EarthWorks, Inc.

U.S.G.S. 7.5 Minute
Topographic Quadrangles
Lanes Bridge, CA
T 11 S - R 20 E
1964 Photoinspected 1973

↑N

0 ½ 1
Miles

Contour Interval: Lanes Bridge 5 Feet

Supplement

P-20-002308

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

PRIMARY RECORD

Primary #
HRI #
Trinomial CA-MAD-2649 H
NRHP Status Code
Other Listings
Review Code Reviewer Date

06-MAD-99; PM 19.8/22.3 EA: 06-293300 Map Ref. #9

P1. Resource # 9, Lateral 32.2-9.9

***P2. Location: *a. County:** Madera

***b. USGS 7.5' Quad:** Berenda (lateral turnouts from 32.2 in sw ¼ of nw ¼ of Section 13 T10S R6E)

c. Address:

d. Assessor's Parcel Number:

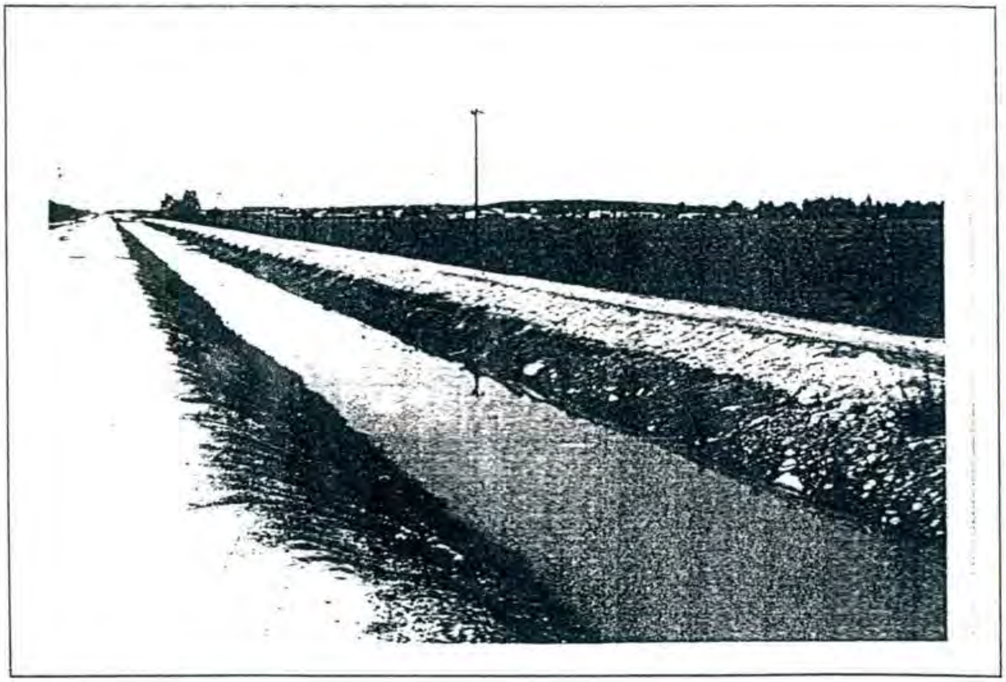
***P3a. Description:**

Lateral 32.2-9.9 diverts from Lateral 32.2 via the "9.9 Headworks" on the east side of Road 20, south of the unincorporated town of Fairmead. The 9.9 then proceeds along the north side of Avenue 21½. Approximately 100 yards from the turnout the lateral goes through cement drop structure to accommodate a change in elevation of approximately 6 feet. When the water flow is at its full cfs the "falls" here is impressive. The "9.9" then continues west to Road 18. It turns south and crosses Berenda Creek and spills into the Dixieland Canal on Road 18 between Avenue 16 ½ and Avenue 17. Altogether the conduit is 7 miles long.

The 32.2-9.9 is unlined and is approximately 6 feet wide within the project APE. Dirt and gravel access roads parallel each side of the lateral. Open ag land lies along the north boundary of this segment; orchards lie along the south side of Avenue 21½.

***P3b. Resource Attributes:** HP20 (Canal/aqueduct)

***P4. Resources Present:** ● Structure



P5b Photo date: 8/30/00

***P6. Date Constructed/Age and Sources:** 1953-54, Harold Ryans, MID

***P7. Owner and Address:**
Madera Irrigation District
12152 Road 28¼
Madera, California
93637-9199

***P8. Recorded by:**
Karana Hattersley-Drayton
Caltrans
3402 N. Blackstone, #201
Fresno, CA 93726-5306

***P9.DateRecorded:**
8/30/00

***P10.SurveyType:**
Intensive

***P11. Report Citation:** Historic Architecture Survey Report, Fairmead Freeway Conversion State Route 99, Madera County, 06-MAD-99, PM 18.7/22.8, EA 06-293300

***Attachments** ● Building, Structure, and Object Record ● Photograph Record

Supplement

P-20-002308

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PHOTO SHEET

Primary #
HRI#
Trinomial CA-MAD-2649H

Page 1 of 1 *Resource #9 Lateral 32.2-9.9

*Taken By: Karana Hattersley-Drayton *Date: 8/30/00

Feature 9: Lateral 32.2-9.9 Drop Structure
(view looking north)

Supplement

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary # P-20-002308
HRI# CA-MAD-2649H

BUILDING, STRUCTURE, AND OBJECT RECORD

*NRHP Status Code: 3S

06-MAD-099; PM 19.8/22.3; EA 293300
Resource # 9

B3. Original Use: Irrigation Lateral **B4. Present Use:** Irrigation lateral
***B5. Architectural Style:** Unlined lateral
***B6. Construction History:** The 32.2-9.9 was constructed c. 1953.

***B7. Moved?** ■ No
***B8. Related Features:**
The lateral includes the headworks where it diverts from the 32.2, one drop structure and numerous siphons and inlet structures.

B9a. Architect: N/A **b. Builder:** Bureau of Reclamation and the Madera Irrigation District
***B10. Significance: Theme** "Water Conveyance Systems in the Fairmead Colonies, 1912-1961"
Period of Significance 1953-54 **Property Type** Irrigation lateral **Applicable Criteria** A

When Fairmead Colonies were developed in 1912 the Co-operative Land and Trust Company advocated ground pumping and the use of reservoirs. Thus the Company did not construct a water conveyance system as was common with most Central Valley colonies. Unfortunately, by the 1940s the water table had dropped so dramatically that water for farming was in short supply and many local farmers were unable to obtain long-term loans. In 1950 the Madera Irrigation District contracted with the Bureau of Reclamation to construct laterals into the area with water from the California Valley Project's Madera Canal. It is not hyperbole to suggest that the construction of these laterals saved many a family farm.

The 32.2 -9.9 was built in three stages in 1953-54 by the Bureau of Reclamation as a turn-out/extension of Lateral 32.2. The 32.2 is one of the four main laterals that diverts from the Madera Canal. The Madera Canal was constructed between 1940 and 1950 as one of the "initial units" of the California Valley Project. The CVP is widely considered to be the "most ambitious public works project ever built" (Haslam 1993:212) which revolutionized agriculture in post-WWII California. These first units of the CVP, thus the Friant Dam, Shasta Dam, Friant-Kern Canal, Delta-Mendota Canal, the Contra Costa Canal and the Madera Canal are an integrated system which were built "state-of-the-art" for the period.

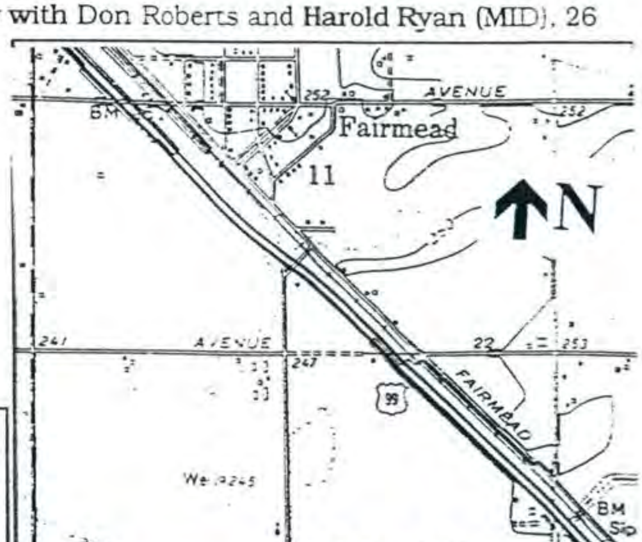
(see continuation)

B11. Additional Resource Attributes:
***B12. References:** "Fairmead for Farmers," 1913; Interview with Don Roberts and Harold Ryan (MID), 26 April 2000; "Factual Report Madera Irrigation District..." 1950; "Madera Irrigation District Sixth Annual Report," 1981; Hundley, The Great Thirst; Haslam et al The Great Central Valley 1993:212; Mikesell 1995; Mikesell 1994.

