

# **Advance Agenda Material**

**Please Retain For** October 17, 2017  
**Board Meeting**



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## Inter Office Memo

DATE: September 20, 2017

TO: Board of Supervisors

FROM:  Steven E. White, Director  
Department of Public Works and Planning

SUBJECT: Advance Agenda Material – Appeal of Initial Study Application No. 7104 and Unclassified Conditional Use Permit No. 3528 (Appellant: Grand Petroleum, Inc.; Applicant: Shawn Shiralian) – October 17, 2017 Board Agenda Item (Granicus File No. 17-1168)

### BACKGROUND AND SUMMARY OF MATERIALS:

Unclassified Conditional Use Permit No. 3528 (UCUP No. 3528) and Initial Study Application No. 7104, filed by Shawn Shiralian proposing an Interstate Freeway Interchange Commercial Development at I-5 and Nees, was presented to and unanimously approved by the Planning Commission on August 24, 2017. An appeal of the Commission's approval of the Conditional Use Permit and adoption of the Mitigated Negative Declaration prepared for Initial Study No. 7104 was subsequently filed by Beveridge and Diamond, a law firm representing Grand Petroleum, Inc. The Appellant represents a company that currently operates an existing commercial center consisting of a fueling station and fast-food restaurant immediately north of the subject application just on the other side of the County Line in Merced County.

Prior to the August 24, 2017 Planning Commission Hearing, the Appellant's attorney submitted a 22-page letter with 106 pages of attachments taking issue with the environmental work completed for UCUP No. 3528. In partial response to this August 18, 2017 letter, the Applicant's traffic engineer submitted information on August 23, 2017 to clarify and respond to the critiques presented by Beveridge and Diamond. The August 18, 2017 letter by Beveridge and Diamond and the August 23, 2017 response by Peters Engineering Group are the first and second pieces of correspondence on the attached compact disk.

Following the August 24, 2017 Planning Commission Hearing, a second letter was received from Beveridge and Diamond dated August 25, 2017 written by the attorney who attended the hearing and presented testimony in opposition to the project. This letter indicated that new information was presented at the hearing related to water and traffic that had not been previously analyzed in the environmental document.

In response to Beveridge and Diamond's August 25, 2017 letter, County staff drafted a letter maintaining the County's position that the environmental document prepared for UCUP No. 3528 is adequate, and that additional information regarding traffic is in fact not new analysis but provided in response by the Applicant's traffic engineer to Beveridge and Diamond's previous letter. Regarding water, staff acknowledged that a speaker representing the Applicant

misquoted the daily estimate of water to be used by the facility, but the quoted amount was less than that analyzed in the environmental document. The August 25, 2017 letter from Beveridge and Diamond and the September 5, 2017 response by the County of Fresno's Department of Public Works and Planning are attached as the third and fourth pieces of correspondence on the attached compact disk. Also enclosed is a separate compact disk containing the August 24, 2017 Planning Commission Hearing Audio. This was included with the September 5, 2017 letter. Testimony for UCUP No. 3528, which was Planning Commission Agenda Item No. 6, begins at 1:56:06 on this disk. Please note this disk must be played on a PC.

Staff also received a letter on August 31, 2017 from the State Department of Transportation (CALTRANS) formalizing verbal comments made at the August 24, 2017 Planning Commission Hearing and restating the Agency's concurrence with the Applicant's Traffic Impact Study. A copy of this letter is included as the fifth piece of late correspondence related to this item.

This information is being provided to the Board in advance of the scheduled October 17, 2017 Board hearing due to its volume as post-Planning Commission correspondence. Staff maintains, as stated in its September 5, 2017 response, that the environmental document prepared for UCUP No. 3528 is adequate and that additional information that could jeopardize the validity of that document was not presented at the August 24, 2017 Planning Commission Hearing.

For additional questions regarding the attached, please contact Chris Motta, Principal Planner at 600-4227.

**Attachments:**

Compact Disk Containing Five Pieces of Late Correspondence regarding Project  
Compact Disk Containing August 24, 2017 Planning Commission Audio

cc: Shawn Shiralian, Applicant  
David McCray, Beveridge and Diamond, Counsel for Appellant

**August 18, 2017 Letter in Opposition**

**Beveridge and Diamond**

**128 Pages with Attachments**



David H. McCray  
456 Montgomery Street, Suite 1800  
San Francisco, CA 94104-1251  
Direct: (415) 262-4025  
DMccray@bdlaw.com

August 18, 2017

**Submitted via email to dchambers@co.fresno.ca.us**

Fresno County Department of Public Works and Planning  
Development Services Division  
Attn: Derek Chambers  
2220 Tulare Street, Suite A  
Fresno, CA 93721

**Re: Comments on Initial Study 7104 relating to Conditional Use Permit  
Application 3528**

Dear Mr. Chambers:

We write on behalf of Grand Petroleum Inc., (“Grand Petroleum”) to comment on Initial Study 7104 (“IS”) and the Mitigated Negative Declaration prepared by the Fresno County Planning Department (“County”) for the Conditional Use Permit Application 3528 (“CUP 3528”). The Applicant for CUP 3528, Shawn Shiralian, seeks to construct a large highway travel center at the northwest quadrant of the Interstate 5/Nees Avenue interchange in Fresno County, California (the “Project”). There are several deficiencies in the Initial Study, and we urge the Planning Commission to reject the Mitigated Negative Declaration and require the County to either 1) prepare a revised initial study to determine whether a negative declaration, mitigated negative declaration, or environmental impact report (“EIR”) is required or 2) require the County to prepare an EIR because there is substantial evidence to support a fair argument that the Project may cause significant adverse environmental impacts.

Several of the materials the applicant submitted in support of the Project are incomplete or inaccurate and thus, the Initial Study and accompanying Mitigated Negative Declaration are not supported by substantial evidence in the record. The decision as to whether a project may have one or more significant effects must be based on substantial evidence in the record of the lead agency. 14 CCR § 15064(f). The County’s Traffic Impact Study is flawed. Serious questions exist about the water demands of the Project, the availability of water, the quality of that water, and how wastewater will be managed for the Project. In these respects, the Applicant

August 18, 2017

Page 2

failed to put forth sufficient facts to enable the agency to meaningfully evaluate the potential environmental impacts of the Project.

The deficiencies of the Initial Study extend beyond the supporting documentation provided by the Applicant. There are multiple instances in which the County did not respond to the checklist questions it was required to address in the Initial Study. Elsewhere, the County relied upon improper mitigation measures. Additionally, the County abdicated its responsibility to analyze and determine whether cumulative impacts exist by merely stating in a single sentence that no “cumulatively considerable impacts” were identified.

One purpose “of the initial study is to help to inform the choice between a negative declaration and an environmental impact report.” *Joshua Tree Downtown Business Alliance v. County of San Bernardino* (2016) 1 Cal.App. 5th 677, 684 (internal citations removed). A core function of the initial study, is thus, meaningfully analyzing the questions presented based on reliable evidence to determine whether an EIR, a negative declaration, or a mitigated negative declaration is required. *See generally* 14 CCR § 15063. The initial study provides “documentation of the factual basis for finding” that a mitigated negative declaration is appropriate. 14 CCR § 15063.

An initial study is deficient if it fails to analyze a component of the Project. *Lighthouse Field Beach Rescue v. City of Santa Cruz* (2005) 131 Cal.App.4th 1170, 1195. Moreover, an initial study is inadequate if there is insufficient factual support for conclusions reached. *City of Redlands v. County of San Bernardino* (2002) 96 Cal.App.4th 398, 404 (“the County failed to gather facts necessary to perform an adequate environmental analysis”).

“When the informational requirements of CEQA are not complied with, an agency has failed to proceed in a manner required by law and has therefore abused its discretion.” *Lighthouse*, 131 Cal.App.4th at 1200 (internal citations removed).

For these reasons and for all the reasons more fully explained below, the County’s efforts have fallen below what is required under CEQA. Accordingly, the Planning Commission should not adopt the mitigated negative declaration or approve the CUP. The Applicant must be required to submit additional accurate data and information, and the County should prepare either a revised Initial Study or an EIR for this Project incorporating the issues raised below.

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August 18, 2017

Page 3

## Comments

### 1. There are Serious Deficiencies with the Applicant's Information and Analysis Regarding Water Use, Source, Quantity, and Quality Which Resulted in the County's Inability to Accurately Determine the Environmental Impacts Associated with the Project

An initial study which omits material necessary to informed decision making subverts the purpose of CEQA and is an abuse of agency discretion. *Lighthouse*, 131 Cal.App.4th at 1202. As explained below, there are several instances in which the County's analysis and conclusions regarding the water demands and requirements of the Project are incomplete and inaccurate and fail to provide substantial evidence to support the conclusion that the Project will not cause significant environmental impacts.

#### *Water Use*

Originally the Applicant stated that it would use approximately 2000 gallons of water per day. **Exhibit 1.** This conclusion was unsupported except for a single sentence that “[b]ased on similar uses along I-5,” the Project would use 2000 gallons of fresh water. The County received comments from various state agencies that the water estimate was too low. For example, on April 6, 2016, the Environmental Health Division estimated wastewater flow of 15,980 gallons/day, not including proposed laundry and shower facilities. **Exhibit 2.** That is nearly eight-times the daily water use the applicant proposed. On March 6, 2017, the Environmental Health Division commented that “[f]rom experience on other Travel Centers along I-5, the number of visitors per day is grossly underestimated at 1500 leading to water and wastewater estimates to also be significantly underestimated.” **Exhibit 3.** Despite these comments, no revised water use estimate was provided.

On May 25, 2017, the Water, Geology and Natural Resources Division requested “additional information” as to how a water use estimate of 2000 gallons/day was calculated. **Exhibit 4.** On June 2, 2017, the County requested the Applicant provide “data to support the 2,000 gallons per day usage.” **Exhibit 5.** The applicant replied that same day: “We drilled a well that pumps 300 gallons a minute. I don’t know what CEQA is but whatever it is we should be able to provide that. We didn’t wait for Water Board.” **Exhibit 6.** The County explained how critical water use and supply analysis and estimates were, as the Project is located in a water-short area. **Exhibit 7.**

Finally, the applicant provided an updated water use estimate to the County on June 7, 2017, which has been included as part of the Initial Study Routing Package. Now the Applicant

August 18, 2017

Page 4

estimates that the Project will use 26,179 gallons per day.<sup>1</sup> There is no explanation for why the water use estimate is now 10-times greater than it was previously. Tellingly, the Applicant did not provide additional information to the County in support of its original 2000 gallon/day water use estimate, which the Applicant appears to have abandoned.

The Applicant's revised calculation is a single page and allegedly supported by IAPMO Water Usage Tables. Grand Petroleum retained Carollo Engineers ("Carollo") to review several aspects of the Applicant's Project relating to water. As Carollo explains, IAPMO tables are not typically used to calculate a daily water use amount. Rather, these tables are used to identify maximum flow rates in a building structure which in turn are used for sizing the plumbing pipelines and fixtures. *See Exhibit 8.* Accordingly, Applicant's revised estimate is also not supported by substantial evidence. 14 CCR § 15064(f)(5).

Using the site plans provided by the Applicant, Carollo calculated the daily water use for a Project of this size with the number of visitors that the Applicant has estimated. Carollo calculated that the Project would use 43,585 gallons per day, and that number increases to 46,938 gallons per day with irrigation. This is nearly twice as many gallons per day as the Applicant estimated. Carollo identified activities with water demands that the Applicant failed to consider entirely. *See Exhibit 8.* Most obviously, Applicant's estimate does not identify any water use associated with restrooms; it only calculated water used with showers. But certainly at a truck stop and restaurant facility, the majority of individuals will use the restroom before departing. Oversights such as these underscore the unreliability of the Applicant's water use estimate. As a result, the conclusion that the Project will not have a significant environmental impact on hydrology is not supported by substantial evidence.

Furthermore, comments in the record indicate that the number of Project trips is underestimated, meaning that Carollo's water usage estimate is likely too conservative because more people will come to the Project and utilize its facilities. *Exhibit 3.* Carollo based its water use estimates on the site plan provided by the Applicant. Therefore, to the extent the number of visitors is underestimated, Carollo's water use calculation is conservative even though the calculation is almost double that of the Applicant's estimate.

As a result of the Applicant using unsupported and inaccurate estimates of the daily water use, the Initial Study is fatally flawed. The County concluded that the Project would have either a "less than significant impact with mitigation incorporated" or a "less than significant impact"

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<sup>1</sup> From our review of the administrative record based on frequent Public Records Act Requests, state and federal agencies have not previously had an opportunity to comment on the Applicant's revised water use estimate as this material was not circulated as a part of a previous "Routing Package."

August 18, 2017

Page 5

for all topics regarding hydrology and water quality (section IX of the Initial Study). The County never analyzed the environmental impact of a realistic daily water use. CEQA requires the County to obtain a factual basis to support its conclusions as to the environmental effect of the project and to engage in fully informed decision-making. *Deep Creek Agr. Ass'n v. County of San Bernardino* (Cal. App. 4th 2008) 2008 WL 2316322, \* 11. Such efforts were thwarted here by the Applicant declining to provide the necessary underlying facts. The mitigated negative declaration should be rejected and additional analysis should be conducted regarding the environmental impact associated with an accurate daily water use.

### *Water Source and Supply*

The Project is located in a Water Short Area. (Initial Study section IX.B.) San Luis Water District has unequivocally stated that it will not provide water to the Project:

Upon review of the application, it appears that the proposed project is anticipating utilizing a groundwater well for its water supply and will not need to depend upon the San Luis Water District for a supply or conveyance. Although the San Luis Water District is not requested to provide a Municipal and Infrastructure (M&I) water supply, and to make is abundantly clear to the applicant, the District will not provide a "can and will serve" letter to the development if requested. The property in question does not receive an M&I allocation from the United States Bureau of Reclamation's Central Valley Project. This property may be eligible to receive an agricultural allocation. However, the planned use as contemplated by the conditional use permit is not an agricultural operation therefore the agricultural water supply is not an adequate supply.

In summary, and in accordance with District policy, the District will not provide any new development water supply from its current allocation and/or supplemental water supplies; it is the responsibility of the project proponent to secure its own supply of water outside of the District. The project proponent must independently secure an adequate water supply (quality and quantity) for the life of the project.

**Exhibit 9.**<sup>2</sup> The Applicant has stated that it will rely on groundwater from two wells drilled onsite to support the Project.

The Applicant asserts, and the County accepts in the Initial Study, that the public water well will produce 300 gallons of water per minute. However, the well completion report was not enclosed with the Initial Study Routing Package, and it is unclear if other agencies and interested individuals providing comments have ever had the opportunity to review this material.

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<sup>2</sup> The date on the letter from the San Luis Water District conflicts with the date Fresno County received the letter. The letter is dated March 14, 2016, but the letter was received by Fresno County March 6, 2017.

August 18, 2017

Page 6

Beveridge & Diamond PC obtained the public well drilling completion report and drilling permits for both the public and private well at the Project through a California Public Records Act Request (“CPRA”). **Exhibit 10.** While the well completion report does estimate well yield at 300 gallons per minute, there are flaws with this conclusion and also significant shortcomings in the County’s Initial Study regarding water supply.

As Carollo explains, best practices support conducting a pumping test at a constant rate for 24 hours and recording the drawdown levels during the test. **Exhibit 11.** Pumping tests are conducted to determine the yield of the well and hydraulic parameters of the aquifer. The duration of the pumping test may be shortened if equilibrium conditions are reached before 24 hours, but there are no notes to indicate why the pumping test was conducted for only 12 hours. Without drawdown data, neither the adequacy of the pumping test data nor the estimated well yield can be objectively assessed.

This lack of information prevented the County from analyzing the potential environmental impacts associated with drawing ground water for the Project. In Section IX.B. of the Initial Study, the County had to determine if the Project would substantially deplete the groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in the aquifer volume or a lowering of the local groundwater table. The County’s response, which is included below in its entirety, failed to even address, let alone answer, the question presented:

*The subject parcel is located in a designated Water-Short Area and is currently devoid of structural improvements; however, a Private water well and a Public water well have been permitted and constructed thereon. Further, according to the Well Completion Report prepared for the Public water well, said well has an estimated yield of 300 gallons of water per minute. According to the Operational Statement provided for this project, it is estimated that the proposed Interstate Freeway Interchange Commercial Development will utilize approximately 26,179 gallons of water per day.*

The County concluded that the project would have a “less than significant impact” on groundwater supplies or groundwater recharge, but the County reached this conclusion with no factual information or analysis. There are no materials accompanying the Initial Study that analyze whether the wells would, or would not, interfere with the groundwater supply or recharge. This illustrates both that the Applicant failed to put forward substantial evidence on this issue and also that the County did not undertake a serious review of the associated environmental impacts of using this groundwater supply. The County’s defunct conclusion falls short of the environmental review required by CEQA in an Initial Study. *Lighthouse*, 131 Cal.App.4th at 1195 (an initial study is deficient if it fails to analyze a component of the project);

August 18, 2017

Page 7

*City of Redlands*, 96 Cal.App.4th at 404 (an initial study is inadequate if there is insufficient factual support for conclusions reached).

*Water Quality*

The Applicant included a report for water quality analyses from BSK Associates to support its Conditional Use Permit Application. There are inconsistencies with the report itself and issues raised by the report that the Applicant, and the County, overlook.

First, there is nothing in the BSK Report that allows a reviewer to determine if the water quality sample BSK analyzed is actually from the Project Site. The report identifies the location of the sample as a “New Well” associated with “Gridley Farm Labor Camp.” No other materials associated with this Conditional Use Permit application that our office received through CPRA Requests or materials the County distributed as a part of the Initial Study Routing Package, use the phrase “Gridley Farm Labor Camp” to describe the location of the Project. Indeed, the city of Gridley, CA is approximately 200 miles north of Fresno, CA.

Second, Carollo reviewed the BSK data and identified internal discrepancies with the chain of custody of the water sample:

The Sample Integrity checklist included with the laboratory report indicates that the measured temperature of the samples at the time of receipt was less than 6 °C, but the sample temperature noted on the chain of custody and case narrative is 12.9 °C. The sample integrity checklist also indicates that information on the bottle labels agree with the chain of custody. However, a separate sample condition checklist completed by Pace Analytical for subcontracted radiological analyses indicates that the sample labels did not match the chain of custody and the sample date and time was not recorded on the sample bottles. The Pace Analytical checklist also notes that no custody seal was present on the shipping container.

**Exhibit 11.**

Third, assuming that the well data is from a well drilled at the Project, there are significant water quality issues that the Applicant does not address. Notably in the operations statement, the Applicant passively acknowledged that the well water will be “tested and treated.” However, the application lacks any meaningful acknowledgment of why the water needs to be treated and how it will actually be treated, and the Initial Study does not evaluate the environmental impacts associated with treatment.

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August 18, 2017

Page 8

Carollo reviewed the BSK Report and concluded that total dissolved solids, specific conductance, chloride, and sulfate were found in concentrations in excess of California’s secondary drinking water standards. Table 1 below, prepared by Carollo, summarizes the exceedances for these constituents and the full report is included as **Exhibit 11**.

Table 1. Secondary Maximum Contaminant Level Ranges and Reported Data

Constituent, Units	Recommended	Upper	Short Term	Reported Value
Total Dissolved Solids, mg/L	500	1,000	1,500	3,200
Specific Conductance, uS/cm	900	1,600	2,200	5,600
Chloride, mg/L	250	500	600	1,100
Sulfate, mg/L	250	500	600	750

At a minimum, the water needs to be treated to a point where the values of total dissolved solids, specific conductance, chloride, and sulfate comply with secondary drinking water standards before the groundwater is suitable for potable uses. The Applicant was notified that these requirements apply at least as far back as May 9, 2016, but no steps appear to have been taken to address these exceedances. **Exhibit 12**. The Applicant did not provide information about how the water is to be treated, and therefore, the County failed to analyze whether such treatment will have a significant impact on the environment.

Additionally, the water is highly saline. While sodium is not regulated as a drinking water contaminant, the United States Environmental Protection Agency recommends that sodium concentration in drinking water not exceed a range of 30 to 60 mg/L. **Exhibit 11**. BSK’s analysis shows that the water sample had an observed concentration of 1,100 mg/L. To illustrate how saline the water is, its use even for irrigation or for livestock would be severely restricted. *Id.*

If the BSK analysis is in fact representative of water that will be drawn from the well at the site, then the water needs to be treated before it can be used as potable water. The County acknowledged that the Applicant needed to comply with all requirements for the operation of a Non-Transient Non-Community Water System. (Initial Study section XVII.D.) However, there is no analysis of how treatment will be performed or whether that treatment will have a significant impact on the environment.

August 18, 2017

Page 9

Moreover, using either reverse osmosis or electrodialysis to treat the water will result in the generation of a highly concentrated brine waste. **Exhibit 11.** The amount of water the Project uses, the method of treatment used, and the efficiency of the treatment method will impact how much brine waste is generated. Highly saline brine waste must be properly handled to prevent adverse environmental impacts, such as groundwater contamination, but these are not discussed by the Applicant or in the Initial Study. *See id.* Brine waste can be handled and disposed of in a variety of ways, but currently, the Applicant does not identify how the waste will be managed. Handling concentrated brine water may cause significant adverse impacts to the environment and both the Applicant and the County overlook this substantive issue entirely. The Applicant has not designed a system that addresses the water quality issues associated with groundwater use and the County never evaluated the environmental impacts associated with the use and treatment of groundwater to support the Project.

Finally, as Carollo explains, “[b]ecause a portion of the raw water is lost as concentrate from the treatment process, treatment may also significantly increase the volume of raw water required to meet demands.” **Exhibit 11.** As explained in detail above, the Applicant has significantly underestimated the daily water demands of the Project. Because the groundwater is highly saline and has concentrations of contaminants in excess of California’s secondary drinking water standards, it must be treated, and this treatment causes some portion of raw water to be lost. This in turn drives the daily water demands of the Project even higher. Both the Applicant and the County declined to engage with these facts or honestly assess their environmental impact.

#### *Handling Wastewater*

The Project will manage its wastewater onsite. The Applicant submitted a report prepared by O.S.T. System Designs, Inc. to demonstrate that it could manage the Project’s wastewater by using a septic tank and a leach field. O.S.T. estimated the peak flow rate for wastewater as 10,692 gallons per day and then based its calculations on designing a system that could accommodate that amount of daily wastewater. For several reasons, O.S.T.’s conclusions from July 5, 2016 cannot be relied upon in the Initial Study released in July 2017.

First, O.S.T. based its estimation for the peak flow rate of wastewater by referring to the California Plumbing Code. However, four of the activities identified are not in the plumbing code, and thus, are not supported by citation. **Exhibit 13.** Furthermore, the square-footage of mini-mart space is different than the mini-mart square footage on the Applicant’s floor plan, resulting in an inaccurate wastewater flow estimate. *Id.*

August 18, 2017

Page 10

Second, in Section 8, O.S.T. recommended “using time and pressure dosed Rock Leach Lines to treat and disperse the wastewater generated by the proposed Travel Center.” However, throughout the report, O.S.T. presents calculations, including the size of the leach field, based on using gravity distribution. The O.S.T. report does not include a recommended volume for a dosing tank or the design flow rate and discharge head of the associated dosing pump. O.S.T. has made a recommendation about how to handle the wastewater, but then the report does not actually explain how to design a system that comports with its recommendation. **Exhibit 13.**

Third, O.S.T.’s wastewater daily flow rate estimate is internally inconsistent with the daily water use estimate eventually put forward by the Applicant. As explained above, the Applicant now estimates that the Project will use 26,179 gallons of water per day. The Applicant’s revised daily water use estimates will generate approximately two-and-a-half times as much wastewater as O.S.T. estimated and then designed a system to accommodate. *See Exhibit 13* (explaining the use of a 90% “to sewer” calculation). As O.S.T. admitted, its conclusions about the ability of the Project to support the needed wastewater treatment system are dependent on the amount of wastewater the Project generates, and its conclusions are not valid if the wastewater flows change.

In the event that changes occur in the design of the project, this report’s recommendations will not be considered valid unless the changes are reviewed with O.S.T. System Designs, Inc. and the conclusions and recommendations are modified or verified in writing. Examples of such changes would include location and/or changes in the type of wastewater characteristics and an increase in wastewater flows.

O.S.T. Report, section 2.0. Therefore, for this reason alone, the County’s conclusion that the use of septic tanks or alternative disposal systems would have a “less than significant impact with mitigation incorporated” is not supported by substantial evidence.

Further, in April 6, 2016, the Environmental Health Department commented that: “An evaluation of the Operations Statement provided by the applicant and 2013 California Plumbing Code Appendix H yields an estimated wastewater flow of 15,980 gallons per day not including proposed laundry and shower facilities.” **Exhibit 2.** The O.S.T. report never considers this higher estimate put forward by the Environmental Health Department or explains why its lower estimate of approximately 10,700 gallons is more accurate.

Carollo reviewed the O.S.T. Report and calculated the size requirements for a wastewater treatment system to accommodate both the daily water use estimated by the Applicant and the daily water use calculated by Carollo. Carollo prepared the following table demonstrating the

August 18, 2017

Page 11

size requirements for leach fields in four different layouts based upon how the leach lines are installed.

<b>Average Daily Wastewater Flow (gallons per day)</b>	<b>Length of Leach Line Required (linear feet)</b>	<b>Number of Leach Lines (count)</b>	<b>Area Required (1) (acres)</b>	<b>Area Required (2) (acres)</b>	<b>Area Required (3) (acres)</b>	<b>Area Required (4) (acres)</b>
10,692	651	7	0.22	0.30	0.36	0.33
23,561	1,337	14	0.44	0.53	0.60	0.65
39,227	2,173	22	0.69	0.83	1.03	0.98

Table Notes:

1. Area Required (1) is based on a leach line configuration of one single long line of leach line installation
2. Area Required (2) is based on a leach line configuration of two leach lines side by side
3. Area Required (3) is based on a leach line configuration of three leach lines side by side
4. Area Required (4) is based on a leach line configuration of four leach lines side by side

**Exhibit 13.** Furthermore, Fresno County mandates that an equal amount of land required for the leach field be set aside and reserved for potential future use for septic tank effluent disposal. *Id.* Therefore, the Applicant needs to identify additional acreage to comply with the Fresno County requirement.

CEQA requires Agencies to make informed decision-making and to make an honest assessment of environmental impacts associated with proposed projects. *See San Lorenzo Valley Community Advocates for Responsible Educ. v. San Lorenzo Valley Unified School Dist.* (2006) 139 Cal.App.4th 1356, 1375 (“an agency’s failure to comply with the procedural requirements of CEQA is prejudicial when the violation thwarts the Act’s goals by precluding informed decision-making and public participation.”). Here, the Applicant needs to revise its soils analysis and sewage feasibility report to accurately reflect realistic wastewater flow projections for the Project. Then the County needs to evaluate whether there will be a significant environmental impact from this wastewater treatment. The construction of a significantly larger leach field and septic tank may pose a substantial environmental impact that needs to be meaningfully evaluated. O.S.T.’s wastewater treatment system also does not address how brine water, or the other liquid generated after treating water to make it suitable for potable use, will be handled. The Applicant must be required to put forward a plan for adequately managing all wastewater generated the Site so the associated environmental impacts can be analyzed.

August 18, 2017

Page 12

Finally, the California Water Resources Control Board Discharge Order WQ 2014-0153-DWQ requires that for wastewater flow rates greater than 20,000 gallons/day, the discharge must be evaluated to determine if nitrogen effluent limits are required. As Carollo explains, the results of a nitrogen effluent limit evaluation impacts the required wastewater treatment method.

**Exhibit 13.** For example, if the evaluation determines that nitrogen control is required then the planned septic tank leach field system will not be permitted and aerobic treatment will be required. As the wastewater flow rates will exceed 20,000 gallons/day based even on the Applicant's revised daily water use estimate, this additional type of wastewater treatment needs to be evaluated at the Initial Study stage because handling wastewater with high nitrogen concentration may have a significant environmental impact.

## **2. The Traffic Impact Study Prepared by the Applicant and Relied Upon by the County is Flawed**

In support of the Project, the Applicant submitted a Traffic Impact Study prepared by Peters Engineer Group ("PEG"). PEG's Traffic Impact Study has significant shortcomings and several conclusions are based on inaccurate, incomplete, or misrepresented data. Elsewhere, PEG failed to provide needed analysis, which results in substantial deficiencies in its Traffic Impact Study. As a result of these inaccurate data issues, the County's conclusions about the environmental impacts associated with the transportation effects of the Project are not based on substantial evidence. 14 CCR § 15064(f)(5).

Grand Petroleum retained MRO Engineers ("MRO") to review PEG's traffic impact study. MRO's report is attached as **Exhibit 14**. MRO identified several deficiencies in PEG's analysis, which are summarized below.

First, PEG did not analyze the correct peak traffic rates in its traffic impact study. PEG addressed conditions using traffic data from 4:00 – 5:00 p.m. on Sunday, which it represented as a peak-hour period. However, the vehicle count was slightly higher on Fridays, which raises the question why the Friday peak hour was not analyzed. *See Attachment A to Exhibit 14*. Moreover, based on PEG's traffic count, Sunday from 3:00 – 4:00 p.m. actually had a higher traffic volume than Sunday from 4:00 – 5:00 p.m., yet this timeframe on Sunday was excluded. To accurately determine the environmental impacts of the Project associated with traffic, the impacts associated with peak traffic rates must be analyzed. The traffic impact analysis should be revised to incorporate an analysis of the actual Sunday peak hour as well as the Friday peak hour.

August 18, 2017

Page 13

Also, highlighted on the table in Attachment A is the 5:00 – 6:00 PM hour between the I-5 ramps on Friday. The total volume during that hour was 200 vehicles, which is approximately the same as the total during the selected analysis period. However, the directional orientation of the vehicles in this period was somewhat different from that shown during the analysis period. In particular, about three-quarters of the Friday volume is eastbound at the current location, whereas the Sunday volumes are approximately evenly split between the eastbound and westbound directions. PEG did not analyze the impacts associated with these changes in traffic direction.

Second, there are several flaws regarding the Project trip estimates, which are presented in PEG Table 6. PEG’s trip generation estimates for the Project were developed based upon traffic counts conducted at an existing Chevron gas station on Paul Negra Road, just north of the proposed Project site. Relying on a single data set is contrary to the Institute of Transportation Engineers’ *Trip Generation Handbook*. The *Trip Generation Handbook* (p. 29) addresses the preferred sample size for selecting appropriate trip generation rates from those available in the *ITE Trip Generation Manual* (ITE, Ninth Edition 2012):

- *If the number of data points is one or two, either (1) consider the use of a different independent variable and its associated data pages, or (2) collect local data and establish a local or consolidated rate. Refer to Chapter 9 for guidance.*
- *If the number of data points is three, four, or five, the analyst is encouraged to collect local data and establish a local or consolidated rate . . . [Emphasis not added]*

**Exhibit 14.** Furthermore, PEG does not explain why the Chevron gas station is a comparable travel center to the Project. Specifically, the Project is designed to include a restaurant and additional truckers’ services, such as laundry, a large restaurant, and showers, and nothing in the record indicates that the Chevron station has similar services such that it is an appropriate comparison. The MRO report states:

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August 18, 2017

Page 14

Moreover, we note that the Project trip generation estimate presented in PEG Table 6 fails to account for the truckers' services component of the Project. It seems to suggest that this activity is fully accounted for within the 3.00 trips per diesel fueling position trip rate, but this assumption is unsubstantiated. Similarly, the 2,400 SF mini-mart/convenience store oriented toward the truck/diesel fuel pumps is unaccounted for, as there is no certainty that the small trip rate directly associated with the diesel fuel pumps fully accounts for activity within the mini-mart. Ignoring these two key components of the Project will likely lead to underestimation of the Project's trip generation, which could, in turn, result in understatement of the Project's traffic impacts.

We also question the approach taken with regard to estimating the number of trips generated by the proposed 4,800 SF sit-down restaurant. For trip generation purposes, the size of the proposed restaurant has been arbitrarily reduced by 1,000 SF to reflect an apparent guess concerning the size of the existing Subway sandwich shop within the Chevron station where trip data was collected. In other words, the traffic analysis addresses a 3,800 SF restaurant, instead of the actual 4,800 SF facility. While the intent is to account for the fact that the Subway trips are included within the total number of trips counted at the Chevron driveway, the validity of the specific adjustment is not adequately demonstrated.

**Exhibit 14.** As MRO explains, PEG has taken steps to arbitrarily reduce the number of trips to the Project for purposes of the Traffic Impact Study, resulting in an analysis that does not allow for an honest assessment of the associated environmental impacts.

Third, PEG's queue length results are not credible. As MRO explains in detail, PEG used queue lengths of 5, 10, and 13 feet. However, no cars are this length, which results in inaccurate conclusions.

*Queue Length Results Are Not Credible* – Table 10 (p. 10) in the PEG report provides the "Intersection Queuing Summary" for Existing Conditions. At the Nees Avenue/I-5 Southbound Ramps intersection, the table indicates a 13-foot queue on the southbound approach. At the Nees Avenue/Northbound Ramps intersection, a 5-foot queue is shown on the eastbound approach and a 10-foot queue on the northbound approach.

These results lack credibility, as there are no vehicles on the American road system that are as little as 5, 10, or even 13 feet long. Similar errors are evident in PEG Table 11 (p. 10), which presents the Existing Plus Project queue lengths (13 feet, for example). Even the Cumulative 2037 With Project queue lengths presented in PEG Table 14 (p. 11) are as short as 15 feet (on the eastbound approach at Nees Avenue/I-5 Northbound Ramps).

We note that the "passenger car" design vehicle designated in Exhibit 2-3 (p. 21) in the document, *A Policy on Geometric Design of Highways and Streets* (American Association of State Highway and Transportation Officials, 2004) is 19-feet long. According to the User Guide for the Synchro 9 software used to calculate the intersection levels of service, the standard

August 18, 2017

Page 15

convention is to assume that a passenger car in a queue consumes 25 feet. (Reference: Trafficware, *Synchro Studio 9 User Guide*, August 18, 2015)

Of course, as noted in the PEG traffic study, 17 percent of the existing traffic at the study intersections consists of trucks. According to Caltrans, trucks are as long as 72 feet. (Reference: Caltrans, *Highway Design Manual*, May 7, 2012, Figures 404.5A and 404.5B, pp. 400-15 and 400-16) Such a vehicle would consume at least 75 feet in a queue.

Claiming that the queues associated with development of the Project will be less than the length of an average passenger car represents a substantial deficiency in the analysis. Such an irrational result raises questions regarding the credibility of the analysis as a whole.

Queuing is a serious potential safety issue for the proposed Project, which is a truck stop. Trucks are slow to stop and start and occupy significantly more length of a highway off-ramp than passenger cars. If queues extend beyond highway off-ramps, it poses a safety concern on the ramp and mainline freeway as well as the County roads. PEG's incorrect queue length calculations prohibit a meaningful analysis of whether a queuing issue is associated with the Project.

Fourth, there are deficiencies with PEG's freeway merge/diverge analysis. The analysis results are simply wrong. Based on PEG's analysis, the merge/diverge density is lower with the Project being built than what exists currently:

The second issue is that the analysis results are wrong. Review of the merge/diverge calculations presented in PEG Appendix F reveals that the addition of the project traffic results in lower density values at the two off-ramps than under "no project" conditions (i.e., the additional traffic results in improved operations). This is true for both Existing Plus Project and Cumulative Plus Project conditions. (Because Near-Term No Project results were not provided, it is not possible to establish whether this issue applies to that time frame, as well.) To illustrate this point, we have prepared Table 3, which presents the detailed density values for existing and cumulative conditions, both with and without the Project.

We have highlighted in yellow the cells within the table that indicate improved operations following the addition of Project-generated traffic. This result is illogical and should have represented a red flag for the analyst that something is wrong.

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August 18, 2017

Page 16

Table 3 Detailed Freeway Merge/Diverge Analysis Results <sup>1</sup>								
Ramp	Existing		Existing Plus Project		2037 No Project		2037 Plus Project	
	Density <sup>2</sup>	LOS <sup>3</sup>	Density	LOS	Density	LOS	Density	LOS
NB Off-Ramp	32.5	D	31.3	D	72.9	F	71.7	F
NB On-Ramp	29.0	D	29.0	D	65.7	F	65.7	F
SB Off-Ramp	26.8	C	25.7	C	61.8	F	60.6	F
SB On-Ramp	22.9	C	22.9	C	54.5	F	54.5	F

Notes:  
<sup>1</sup> Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016, Table 17, p. 19.  
<sup>2</sup> Passenger cars/mile/lane.  
<sup>3</sup> Level of service.

**Exhibit 14.** Plainly, the construction of the Project will not result in fewer merges or diverges from the highway. This fundamental flaw calls into question PEG’s conclusion that “[t]he construction of the Project and pending project is not expected to cause a reduction in the [levels of service]. Therefore, the Project does not cause a significant impact with respect to merging and diverging at the ramps.”

Fifth, PEG failed to consider how traffic growth on I-5, the main (indeed, nearly exclusive) source of visitors to the Project would impact cumulative traffic volumes at the Project. PEG used an annual growth rate of 1.0 to estimate traffic volumes in 2037. This approach ignores the fact that traffic volumes on Paul Negra Road and Nees Avenue are linked to traffic volumes on I-5. As MRO explains, PEG’s analysis in Figure 4 of the PEG report acknowledges this point, as it shows that 90 percent of the Project-related traffic is oriented to/from I-5. Therefore, as traffic on I-5 grows, traffic volumes on Paul Negra Road will also grow.

For both daily and peak hour periods, Caltrans projects the volume on I-5 to grow by 180 percent between 2011 and 2035. Over that 24-year period, that equates to an annual growth rate of 7.5 percent. This is obviously considerably higher than the 1.0 percent per year assumption in the PEG traffic analysis.

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August 18, 2017

Page 17

Consequently, PEG's analysis substantially underestimated the year 2037 traffic volumes on Nees Avenue and Paul Negra Road. This will lead, in turn, to understatement of the vehicular delay values at the study intersections, so that no meaningful indication of the future level of service is provided for those locations. The degraded "no project" level of service that is certain to result from the use of more realistic future traffic estimates increases the probability that addition of the Project-generated traffic will result in a significant impact under Fresno County significance criteria. That is, as traffic increases on Nees Avenue and the I-5 freeway ramps, it becomes increasingly likely that the critical movements at the study intersections will operate at unacceptable levels of service and that addition of the Project traffic will cause the delays on those critical movements to increase by 5.0 seconds or more.

The analysis must be revised to reflect the level of traffic growth projected by Caltrans and to provide an accurate indication of the operating conditions at the study intersections.

Sixth, the MRO report identifies issues with PEG's analysis of the internal trip reduction rates and the pass-by trips. The PEG trip generation estimate also includes a 20 percent internal trip reduction, based on information presented in Tables 7.1 and 7.2 in Second Edition (June 2004) of the *ITE Trip Generation Handbook*. However, the only 20 percent values in the referenced tables are for trips from one retail use to another retail use in the weekday PM peak hour of adjacent street traffic. Of course, the PEG study addresses the Sunday peak hour, so it would appear that the assumed 20 percent value does not apply.

The PEG analysis assumes that 15 percent of the trips at the Project will be "pass-by" trips; that is, they represent vehicles that were already passing by the site on Paul Negra Road, which enter the site rather than continuing on to the existing Chevron station. While the PEG study correctly recognizes that the standard pass-by trip rates documented in the *ITE Trip Generation Handbook* do not apply (because of the limited volume of traffic passing by the site), it does not adequately describe the derivation of or justify the use of the 15 percent value employed in the analysis.

The MRO Report thoroughly explains the shortcomings of the PEG report. In several instances, the PEG report relies on "evidence that is clearly inaccurate or erroneous or evidence that is not credible," which does constitute substantial evidence. § 15064(f)(5).

Based on the PEG report, the County concluded that the "proposed Interstate Freeway Interchange Commercial Development will cause a "significant traffic impact by increasing the Traffic Index (TI) on Nees Avenue between the subject parcel and the Interstate Highway 5 northbound ramps by a significant amount (at least 0.5)." However, the County fails to identify responsive mitigation for this impact as required by CEQA. The only mitigation measure required was to add a two-inch Hot Mix Asphalt overlay on Nees Avenue and Paul Negra Road

August 18, 2017

Page 18

between the subject parcel and the I-5 northbound ramps and therefore, no analysis exists in the PEG report or by the County that this mitigation measure will address the impacts associated with additional traffic at the Project. Therefore, the County's conclusion that with mitigation, traffic would cause a less than significant impact is unsupported and flawed.

### **3. The County Failed to Respond to Questions Posed in the Initial Study**

Using an "Initial Study Environmental Checklist Form," the County completed an "Evaluation of Environmental Impacts" and concluded that a mitigated negative declaration was appropriate for the Project. Both documents include the same series of questions to which the County must respond. In several instances, the County failed to respond to the questions proposed in the "Evaluation of Environmental Impacts" document.

First, as already explained above, the County failed to address the question presented about the impact a groundwater well would have on the existing aquifer and groundwater recharge. *See* Comment 1.

Second, in Section IX.E of the Initial Study, the County similarly failed to analyze or answer the question put before it. In this section, the County had to determine if the project would create or contribute run-off which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted run-off. The County concluded that there would be a "less than significant impact" by stating:

*According to the Development Engineering Section of the Fresno County Department of Public Works and Planning, any additional runoff generated by development of the proposed Interstate Freeway Interchange Commercial Development cannot be drained across property lines and must be retained onsite per County Standards. This mandatory requirement will be included as a Project Note.*

The County's response does not address how the water would be retained onsite and disposed. There is no analysis of potential environmental impacts associated with polluted runoff.

Third, the County's conclusion to section II titled Agricultural and Forestry Resources similarly fails to address the questions presented. Here too, the County concluded that the Project would have a "less than significant impact" on agricultural and forestry resources, but its response does not address several of the questions presented. The County wrote that it will require that "prior to occupancy, the owner of the subject parcel shall acknowledge the inconveniences and discomforts associated with agricultural land uses." Having a property owner acknowledge the Fresno County Right-to-Farm Notice does not respond to the questions posed.