B13. Remarks:

***B14. Evaluator:** Karana Hattersley-Drayton, Caltrans District 6
***Date of Evaluation:** December 12, 2000

(This space reserved for official comments.)



B10 continued

In 1995 the Friant-Kern Canal was found eligible to the National Register. Steve Mikesell of JRP Historical Consulting Services who prepared the report on the Friant-Kern Canal also evaluated the Madera Canal a year earlier, in 1994. At that time the Madera Canal was less than 50-years old. Mikesell wrote, however: "it is advisable to regard the [Madera] canal as having a high potential for National Register eligibility as an unmodified example of the early CVP canals, when it has attained 50 years of age in the year 2000" (Mikesell 1994:34). He concluded in fact that the entire CVP system warrants consideration for National Register eligibility in the early 21st century (Ibid).

The 32.2 and the 32.2/9.9 can be viewed two ways: as both integral components of the CVP system, and as having a life of their own. The Madera Canal is strictly a bulk conveyance system. Thus it is only through laterals constructed along the canal's 35.8-mile route by various irrigation districts that water is supplied for farming. Lateral 32.2 has its headworks on the Madera Canal approximately 32.2 miles from Friant Dam, and thus the name, "32.2." The lateral is approximately 15 miles long and is earthen-lined (as built) other than a 3,312 foot segment along the frontage road from Avenue 21 to Avenue 20 ½ that was put into pipe in late 1972 to allow for the widening of the freeway. The 32.2-9.9 diverts 9.9 miles from the headworks of the 32.2 (and thus the name) and is approximately seven miles long. It retains its original alignment. Routine maintenance has not changed its trapezoidal profile.

With the exception of one segment that has been piped, Lateral 32.2 retains integrity of location, setting, design, materials, workmanship, feeling and association. The 32.2-9.9 also retains integrity of location, setting, design, materials, workmanship, feeling and association. The 32.2-9.9 is part of an integrated system intrinsically tied to the Madera Canal and thus a part of the California Valley Project. Of greater importance is that both the 32.2 and the 32.2-9.9 laterals were key to the preservation and expansion of agriculture in the area in the early 1950s and remain the lifeblood for farming in the (former) Fairmead Colonies. Thus Lateral 32.2-9.9 appears to meet both requirements of significance and integrity and is eligible to the National Register of Historic Places at Criterion A at the local level of significance within the historic context "Water Conveyance Systems in the Fairmead Colonies, 1912-1920 within the Period of Significance. "Modern Water Conveyance Systems. 1939-1961." Lateral 32.2-9.9 also appears to qualify as a historical resource for the purposes of CEQA.

Supplement

State of California — The Resources Agency DEPARTMENT OF PARKS AND RECREATION **PRIMARY RECORD**	Primary # P-20-002308 HRI # Trinomial CA-MAD-2649H NRHP Status Code
Other Listings	
Review Code	Reviewer Date

06-MAD-99; PM 19.8/22.3 EA: 06-293300 **Map Ref. #8**

P1. Resource #8, **Lateral 32.2 (Madera Canal)**

***P2. Location:** *a. County: Madera

***b. USGS 7.5' Quad:** Berenda (lateral enters APE in the sw ¼ of the nw ¼ of Section 13 T10S R 16E)

c. Address: N/A

d. Assessor's Parcel Number: N/A

***P3a. Description:** Lateral 32.2 distributes water for agricultural purposes through the northern part of the Madera Irrigation District. It is approximately 15 miles long and starts as a turnout on the Madera Canal, approximately 32.2 miles from the Friant Dam (and hence the lateral's name). The canal is earthen lined with clay which was dug in "Dixieland," the southern most of the Fairmead Colonies. The 32.2 enters the project area as it crosses under SR 99 slightly north of Avenue 21½ near the town of Fairmead. The lateral then runs due south along Road 20 where it crosses under Avenue 21½. The lateral continues south, crosses under Avenue 21 and turns east towards the frontage road (Golden State Drive) where it is then piped for 3,312 feet along the western side of SR 99. The section of lateral here was formerly open ditch but was put into pipe in late 1972 when the highway was expanded. At approximately milepost 11.7 the lateral again becomes open ditch and continues several miles until it eventually dumps into the Dry Creek. after the confluence of the 32.2 and the Dixieland Canal. Along the 15-mile route there are 9 drop structures, due to the change in elevation from north to south.

The profile of the 32.2 within the project APE at Road 20 and Avenue 21½ is trapezoidal, with grass-covered berms on each side about 6 feet above grade. The width of the lateral at water level is 10-12 feet whereas the width at the top of the berms is closer to 20 feet. There are dirt access roads running atop each berm. At Avenue 21½ there is a turnout to the west for the 32.2/9.9 (see Primary Record #9). The 32.2 is pulled under Avenue 21½ and emerges on the other side where it runs south and parallel to Road 20. The conduit at this point is narrower, approximately 8 feet at the water and 12-15 feet at the top of the berms that are considerably lower with very narrow access roads along the top of each. SR 99 is on a diagonal to the east, with open fields and/or orchards to the west. (See continuation sheet)

***P3b. Resource Attributes:** HP20 (Canal/aqueduct)

***P4. Resources Present:** • Structure

P5b Photo date: 8/30/00

***P6. Date Constructed/Age and Sources:** c. 1953; Roberts/Ryan interview

***P7. Owner and Address:** Madera Irrigation District 12152 Road 28¼ Madera, California 93637-9199

***P8. Recorded by:** Karana Hattersley-Drayton Caltrans 3402 N. Blackstone, #201 Fresno, CA 93726-5306

***P9.Date Recorded:** 8/30/00

***P10. Survey Type:** Intensive

***P11. Report Citation:** Historic Resource Evaluation Report and Historic Architecture Survey Report, Faimread Interchange State Route 99, 06-MAD-99, PM 19.8/22.3, EA 06-293300.

***Attachments** • Building, Structure, and Object Record • Photograph Record • Continuation Sheet

P-20-002308

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET Supplement

Primary
HRI#
Trinomial CA-MAD-2649H

 *Resource Name or # 8

■ Continuation ☐ Update

P3a. Description (continued):

The 32.2 lateral crosses back into the project APE at Avenue 21 where it parallels the road on the south side. The width of this segment of the lateral here is 10-12 feet at the water level, with 20 feet at the top of the low berms. Dirt access roads run along each side. The lateral drops into a pipe at the intersection of Avenue 21 and Golden State. A trash grate of pipe catches debris before it enters the pipe. To the west, 32.2 crosses under a farm road and continues on, out of the project APE. Open fields are to the north with trees (orchards) to the south.

Supplement

P-20-002308

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PHOTO SHEET

Primary #
HRI#
Trinomial CA-MAD-2649H

Page 1 of 1 *Resource#8, **Lateral 32.2**

***Taken By:** Karana Hattersley-Drayton ***Date:** 8/30/00

Feature 8: **Lateral 32.2**, **West Side of SR 99**
(view looking east)

Feature 8b: Lateral 32.2 at Avenue 21 and Golden State
(view looking east)

DPR 523K (1/95) *Required information

P-20-002308

Supplement

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

Primary #
HRI#

BUILDING, STRUCTURE, AND OBJECT RECORD

CA-MAD-2649H

*NRHP Status Code: 3S

06-MAD-099; PM 19.8/22.3; EA 293300
Resource #8 Lateral 32.2 (Madera Canal)

B3. Original Use: Irrigation lateral **B4. Present Use:** Irrigation lateral

***B5. Architectural Style:** Earthen-lined lateral

***B6. Construction History:** The 32.2 was constructed through the project APE in 1953 and reached the Berenda area by 1954. It is unchanged other than a 3,312 foot segment along SR 99 which was put into pipe 1972 when the highway was widened.

***B7. Moved?** ☐No ■Yes ☐Unknown Segment along SR99 placed in pipe in 1972.

***B8. Related Features:** The lateral includes drop structures, headworks (for the turnout at the 9.9), inverted siphons and inlet structures.

B9a. Architect: N/A **b. Builder:** Bureau of Reclamation and the Madera Irrigation District (contract signed 1951).