August 18, 2017

Page 19

An initial study must meaningfully analyze the questions presented based on reliable evidence to determine whether an EIR, a negative declaration, or a mitigated negative declaration is required. *See generally* 14 CCR § 15063. The Initial study provides “documentation of the factual basis for finding” that a mitigated negative declaration is appropriate. 14 CCR § 15063. The County’s Initial Study must honestly assess the questions presented to determine if the Project will have a significant impact or not. An initial study is deficient if it fails to analyze a component of the Project. *Lighthouse*, 131 Cal.App.4th 1170 at 1195 (initial study did not reflect that the City ever considered or assessed the environmental effect of the revisions on city plans regarding future off-leash dog use at park).

“When the informational requirements of CEQA are not complied with, an agency has failed to proceed in a manner required by law and has therefore abused its discretion.” *Id.* at 1200 (internal citations removed). The County’s efforts here have fallen short in many regards. Accordingly, the decision to propose a mitigated negative declaration is based on incomplete conclusions and should not be adopted.

#### **4. The County Has Improperly Deferred Mitigation Measures**

In Section XVII.D of the Initial Study, the County analyzed whether the project had sufficient water supplies available from existing entitlements and resources or whether new or expanded entitlements are needed. The County concluded that the Project would have a “less than significant impact with mitigation incorporated.” However, to mitigate the significant impact, the County relied solely on the Applicant obtaining a permit from the State Water Resources Control Board, Division of Drinking Water:

*Prior to completion of the Site Plan Review (SPR) required for the proposed Interstate Freeway Interchange Commercial Development, the Applicant shall submit for any permits required by the State Water Resources Control Board, Division of Drinking Water for operation of a Non-Transient Non-Community Water System. Additionally, the Applicant shall comply with State mandatory permitting requirements as listed in the Project Notes for Unclassified Conditional Use Permit No. 3528. Further, proof of acceptance by the State regarding the design of the Non-Transient Non-Community Water System, and authorization from the State to operate the Non-Transient Non-Community Water System must be provided to the County prior to granting occupancy to the proposed Interstate Freeway Interchange Commercial Development.*

This response does not address the fundamental issue that there is no evidence to show that the Project has sufficient water supplies available from existing entitlements and resources. The San Luis Water District stated it will not issue a “will-serve” letter for the Project. **Exhibit**

August 18, 2017

Page 20

9. The County did not evaluate the environmental impacts associated with pumping groundwater to meet the daily water demand of the Project nor how to treat the water, given its salinity and concentrations in excess of California's Secondary Drinking Water Standards, and thus the mitigation measures are unresponsive to environmental impacts associated with those activities.

Similarly, in section VI.E, the County included a mitigation measure requiring the Applicant to submit "[s]pecific design and capacity details for the" onsite wastewater treatment system. As already explained above, there are serious shortcomings with the O.S.T. Report. By including as a mitigation measure the requirement that the Applicant design and construct an onsite wastewater treatment system that can address grey water and black water treatment, the County is improperly using mitigation by allowing the Applicant to conduct another study at a later time that will be free from public scrutiny and a robust inquiry into environmental effects. *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 307.

Generally, it's improper for an Agency to defer mitigation by relying on future planning or studies. *Id.* at 306-07; *see also* 14 CCR § 15126.4 ("formation of mitigation measures should not be deferred until some future time."). The ability to treat the wastewater onsite should be meaningfully evaluated now, as a part of the Initial Study, and not deferred to a later date. "A study conducted after approval of a project will inevitably have a diminished influence on decision making. Even if the study is subject to administrative approval, it is analogous to the sort of post hoc rationalization of agency actions that has been repeatedly condemned in decisions construing CEQA." *Sundstrom*, 202 Cal.App.3d at 306.

Finally, as explained in comment 2, the mitigation measure proposed for addressing the significant impact relating to traffic is non-responsive to the impact identified. The County concluded that the "proposed Interstate Freeway Interchange Commercial Development will cause a "significant traffic impact by increasing the Traffic Index (TI) on Nees Avenue between the subject parcel and the Interstate Highway 5 northbound ramps by a significant amount (at least 0.5)." The only mitigation measure required was to add a two-inch Hot Mix Asphalt overlay on Nees Avenue and Paul Negra Road between the subject parcel and the I-5 northbound ramps. This mitigation measure is unresponsive to the impact identified because it does nothing to alleviate the increase in traffic.

5. **The County Failed to Meaningfully Analyze Whether the Project has Cumulatively Considerable Impacts**

The Initial Study concludes that "[n]o cumulatively considerable impacts were identified in the project analysis." (IS section XVII.B.) Such a conclusory statement does not satisfy the lead agency's requirement to evaluate whether the Project would have a cumulative impact or

August 18, 2017

Page 21

presents cumulatively considerable impacts. The lead agency must analyze whether potentially significant environmental impacts would have a cumulative impact—not merely state whether the Applicant identified cumulatively considerable impacts in the project analysis.

Initial Studies are used to “[p]rovide documentation of the factual basis for the finding in a Negative Declaration that a project will not have a significant effect on the environment.” 14 CCR § 15063(c)(5). Regarding cumulative impacts, the lead agency must consider whether the cumulative impact is significant and whether the project’s incremental effect, though individually limited, is cumulatively considerable. 14 CCR § 15064(h)(1). This includes an evaluation of the effects of probable future projects. *Id.*

Here, the County’s analysis is merely perfunctory. In a single sentence the County stated that cumulatively considerable impacts were not identified. This sentence appears to shift the burden to the applicant to identify a cumulatively considerable impact for the County’s consideration. But the County, as the lead agency, is charged with determining whether cumulatively considerable impacts exists on such issues as water, air and traffic. *Id.* The County failed to do so.

**6. The County Did Not Address All Identified Endangered Species in the Proposed Mitigation Measures**

The Initial Study cited to a United States Fish and Wildlife Service (“USFWS”) comment letter dated May 17, 2016, which explained that the subject parcel contains vegetation indicative of habitat suitable for the federally-listed endangered species San Joaquin Kit Fox, Blunt-Nosed Leopard Lizard and Giant Kangaroo. (IS section IV.F.) The County summarized the Endangered Species Habitat Assessment that was performed and then identified some mitigation measures so that the Project would have a “less than significant impact with mitigation incorporated”:

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August 18, 2017

Page 22

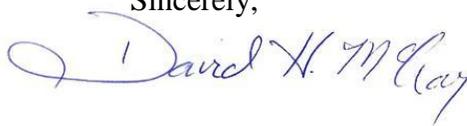
*An Endangered Species Habitat Assessment was prepared for this proposal by Colibri Ecological Consulting, LLC based upon literature review, database review [including the California Natural Diversity Database (CNDDDB) and California Native Plant Society Database (CNPS)], and a reconnaissance-level field survey of the subject parcel which included a 250-foot area around the perimeter of the subject parcel. According to the Endangered Species Habitat Assessment prepared by Colibri Ecological Consulting, LLC, no plant or wildlife species listed as endangered was observed within the boundaries of the survey area. However, due to the potential for special status wildlife species to occur on or adjacent to the subject parcel, Mitigation Measures are recommended to ensure that project impacts to sensitive biological resources are reduced to a less than significant level. These Mitigation Measures pertain to San Joaquin Kit Fox, American Badger, Burrowing Owl and nesting birds.*

The mitigation measures proposed by the County do not address the Blunt-Nosed Leopard Lizard or the Giant Kangaroo Rat. The County provided no support for why pre-construction surveys were required for the San Joaquin Kit Fox, the American Badger, the Burrowing Owl, and nesting birds but not for the Blunt-Nosed Leopard Lizard or the Giant Kangaroo Rat even though there is “potential for special status wildlife species to occur on or adjacent to the subject parcel.” Failure to provide an explanation for why there will be no significant effect on biological resources, even at the initial study phase, is impermissible. *See Deep Creek*, 2008 WL 2316322, at \*11 (“[T]he initial study’s conclusion that the project will have no significant effect on biological resources, apart from the three species as to which it concluded mitigation is or may be necessary, is based solely on general information that there is a low probability that members of the identified plant and animal species will be found on or near the project[,] which was found inadequate to discharge the “county’s duty under CEQA to engage in fully informed decisionmaking.”).

## **Conclusion**

For all of the reasons explained above, the County’s efforts have fallen below what is required under CEQA. Accordingly, the Planning Commission should not adopt the mitigated negative declaration or approve the CUP. The Applicant must be required to submit additional accurate data and information and the County should prepare either a revised Initial Study or an EIR for this Project incorporating the issues raised above.

Sincerely,



David H. McCray

Enclosures

# **EXHIBIT 1**

Operations Statement

N/W Corner of I-5 and Nees

APN = 005-100-475

1. Nature of Operation

Proposed is an Interstate Highway Travel Center for automobiles and transport trucks. Included is a +/- 12,000 square foot building that will have a Mini-mart for autos, a Mini-mart for trucks, a full size QSR (Quick Serve Restaurant) with drive thru, Food Court with 3 or 4 mini Quick Serve restaurants, trucker showers and laundry, and restrooms.

Outside to the East will be a 10 space covered fuel depot for transport trucks (Big Rigs). To the West will be 2 auto fuel canopies with 6 MPD each, offering 2 fuel brands. North of the auto fuel canopies will be a "LP for Sale" area and a truck/motorhome parking area of +/- 59 short term spaces. To the South is a designated area for storm drainage and above ground fuel storage tanks.

2. Operational Time Limits

The entire site will be open for business 24 hours a day, 7 days a week and 52 weeks a year.

3. Daily Customer Visits

On the East side truck fueling canopy, there will be approximately 300 visits for re-fueling and 300 stops for food and/or sundries from the Mini-mart.

On the West side automobile fueling canopies, the expectation is for 1500 combined fuel and food visitors per day.

The total for the site is approximately 2100 trips per day, with an average of 87 vehicles per hour.

4. Employees

Large QSR	16 daily employees
4 food court QSR's	16 daily employees
Truck Mini-mart	8 daily employees
Car Mini-mart	8 daily employees
Grounds Keepers	4 daily employees

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Total            52 daily employees  
                     +/- 4 shifts of 13 employees

There will be no employees who live on site.

5. Service and Delivery Vehicles

There will be at least 1 fuel delivery per day. Other deliveries include groceries, beverages and sundries for both Mini-marts at 1 each per day. Also deliveries of food and supplies for each of the Quick Serve Restaurants at 1 each per day.

Total of 7 per day during the week and none during the weekend.

6. Access to the Site

Proposed, there is 1 entrance to the site for trucks and 2 entrances for cars and RV's. There are 4 additional access points to the site that will serve mostly as Exit points for the trucks & RV's.

All Entrances and Exits front on Paul Negra Road, which is a continuation of Nees Avenue and the On and Off ramps for North and South bound I-5.

7. Parking Spaces

There are	69	Auto Parking Spaces
	24	Auto Refueling Spaces
	2	L.P. Refueling Spaces
	7	RV Only Spaces
	59	Transport Truck Spaces
	10	Transport Truck Refueling Spaces

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171 Total Parking

8. Goods and Services Sold Onsite

Naturally, gasoline and diesel fuel are the main focus of the goods for sale.

The Mini-mart will sell typical Mini-mart grub and beverages.

The QSR's will serve foods associated with their brand names.

The trucker's laundry and showers, offer the named serves.

9. Equipment Used

Equipment used shall be fuel tanks, fuel pumps, mini-mart marketing equipment, QSR cooking equipment and so on, as might be typical for the designated use.

10. Supplies Used

Supplies used will be typical for designated use.

11. Does Use Cause and Unsightly Appearance

Of all approximately 12 uses proposed on site none will be unsightly, cause glare, dust, or bad odor.

Typical unmodified diesel transport trucks are not usually noisy or loud. If 20 or so were running in one place on site it might get noisy. However, due to the sites proximity to I-5, the onsite noise will be less. No matter what, there will be the ever present smell of burnt diesel fuel (exhaust). Perhaps cloaked a bit by the smell of fried hamburgers and French fries that is emitted by the hood exhaust at the QSR's.

12. Solid and Liquid Waste

In terms of trash (garbage), solid wastes will include un-eaten/un-used food, waste paper and boxes. These items will be recycled and stored in one of several trash enclosures located on

site. Several times a week a local refuse company will pick up these items and transport them back to their facilities. This includes grease and oils from the QSR's.

Solid waste as in terms of sewers will be properly conditioned and treated then pumped to leach areas where shown on site plan. Please note that the proposed owner wishes for any sewer/sewage studies that will be required to be a condition of approval rather than be required prior to approval.

Liquid waste as in the form of grey water will be pumped to a condition/treatment facility on site. There, usable landscape irrigation water will be separated, treated and pumped to a holding tank for use on landscape areas.

The remaining waste water will be combined back into the sewer system and deployed into the leach field.

### 13. On-site Water

Water will be coming from a newly developed onsite well. Water will be tested and treated per Health Department Standards. The proposed owner wishes that testing and reports and engineering be a condition of approval item (to be dealt with at permit phase....if it goes that far).

Based on similar uses along I-5 it is estimated that 2000 gallons of fresh water a day will be used by the Mini-marts, QSR's, Restrooms and showers.

### 14. Advertising

An 80' tall pole sign is proposed at the Northern end of the property.

It will have the names of the onsite businesses on it, as well as pricing for fuel. Plans and permits by others. A tall sign is needed to help notify travelers well enough in advance for them to slow down and move safely to the off ramp.

Another sign will be between driveways on Paul Negra Road. This sign will be a monument sign with the names of onsite businesses as well as fuel pricing. Plans and permits by others.

Other signs onsite will be the standard fuel canopy logos and names along with business names on the building. Plans and permits by others.

### 15. Buildings

Currently, the site is vacant. All proposed buildings will be new. Please see proposed elevations. (to be submitted)

### 16. Building

All buildings proposed will be for the use at this site. See proposed elevations (to be submitted).

### 17. Outdoor Lighting

Outdoor lighting will be handled by 30' tall parking lot lights in parking areas, wall packs on buildings and recess lights in fuel canopies. All lighting shall meet the minimums for Title 24 and CalGreen.

#### 18. Landscaping

Landscaping will consist of drought tolerant trees and shrubs.

Irrigation for landscaping will be drip and use recycled water when available.

The entire property (except in front of automobile fuel canopies) will be fenced with chain link.

Vinyl lats will be installed where visual barriers are needed to block the view of onsite equipment and drainage ponds.

#### 19. Other Information

The property is subject to Section 860 of the Zoning Ordinance.

Per that Ordinance all of I-5 thru Fresno County is identified as a "Scenic Highway in the Open Space and Conservation Element". The description of the "Scenic Corridor" is very vague as to where it starts and ends.

Also, the site is listed as a minor Commercial Center per Section 860 A.2.a and requires a Site Plan Review Application. The Site Plan as proposed may be subject to Policy 05-L.3.d.3.

# **EXHIBIT 2**



## Inter Office Memo

DATE: April 6, 2016  
TO: Derek Chambers, Development Services Division  
FROM: Janet Gardner, Environmental Health Division  
SUBJECT: CUP 3528, IS 7104; Shiralian, Interstate Highway Travel Center

LU0018451  
PE 2611

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PROJECT DESCRIPTION: Proposal to allow an Interstate Freeway Interchange Commercial Development comprised of a restaurant, market, automobile fueling station, truck fueling station, laundry facility, shower facility, liquefied petroleum gas sales, photovoltaic solar power generation system on a 10.1-acre parcel in the AE-40 Zone District.

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1. Is there sufficient information for you to evaluate the probable environmental impacts of this project?  
 Yes  No, the following information is needed:  
See Additional Comments below
2. What potential adverse impacts will the project have on the vicinity or inhabitants of the project itself?
3. Are the potential impacts, identified in Question 2, significant enough to warrant the preparation of an EIR?  
 Yes  No
- 4a. If the project is approved, what conditions of approval are necessary to implement County plans and policies or to protect the public health, safety, and general welfare?
- 4b. Please identify specific existing regulations, standards, or routine processing procedures which would mitigate the potential impacts identified in Question 2, or to implement the conditions identified in Question 4a.

State of California, Water Code  
State of California, Plumbing Code  
State of California, Code of Regulations

5. Additional Comments:

An evaluation of the Operations Statement provided by the applicant and 2013 California Plumbing Code Appendix H yields an **estimated wastewater flow of 15,980 gallons per day not including proposed laundry and shower facilities**. The estimated sewage flows and required disposal areas indicated on the site plan are grossly inadequate in addressing the area required for wastewater treatment and/or disposal. Given the extent of proposed development, the 10.1 acre parcel appears inadequate to accommodate the required wastewater disposal needs of the project. **In order to complete the Initial Study and Environmental Checklist, a more comprehensive evaluation of the sewage treatment and disposal system must be provided.**

Derek Chambers  
CUP 3528, IS 7104  
April 6, 2016  
Page 2 of 2

There is another Interstate Commercial Center adjacent to this proposed project, across county lines in Merced County. It is highly recommended the two developments connect for sewer and water services.

Given the volume and extent of proposed operations, an Environmental Impact Report may be warranted.

Prior to closure of the initial study, comments from the State Water Resources Control Board and Regional Water Quality Control Board (RWQCB) should be received and incorporated in the initial study findings. Use of recycled, treated waste water is under the jurisdiction of the State Water Resources Control Board. Discharge to land of treated waste water is under the jurisdiction of the Regional Water Quality Control Board (RWQCB).

The site plan shall clearly indicate the two water wells located on the parcel: one permitted as a domestic private water well with a proposed 20-foot annual seal and the other as a public supply water well with proposed 50-foot seal. (Water Well permits issued in 2015)

cc. Betsy Lichti, California Water Resources Control Board  
Scott Moore, Regional Water Quality Control Board  
Scott Hatten, Regional Water Quality Control Board

CUP3528 EHD comments.doc

# **EXHIBIT 3**



## Inter Office Memo

DATE: March 6, 2017  
TO: Derek Chambers, Development Services Division  
FROM: Janet Gardner, Environmental Health Division  
SUBJECT: CUP 3528, IS 7104; Shiralian, Interstate Highway Travel Center

RECEIVED  
COUNTY OF FRESNO

MAR 06 2017

LU0018451  
PE 2611

DEPARTMENT OF PUBLIC WORKS  
AND  
DEVELOPMENT DIVISION

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PROJECT DESCRIPTION: Proposal to allow an Interstate Freeway Interchange Commercial Development comprised of a restaurant, market, automobile fueling station, truck fueling station, laundry facility, shower facility, liquefied petroleum gas sales, photovoltaic solar power generation system on a 10.1-acre parcel in the AE-40 Zone District.

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1. Is there sufficient information for you to evaluate the probable environmental impacts of this project?  
 Yes  No, the following information is needed:
2. What potential adverse impacts will the project have on the vicinity or inhabitants of the project itself?
  - The potential adverse impacts caused by this project could include (but are not limited to) water quality degradation, noise, odors and vectors.
3. Are the potential impacts, identified in Question 2, significant enough to warrant the preparation of an EIR?  
 Yes  No
- 4a. If the project is approved, what conditions of approval are necessary to implement County plans and policies or to protect the public health, safety, and general welfare?
- 4b. Please identify specific existing regulations, standards, or routine processing procedures which would mitigate the potential impacts identified in Question 2, or to implement the conditions identified in Question 4a.

State of California, Water Code  
State of California, Plumbing Code  
State of California, Code of Regulations

5. Additional Comments:

**From experience on other Travel Centers along I5, the number of visitors per day is grossly underestimated at 1500 leading to water and wastewater estimates to also be significantly underestimated.**

The following shall be included as a mitigation measure:

**The sewage feasibility report submitted by O.S.T. System Designs, Inc. (dated July 5, 2016) indicates the parcel can support an Onsite Wastewater Treatment System (OWTS) for the proposed project. Prior to the issuance of building permits for each structure connecting to an OWTS, specific design and capacity details for the OWTS shall be approved by the California Regional Water Quality Control Board.**

The following shall be included as project notes:

- Prior to issuance of building permits for each food facility, the applicant shall submit complete food facility plans and specifications to the Fresno County Department of Public Health, Environmental Health Division, for review and approval. And prior to operations, the operator shall apply for and obtain a permit to operate a food facility from the Fresno County Department of Public Health, Environmental Health Division Contact the Consumer Food Protection Program at (559) 600-3357 for more information.
- The applicant shall obtain their license to sell alcoholic beverages prior to alcohol sales. Contact the California Alcoholic Beverage Control Department at (559) 225-6334 for more information.
- Facilities proposing to use and/or store hazardous materials and/or hazardous wastes shall meet the requirements set forth in the California Health and Safety Code (HSC), Division 20, Chapter 6.95, and the California Code of Regulations (CCR), Title 22, Division 4.5. Any business that handles a hazardous material or hazardous waste may be required to submit a Hazardous Materials Business Plan pursuant to the HSC, Division 20, Chapter 6.95 (<http://cers.calepa.ca.gov/> or <https://www.fresnocupa.com/>). The default State reporting thresholds that apply are:  $\geq 55$  gallons (liquids),  $\geq 500$  pounds (solids),  $\geq 200$  cubic feet (gases), or at the threshold planning quantity for extremely hazardous substances.
- A spill prevention control and countermeasure plan (SPCC) is required for aboveground petroleum storage tanks with greater than or equal to 1320-gallons of storage capacity. (Storage capacity means the aggregate capacity of all aboveground tanks and containers at a tank facility.)
- The applicant should contact their local Fire Authority concerning construction and installation requirements for aboveground fuel storage tanks.
- All hazardous waste shall be handled in accordance with requirements set forth in the California Code of Regulations (CCR), Title 22, Division 4.5. This Division discusses proper labeling, storage and handling of hazardous wastes.