***B10. Significance: Theme** "Water Conveyance Systems in the Fairmead Colonies, 1912-1961"
Period of Significance 1953-4 **Property Type** Irrigation Canal **Applicable Criteria** A

When Fairmead Colonies were developed in 1912 the Co-operative Land and Trust Company advocated ground-pumping and the use of reservoirs. Thus the Company did not construct a water conveyance system as was common with most Central Valley colonies. Unfortunately, by the 1940s the water table had dropped so dramatically that water for farming was in short supply and many local farmers were unable to obtain long-term loans. In 1950 the Madera Irrigation District contracted with the Bureau of Reclamation to construct laterals into the Fairmead area with water from the California Valley Project's Madera Canal. It is not hyperbole to suggest that the construction of these laterals saved many a family farm.

The 32.2 was built in 1953-54 as one of four turn-outs along the Madera Canal. The Madera Canal was constructed between 1940 and 1950 as one of the "initial units" of the California Valley Project. The CVP is widely considered to be the "most ambitious public works project ever built" (Haslam 1993:212) which revolutionized agriculture in post-WWII California. These first units of the CVP, thus the Friant Dam, Shasta Dam, Friant-Kern Canal, Delta-Mendota Canal, the Contra Costa Canal and the Madera Canal are an integrated system which were built "state-of-the-art" for the period.

(see continuation sheet)

B11. Additional Resource Attributes:

***B12. References:** "Fairmead for Farmers," 1913; Interview with Don Roberts and Harold Ryan (MID), 26 April 2000; "Factual Report Madera Irrigation District..." 1950; "Madera Irrigation District Sixth Annual Report," 1981; Hundley, The Great Thirst; Haslam et al The Great Central Valley 1993:212; Mikesell 1995; Mikesell 1994; Ryan communication 13 December 2000.

B13. Remarks:

***B14. Evaluator:** Karana Hattersley-Drayton, Caltrans District 6

***Date of Evaluation:** December 13, 2000

(This space reserved for official comments.)

B10 continued

In 1995 the Friant-Kern Canal was found eligible to the National Register. Steve Mikesell of JRP Historical Consulting Services who prepared the report on the Friant-Kern Canal also evaluated the Madera Canal a year earlier, in 1994. At that time the Madera Canal was less than 50-years old. Mikesell wrote, however: "it is advisable to regard the [Madera] canal as having a high potential for National Register eligibility as an unmodified example of the early CVP canals, when it has attained 50 years of age in the year 2000" (Mikesell 1994:34). He concluded in fact that the entire CVP system warrants consideration for National Register eligibility in the early 21st century (Ibid).

The 32.2 can be viewed two ways: as both an integral component of the CVP system, and as having a life of its own. The Madera Canal is strictly a bulk conveyance system. Thus it is only through laterals constructed along the canal's 35.8-mile route by various irrigation districts that water is supplied for farming. Lateral 32.2 has its headworks on the Madera Canal approximately 32.2 miles from Friant Dam, and thus the name, "32.2." The lateral is approximately 15 miles long and is earthen-lined (as built) other than a 3.312 foot segment along SR 99 that was put into pipe in late 1972 to allow for the widening of the freeway. The lateral includes 9-drop structures from beginning to end to accommodate changes in elevation. Routine maintenance has not changed the trapezoidal profile.

With the exception of one segment that has been piped, Lateral 32.2 retains integrity of location, setting, design, materials, workmanship, feeling and association. The 32.2 is part of an integrated system intrinsically tied to the Madera Canal and thus a part of the California Valley Project. Of greater importance is that the 32.2 was key to both the preservation and expansion of agriculture in the area in the early 1950s and remains the lifeblood for farming in the (former) Fairmead Colonies. Thus the lateral appears to meet both requirements of significance and integrity and is eligible to the National Register of Historic Places at Criterion A at the local level of significance within the historic context "Water Conveyance Systems in the Fairmead Colonies, 1912-1961" within the Period of Significance, "Modern Water Conveyance Systems, 1939-1961." Lateral 32.2 also appears to qualify as a historical resource for the purposes of CEQA.

P-20-002308
CA-MAD-2649H

DITCH/CANAL INVENTORY FORM

Location No. 1

Developed by JRP Historical Consulting Services

1. **Name of ditch/canal:** Madera Canal Madera County

2. **Location for recordation:** Highway 41 at Bridge 41-39. Lanes Bridge 7.5' map. # 379A

3. **Other locations recorded for this ditch/canal:** 2

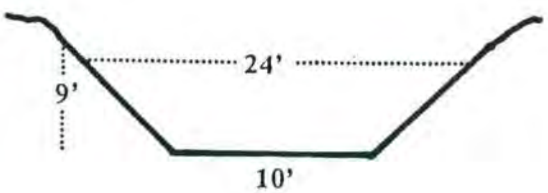
4. **Structures at or near this location:** Bridge 41-39; flume.

5. **Setting at this location:** Canal crosses under Highway 41.

6. **Integrity considerations for this ditch/canal:** Very high degree of integrity.

7. **Attributes of conduit at this location:**
   Width (in feet): 24; 10
   Depth (in feet): 9
   Material: Concrete

8. **Sketch, in cross-section:**



9. **Date(s) of enclosed photograph(s):**
   August 6, 1992

*see also P-10-004447 for Fresno Co. Portion of Resource

P-20-002308
CA-MAD-2649H

DITCH/CANAL INVENTORY FORM

Location No. 2

Developed by JRP Historical Consulting Services

1. **Name of ditch/canal:** Madera Irrigation District Lateral 6.2

2. **Location for recordation:** Highway 41, Madera County, post mile 5.3.

3. **Other locations recorded for this ditch/canal:** 1

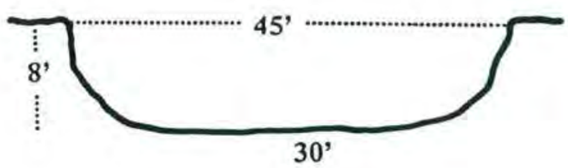
4. **Structures at or near this location:** Falls and culvert at Highway 41.

5. **Setting at this location:** Open land; scattered commercial.

6. **Integrity considerations for this ditch/canal:** Excellent integrity.

7. **Attributes of conduit at this location:**
   Width (in feet): 45; 30
   Depth (in feet): 8
   Material: Earthen

8. **Sketch, in cross-section:**



9. **Date(s) of enclosed photograph(s):**
   August 6, 1992

P-20-002308
CA-MAD-2649H

PHOTOGRAPH ATTACHMENT SHEET

Location No. 1

Flume across Madera Canal.