# **EXHIBIT 4**

## **Chambers, Derek**

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**From:** Parks, Jennifer  
**Sent:** Thursday, May 25, 2017 3:17 PM  
**To:** Chambers, Derek  
**Subject:** RE: Revised project for review and comment - IS 7104 and CUP 3528

A Hydro-Study will likely be required but we are requesting further information about water quantity. The Water, Geology and Natural Resources Division feels that the estimated water usage for the facility is low. We would like additional information as to how as to how the applicant arrived upon 2000 gallons per day. Also if the applicant could also submit a copy of the well drillers log.

Jennifer Parks  
Engineering Tech II  
Department of Public Works and Planning  
Division of Development Services  
Ph: 559-600-4279

### **How are we doing?**

Please take a couple minutes to complete our new [Super Short Customer Service Survey](#).  
Development Engineering

---

**From:** Chambers, Derek  
**Sent:** Thursday, May 25, 2017 9:09 AM  
**To:** Parks, Jennifer <jparks@co.fresno.ca.us>  
**Subject:** FW: Revised project for review and comment - IS 7104 and CUP 3528  
**Importance:** High

Good morning Jennifer,

May I have Water comments for IS Application No. 7104 – CUP Application No. 3528? That's the last thing I need to complete processing.

The hyperlink in the email below will access the latest routing package for this application.

Thank you for your help,

Derek Chambers, Planner  
Development Services Division  
Fresno County Public Works and Planning  
(559) 600-4205 voice  
(559) 600-4200 fax

Public Works and Planning is continuing to work to improve customer services provided by the Department. Your feedback on how we are doing would be greatly appreciated. Please take a few minutes to complete our short Customer Service Survey at the following link: [Short Customer Service Survey](#)

---

**From:** Chambers, Derek

**Sent:** Thursday, March 02, 2017 4:43 PM

**To:** Ramirez, Augustine <[auramirez@co.fresno.ca.us](mailto:auramirez@co.fresno.ca.us)>; Mtunga, Tawanda <[tmtunga@co.fresno.ca.us](mailto:tmtunga@co.fresno.ca.us)>; Ishii, Randy <[rishii@co.fresno.ca.us](mailto:rishii@co.fresno.ca.us)>; Daniele, Frank <[FDaniele@co.fresno.ca.us](mailto:FDaniele@co.fresno.ca.us)>; Lopez, Nadia <[nllopez@co.fresno.ca.us](mailto:nllopez@co.fresno.ca.us)>; Alimi, Mohammad <[malimi@co.fresno.ca.us](mailto:malimi@co.fresno.ca.us)>; Siemer, Dale <[DSiemer@co.fresno.ca.us](mailto:DSiemer@co.fresno.ca.us)>; Allen, Glenn <[glallen@co.fresno.ca.us](mailto:glallen@co.fresno.ca.us)>; Gardner, Janet <[jgardner@co.fresno.ca.us](mailto:jgardner@co.fresno.ca.us)>; Tsuda, Kevin <[KTsuda@co.fresno.ca.us](mailto:KTsuda@co.fresno.ca.us)>; Padilla, Dave@DOT <[dave.padilla@dot.ca.gov](mailto:dave.padilla@dot.ca.gov)>; Navarro, Michael@DOT <[michael.navarro@dot.ca.gov](mailto:michael.navarro@dot.ca.gov)>; Michael Corder <[Michael.Corder@valleyair.org](mailto:Michael.Corder@valleyair.org)>

**Subject:** Revised project for review and comment - IS 7104 and CUP 3528

Good day,

The Department of Public Works and Planning, Development Services Division is reviewing the subject applications proposing to allow an Interstate Freeway Interchange Commercial Development comprised of a restaurant, market, automobile fueling station, truck fueling station, laundry facility, shower facility, Liquefied Petroleum Gas (LPG) sales, photovoltaic solar power generation system to provide electricity to the proposal, and a 100-foot tall marquee sign on a 10.10-acre parcel in the AE-40 (Exclusive Agricultural, 40-acre minimum parcel size) Zone District.

The subject parcel is located on the northwest corner of Interstate 5 (I-5) and Nees Avenue, approximately 17 miles west of the nearest city limits of the City of Firebaugh (Sup. Dist. 1) (APN 005-100-47s).

Please utilize the following hyperlink to access information regarding this project:

[-CUP3528 Routing Pkg 5.pdf](#)

We must have your comments by **March 17, 2017** and comments received after this date may not be used.

Please address any correspondence or questions related to environmental and/or policy/design issues to me, Derek Chambers, Planner, Development Services Division, Fresno County Department of Public Works and Planning, 2220 Tular Street, Sixth Floor, Fresno, CA 93721, or call (559) 600-4205, or email [dchambers@co.fresno.ca.us](mailto:dchambers@co.fresno.ca.us)

Thank you,

Derek Chambers, Planner  
Development Services Division  
Fresno County Public Works and Planning  
(559) 600-4205 voice  
(559) 600-4200 fax

Public Works and Planning is continuing to work to improve customer services provided by the Department. Your feedback on how we are doing would be greatly appreciated. Please take a few minutes to complete our short Customer Service Survey at the following link: [Short Customer Service Survey](#)

# **EXHIBIT 5**

## Chambers, Derek

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**From:** Chambers, Derek  
**Sent:** Friday, June 02, 2017 4:47 PM  
**To:** 'Bob Shockley'  
**Cc:** E-ZTRIP@msn.com; 'ty kharazi'  
**Subject:** RE: I-5 / Nees commercial development - CUP 3528

Sorry Bob,

We can't proceed to Planning Commission Hearing without the CEQA analysis that is being held up by this water issue.

Regarding the water issue, the Operational Statement identifies 2,000 gallons per day as the water usage; however, staff from the State Water Resources Control Board informed me that commercial developments comparable to that being proposed utilize about 1,000 gallons of water per hour. This is a pretty substantial difference, and a serious issue as the project site is located in a designated Water-Short Area.

Do you or your team have any data to support the 2,000 gallons per day usage? If you do, it would greatly help.

Thank you,

Derek Chambers, Planner  
Development Services Division  
Fresno County Public Works and Planning  
(559) 600-4205 voice  
(559) 600-4200 fax

Public Works and Planning is continuing to work to improve customer services provided by the Department. Your feed back on how we are doing would be greatly appreciated. Please take a few minutes to complete our short Customer Service Survey at the following link: [Short Customer Service Survey](#)

---

**From:** Bob Shockley [mailto:bshockley@netptc.net]  
**Sent:** Friday, June 02, 2017 12:11 PM  
**To:** Chambers, Derek <dchambers@co.fresno.ca.us>  
**Cc:** E-ZTRIP@msn.com; 'ty kharazi' <tkharazi@yahoo.com>  
**Subject:** RE: I-5 / Nees commercial development - CUP 3528

Aloha Derek,

Ty is a good guy.  
He is the owner's attorney.  
I have no clue who the other people are.

As far as the well and water goes.  
If you will recall, Janet Gardner of Fresno county EH would not entertain commenting on the project until a well was dug and water tested.  
That was over a year and a half ago. The owner spent several hundred thousand dollars having a well bored by Nor-Cal Pump.

Nor-Cal pulled a permit.

I do not know the results of the testing. All I know is that there is plenty of water to be had.

I think that waiting yet another 6 months and spending even more money to have the engineering done and approved by the state...for an approved public water system, it should be a condition of approval.

Just to verify...we are still scheduled for Planning Commission on June 29<sup>th</sup>...correct.

Mahalo,

Bob

---

**From:** Chambers, Derek [<mailto:dchambers@co.fresno.ca.us>]

**Sent:** Friday, June 2, 2017 10:58 AM

**To:** Bob Shockley

**Cc:** [E-ZTRIP@msn.com](mailto:E-ZTRIP@msn.com)

**Subject:** I-5 / Nees commercial development - CUP 3528

Hello Bob,

I wanted to let you know that we received a letter on Wednesday from H. Ty Kharazi of the law firm Yarra, Kharazi, Clason & Aniotzbehere requesting to be placed on the mailing list for public notice.

For informational purposes, the contact information I have for H. Ty Kharazi and the law firm Yarra, Kharazi, Clason & Aniotzbehere is as follows:

2000 Fresno Street, Suite 300  
Fresno, CA 93721

(559) 441-1214 voice  
(559) 441-1215 fax  
[www.YKA-LAW.com](http://www.YKA-LAW.com)

We have also been contacted by Kaitlyn D. Shannon of the law firm Beveridge & Diamond, who were provided a copy of the CUP 3528 project folder contents in accordance with a Public Records Act (PRA) Request made by their firm.

For informational purposes, the contact information I have for Kaitlyn D. Shannon and the law firm Beveridge & Diamond is as follows:

456 Montgomery Street, Suite 1800  
San Francisco, CA 94104

(415)-262-4020 voice  
(415)-262-4040 fax  
[KShannon@bdlaw.com](mailto:KShannon@bdlaw.com)

Additionally, with regard to status, while trying to finalize the Initial Study (IS) CEQA analysis I was informed that there are some issues with the project site with regard to water availability and there may also be issues with the ability of the water wells to be utilized for the project as the design of said wells may not be compatible with State permitting requirements for non-residential drinking water. I am currently working with the County Health Department, our Water/Geology/Natural Resources staff, and the State Water Resources Control Board's Division of Drinking Water to resolve these issues as soon as possible.

Sincerely,

Derek Chambers, Planner  
Development Services Division

Fresno County Public Works and Planning  
(559) 600-4205 voice  
(559) 600-4200 fax

Public Works and Planning is continuing to work to improve customer services provided by the Department. Your feedback on how we are doing would be greatly appreciated. Please take a few minutes to complete our short Customer Service Survey at the following link: [Short Customer Service Survey](#)

# **EXHIBIT 6**

## Chambers, Derek

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**From:** SHAWN SHIRALIAN <E-ZTRIP@msn.com>  
**Sent:** Friday, June 02, 2017 5:32 PM  
**To:** Chambers, Derek  
**Cc:** Bob Shockley; ty kharazi  
**Subject:** Re: I-5 / Nees commercial development - CUP 3528

Dereck,

We drilled a well that pumps 300 gallons a minute. I don't know what CEQA is but whatever it is we should be able to provide that. We didn't wait for Water Board.

Shawn Shiralian

Sent from my iPhone

On Jun 2, 2017, at 4:47 PM, Chambers, Derek <[dchambers@co.fresno.ca.us](mailto:dchambers@co.fresno.ca.us)> wrote:

Sorry Bob,

We can't proceed to Planning Commission Hearing without the CEQA analysis that is being held up by this water issue.

Regarding the water issue, the Operational Statement identifies 2,000 gallons per day as the water usage; however, staff from the State Water Resources Control Board informed me that commercial developments comparable to that being proposed utilize about 1,000 gallons of water per hour. This is a pretty substantial difference, and a serious issue as the project site is located in a designated Water-Short Area.

Do you or your team have any data to support the 2,000 gallons per day usage? If you do, it would greatly help.

Thank you,

Derek Chambers, Planner  
Development Services Division  
Fresno County Public Works and Planning  
(559) 600-4205 voice  
(559) 600-4200 fax

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**From:** Bob Shockley [<mailto:bshockley@netptc.net>]  
**Sent:** Friday, June 02, 2017 12:11 PM  
**To:** Chambers, Derek <[dchambers@co.fresno.ca.us](mailto:dchambers@co.fresno.ca.us)>  
**Cc:** E-ZTRIP@msn.com; 'ty kharazi' <[tkharazi@yahoo.com](mailto:tkharazi@yahoo.com)>  
**Subject:** RE: I-5 / Nees commercial development - CUP 3528

Aloha Derek,

Ty is a good guy.  
He is the owner's attorney.  
I have no clue who the other people are.

As far as the well and water goes.  
If you will recall, Janet Gardner of Fresno county EH would not entertain commenting on the project until a well was dug and water tested.  
That was over a year and a half ago. The owner spent several hundred thousand dollars having a well bored by Nor-Cal Pump.

Nor-Cal pulled a permit.  
I do not know the results of the testing. All I know is that there is plenty of water to be had.  
I think that waiting yet another 6 months and spending even more money to have the engineering done and approved by the state...for an approved public water system, it should be a condition of approval.

Just to verify...we are still scheduled for Planning Commission on June 29<sup>th</sup>...correct.

Mahalo,  
Bob

---

**From:** Chambers, Derek [<mailto:dchambers@co.fresno.ca.us>]  
**Sent:** Friday, June 2, 2017 10:58 AM  
**To:** Bob Shockley  
**Cc:** [E-ZTRIP@msn.com](mailto:E-ZTRIP@msn.com)  
**Subject:** I-5 / Nees commercial development - CUP 3528

Hello Bob,

I wanted to let you know that we received a letter on Wednesday from H. Ty Kharazi of the law firm Yarra, Kharazi, Clason & Aniotzbehere requesting to be placed on the mailing list for public notice.

For informational purposes, the contact information I have for H. Ty Kharazi and the law firm Yarra, Kharazi, Clason & Aniotzbehere is as follows:  
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(559) 441-1214 voice  
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[www.YKA-LAW.com](http://www.YKA-LAW.com)

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456 Montgomery Street, Suite 1800  
San Francisco, CA 94104

(415)-262-4020 voice

(415)-262-4040 fax  
[KShannon@bdlaw.com](mailto:KShannon@bdlaw.com)

Additionally, with regard to status, while trying to finalize the Initial Study (IS) CEQA analysis I was informed that there are some issues with the project site with regard to water availability and there may also be issues with the ability of the water wells to be utilized for the project as the design of said wells may not be compatible with State permitting requirements for non-residential drinking water. I am currently working with the County Health Department, our Water/Geology/Natural Resources staff, and the State Water Resources Control Board's Division of Drinking Water to resolve these issues as soon as possible.

Sincerely,

Derek Chambers, Planner  
Development Services Division  
Fresno County Public Works and Planning  
(559) 600-4205 voice  
(559) 600-4200 fax

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# **EXHIBIT 7**

## Chambers, Derek

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**From:** Chambers, Derek  
**Sent:** Monday, June 05, 2017 5:31 PM  
**To:** 'Bob Shockley'  
**Cc:** 'E-ZTRIP@msn.com'; 'ty kharazi'; Kettler, William; Motta, Chris  
**Subject:** I-5 / Nees commercial development - CUP 3528

Hello Bob,

While staff is appreciative of the concerns of you and your client, the issue of water supply to the project site is an important one, and its resolution is necessary to finalize the project's CEQA document and schedule the proposal before the Planning Commission. In that regard, the Operational Statement identifies 2,000 gallons per day as the total water usage for the proposal; however, the State Water Resources Control Board has informed us that commercial developments comparable to that being proposed utilize a substantially greater amount of water. As an example, the "Firebaugh Travel Plaza" located northwesterly adjacent to your client's project site, utilizes approximately 51,200 gallons of water per day for a gas station with mini mart, truck wash, and restaurant. Additionally, the "Sommerville Almond Tree RV Park" located at the southwest corner of I-5 and Jayne Avenue utilizes approximately 24,240 gallons of water per day for 85 RV spaces, two gas stations with mini marts, and a restaurant. Further, a prior land use application filed on your client's project site in 2002 (CUP Application No. 3013), which ultimately was withdrawn by the applicant, estimated 19,500 gallons per day of water usage for a gas station with mini mart, and a restaurant.

Considering the discrepancy between the proposed water usage and the water usage documented for similar developments, it is requested that you provide a break-down of the estimated daily water for each use proposed with CUP No. 3528 (i.e. mini mart, gas station, restaurant, shower facilities, laundromat).

Staff thanks you for providing the water quality report prepared by BSK Associates; however, please be aware that said report did not analyze the capacity (i.e. output) of the wells located on your client's project site. Additional well information is being reviewed with staff of the State Office of Drinking Water. I should note that the State has requested if your client made any effort to pursue water system consolidation with the existing commercial center to the north located in Merced County.

Staff appreciates your concerns regarding completion of CUP application processing; however, water sustainability is a very important issue in this case as the project site is located in a designated Water-Short area. It is also important to determine if this project will be able to satisfy State permitting requirements regarding drinking water as indicated above.

We would appreciate receiving your updated information regarding estimates for on-site water consumption.

This water issue must be resolved in order to complete the Initial Study (IS) CEQA environmental analysis that must be circulated for 30-day State Clearinghouse Review prior to Planning Commission Hearing. As such, CUP Application No. 3528 will not be scheduled for the June 29, 2017 Planning Commission Hearing.

Sincerely,

Derek Chambers, Planner  
Development Services Division  
Fresno County Public Works and Planning  
(559) 600-4205 voice  
(559) 600-4200 fax

Public Works and Planning is continuing to work to improve customer services provided by the Department. Your feedback on how we are doing would be greatly appreciated. Please take a few minutes to complete our short Customer Service Survey at the following link: [Short Customer Service Survey](#)

# **EXHIBIT 8**

August 11, 2017

Mr. Amin Salkhi, President  
Grand Petroleum, Inc.  
1451 Danville Boulevard, Suite 201  
Alamo, CA 94507

**Subject: Review of Applicant's Water Use Estimate and Calculation of Daily Water Use for the Proposed E-Z Trip Travel Center, Fresno County, California**

Dear Mr. Salkhi:

As requested, Carollo Engineers, Inc. has reviewed the Applicant's water use estimate and calculated the daily water use for the proposed truck stop facility in Fresno County, California. We calculate the daily water demand as 43,585 gallons per day not including landscape irrigation and 46,938 gallons per day including landscape irrigation. Our calculations and the support for those calculations are provided in the following four attachments to this letter.

1. Engineer's Calculation of Daily Water Use of Applicant's Proposed Truck Stop
2. Footnotes to Engineer's Calculation of Daily Water Use of Applicant's Proposed Truck Stop
3. Restroom Water Use per Day Calculation Sheet
4. Figure 1 - Reference Evapotranspiration Zones

Carollo's calculated daily water use varies significantly from the water use estimate developed by the Applicant. The Applicant initially estimated a daily water use of 2,000 gallons per day which was not supported by quantification or narrative explanation. This number was later revised to 26,179 gallons per day based on International Association of Plumbing and Mechanical Officials (IAPMO) water usage tables. The water usage tables are more typically used to identify maximum flow rates in a building structure which in turn are used for sizing the plumbing pipelines and fixtures in a building rather than calculating daily water use.

Carollo's calculations are based on quantities provided by the Applicant in their revised Operations Statement dated February 3, 2017 and on information derived from the civil site plan, the landscaping plan, and the architectural floor plan submitted by the Applicant with their Conditional Use Permit application to Fresno County, California. Carollo used daily water demand values from reliable sources including government agencies and trade associations along with conservatively projected use rates to calculate a daily water use for the proposed truck stop.

Please feel free to contact at me at your convenience if you have any questions or need additional information related to Carollo's daily water use calculation.

Mr. Amin Salkhi, President  
Grand Petroleum, Inc.  
August 11, 2017

Page 2

Sincerely,

CAROLLO ENGINEERS, INC.



Eric McGrath, P. E.  
Project Manager

ETM: etm

Enclosures

1. Engineer's Calculation of Daily Water Use of Applicant's Proposed Truck Stop
2. Footnotes to Engineer's Calculation of Daily Water Use of Applicant's Proposed Truck Stop
3. Restroom Water Use per Day Calculation Sheet
4. Figure 1 - Reference Evapotranspiration Zones

cc: Mr. Kenneth B. Finney, Beveridge & Diamond, P. C.  
Ms. Kaitlyn D. Shannon, Beveridge & Diamond P. C.

**CONFIDENTIAL - ATTORNEY WORK PRODUCT**

**Engineer's Calculation of Daily Water Use of Applicant's Proposed Truck Stop**

This document calculates daily water use of the Applicant's proposed truck stop in Fresno County, California. The calculation uses water use factors along with the count of various water use items and a corresponding demand rate for each water use. The calculated daily water use results include subtotals for daily water demands for non-irrigation water use and irrigation water use. The quantity counts used are from the Applicant's Operations Statement revised February 3, 2017 and the construction plan sheets submitted along with the Applicant's Conditional Use Permit application to Fresno County. The footnote number column references footnote numbers detailing sources, projections and other relevant information related to the corresponding water use item.