P-20-002308
CA-MAD-2649H

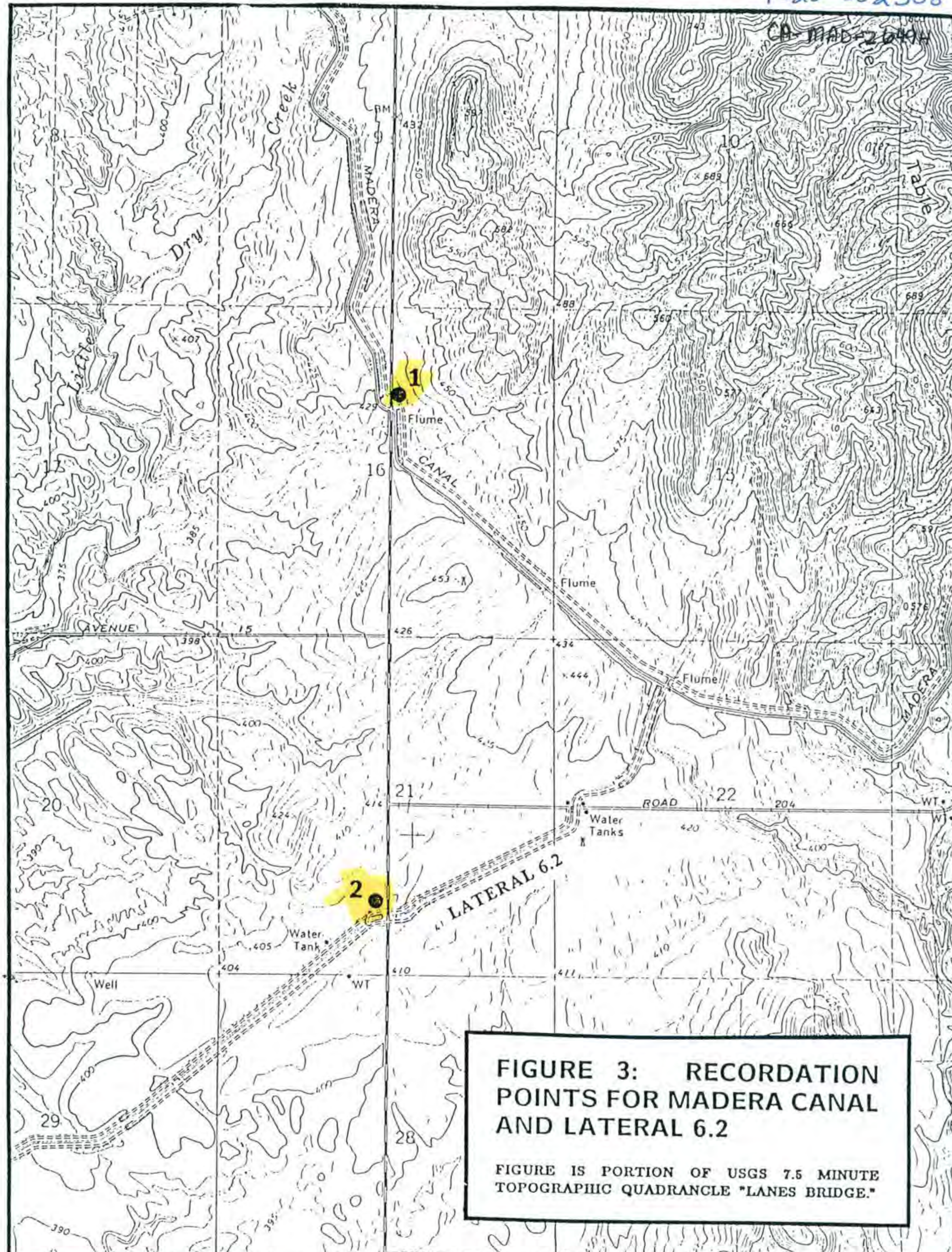


FIGURE 3: RECORDATION POINTS FOR MADERA CANAL AND LATERAL 6.2

FIGURE IS PORTION OF USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE "LANES BRIDGE."

ATTACHMENT F

DRAINAGE STUDY

Drainage Study for

North Fork Rancheria Casino

Prepared for:

Friedmutter Group

February 2021

--DRAFT--

Prepared by:

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME
3301 C Street, Bldg 100-B
Sacramento, CA 95816
Tel: 916.341.7760
Fax: 916.341.7767

TABLE OF CONTENTS

TABLES

I. INTRODUCTION

A. Introduction

The Project site is located within Madera County, California, just west of SR 99 and Golden State Boulevard and north of Schmidt Creek. (See **Figure 1** – Location Map.)

B. Purpose

The purpose of this report is to present the drainage improvements to the project site and document the assumptions and results of the hydrologic and hydraulic analysis.

II. ANALYSIS CRITERIA AND REFERENCES

A. References and Previous Studies

Hydrologic and hydraulic analyses for the Project Site have been previously evaluated as part of the North Fork Rancheria Casino and Hotel Draft Environmental Impact Statement (EIS). Relevant reports from the EIS and additional references are presented as follows:

1. *Site Grading and Storm Drainage*, Robert A. Karn & Associates, Rev. October 2006
2. *Project Floodplain Study*, Robert A. Karn & Associates, August 2006
3. *Madera County Flood Insurance Study*, Federal Emergency Management Agency (FEMA), Effective Date September 26, 2008
4. *ORDER NO. 2010-0014-DWQ, National Pollutant Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction and Land Disturbance Activities (Construction General Permit),* California State Water Resources Control Board, 2010
5. *Atlas 14 Point Precipitation Frequency Estimates, https://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ca*, National Oceanic and Atmospheric Administration (NOAA), accessed December 2020
6. *Web Soil Survey, https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx*, U. S. Department of Agriculture Natural Resources Conservation Service (NRCS), accessed December 2020

7. *Part 630 Hydrology, National Engineering Handbook, Chapter 9, Hydrologic Soil-Cover Complexes,* U. S. Department of Agriculture Natural Resources Conservation Service (NRCS), July 2004

8. *Kern County Hydrology Manual*, Kern County Public Works

9. *City and County of Sacramento Drainage Manual, Volume 2: Hydrology Standards,* Sacramento County Water Resources, 1996

B. Analysis Criteria

1. On-site Storm Drainage – Madera County Public Works Department

While the County does not have written criteria, via personal communication with Fahed Mosleh, the following standards are applicable:

a. Retention basins are to provide sufficient storage for the 100-year, 10-day storm event

b. Detention basins are to consider the 100-year 24-hour storm event

c. Onsite storm drains are to consider the 10-year 24-hour storm event

d. No minimum infiltration rates or required drawdown time are required for retention basins

2. Pipe Network

The trunk pipe system will be sized to convey the peak 10-year, 24-hour flow, which will discharge into a retention basin. The peak 10-year flow rates will be developed using HEC-HMS and the pipe network will be evaluated using XP-SWMM. The 10-year, 24-hour design storm will be constructed using point precipitation values from NOAA Atlas 14. The system will be designed so that the peak 10-year maximum water surface elevations (WSE) will be required to be at least one foot below the rim elevation of each structure.

3. Retention Basin Design Storm

The on-site retention basin will be required to provide sufficient storage for the 100-year, 10-day storm event. The 10-day storm precipitation values were obtained from NOAA Atlas 14 point precipitation frequency estimates. The total 100-year, 10-day storm precipitation for the project site is 6.36 inches. The total storm volume will be determined using HEC-HMS. The 10-day precipitation distribution was referenced from the Sacramento County Drainage Manual.

4. Water Quality – California State Water Resources Control Board

While Madera County has no written standards for storm water quality, the project is required to comply with the post-construction water quality requirements that are in the Construction General Permit. This requires a water balance that "replicates" pre-project runoff up to the 85th percentile storm.

5. FEMA Floodplains

The Project Site is within a FEMA Special Flood Hazard Area SFHA Zone AO, with a defined depth of 1-foot. Zone AO is defined as "Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are between one and three feet." Based on conversations with Fahed Mosleh (Madera County Public Works), proposed buildings within a FEMA SFHA Zone AO with depth = 1 foot will need to be elevated to 1-foot above the determined Base Flood Elevation (BFE).

III. EXISTING CONDITIONS HYDROLOGY AND HYDRAULICS

A. Hydrologic Parameters

Existing conditions hydrology was determined using HEC-HMS. The 10-year, 24-hour frequency storm was developed using HEC-HMS and point precipitation values from NOAA Atlas 14. The total 10-year, 24-hour precipitation for the Project site was determined to be 2.02 inches. The 100-year, 10-day design storm was developed using point precipitation values from NOAA Atlas 14 and a 10-day precipitation distribution pattern referenced from the Sacramento City/County Drainage Manual (**Reference 9**). The 100-year, 10-day total precipitation for the Project site was determined to be 6.36 inches. Loss rates were determined using the SCS Curve number method. Lag times were determined using site topography using TR-55 methodology. The hydrograph transform method was user-specified S-graph. This methodology was chosen because it is more robust and site-specific than other transform methods such as the SCS unit hydrograph method. An S-graph representing "Valley-Undeveloped" conditions referenced from the Kern County Hydrology Manual (**Reference 8**) was used for the existing condition watersheds. No baseflow was assumed.

1. Topography and Site Drainage

The elevation of the site ranges from approximately 242 feet to 260 feet NAVD. The site drains from east to west. Schmidt Creek originates east of SR 99 and runs through the Project Site, but within the Project Site Schmidt Creek is a channelized irrigation canal and runoff is blocked from entering the creek via an approximately 2-foot high berm adjacent to the creek. The Airport Road Lateral is a channelized irrigation canal also protected by a short berm approximately 2-foot high, located along the western edge of the Project Site, parallel to Road 23. Therefore, runoff from the Project Site drains from just east of SR 99 to the west and will either infiltrate through the soil, or pond up and enter either Schmidt Creek or the Airport Road Lateral. Schmidt Creek and the Airport Road Lateral are not hydraulically connected. Schmidt Creek flows are directed under Road 23 and into the Schmidt Creek Lateral, which drains to the west and eventually discharges into Dry Creek. (See **Figure 2** – Existing Topography)

2. Watershed Delineation

GIS tools were used to develop watershed boundaries. Watershed EX1 represents existing condition drainage to the location of the proposed retention basin. Watershed EX2 represents the remaining portion of the site that drains west to the project boundary and eventually ponds up and drains to the confluence of Schmidt Creek and the Schmidt Creek Lateral. Watershed EX3 represents the portion of the existing site that drains south and east offsite, which eventually enters the Airport Road Lateral farther downstream. Flow combination point OUT represents flows from watersheds EX1 and EX2 which drain west to the confluence of Schmidt Creek and the Schmidt Creek Lateral at the western project boundary adjacent to Road 23. Combination point SITE represents all flows generated within the Project Site boundary. (See **Figure 3** – Existing Watersheds)