Water Use (description of count)	Demand Rate Units	Count		Demand Rate		Daily Water Use Estimate (gallons)	Footnote Number
<b>Laundry</b> (count of number of clothes washing machines)	gpd per machine	4	x	500	=	2,000	1
<b>24 Hour Full Service Restaurant Meals Including Dishwashing</b> (count of number of restaurant seats)	gpd per seat	204	x	100	=	20,400	2
<b>Mini-Mart Convenience Store</b> (count per 100 square feet of floor space)	gpd per 100 sq. ft. of retail space	70.5	x	60	=	4,230	3
<b>Showers</b> (count of number of shower facilities)	gallons per day per shower facility	6	x	272	=	1,632	4
<b>Restroom Use by Men</b> (count by number of restroom facility uses by men)	gallons per restroom use	2,494	x	2.15	=	5,362	5
<b>Restroom Use by Women</b> (count by number of restroom facility uses by women)	gallons per restroom use	2,494	x	2.60	=	6,484	5
<b>Ice Making Machines</b> (number of ice making machines)	gallons per day per ice machine	2	x	1000	=	2,000	6
<b>Floor Mopping</b> (count per square feet of floor, mopping 3 times per day)	square footage mopped per gallon of water used	46,182	/	164	=	282	7
<b>Exterior Cleaning</b> (count by number of wash downs per day at flow of 3 gpm)	minutes of hose use per exterior wash down	3	x	90	=	270	8
<b>Employee Water Use</b> count by number of employees	gallons per employee	37	x	25	=	925	9
<b>Subtotal (Not Including Irrigation)</b>					=	<b>43,585</b>	NA
<b>Landscape Irrigation</b> (count by square footage of landscaped area)	gallons per day	See Footnote	x	See Footnote	=	3,353	10
<b>Subtotal (Landscape Irrigation)</b>					=	<b>3,353</b>	NA
<b>Total Estimated Daily Water Use (gallons per day)</b>					=	<b>46,938</b>	NA

**CONFIDENTIAL – ATTORNEY WORK PRODUCT**

**Footnotes to Engineer’s Calculation of Daily Water Use at Applicant’s Proposed Truck Stop**

The following provides information supporting the count, the demand rate unit, and the demand rate used in preparing the engineer’s calculation of daily water consumption for the Applicant’s proposed truck stop in Fresno County, California. The **daily water use item** for each water use along with the **resultant value** is provided in **bold print**.

**1. Laundry**

The count is the number of clothes washing machines at the truck stop = 4 (per Applicant’s floor plan)

The demand rate unit is gallons per day (gpd) per washing machine.

High efficiency washers use approximately 25 gallons per cycle, this value is near the average of the values in the post-retrofit column of Table 4 in the following link to the California Urban Water Conservation Council, <http://www.cuwcc.org/Research-Portal/High-efficiency-washers>. This value is substantiated by the United States Geological Survey (USGS) which indicates newer washing machines use 25 gallons per cycle whereas older washing machines use 40 gallons per cycle as discussed in the following link <https://water.usgs.gov/edu/qa-home-percapita.html> A value of 25 gallons per wash cycle was used in the calculation.

Conservatively projecting 20 uses per day per machine for determining the demand rate, the demand rate = (25 gallons per cycle) x (20 cycles per day) = 500 gallons per day per washing machine use.

Using the count and the demand rate:

**Laundry Daily Water Use** = (4 washing machines) x (500 gpd/washing machine) = **2,000 gallons per day**

**2. 24 Hour Full Service Restaurant Meals Including Dishwashing**

The count is the number of restaurant seats = 204 seats (per the Applicant’s Operations Statement)

The demand rate unit is gallons per day per restaurant seat.

The demand rate used is 100 gpd per seat for truck stop along freeway as provided in the *Ohio Environmental Protection Agency Guidelines for Design of Small Public Ground Water Systems* published by the Division of Drinking and Groundwaters dated 2015 which is provided in the following link <http://epa.ohio.gov/portals/28/documents/engineering/greenbook.pdf>

Using the count and the demand rate:

**Restaurant Daily Water Use** = (204 seats) x (100 gpd per seat) = **20,400 gallons per day.**

**3. Mini-Mart Convenience Store**

The count is per 100 square feet of floor space = 70.5 hundreds of square feet (per Applicant’s floor plan).

The demand rate unit is gallons per day per 100 square feet of retail space.

The demand rate used is 60 gpd per 100 sq. ft. of retail space as provided in the North Carolina Administrative Code, Title 15A Environmental Quality, Chapter 02 Environmental Management, Sub-Chapter T, Section 02T.0114 entitled Wastewater Design Flow Rates which is available at the following link.

<http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20t/15a%20ncac%2002t%20.0114.pdf>

Using the count and the demand rate:

**Mini-Mart Daily Water Use** = (70.5 hundreds of sq. ft.) x (60 gpd/100 sq. ft.) = **4,230 gallons per day.**

#### **4. Showers**

The count is the number of shower facilities = 6 shower facilities (per Applicant's floor plan)

The demand rate unit is gallons per day per shower facility

The average shower uses approximately 17 gallons of water per the Portland Water Bureau of Portland Oregon as provided in the following link <https://www.portlandoregon.gov/water/article/305153>.

Therefore the demand rate = (17 gallons/shower) x (16 showers/day/shower facility) = 272 gpd/shower facility.

Using the count and the demand rate:

**Showers Daily Water Use** = (6 shower facilities) x (272 gpd/shower) = **1,632 gallons per day.**

#### **5. Restroom Use by Men and Women**

The count is by number of restroom uses by men and women. The number of restroom uses by men is 2,494 per day and the number of restroom uses by women is 2,494 per day. See the *Restroom Water Use per Day Calculation Sheet* for details.

The demand rate unit is gallons per restroom use. The demand rate = 2.15 gallons per use for men and 2.60 gallons per use by women. See the *Restroom Water Use per Day Calculation Sheet* for details.

Per the United States Geological Survey (USGS) Water Science School the current US standard is 1.6 gallons per toilet flush, the USGS also indicates that 1 gallon of water is used for each hand/face washing as detailed in the following link <https://water.usgs.gov/edu/ga-home-percapita.html>

Per US Environmental Protection Agency the current US standard for bathroom urinals is 1.0 gallon per flush as discussed in the following link <https://www.epa.gov/sites/production/files/2017-01/documents/ws-products-factsheet-urinals.pdf>

Using the counts and the demand rates:

**Men's Restroom Daily Water Use** = (2,484 restroom uses) x (2.15 gallons/restroom use) = **5,362 gallons per day**

**Women's Restroom Daily Water Use** = (2484 restroom uses) x (2.60 gallons/restroom use) = **6,484 gallons per day**

## 6. Ice Making Machines

The count is by number of ice making machines = 2 (per Applicant's floor plan)

The demand rate unit is gallons per day per ice machine.

A study entitled *A Field Study to Characterize Water and Energy Use of Commercial Ice-Cube Machines and Quantity Savings Potential* was prepared by Fisher and Nickel of San Ramon, California for the East Bay Municipal Utility District, Pacific Gas and Electric, and Seattle Public Utilities. The report indicates that water cooled ice making machines use approximately 200 gallons of water per 100 pounds of ice produced as discussed on page 20 in the following link.

[https://fishnick.com/publications/fieldstudies/Ice\\_Machine\\_Field\\_Study.pdf](https://fishnick.com/publications/fieldstudies/Ice_Machine_Field_Study.pdf)

Using 200 gallons of water required to produce 100 pounds of ice and conservatively projecting each ice machine produces 500 pounds of ice per day the demand rate = (200 gallons/100 pounds ice) x (500 pounds ice per day) = 1,000 gpd per ice machine.

Using the count and the demand rate:

**Ice Machine Daily Water Use** = (2 ice making machines) x (1,000 gpd per ice machine) = **2,000 gallons per day**

## 7. Floor Mopping

The count is per square feet of floor mopped.

The floor area to be mopped is provided in Table 1.

Table 1 - Floor Area to be Mopped	
Location	Area (square feet)
Restaurant	2,500
Restrooms (four total)	5,844
Mini-Mart	7,050
<b>Total</b>	<b>15,394</b>

Table Note: The square footage is per the Applicant's floor plan.

Conservatively projecting floors being mopped 3 times per day = (15,394 sq. ft.) x (3 times per day) = 46,182 sq. ft./day

The demand rate unit is square footage mopped per gallon of water used.

The demand rate = 164 square feet mopped per gallon of water used per an analysis performed by Sanitary Maintenance magazine and detailed in the following link.

<http://www.cleanlink.com/cleanlinkminute/details/Water-Usage-During-Restroom-Mopping--50493>

Using the count and the demand rate:

**Floor Mopping Daily Water Use** = (46,182 sq. ft./day) / (164 sq. ft. mopped/gallon water used) = **282 gallons per day**

## 8. Exterior Cleaning

Exterior cleaning involves the use of a garden hose at a flow rate of 3 gallons per minutes to wash down hardscape surfaces adjacent to the truck stop main building structure. The main building of the truck stop has sidewalks of varying width on three sides of the building and a parking on the fourth side and there are 8 separate entrances into the building. These are the hardscape surfaces that will require daily cleaning.

The count is the number of hose wash downs per day = 3 hose wash downs/day

The demand rate unit is minutes of hose wash down per day (at flow rate of 3 gpm)

The demand rate = (30 minutes/hose wash down) x ( 3 gallons/minute) = 90 gallons/hose wash down

Using the count and the demand rate:

**Exterior Cleaning Daily Water Use** = (3 hose wash downs/day) x (90 gallons/hose wash down) = **270 gallons per day.**

## 9. Employee Water Use

The count is by the number of employees = 37 (per the Applicant's Operations Statement dated February, 2017)

The demand rate used is 25 gpd per employee per shift as provided in the North Carolina Administrative Code, Title 15A Environmental Quality, Chapter 02 Environmental Management, Sub-Chapter T, Section 02T.0114 entitled Wastewater Design Flow Rates which is available at the following link.

<http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2002%20-%20environmental%20management/subchapter%20t/15a%20ncac%2002t%20.0114.pdf>

Using the count and the demand rate:

**Employee Daily Water Use** = (37 employees) x (25 gallons/employee) = **925 gallons per day**

## 10. Landscape Irrigation Water Use Estimation

The count is by square footage of landscaped area = 113,172 square feet as provided in the Site Statistics of the project site plan, sheet 1.1 dated 15 January 2017

The demand rate unit is gallons per day per square foot of landscaped area

The irrigation water demand estimate is per ANSI/ASABE S623 which is jointly published by the American National Standards Institute (ANSI) and the American Society of Agricultural and Biological (ASABE) Engineers as provided in the following link though the University of California Division of Agriculture and Natural Resources Center for Landscape and Urban Horticulture and is available at the following link.

[http://ucanr.edu/sites/UrbanHort/Water\\_Use\\_of\\_Turfgrass\\_and\\_Landscape\\_Plant\\_Materials/SLIDE\\_Simplified\\_Irrigation\\_Demand\\_Estimation/](http://ucanr.edu/sites/UrbanHort/Water_Use_of_Turfgrass_and_Landscape_Plant_Materials/SLIDE_Simplified_Irrigation_Demand_Estimation/)

The landscape water use calculation method uses ANSI/ASABE S623 and the associated Simplified Landscape Irrigation Demand Estimation (SLIDE) Equation.

The SLIDE Equation is as follows.

Landscape Water Demand (gallons) =  $ET_o \times PF \times LA \times 0.623$

Where:

$ET_o$  = Evapotranspiration (inches)

PF = Plant Factor per ANSI/ASABE S623 Table 1 (unitless)

LA = Landscape Area (square feet)

0.623 = Conversion factor (for inches to gallons)

$ET_o = 57.9$  inches/year

The  $ET_o$  value is the evapotranspiration rate in units of inches per year. The rate is for Zone 15 per the State of California Department of Water Resources, California Irrigation Management Information System, see Figure 1.

PF = 0.3

(Plant factor used is for desert adapted plants)

LA = 113,172 square feet

(Per Site Statistics provided on project site plan, sheet 1.1 dated 15 January 2017)

**Irrigation Daily Water Use** =  $ET_o \times PF \times LA \times 0.623 = (57.9) \times (0.3) \times (113,172) \times (0.623) = 1,224,691$   
gallons/year = **3,353 gallons per day**

**CONFIDENTIAL - ATTORNEY WORK PRODUCT**  
**Restroom Water Use per Day Calculation Sheet**

**Vehicle Stops**

Vehicle Stop Type	Vehicle Stops per Day	Number of People per Vehicle	Number of People per Day
Trucks Fueling Stops	300	1	300
Trucks Mini-Mart Stops	300	1	300
Auto Fueling Stops	1,500	3.5	5,250
Restaurant Customers	400	2	800
<b>Total</b>	<b>2,500</b>	<b>Not Applicable</b>	<b>6,650</b>

Notes:

- (1) Vehicle Stops per Day taken from Applicant's Operations Statement dated February 3, 2017
- (2) For automobile fueling stops, the calculation takes into account that multiple people can be within a vehicle. Additionally, buses and vans are included in the automobile fueling stops category which can carry more people than a car.

**Water Demand Rate**

User	Toilet (gallons per use)	Percentage Toilet Use (percent)	Urinal (gallons per use)	Percentage Urinal Use (percent)	Lavatory (gallons per use)	Restroom Water Use (gallons per use)
Male	1.6	25%	1.0	75%	1.0	2.15
Female	1.6	100%	Not Applicable	Not Applicable	1.0	2.60

Notes:

- (1) Toilet and urinal gallons per use per current US national standards
- (2) Each toilet or urinal use includes a lavatory use

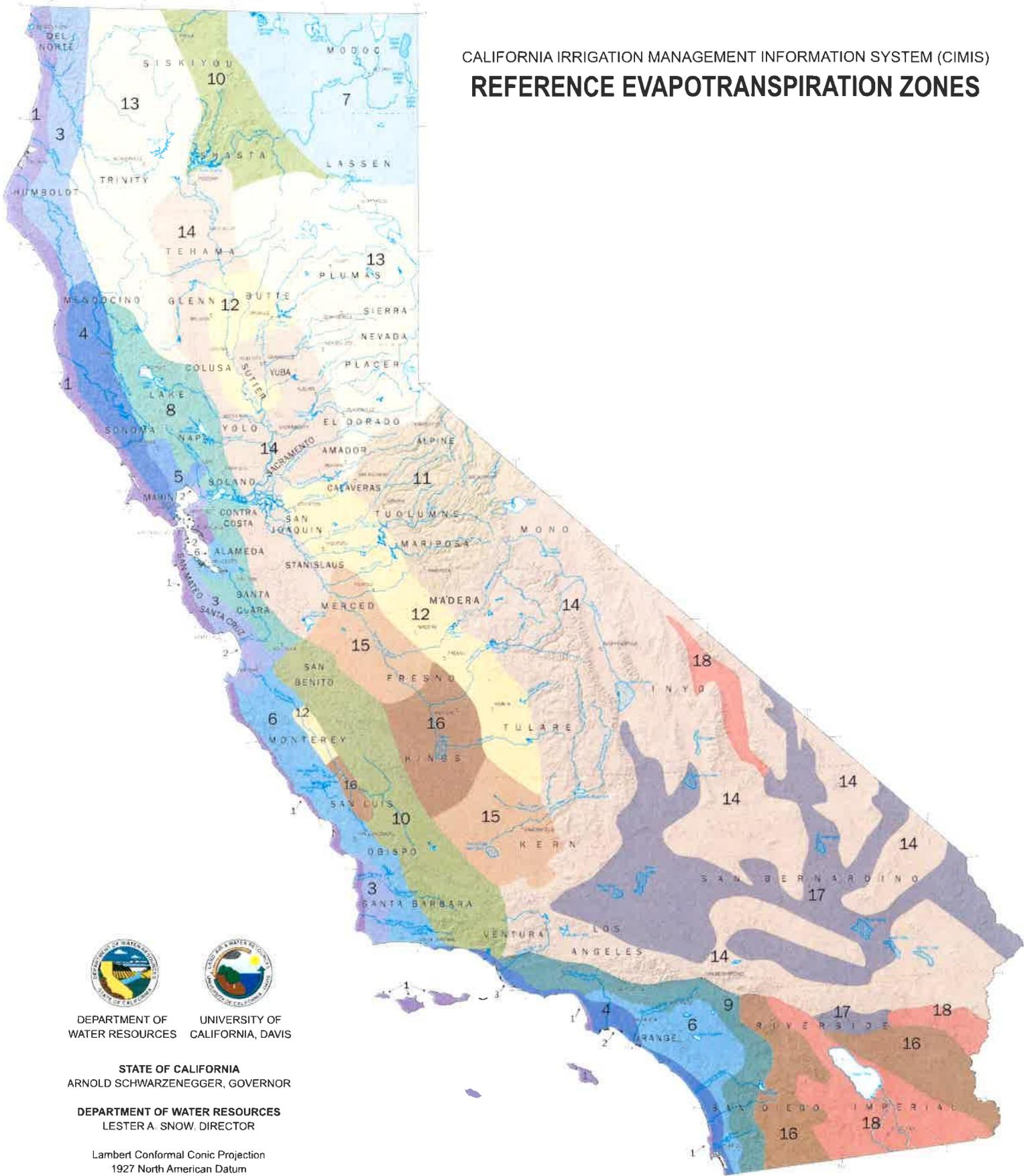
**Water Use**

Sex	Number per Day	Percentage Using Restroom	Number of Restroom Uses	Restroom Water Use (gallon/use)	Restroom Water Use per Day (gallons/day)
Male	3,325	75%	2,494	2.15	5,362
Female	3,325	75%	2,494	2.60	6,484
	<b>Total</b>		<b>4,988</b>	Not Applicable	<b>11,845</b>

Notes:

- (1) The number of males and females used is a 50/50 split of total number of people per day.
- (2) Percentage of people using the bathroom is conservatively projected. It is reasonable to assume that the majority of people stopping at the truck stop are on long haul road trips and will likely use the restroom facilities.

CALIFORNIA IRRIGATION MANAGEMENT INFORMATION SYSTEM (CIMIS)  
**REFERENCE EVAPOTRANSPIRATION ZONES**



DEPARTMENT OF  
 WATER RESOURCES



UNIVERSITY OF  
 CALIFORNIA, DAVIS

STATE OF CALIFORNIA  
 ARNOLD SCHWARZENEGGER, GOVERNOR

DEPARTMENT OF WATER RESOURCES  
 LESTER A. SNOW, DIRECTOR

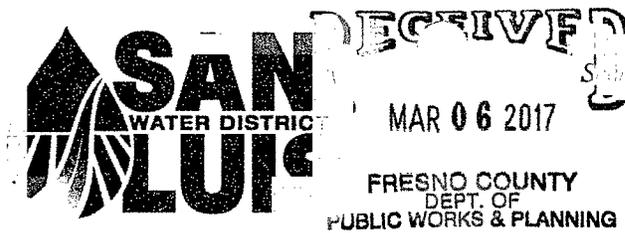
Lambert Conformal Conic Projection  
 1927 North American Datum

# **EXHIBIT 9**

**Bill Diedrich**  
*President*

**Mike Wood**  
*Vice President*

**Chris Hurd**  
*Tax Assessor/Collector*



**Tom Teixeira**  
*Secretary/Treasurer*

**Grant Craven**  
*Director*

**Lon Martin**  
*General Manager*

Date: March 15, 2016

To: Derek Chambers, Development Services Division, Fresno County Department of Public Works and Planning

Re: **Initial Study Application No. 7104 and Unclassified Conditional Use Permit No. 3528 – Revised Site Plan and Revised Operational Statement**

Dear Mr. Chambers,

Thank you for providing San Luis Water District (SLWD or District) the opportunity to comment on the possible impacts for the proposed project; we have reviewed your letter dated March 2, 2017 discussing the proposed development at Paul Negra Road and I-5.

Upon review of the application, it appears that the proposed project is anticipating utilizing a groundwater well for its water supply and will not need to depend upon the San Luis Water District for a supply or conveyance. Although the San Luis Water District is not requested to provide a Municipal and Infrastructure (M&I) water supply, and to make is abundantly clear to the applicant, the District will not provide a “can and will serve” letter to the development if requested. The property in question does not receive an M&I allocation from the United States Bureau of Reclamation’s Central Valley Project. This property may be eligible to receive an agricultural allocation. However, the planned use as contemplated by the conditional use permit is not an agricultural operation therefore the agricultural water supply is not an adequate supply.

In summary, and in accordance with District policy, the District will not provide any new development water supply from its current allocation and/or supplemental water supplies; it is the responsibility of the project proponent to secure its own supply of water outside of the District. The project proponent must independently secure an adequate water supply (quality and quantity) for the life of the project.

If you have any questions or comments in regards to this letter, please don’t hesitate to contact the District, (209) 826-4043.