3. Soil Properties

The hydrologic soil groups (HSG) were obtained from U. S. Department of Agriculture Natural Resources Conservation Service (NRCS) Web Soil Survey. The Project Site contains soils in HSG A, B, and D. (See **Figure 4** –Existing Soil Properties)

4. Land Use/Precipitation Losses

The existing zoning data was extracted from the Madera County Geographic Information System. The entire site is zoned as ARE-40, representing Agricultural, Rural, Exclusive (40 acre) District. Precipitation losses were determined using HEC-HMS through the CSC Curve number method. The site is defined as pasture, grassland, or range- continuous forage for grazing, in good condition, per Table 9-1 in Chapter 9 of the National Engineering Handbook (**Reference 7**). Curve number values for HSG A, B, and D were determined to be 39, 61, and 80, respectively. (See **Figure 5** – Land Use)

Table 1 – Summary of Existing Hydrologic Inputs and Resulting Runoff

Watershed/ Combination Point	Area (Acres)	Lag Time (hour)	Q10 (cfs)	Q100 (cfs)
EX1	95.0	0.58	14.1	29.7
EX2	184.6	0.40	3.6	46.6
EX3	36.7	0.24	0.3	8.7
OUT	279.6	N/A	17.2	76.3
SITE	316.3	N/A	17.3	85.1

B. Hydraulic Analysis

No Hydraulic Analysis was prepared for the existing condition. The Site is located within the FEMA Zone AO floodplain, with a depth of 1-foot. Schmidt Creek is listed on the FEMA FIS for Madera County, but the floodplain for Schmidt Creek does not extend past SR 99. Based on conversations with Fahed Mosleh (Madera County Public Works), proposed buildings within a FEMA SFHA Zone AO with depth = 1 foot will need to be elevated to 1-foot above the determined Base Flood Elevation (BFE). (See **Figure 6** – Existing Floodplain and Hydraulic Features)

IV. PROPOSED CONDITIONS HYDROLOGY AND HYDRAULICS

The Project proposes to construct a hotel and casino on the property, with an on-site storm drainage system and retention basin sized to contain the 100-year, 10-day storm event. Any buildings will need to be raised at least 1-foot above the BFE within the SFHA Zone AO.

A. Hydrologic Parameters

Proposed conditions hydrology was determined using HEC-HMS, with hydrographs for the 10-year 24-hour storm event imported into XP-SWMM to evaluate the proposed onsite drainage system. The 10-year, 24-hour frequency storm was developed using HEC-HMS and point precipitation values from NOAA Atlas 14. The total 10-year, 24-hour precipitation for the Project site was determined to be 2.02 inches. The 100-year, 10-day design storm was developed using point precipitation values from NOAA Atlas 14 and a 10-day precipitation distribution pattern referenced from the Sacramento City/County Drainage Manual (**Reference 9**). The 100-year, 10-day total precipitation for the Project site was determined to be 6.36 inches. Loss rates were determined using the SCS Curve number method. Lag times were determined using site topography using TR-55 methodology, with a minimum time of concentration of 5 minutes for each watershed. Lag Times were determined by multiplying the time of concentration by 0.6. The hydrograph transform method was user-specified S-graph. This methodology was chosen because it is more robust and site-specific than other transform methods such as the SCS unit hydrograph method. An S-graph representing "Valley-Undeveloped" conditions referenced from the Kern County Hydrology Manual (**Reference 8**) was used for the existing condition watersheds. No baseflow was assumed.

1. Watershed Delineation/ Proposed Grading

GIS tools were used to develop watershed boundaries. The proposed site will follow existing drainage patterns, draining from east to west. Elevations in the site range from approximately 250 feet in the southwest entrance near watershed GS-1 to 249 feet in the northwest corner of the proposed parking lot. The proposed finished floor elevation for the main building is 254.5 feet, which is well above the highest adjacent BFE. Review of the Project DEM shows the nearest ground elevation to be 249.5 feet, therefore the corresponding BFE at this location would be 250.5 feet. A separate Letter of Map Revision will need to be submitted with an analysis showing the finished floor elevation and adjacent BFE. (See **Figure 7** – Proposed Watersheds)

2. Soil Properties

The hydrologic soil group from NRCS is the same as existing conditions. The entire developed casino and hotel portion of the site is located in HSG D. (See Figure 4 – Existing Soil Properties)

3. Precipitation losses

The proposed Project is a hotel/casino with parking and buildings. Impervious areas within the Project site were given a curve number of 98, while pervious areas were assigned a curve number of 80 per Table 9-5 in **Reference 7.**

4. Hydrologic Analyses

Table 2 presents results of the proposed condition hydrologic analyses. Runoff hydrographs from the 10-year,24-hour HEC-HMS model were input into the XPSWMM model to evaluate the storm drain system. The results of the 100-year, 10-day model were used to size the onsite retention basin.

Table 2 – Summary of Proposed Hydrologic Inputs and Resulting Runoff

Watershed/ Combination Point	Area (Acres)	Tc (min)*	Q10 (cfs)	Q100 (cfs)
GS1	0.1272717	5	0.1	0.1
GS2	0.6814946	14.5	0.5	0.3
GS3	0.0959166	5	0.1	0
GS4	0.8363016	5	1	0.4
GS1	0.127272	5	0.1	0.1
GS2	0.681495	14.5	0.5	0.3
GS3	0.095917	5	0.1	0
GS4	0.836302	5	1	0.4
GS5	0.064558	5	0.1	0
GS6	0.17061	2.5	0.3	0.1
OFF1	39.4133	32.8	8	13.5
OFF2	224.8422	40.2	4.7	57
ON01	0.392101	0	0.5	0.2
ON02	1.993858	0	2.2	0.9
ON03	3.769365	5	4.3	1.6
ON04	0.547033	5	0.6	0.2

ON05	0.350047	5	0.4	0.1
ON06	0.494163	5	0.6	0.2
ON07	0.513117	5	0.6	0.2
ON08	0.584022	5	0.6	0.3
ON09	0.350022	5	0.4	0.1
ON10	0.502082	5.34	0.6	0.2
ON11	0.4535	5	0.6	0.2
ON12	3.801512	5	4.8	1.6
ON13	1.809672	3.58	2	0.8
ON14	0.467365	4.22	0.5	0.2
ON15	1.734507	5	1.6	0.7
ON16	1.523276	5	1.8	0.7
ON17	0.186369	5	0.2	0.1
ON18	0.731648	5	0.9	0.3
ON19	1.23297	5	1.3	0.5
ON20	0.936791	5	1.1	0.4
ON21	0.052103	5.34	0.1	0
ON22	1.026608	5	1.2	0.4
ON23	0.835537	5	0.8	0.4
ON24	0.391833	5	0.4	0.2
ON25	0.301959	5	0.3	0.1
ON26	0.07602	5	0.1	0
ON27	0.237117	5	0.3	0.1
ON28	0.176688	5	0.2	0.1

ON29	0.425166	5	0.5	0.2
ON30	0.249755	5	0.3	0.1
ON31	0.127452	5	0.1	0.1
ON32	0.202322	5	0.2	0.1
ON33	0.144663	5	0.2	0.1
ON34	0.786982	5	0.9	0.3
ON35	1.607131	5	1.8	0.7
ON36	1.389366	5	1.6	0.6
ON37	1.27292	5	1.5	0.6
ON38	1.84126	5	1.9	0.8
ON39	0.995256	5	1.1	0.4
ON40	0.252739	5.6	0.3	0.1
ON41	2.843646	5	2.6	1.2
ON42	0.168692	5	0.2	0.1
ON43	0.100367	8.14	0.1	0
ON44	0.587145	5	0.7	0.3
ON45	0.026881	5	0	0
ON46	0.095047	5	0.1	0
ON47	0.206293	5	0.2	0.1
ON48	0.882486	5	1	0.4
ON49	0.36478	5	0.4	0.2
ON49A	0.077154	5	0.1	0
ON50	0.591175	5	0.7	0.3
ON51	0.15314	5	0.1	0.1

ON52	0.426422	5	0.5	0.2
ON53	0.155403	5	0.2	0.1
ON54	0.286843	5	0.3	0.1
ON55	0.470618	5	0.5	0.2
ON56	0.341627	5	0.4	0.1
ON57	0.158931	5	0.2	0.1
ON58	0.920834	5	1	0.4
ON59	0.275898	5	0.3	0.1
ON60	0.298173	5	0.3	0.1
ON61	0.390523	5	0.5	0.2
ON62	0.144405	5	0.2	0.1
RETENTION-1	86.1	N/A	0	0
OUT	311	N/A	4.7	57

B. Hydraulic Analysis

Te on-site drainage system was evaluated using XPSWMM.

1. Tailwater Conditions

Tailwater conditions were assumed to be at the top of the pipe. The entire system drains to a retention basin.

2. On-site Storm Drain System

XP-SWMM was used to evaluate the storm drain system in the 10-year, 24-hour storm event. All nodes had over 2 feet of available freeboard. (See **Figure 8 -** Proposed Storm Drain System)

3. Low Impact Development (LID) and Stormwater Quality Treatment

WOOD RODGERS
DEVELOPING INNOVATIVE DESIGN SOLUTIONS

The Project meets the requirements of the Construction General Permit, as all flows drain into a retention basin, which constitutes a water balance that "replicates" pre-project runoff up to the 85th percentile storm. In this event all flows are infiltrated into existing soils as 2-foot high berms prevent runoff from entering Schmidt Creek and the Airport Road Lateral at the downstream end of the Project.

4. Retention Basin

The proposed retention basin has an available storage of 90 Acre-feet, assuming 1 foot of available freeboard. The top of the retention basin is at elevation 248 feet. The results of the 100-year, 10-day storm event showed a total runoff draining to the retention basin as 52.3 Acre-feet, at a peak stage of 239.3 feet.

V. DISCUSSION OF RESULTS

Table 3 – Comparison of Peak Flows

Location	Q100-Exist	Q100-Proposed	Q10-Exist	Q10-Proposed
EX1/RETENTION	29.4	0.0	14.1	0.0
OUT	85.1	57.0	17.3	4.7

Table 3 shows that peak flows are reduced in the proposed condition in the 10-year and 100-year events as a result of the retention basin.

VI. CONCLUSIONS

The North Fork Rancheria Project proposes to construct a hotel and casino on an approximately 311-acre site. The proposed storm drain system was sized to convey the 10-year, 24-hour storm event. A retention basin was designed to hold the 100-year, 10-day storm event. In addition, an emergency pump will be designed to convey a peak flow of 2 cfs to drain the retention basin in emergency situations. Flows from the pump will be spread out downstream of the basin, which will approximate existing drainage patterns. Also, runoff from the existing project site must pond above an approximately 2-foot high berm adjacent to both Schmidt Creek and the Airport Road Lateral, therefore flows from the pump will not contribute to increased runoff into either Schmidt Creek or the Airport Road Lateral.

WOOD RODGERS
BUILDING RELATIONSHIPS ONE PROJECT AT A TIME

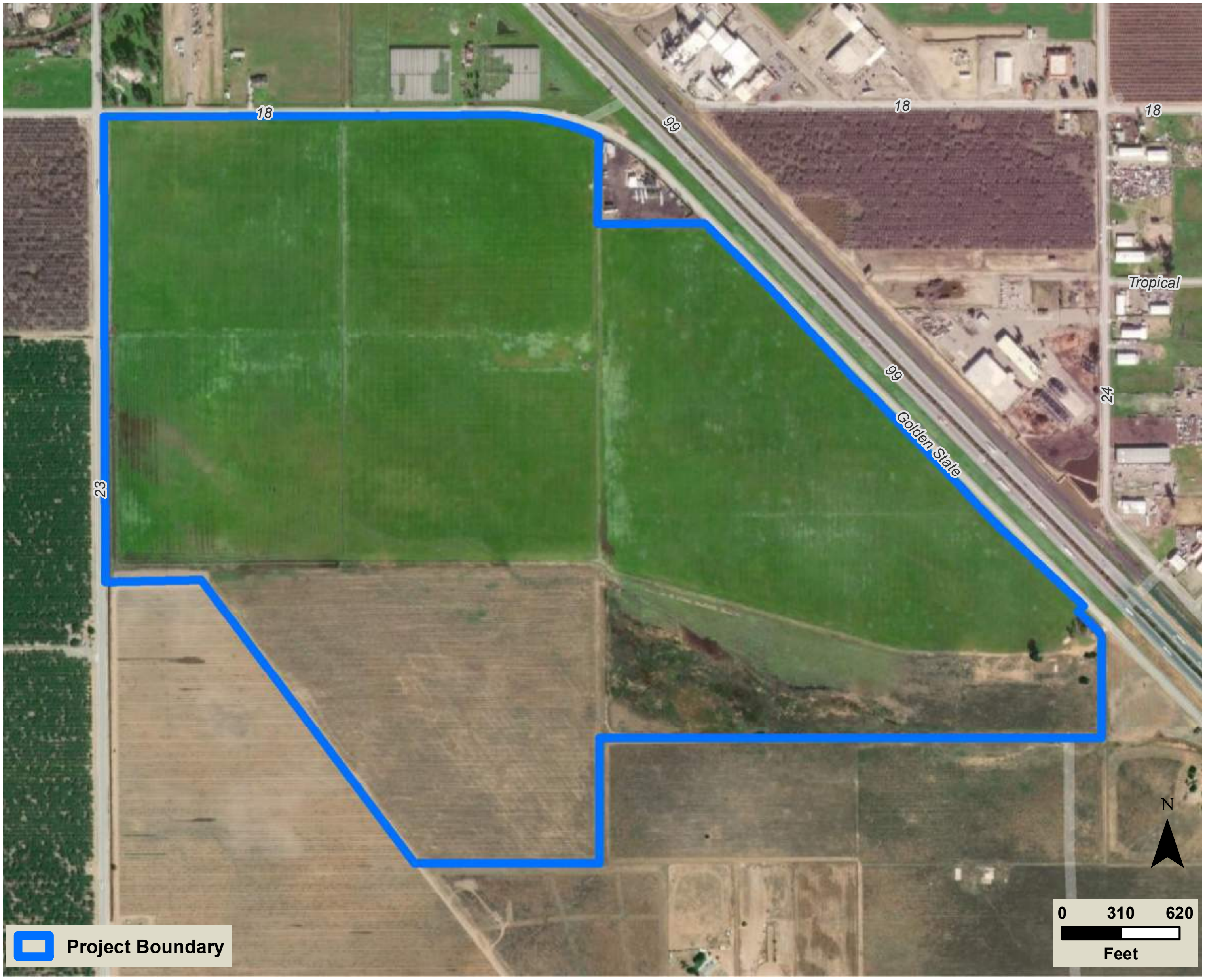


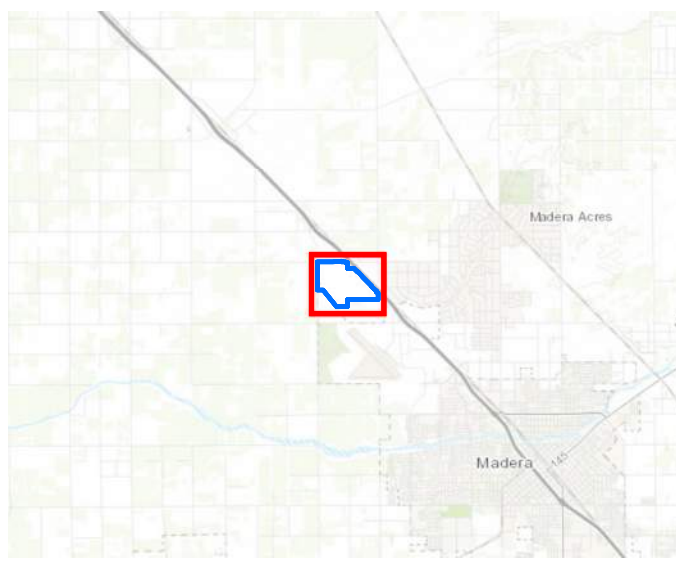
FIGURE 1
Vicinity Map

North Fork Rancheria Casino

Madera County, California

February 2021

Prepared By: dm *Checked By: kg*



\\woodrodgers.loc\ProductionData\Jobs\3000-s\3966_Friedmutter\001_NorthForkCasino\GIS\Data_Hydro\Report\Fig1 North Fork-Vicinity Map.mxd 2/9/2021 7:41:16 PM dmueller