Kindest Regards,

Vince Lucchesi, PE  
District Engineer, San Luis Water District

# **EXHIBIT 10**

\*The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

File Original with DWR

State of California

### Well Completion Report

Refer to Instruction Pamphlet  
No. e0332118

Page 1 of 1

Owner's Well Number \_\_\_\_\_

Date Work Began 09/01/2015 Date Work Ended 9/23/2015

Local Permit Agency Fresno County

Permit Number WP0035766 Permit Date 9/11/15

**DWR Use Only - Do Not Fill In**

State Well Number/Site Number \_\_\_\_\_

Latitude \_\_\_\_\_ Longitude \_\_\_\_\_

APN/TRS/Other \_\_\_\_\_

Geologic Log		
Orientation <input checked="" type="radio"/> Vertical <input type="radio"/> Horizontal <input type="radio"/> Angle Specify _____		
Drilling Method <input checked="" type="radio"/> Reverse Circulation Rotary <input type="radio"/> Drilling Fluid <input type="radio"/> Fresh Water		
Depth from Surface	Description	
Feet to Feet	Describe material, grain size, color, etc	
0	12	top soil
12	35	brown clay
34	79	clay with sand
79	225	brown clay w/sand
225	300	small gravel and sand
300	350	sandy clay
350	460	brownn clay
460	470	sand
470	500	pea gravel and sand
500	550	brown clay
550	575	small gravel
575	620	clay/sand
620	900	sticky clay
900	1,040	small gravel/sand
1040	1,090	clay
1090	1,130	sand/small gravel
1130	1,160	clay/sand
1160	1,200	sand
1200	1,340	clay
1340	1,350	sand
1350	1,430	clay/silt
1430	1,470	sand/gravel
1470	1,500	clay
1500	1,540	sand/silt
1540	1,650	clay
1650	1,660	sand
1660	1,710	clay
1710	1,720	sand
1720	1,750	sand/silt/clay
Total Depth of Boring <u>1750</u> Feet		
Total Depth of Completed Well <u>1750</u> Feet		

**Well Owner**

Name \_\_\_\_\_

Mailing Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

**Well Location**

Address paul negra rd. west of I-5 ramp

City Firebough County Fresno

Latitude 36 51 15 N Longitude 120 46 37 W  
Dec. Mn. Sec. Dec. Mn. Sec.

Datum \_\_\_\_\_ Dec. Lat. \_\_\_\_\_ Dec. Long. \_\_\_\_\_

APN Book 005 Page 100 Parcel 47

Township \_\_\_\_\_ Range \_\_\_\_\_ Section \_\_\_\_\_

**Location Sketch**  
(Sketch must be drawn by hand after form is printed.)

North

West

South

East

Illustrate or describe distance of well from roads, buildings, fences, rivers, etc. and attach a map. Use additional paper if necessary. Please be accurate and complete.

**Activity**

New Well  
 Modification/Repair  
 Deepen  
 Other \_\_\_\_\_  
 Destroy  
Describe procedures and materials under 'GEOLOGIC LOG'

**Planned Uses**

Water Supply  
 Domestic  Public  
 Irrigation  Industrial

Cathodic Protection  
 Dewatering  
 Heat Exchange  
 Injection  
 Monitoring  
 Remediation  
 Sparging  
 Test Well  
 Vapor Extraction  
 Other \_\_\_\_\_

**Water Level and Yield of Completed Well**

Depth to first water 900 (Feet below surface)

Depth to Static \_\_\_\_\_

Water Level 600 (Feet) Date Measured 09/23/2015

Estimated Yield \* 300 (GPM) Test Type Constant Rate

Test Length 12.0 (Hours) Total Drawdown \_\_\_\_\_ (Feet)

\*May not be representative of a well's long term yield.

Casings							
Depth from Surface	Borehole Diameter	Type	Material	Wall Thickness	Outside Diameter	Screen Type	Slot Size
Feet to Feet	(Inches)			(Inches)	(Inches)		if Any (Inches)
0	50	36	Conductor	Low Carbon Steel	.250	20	
0	950	17.5	Blank	Low Carbon Steel	.250	8	
950	1,750	17.5	Screen	PVC Sch. 80	.250	8	Milled Slots 0.080

Annular Material			
Depth from Surface	Fill	Description	
Feet to Feet			
0	50	Cement	10.3
50	1,750	Filter Pack	gravel

**Attachments**

Geologic Log  
 Well Construction Diagram  
 Geophysical Log(s)  
 Soil/Water Chemical Analyses  
 Other google map

Attach additional information, if it exists.

**Certification Statement**

I, the undersigned, certify that this report is complete and accurate to the best of my knowledge and belief

Name NorCal pump and well drilling  
Person, Firm, or Corporation

1325 Barry rd. Yuba City CA 95993  
Address City State Zip

Signed [Signature] 12/20/2016 908591  
C-57 Licensed Water Well Contractor Date Signed C-57 License Number



## Well Completion Reports

DWR is responsible for maintaining a file of well completion reports, which must be submitted whenever a driller constructs, alters, or destroys a well. This is a valuable resource and service to landowners who want to find out about subsurface geologic conditions on their property or to determine particular well construction details for their water wells. The information is also valuable to researchers trying to better understand the groundwater basin.

### Public Access to Well Completion Reports

In June 2015, **Senate Bill 83** amended **California Water Code §13752** (see below) to allow public access to Well Completion Reports. However, the law requires the Department of Water Resources to comply with **The Information Practices Act of 1977**, redacting personal information from the Well Completion Reports before making them public. Since there are about 800,000 reports on file with the Department, it requires a significant effort to redact the personal data from all reports. DWR is in the process of redacting the personal information with the goal of making all Well Completion Reports available online at no charge within the next year. If you need access to the reports before they are available online, the Department can process your request, but a fee may be charged as provided by the law. If you are interested in receiving Well Completion Reports before free online access is available, please contact your **DWR Region Office representative** for an estimate of charges.

#### California Water Code §13752.

(a) Reports made in accordance with paragraph (1) of subdivision (b) of Section 13751 shall be made available as follows:

(1) To governmental agencies.

(2) To the public, upon request, in accordance with subdivision (b).

(b) (1) The department may charge a fee for the provision of a report pursuant to paragraph (2) of subdivision (a) that does not exceed the reasonable costs to the department of providing the report, including costs of promulgating any regulations to implement this section.

(2) Notwithstanding subdivision (g) of Section 1798.24 of the Civil Code, the disclosure of a report in accordance with paragraph (2) of subdivision (a) in the possession of the department or another governmental agency shall comply with the Information Practices Act of 1977 (Chapter 1 (commencing with Section 1798) of Title 1.8 of Part 4 of Division 3 of the Civil Code).

### Well Completion Report Request Form

Passage of Senate Bill 83 necessitated a revision to the Well Completion Request form. The updated form is available here:

[Well Completion Report Request Form \(updated September 2015\)](#)

Please note that requests for Well Completion Reports are numerous and the availability of staff is limited. Clear and complete information is necessary to process your request. Unclear and/or incomplete information will delay the processing of your request.

### Other Well Forms for Well Drillers, Water Well Contractors, and Well Owners

To protect the State's groundwater supplies, the Legislature authorized the establishment of **well standards** (**Department of Water Resources Bulletins 74 81 and 74-90**) and regulations pertaining to the construction, alteration, and destruction of wells. California Water Code Section 13750.5 requires that those responsible for the construction, alteration, or destruction of water wells, cathodic protection wells, groundwater monitoring wells, or

### GROUNDWATER HOME

#### GROUNDWATER INFORMATION CENTER

[Groundwater Basics](#)

[Maps and Reports](#)

[GIC Interactive Map Application](#)

[Groundwater Management](#)

[Well Information](#)

[California Well Standards](#)

[Well Completion Reports](#)

[OSWCR](#)

[Well Basics](#)

[Well Permitting Agencies](#)

[DWR Well Inquiry Contacts](#)

[Monitoring and Data Collection](#)

[CASGEM](#)

[Water Data Library](#)

[Groundwater Contacts](#)

#### SUSTAINABLE GROUNDWATER MANAGEMENT

[CASGEM](#)

[BULLETIN 118](#)

### Highlights

[NASA Subsidence Report](#)

[Water Mgmt. Planning Tool](#)

[Initial Basin Prioritization for SGM](#)

[Geology of the Northern Sacramento Valley](#)



geothermal heat exchange wells possess a C-57 Water Well Contractor's License. This license is issued by the Contractors State License Board. California Water Code Section 13751 requires that anyone who constructs, alters, or destroys a water well, cathodic protection well, groundwater monitoring well, or geothermal heat exchange well must file with the Department of Water Resources a report of completion within 60 days of the completion of the work.

#### **Well Completion Report Form - DWR 188** (PDF 437KB)

The free Adobe Reader may be used to view and complete this form. However, software must be purchased to complete, save, and reuse a saved form.

#### **How to Get the Well Completion Report Form to Work** (PDF 881KB)

These instructions are how to use the above-linked PDF form, these instructions detail the process of making a PDF document a 'trusted document' to allow the system to populate the Well Completion Report number before you print the PDF.

#### **How to Fill Out a Well Completion Report-Instructional Pamphlet** (PDF 887 KB)

The California Water Code (Section 13700) recognizes that improperly constructed and abandoned water wells can be a source of groundwater contamination and a threat to public health. The purpose of this instruction pamphlet is to assist Water Well Contractors with filling out a Well Completion Report (WCR) to meet the requirements of California law. The Water Code requires Water Well Contractors file a WCR form with the California Department of Water Resources (Section 13751).

#### **Well Data** (PDF 249KB)

Well owners are encouraged to maintain records of their wells. The Well Data Form is a form on which well owners can record vital statistics about their well for their personal records.



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Last Modified: 09/18/2015



**DEPARTMENT OF PUBLIC HEALTH - ENVIRONMENTAL HEALTH DIVISION**  
 P.O. Box 11867 Zip 93775, 1221 Fulton Mall, Fresno, California 93721  
 Telephone: (559) 600-3357 Fax: (559) 600-7629 Website: www.fcdph.org/water  
**PERMIT TO CONSTRUCT, DEEPEN, DESTROY, RECONDITION, OR REPAIR A WELL**

9/11/2015 ASAP  
 Application Date ASAP Estimated Start Date  
 T 12 R 11 S 28  
 APN 005 - 100 - 47  
 (ex### -### -##)  
 Contractor Nor-Cal Pump and Well  
 License # 908591  
 Phone 530 674 5861  
 FAX 530 674 1525

**OFFICE USE ONLY**  
 Well Permit# 4650 WP0035766 FA# \_\_\_\_\_  
 Specialist \_\_\_\_\_ CT 8402  
 **Corcoran Clay Depth** 100 Ft  
 (see Special Corcoran Clay Annular Seal Requirements on attachment)  
 **Well Location in Flood Zone.** (Extend Casing above known flood level; Flood Elevation Certificate required to be submitted to the Fresno Co. Public Works. Dept. prior to approval of the well electrical permit.)  
 Approved ms Date 9/15/15 Seal Inspection \_\_\_\_\_ Date \_\_\_\_\_  
 Final Inspection \_\_\_\_\_ Date \_\_\_\_\_ Supervisor \_\_\_\_\_

Job Address/Location Paul Negra Road West Of I-5 Ramp Parcel Size 10.10 Acres  
 Owner Name Bholay LLC Owner Phone 559 994 3558  
 Owner Address 2416 Pinecrest Court City Fullerton State CA Zip 92835

Type of Work	Type of Well	Intended Use	Well Construction
<input checked="" type="checkbox"/> New Well <input type="checkbox"/> Replacement Well <input type="checkbox"/> Reconstruction/Deepening <input type="checkbox"/> Test Hole <input type="checkbox"/> Destruction	<input type="checkbox"/> Casing Driven <input type="checkbox"/> Cable Tool <input type="checkbox"/> Hardrock <input type="checkbox"/> Auger <input type="checkbox"/> Direct Rotary <input checked="" type="checkbox"/> Reverse Rotary	<input type="checkbox"/> Domestic Private <input checked="" type="checkbox"/> Domestic Public <input type="checkbox"/> Agricultural <input type="checkbox"/> Industrial <input type="checkbox"/> Cathodic <input type="checkbox"/> Test Hole <input type="checkbox"/> Monitoring <input type="checkbox"/> Other	Well Casing Material <u>Steel .250</u> Well Casing Diameter <u>8</u> in Well Casing Gauge <u>.250</u> Conductor Casing Material <u>Mild Steel</u> Conductor Casing Diameter <u>20</u> in Conductor Casing Depth <u>20</u> Ft Annular Seal Depth <u>50</u> Ft Borehole Diameter <u>17 1/2</u> in Gravel Pack <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**Well Destruction**  
 Type  Gravel Pack  Open Bottom  Uncased  Other \_\_\_\_\_  
 Well Diameter \_\_\_\_\_ In Total Depth \_\_\_\_\_ Ft  
 Depth to Water \_\_\_\_\_ Ft  
 Casing to be Perforated \_\_\_\_\_ Ft to \_\_\_\_\_ Ft  
 Casing cut off \_\_\_\_\_ Ft Below Grade (6ft max allowed)  
 Oil lubricated pump (**Any oil in the well shall be removed and properly disposed of prior to destruction**)

**Sealing Material/Seal Placement Method**  
 Neat Cement  Sand Cement  Concrete  
 Bentonite - Product Name \_\_\_\_\_  
 Pumped  Free Fall (**allowed only when the interval to be sealed is dry and less than 30 Ft depth**)

**Setbacks**  All setbacks exceed 300 Feet  Other Wells \_\_\_\_\_ Ft  
 Leach Lines \_\_\_\_\_ Ft  Septic Tank \_\_\_\_\_ Ft  Cesspool \_\_\_\_\_ Ft  Seepage Pits \_\_\_\_\_ Ft  
 Sewer Lines \_\_\_\_\_ Ft  Animal/Fowl Enclosure \_\_\_\_\_ Ft  Designated Sewage Replacement Area \_\_\_\_\_ Ft  
 Flood Control Basins \_\_\_\_\_ Ft  Waste Water Disposal Ponds \_\_\_\_\_ Ft  Lakes/Streams \_\_\_\_\_ Ft

**FEE**  \$605 (Domestic/Agricultural/ Cathodic/Test Hole PE4650, Public/Industrial PE4652)  \$407 (Well Destruction PE4651)  
 No Charge (Monitoring Well/Soil Boring PE4653)  
 PAYMENT METHOD  Cash  Check  Credit Card (Authorization on file with Dept. of Public Health, Env. Health Division)

I hereby certify that the information described herein is correct. I understand that all work is to be done in accordance with the California Well Standards Ordinance and the conditions of this permit application, including any conditions which are added by the Environmental Health Division upon review of this application and issuance of the permit. I certify that I have a current C-57 Contractor's License and, if I employ workers, a current certificate of Workers' Compensation Insurance. I further understand that any permit issued pursuant to this application is subject to such further conditions as may be deemed necessary to ensure compliance with the Ordinance. **Note: This permit is non-transferable and is valid for 180 days.**

CONTRACTOR SIGNATURE: [Signature] DATE: 9/11/2015

**OFFICE USE ONLY - ENVISION CLERICAL:**  
 Account# AR0036067 Invoice# 0207581  
 Entered By bbj Date 9.15.15  
 SPECIAL REQUIREMENTS: Faxed by 9.15.15 bbj

REG/RCPT#: 005-00020022 EBARBER  
 ACCOUNTING DATE: 09-15-2015  
 RECEIPT TOTAL = \$605.00  
 COM: CHECK #49642  
 REF#: PAUL NEGRA RD W OF I-5 RAMP

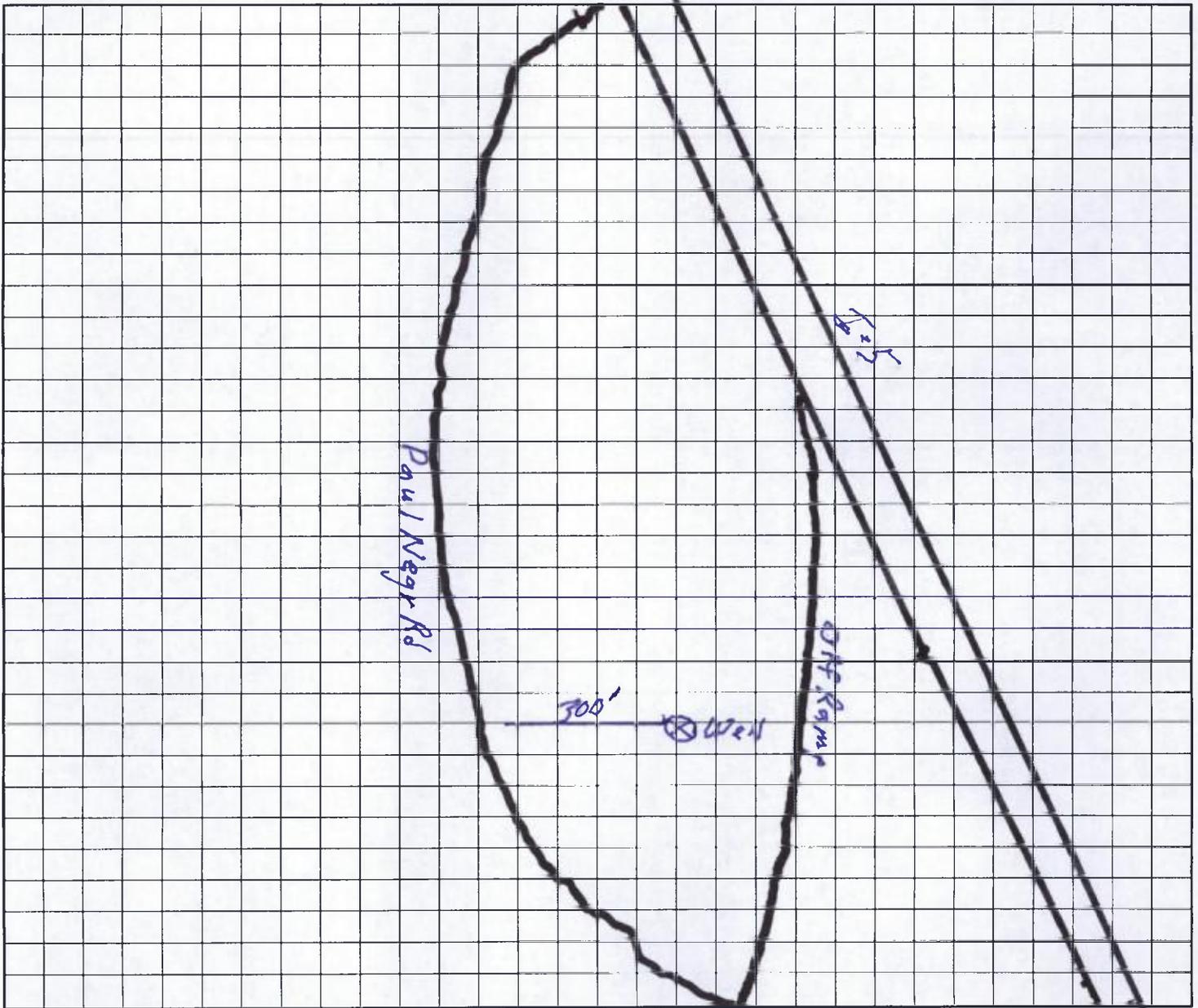


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P.O. Box 11867 Zip 93775, 1221 Fulton Mall, Fresno, California 93721  
Telephone: (559) 600-3357 Fax: (559) 600-7629 Website: [www.fcdph.org/water](http://www.fcdph.org/water)  
**PLOT PLAN TO ACCOMPANY PERMIT TO CONSTRUCT, DEEPEN, DESTROY,  
RECONDITION, OR REPAIR A WELL**

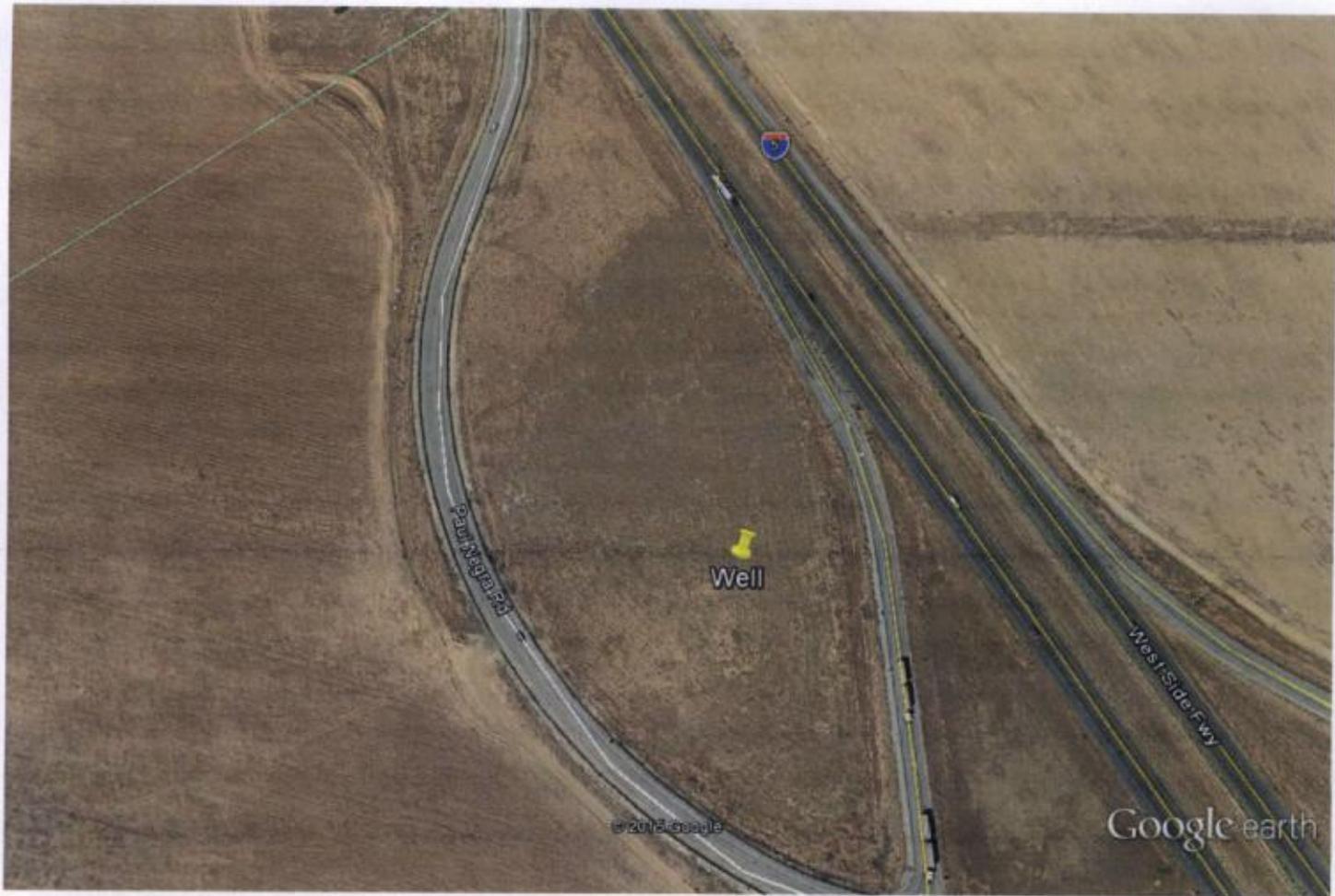
Note: This permit is non-transferable and is valid for 180 days

Job Address / Location: Paul Negra Road West Of I-5 Ramp APN: 005 / 100 / 47 PERMIT # \_\_\_\_\_

Indicate distances in feet. Provide the names of streets or roads nearest to the property. Provide dimensions of the property and all existing or proposed structures. Provide locations of existing or proposed sewage disposal systems, including expansion or repair areas, within 250 feet of the new well. Provide locations of all other wells within 300 feet of the new well. Location information shall include all adjacent parcels, if within setbacks.

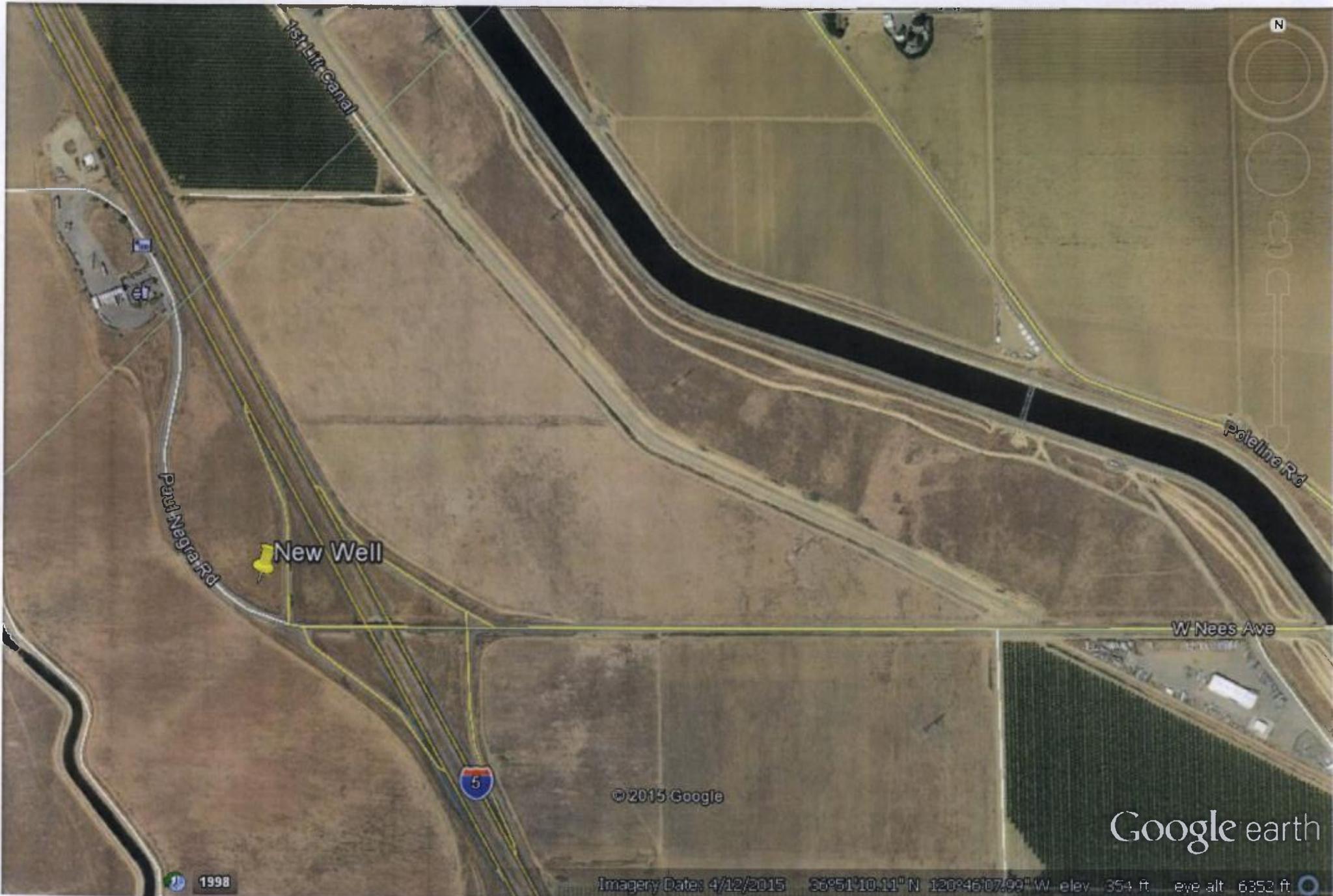


↑  
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Google earth





New Well

Patricia Negra Rd

1st Lift Canal

Poteline Rd

W Nees Ave



© 2015 Google

Google earth

1998

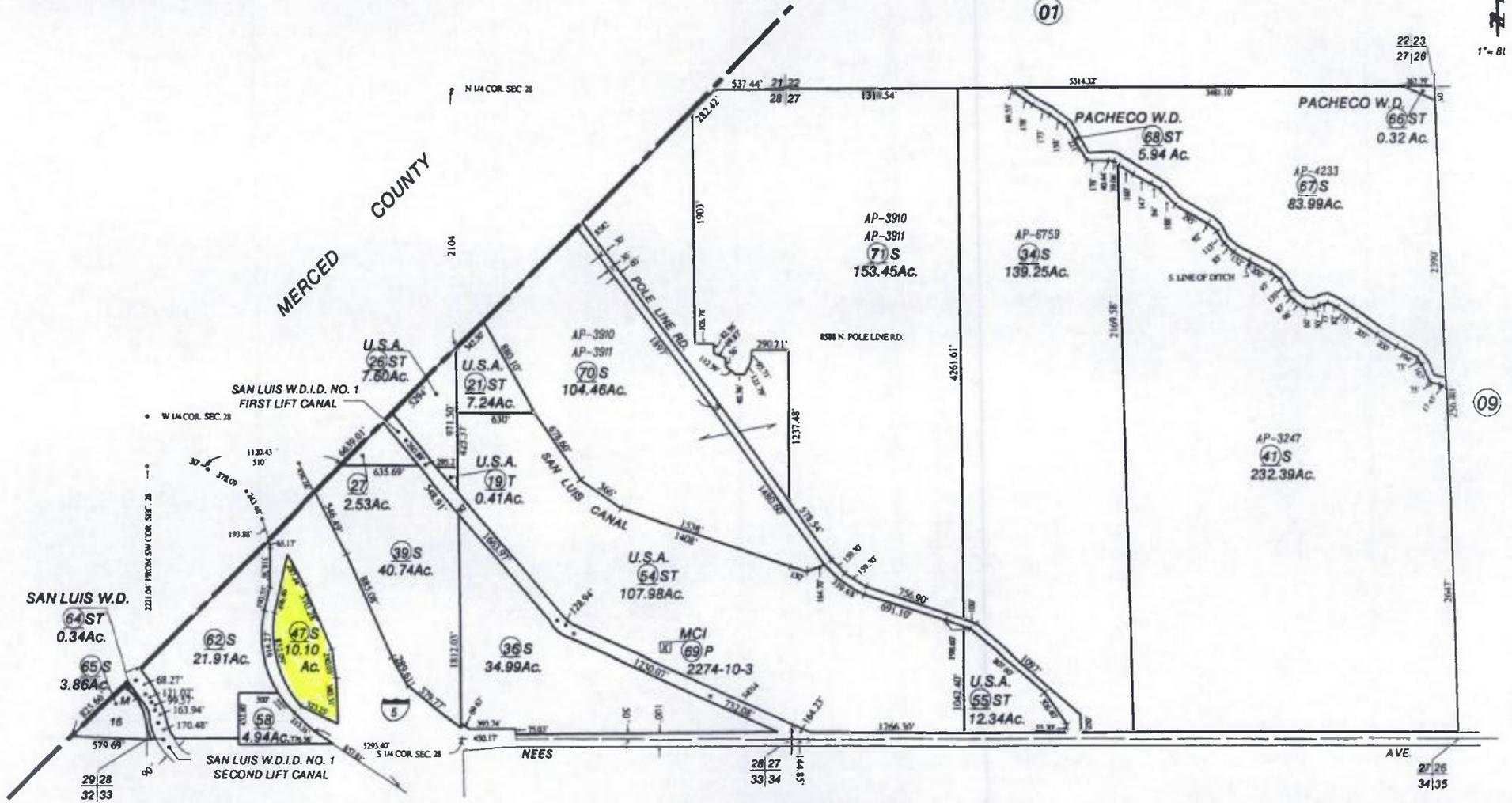
Imagery Date: 4/12/2015 36°51'10.11" N 120°46'07.99" W elev. 354 ft eye alt 6352 ft

--- NOTE ---  
 This map is for Assessment purposes only.  
 It is not to be construed as portraying  
 legal ownership or divisions of land for  
 purposes of zoning or subdivision law.

SEC 27, POR. SEC'S 28 & 29, T. 12 S., R. 11 E., M. D. B. & M.

Tax Rate Area  
 64-016  
 64-018

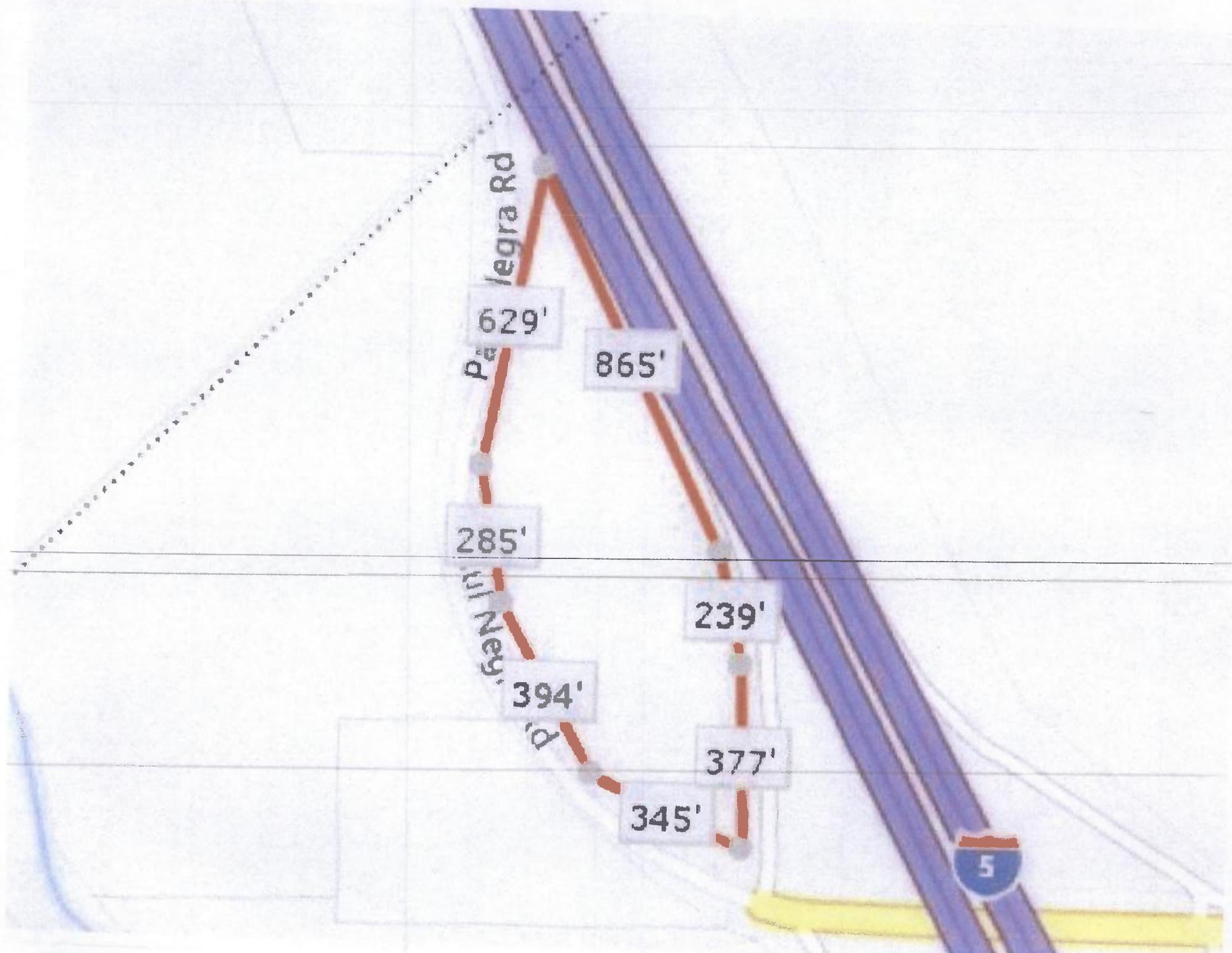
005-10



Agricultural Preserve

Assessor's Map Bk.005 - Pg.10  
 County of Fresno, Calif.

NOTE - Assessor's Block Numbers Shown in Ellipses.  
 Assessor's Parcel Numbers Shown in Circles.



Pegra Rd

629'

865'

285'

New Rd

394'

239'

377'

345'

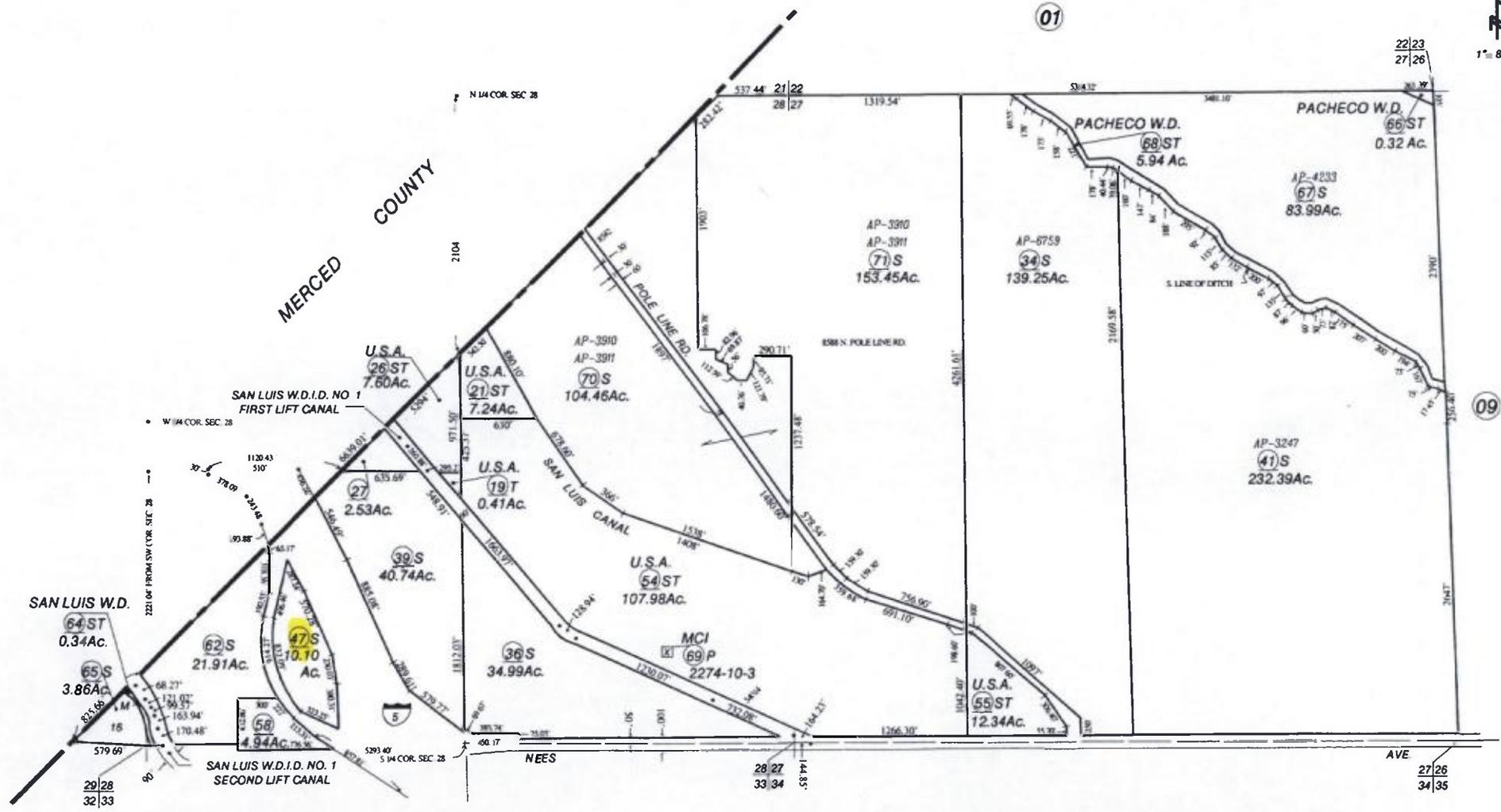


SEC 27, POR. SEC'S 28 & 29, T. 12 S., R. 11 E., M. D. B. & M.

Tax Rate Area  
64-016  
64-018



NOTE  
This map is for Assessment purposes only. It is not to be construed as portraying legal ownership or divisions of land for purposes of zoning or subdivision law.



11

12

NOTE - Assessor's Block Numbers Shown in Ellipses.  
Assessor's Parcel Numbers Shown in Circles.



County of Fresno

DEPARTMENT OF PUBLIC HEALTH  
DAVID POMAVILLE, M.B.A., R.E.H.S.  
INTERIM DIRECTOR

SPECIAL SEALING REQUIREMENTS FOR WELLS LOCATED IN AREAS OF  
CORCORAN CLAY WITHIN FRESNO COUNTY

Drilling Contractor Nor-Cac Pumps & WELL

Location PAUL NEGRA Rd

Owner: Rhocay LLC

WP# 0035766 APN 005-100-47

The well location for this permit has been determined to be within an area where special sealing requirements exist. Fresno County Ordinance Code 14.08.060. "Sealing-off strata" requires special sealing procedures if the well penetrates more than one aquifer separated by Corcoran Clay. **The Corcoran Clay in the area where this well is located is estimated by the Water Resources Control Board to be located at 100 ft deep.**

Bulletin No. 74-6, Water Well Standards-Fresno County was written by the California Department of Water Resources. This Bulletin describes the various geological conditions where water is found in Fresno County and ways to prevent water contamination. The Bulletin divides the county into four areas, Area III or the Valley Trough runs north to south along the west side of Fresno County, east of the coast range and west of the city of Fresno. Within this area is a layer of confining clay called Corcoran Clay that separates the water aquifers and keeps their water quality different. The upper aquifer in this area has more salts and minerals than the water below the Corcoran Clay. Water with high salts and minerals can be detrimental to crops and undesirable to drink. It is a benefit to the citizens of the county to keep the two aquifers separated and maintain the better water quality found in the lower aquifer.

Within Area III are three water bearing aquifers; (1) a confined aquifer below the Corcoran Clay, (2) an unconfined aquifer above the Corcoran Clay and (3) a perched aquifer near the ground surface. Wells constructed in these areas have special sealing requirements that are intended to preclude the water in these aquifers from mixing (Bulletin 74-6, Water Well Standards Fresno County).

Fresno County Ordinance Code Title 14 Section 14.08.060 in part reads:

"In areas where a well penetrates more than one water bearing stratum and any of the stratum contains water of a quality such that, if allowed to mix with water of another stratum, will in the judgment of the Health Officer result in a significant deterioration, the

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*faxed  
9.15.15  
bb*

stratum producing such inferior water shall be sealed off to prevent entrance of the water into the well or its vertical migration to other Strata.

- A. The undesirable water bearing stratum shall be sealed off by placing impervious material opposite the stratum and opposite the confining bed for a sufficient vertical distance (but not less than 10 ft) in either direction to prevent the vertical movement of water from the producing formation. Sufficient sealing material shall be applied to fill the annular space between the casing and the wall of the drilled hole in the interval to be sealed, and to fill the voids which might absorb the sealing material.
- B. Sealing material shall consist of neat cement, cement grout, or other suitable impervious material (Section 14.08.160-E-1).
- C. Sealing shall be accomplished by a method approved by the health officer.
- D. In areas of Fresno County underlain by Corcoran Clay, wells which extend through this clay shall not be perforated both above and below the clay except in the following instances:
  1. Where the Corcoran Clay is less than twenty feet in thickness;
  2. In areas where the difference in water quality above and below the clay is approximately seven hundred micromhos (five hundred ppm TDS) or less;
  3. In the area east of the Fresno Slough and south of the Murphy Slough.”