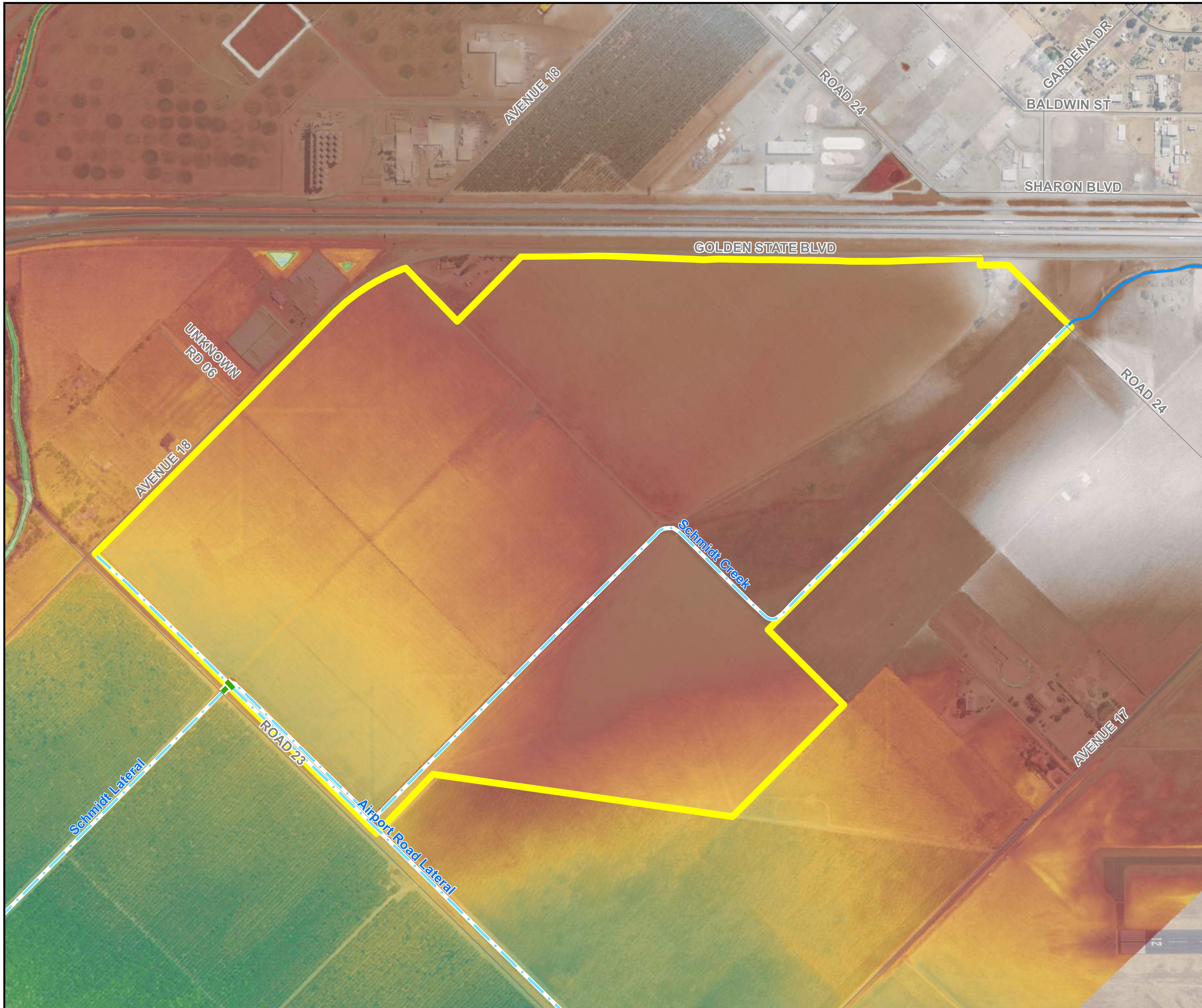


FIGURE 2

EXISTING TOPOGRAPHY

NORTH FORK RANCHERIA CASINO
MADERA COUNTY, CALIFORNIA
FEBRUARY 2021

Legend

EXIST_DRAINAGE

- Channel
- Creek
- Culvert
- site

CVFED_DEM.tif

Value

High : 285.5

Low : 231.5

0 300 600 1,200
Feet

NORTH

WOOD RODGERS

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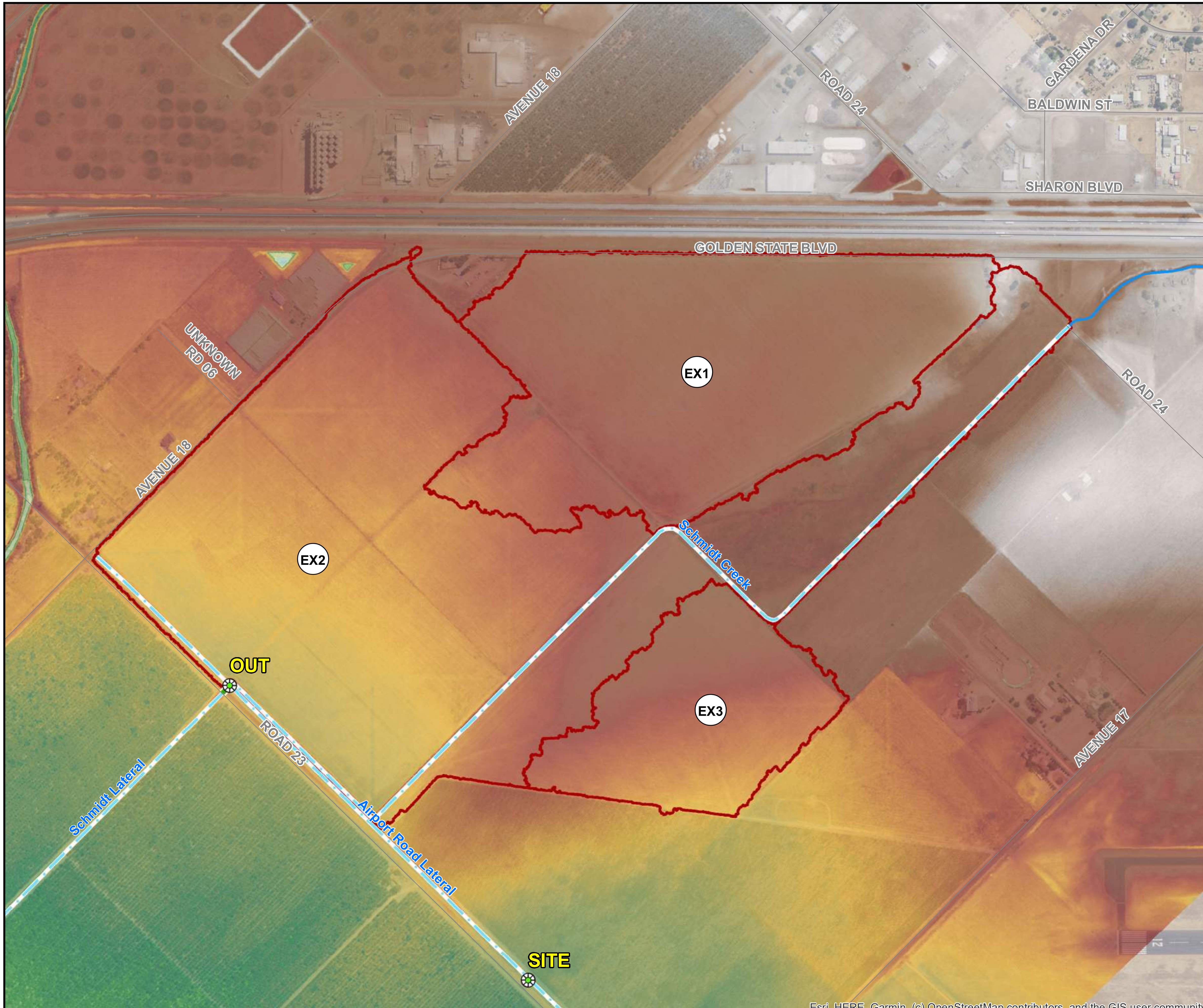

FIGURE 3

EXISTING WATERSHEDS

NORTH FORK RANCHERIA CASINO

MADERA COUNTY, CALIFORNIA

FEBRUARY 2021

Legend

NODE_EXIST

EXIST_DRAINAGE

Channel

Creek

Culvert

Existing Watershed

CVFED_DEM.tif

Value

High : 285.5

Low : 231.5

0 300 600 1,200

Feet

NORTH

WOOD RODGERS

FIGURE 4

EXISTING SOIL PROPERTIES

NORTH FORK RANCHERIA CASINO

MADERA COUNTY, CALIFORNIA

FEBRUARY 2021

Legend

NODE_EXIST

Existing Watershed

soilmu_a_aoi

HSG

A

B

D

0 300 600 1,200

Feet

NORTH

WOOD RODGERS

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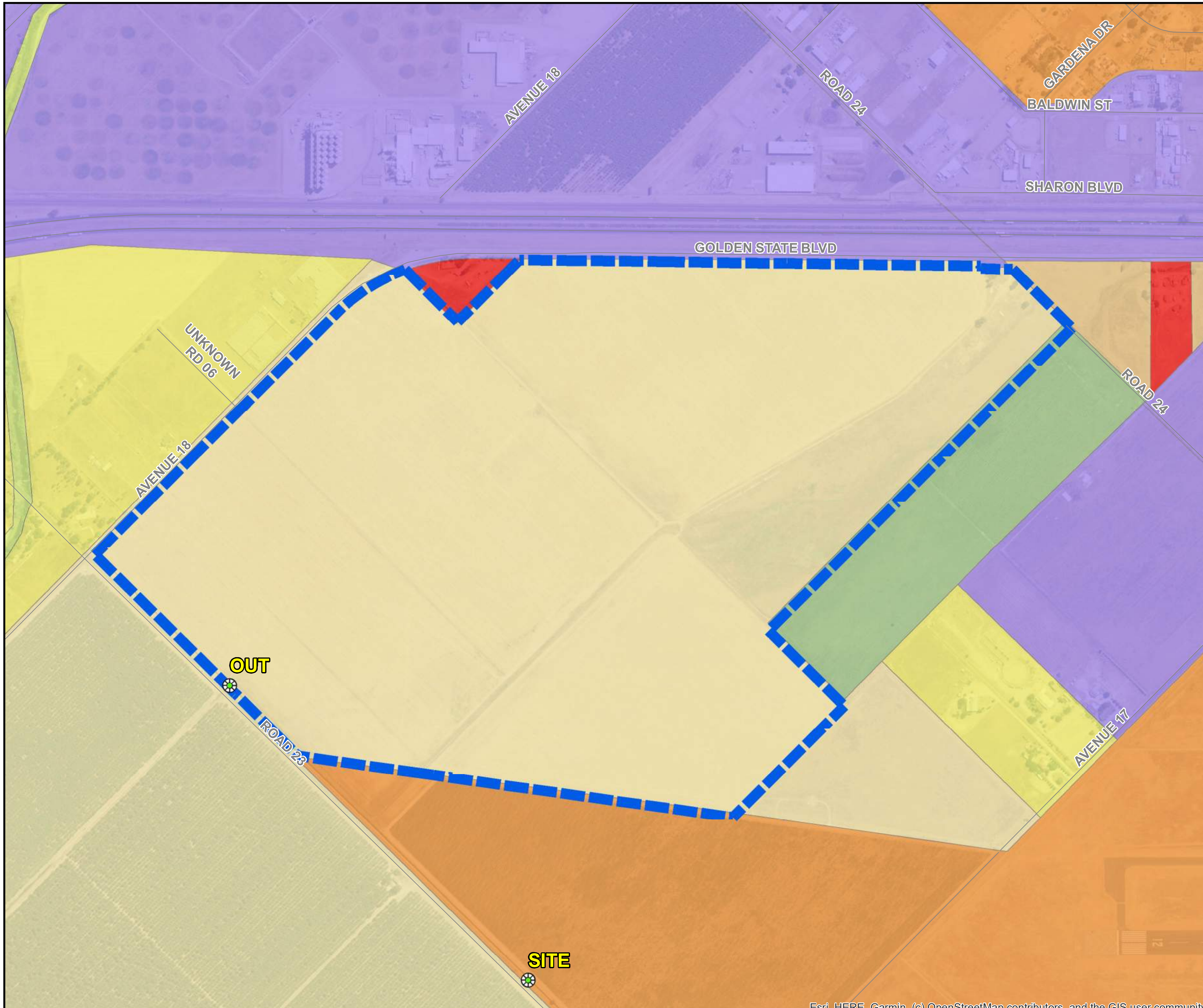

FIGURE 5

LAND USE

NORTH FORK RANCHERIA CASINO

MADERA COUNTY, CALIFORNIA

FEBRUARY 2021

Legend

ZONING

- AR-5
- ARE-20
- ARE-40
- CITY OF MADERA
- CRG
- CRH
- IL
- POS
- RRM
- NODE_EXIST
- PROP_LINE

0 300 600 1,200

Feet

NORTH

WOOD RODGERS

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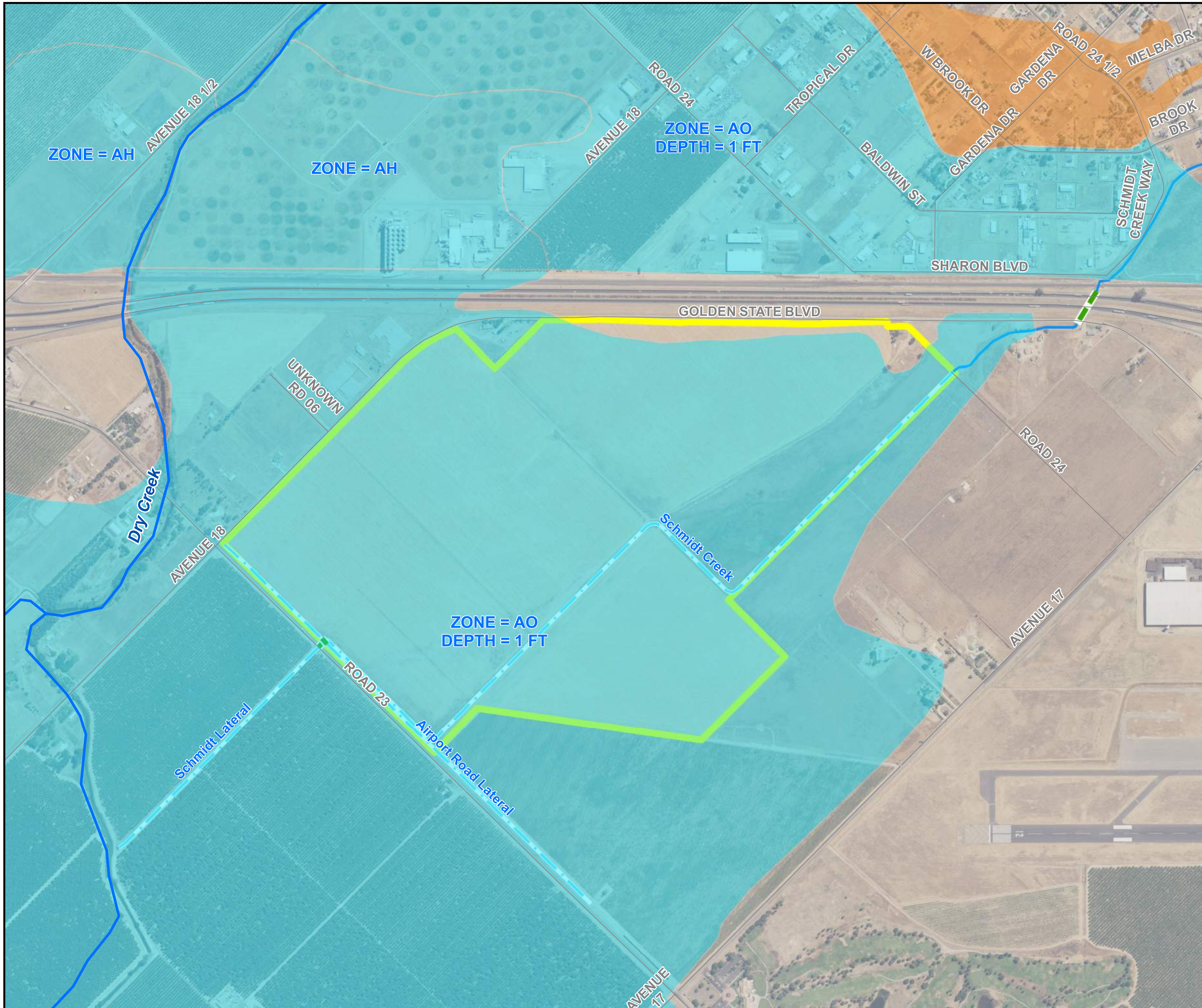

FIGURE 6

EXISTING FLOODPLAINS AND HYDRAULIC FEATURES

NORTH FORK RANCHERIA CASINO

MADERA COUNTY, CALIFORNIA

FEBRUARY 2021

Legend

S_WTR_LN

FLD_ZONE, ZONE_SUBTY

AH,

AO,

X, 0.2 PCT FLOOD HAZARD

EXIST_DRAINAGE

Channel

Creek

Culvert

site

0 400 800 1,600

Feet

NORTH

WOOD RODGERS

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FIGURE 7

PROPOSED WATERSHEDS

NORTH FORK
RANCHERIA CASINO
MADERA COUNTY, CALIFORNIA
FEBRUARY 2021

FIGURE 8

PROPOSED STORM DRAIN SYSTEM

NORTH FORK RANCHERIA CASINO

MADERA COUNTY, CALIFORNIA

FEBRUARY 2021