#### Perched Water

Fresno County Ordinance Code Section 14.08.060 G

“G. Wells which penetrate perched waters shall meet the following requirements:

1. Perched waters, including those retained on the A Clay, shall be excluded from all wells except when the well is drilled expressly for the extraction of perched waters for ground water level control, or water quality control, or where it can be demonstrated that the transfer of such water will not in the judgment of the Health Officer cause a significant deterioration of the quality of water in underlying water strata.
2. Wells drilled for extraction of perched waters for ground water level control or for water quality control shall not penetrate any usable ground water body lying below the perched water.
3. In rotary type wells penetrating the A Clay, a positive seal at least twenty feet or at least the thickness of the A Clay shall be provided in the annular space of each well.”

***Water Well Contractors drilling wells within Area III where the Corcoran Clay is located are required to follow the sealing requirements listed above to ensure that the well is constructed in such a way that both aquifers in this area do not mix.***

If you have any questions please contact Fresno County Environmental Health Division at (559) 600-3357.

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## WATER WELL CHECK LIST

Well Permit Number: WP 0035766

Well Location: PAUL Negra Rd, WEST OF I-5

	DATE	INITIAL		
Permit Received	9/15/15	ny		
Fee Paid	605			
Permit information Approved	✓			
Lot < 1.5 acres (Review)	—			
Land Use Check	✓			
Site Review Completed (Yes/No)				
B & S File Review (Yes/No)				
Dairy-reviewed by Dairy Insp.	—			
Parcel map attached	✓			
Existing wells (Yes/No)				
Lat.		Lon.		
Existing wells Permit # (Yes/No)				
Lat.		Lon.		
Within Flood Zone (Yes/No)				CLAY @ 100'
Corcoran Clay Layer (Yes/No)				
<b>Permit Approved</b>	9/15/15	MS		
Well Seal Inspection				
Well Log Received				
Final Inspection				
GPS Coordinates				
Lat.		Lon.		
Bacteriological Sample Taken				
Chemical Sample Taken				
Results Sent to Owner				
File Completed				
File Incomplete				



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**PERMIT TO CONSTRUCT, DEEPEN, DESTROY, RECONDITION, OR REPAIR A WELL**

CT 84.02 ✓

6/8/15 6/15/15  
 Application Date Estimated Start Date  
 T 12 R 11 S 28  
 APN 005-100-47  
 Contractor V & W Drilling  
 License # 720904  
 Phone 209-469-7100  
 FAX Karli@VWdrill.com

4650 OFFICE USE ONLY  
 Well Permit# WP0035123 FA#  
 Specialist CT 84.02  
 Corcoran Clay Depth \_\_\_\_\_ Ft  
 (see Special Corcoran Clay Annular Seal Requirements on attachment)  
 Well Location in Flood Zone. (Extend Casing above known flood level; Flood Elevation Certificate required to be submitted to the Fresno Co. Public Works. Dept. prior to approval of the well electrical permit.)  
 Approved MS Date 6-11-15 Seal Inspection \_\_\_\_\_ Date \_\_\_\_\_  
 Final Inspection \_\_\_\_\_ Date \_\_\_\_\_ Supervisor \_\_\_\_\_

Job Address/Location West Nees Ave + Paul Negra Rd. parcel Size 10.1 Acres  
 Owner Name Bholay LLC Owner Phone \_\_\_\_\_  
 Owner Address 2416 Pinecrest Ct City Fullerton State CA Zip 92835

<b>Type of Work</b> <input checked="" type="checkbox"/> New Well <input type="checkbox"/> Replacement Well <input type="checkbox"/> Reconstruction/Deepening <input type="checkbox"/> Test Hole <input type="checkbox"/> Destruction	<b>Type of Well</b> <input type="checkbox"/> Casing Driven <input type="checkbox"/> Cable Tool <input type="checkbox"/> Hardrock <input type="checkbox"/> Auger <input checked="" type="checkbox"/> Direct Rotary <input type="checkbox"/> Reverse Rotary	<b>Intended Use</b> <input checked="" type="checkbox"/> Domestic Private <input type="checkbox"/> Domestic Public <input type="checkbox"/> Agricultural <input type="checkbox"/> Industrial <input type="checkbox"/> Cathodic <input type="checkbox"/> Test Hole <input type="checkbox"/> Monitoring <input type="checkbox"/> Other	<b>Well Construction</b> Well Casing Material 5" SCD SC PVC Well Casing Diameter 4 in Well Casing Gauge 50 Conductor Casing Material PVC Conductor Casing Diameter 16 in Conductor Casing Depth 20 Ft Annular Seal Depth 20 Ft Borehole Diameter 12 in Gravel Pack <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
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**Well Destruction**  
 Type  Gravel Pack  Open Bottom  Uncased  Other \_\_\_\_\_  
 Well Diameter \_\_\_\_\_ In Total Depth \_\_\_\_\_ Ft  
 Depth to Water \_\_\_\_\_ Ft  
 Casing to be Perforated \_\_\_\_\_ Ft to \_\_\_\_\_ Ft  
 Casing cut off \_\_\_\_\_ Ft Below Grade (6ft max allowed)  
 Oil lubricated pump (Any oil in the well shall be removed and properly disposed of prior to destruction)

**Sealing Material/Seal Placement Method**  
 Neat Cement  Sand Cement  Concrete  
 Bentonite - Product Name \_\_\_\_\_  
 Pumped  Free Fall (allowed only when the interval to be sealed is dry and less than 30 Ft depth)

**Setbacks**  All setbacks exceed 300 Feet  Other Wells \_\_\_\_\_ Ft  
 Leach Lines \_\_\_\_\_ Ft  Septic Tank \_\_\_\_\_ Ft  Cesspool \_\_\_\_\_ Ft  Seepage Pits \_\_\_\_\_ Ft  
 Sewer Lines \_\_\_\_\_ Ft  Animal/Fowl Enclosure \_\_\_\_\_ Ft  Designated Sewage Replacement Area \_\_\_\_\_ Ft  
 Flood Control Basins \_\_\_\_\_ Ft  Waste Water Disposal Ponds \_\_\_\_\_ Ft  Lakes/Streams \_\_\_\_\_ Ft

**FEE**  \$605 (Domestic/Agricultural/ Cathodic/Test Hole PE4650, Public/Industrial PE4652)  \$407 (Well Destruction PE4651)  
 No Charge (Monitoring Well/Soil Boring PE4653)  
 PAYMENT METHOD  Cash  Check  Credit Card (Authorization on file with Dept. of Public Health, Env. Health Division)

I hereby certify that the information described herein is correct. I understand that all work is to be done in accordance with the California Well Standards Ordinance and the conditions of this permit application, including any conditions which are added by the Environmental Health Division upon review of this application and issuance of the permit. I certify that I have a current C-57 Contractor's License and, if I employ workers, a current certificate of Workers' Compensation Insurance. I further understand that any permit issued pursuant to this application is subject to such further conditions as may be deemed necessary to ensure compliance with the Ordinance. Note: This permit is non-transferable and is valid for 180 days.  
 \*Limited to work to be performed by V & W Drilling, Inc.  
 CONTRACTOR SIGNATURE: Karli Strong DATE: 6/8/15

**OFFICE USE ONLY - ENVISION CLERICAL:**  
 Account# AR0035733 Invoice# 6204644  
 Entered By Karen Date 6-11-15  
 SPECIAL REQUIREMENTS: Faxed by Keshia Criswell  
 6-12-15 to  
 916-366-7013

REG/ROPT#: 005-00018962 89BARBER  
 ACCOUNTING DATE: 06-10-2015  
 RECEIPT TOTAL = \$605.00  
 COM: CHECK #5198  
 REF#: NEES & PAUL NEGRA RD

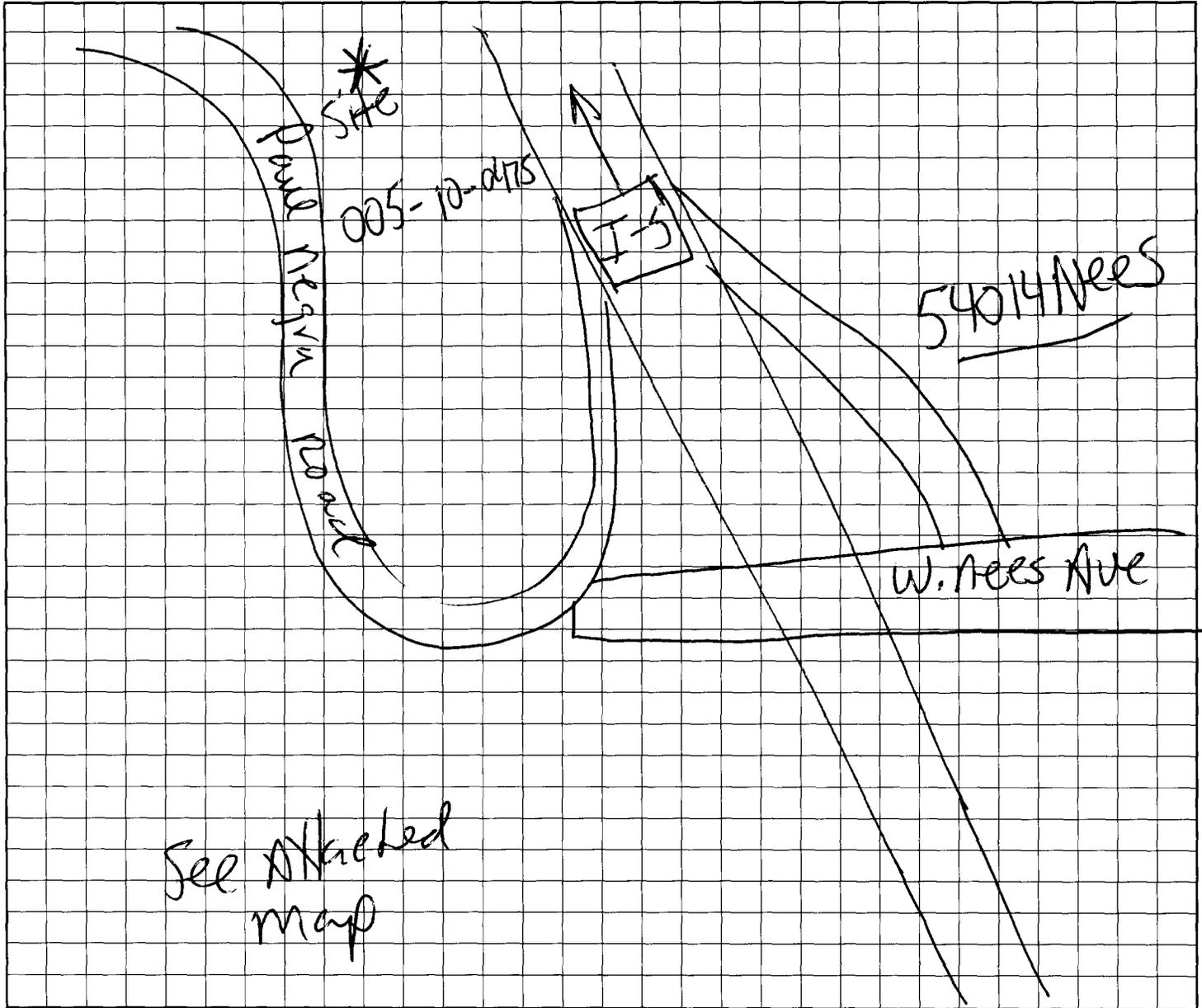


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**PLOT PLAN TO ACCOMPANY PERMIT TO CONSTRUCT, DEEPEN, DESTROY,  
RECONDITION, OR REPAIR A WELL**

Note: This permit is non-transferable and is valid for 180 days

Job Address / Location: J-5 + Nees Ave (W) + Paul Negra Rd APN: 005 110 10475 PERMIT # \_\_\_\_\_

Indicate distances in feet. Provide the names of streets or roads nearest to the property. Provide dimensions of the property and all existing or proposed structures. Provide locations of existing or proposed sewage disposal systems, including expansion or repair areas, within 250 feet of the new well. Provide locations of all other wells within 300 feet of the new well. Location information shall include all adjacent parcels, if within setbacks.



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County of Fresno

DEPARTMENT OF PUBLIC HEALTH  
DAVID POMAVILLE, M.B.A., R.E.H.S.  
INTERIM DIRECTOR

**SPECIAL SEALING REQUIREMENTS FOR WELLS LOCATED IN AREAS OF  
CORCORAN CLAY WITHIN FRESNO COUNTY**

Drilling Contractor V & W Drilling

Location Nees/Paula Negra Rd.

Owner: Bholay LLC

WP# 0035125

APN 005-100-47

The well location for this permit has been determined to be within an area where special sealing requirements exist. Fresno County Ordinance Code 14.08.060. "Sealing-off strata" requires special sealing procedures if the well penetrates more than one aquifer separated by Corcoran Clay. **The Corcoran Clay in the area where this well is located is estimated by the Water Resources Control Board to be located at 100 ft deep.**

Bulletin No. 74-6, Water Well Standards-Fresno County was written by the California Department of Water Resources. This Bulletin describes the various geological conditions where water is found in Fresno County and ways to prevent water contamination. The Bulletin divides the county into four areas, Area III or the Valley Trough runs north to south along the west side of Fresno County, east of the coast range and west of the city of Fresno. Within this area is a layer of confining clay called Corcoran Clay that separates the water aquifers and keeps their water quality different. The upper aquifer in this area has more salts and minerals than the water below the Corcoran Clay. Water with high salts and minerals can be detrimental to crops and undesirable to drink. It is a benefit to the citizens of the county to keep the two aquifers separated and maintain the better water quality found in the lower aquifer.

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"In areas where a well penetrates more than one water bearing stratum and any of the stratum contains water of a quality such that, if allowed to mix with water of another stratum, will in the judgment of the Health Officer result in a significant deterioration, the

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stratum producing such inferior water shall be sealed off to prevent entrance of the water into the well or its vertical migration to other Strata.

- A. The undesirable water bearing stratum shall be sealed off by placing impervious material opposite the stratum and opposite the confining bed for a sufficient vertical distance (but not less than 10 ft) in either direction to prevent the vertical movement of water from the producing formation. Sufficient sealing material shall be applied to fill the annular space between the casing and the wall of the drilled hole in the interval to be sealed, and to fill the voids which might absorb the sealing material.
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  2. In areas where the difference in water quality above and below the clay is approximately seven hundred micromhos (five hundred ppm TDS) or less;
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#### Perched Water

Fresno County Ordinance Code Section 14.08.060 G

“G. Wells which penetrate perched waters shall meet the following requirements:

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***Water Well Contractors drilling wells within Area III where the Corcoran Clay is located are required to follow the sealing requirements listed above to ensure that the well is constructed in such a way that both aquifers in this area do not mix.***

If you have any questions please contact Fresno County Environmental Health Division at (559) 600-3357.

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## WATER WELL CHECK LIST

Well Permit Number: WP 0035125

Well Location: W Npes / PAUL NEGRA Rd.

	DATE	INITIAL		
Permit Received	6/10/15	MS		
Fee Paid	605			
Permit information Approved	✓			
Lot < 1.5 acres (Review)	—			
Land Use Check	✓		WELL must be for private use only. OR 50' Seal if for Public use.	
Site Review Completed (Yes/No)				
B & S File Review (Yes/No)				
Dairy-reviewed by Dairy Insp.	—			
Parcel map attached	✓			
Existing wells (Yes/No)				
Lat.	Lon.			
Existing wells Permit # (Yes/No)				
Lat.	Lon.			
Within Flood Zone (Yes/No)				
Corcoran Clay Layer (Yes/No)			100'	
<b>Permit Approved</b>	6-11-15	MS		
Well Seal Inspection				
Well Log Received				
Final Inspection				
GPS Coordinates				
Lat.	Lon.			
Bacteriological Sample Taken				
Chemical Sample Taken				
Results Sent to Owner				
File Completed				
File Incomplete				

# **EXHIBIT 11**

August 7, 2017

Mr. Amin Salkhi, President  
Grand Petroleum, Inc.  
1451 Danville Boulevard, Suite 201  
Alamo, CA 94507

**Subject: Review of Groundwater Data for Conditional Use Permit Application No. 3528**

Dear Mr. Salkhi:

Carollo Engineers, Inc. (Carollo) has reviewed the groundwater and well information associated with Conditional Use Permit Application No. 3528. This letter provides our opinion regarding the potential yield of the well and suitability of the groundwater for public consumption at the proposed highway travel center.

The information reviewed comprises two County of Fresno, California, well construction permits for the subject property located on the northwest corner of Interstate 5 and Nees Avenue (Assessor's Parcel Number 005-100-47s), a State of California Well Completion Report, a laboratory report for water quality analyses from BSK Associates Fresno, correspondence from the State Water Resources Control Board Division of Drinking Water dated May 9, 2016, and the County of Fresno's Evaluation of Environmental Impacts and Proposed Mitigated Negative Declaration (Initial Study).

#### **Well Information**

Based on the two well construction permits, the County of Fresno Department of Public Health-Environmental Health Division approved the construction of a domestic private well on the subject property on June 11, 2015, permit number WP0035125, and a domestic public well on September 15, 2015, permit number WP0035766. California Water Code Section 13751 requires the licensed well drilling contractor to file a report of completion with the Department of Water Resources within 60 days of the completion of the work. No well completion report associated with permit number WP0035125 was received, but the Initial Study states that a private well was drilled on the property. A Well Completion Report associated with permit number WP0035766 indicates the domestic public well was completed on September 23, 2015. However, this Well Completion Report is dated December 20, 2016, nearly 15 months after the stated well completion date. The owner's name is redacted. The signature on the report is illegible, but the company name is "NorCal pump and well drilling" with matching C-57 license number.

The Well Completion Report states that the well was completed using 8-inch diameter carbon steel casing set within a 17.5-inch diameter borehole with 8-inch Schedule 80 PVC slotted screen. The well was drilled and completed to a total depth of 1,750 feet below ground surface (bgs) and was screened across multiple sand, gravel, and clay layers from 950 feet to 1,750 feet bgs. The borehole annulus was filled with a gravel filter pack from 50 feet to 1,750 feet bgs and with cement from the ground surface to 50 feet bgs. The report states that water was first encountered at 900 feet bgs and subsequently rose to 600 feet bgs after well completion indicating the aquifer is confined at this depth. The estimated well yield is stated to be 300 gallons per minute based on a 12-hour constant rate pumping test. The observed drawdown during the pumping test was not reported.

Pumping tests are conducted to determine the yield of the well and hydraulic parameters of the aquifer; this information can be used to select an appropriately sized pump for the well and to evaluate the effects of new withdrawals on existing wells. For a confined aquifer, the pumping test should be conducted at a constant rate for 24 hours while recording the drawdown in the well. The duration of the pumping test may be shortened if equilibrium conditions are reached before 24 hours. The Well Completion Report does not provide the drawdown at the conclusion of the pumping test nor any intermediate measured drawdown data. Without drawdown data, the adequacy of the pumping test duration and estimated well yield cannot be assessed.

### **Water Quality Data**

A laboratory report for water quality analyses from BSK Associates Fresno was included with the Conditional Use Permit application. This report is dated December 8, 2015 and is addressed to Nar Heer of Nor-Cal Pump and Well Service. Several discrepancies are noted within the lab report which lead to questions regarding the origination and representativeness of the samples. The laboratory report and chain of custody identify the samples as collected from "New Well" associated with the "Gridley Farm Labor Camp" project; no other identifying information for the samples is provided. No information on the chain of custody or lab report indicates any association with either of the wells permitted by the County of Fresno on the subject property.

The Sample Integrity checklist included with the laboratory report indicates that the measured temperature of the samples at the time of receipt was less than 6 °C, but the sample temperature noted on the chain of custody and case narrative is 12.9 °C. The sample integrity checklist also indicates that information on the bottle labels agree with the chain of custody. However, a separate sample condition checklist completed by Pace Analytical for subcontracted radiological analyses indicates that the sample labels did not match the chain of custody and the sample date and time was not recorded on the sample bottles. The Pace Analytical checklist also notes that no custody seal was present on the shipping container.

Based on lack of clear documentation, there is no indication or assurance that the samples received at BSK Associates Fresno were collected from a well on the subject property or that the samples were properly handled either during the sample collection process or when received at the laboratory.

None of the available information provides a description of the sample collection process including the sampling collection method, purging of the well prior to sample collection, or well and site conditions at the time of sampling. Because all of these factors can affect how well a sample represents ambient groundwater in the aquifer, these samples cannot be relied upon to represent the groundwater without additional supporting documentation.

Water quality analyses included in the laboratory report from BSK Associates Fresno include general water chemistry, metals, organics, perchlorate, hexavalent chromium, dioxins, asbestos, and radionuclides. Analyses for asbestos were subcontracted to LA Testing in South Pasadena, California, analyses for dioxins were subcontracted to Maxxam Analytics International Corporation in Mississauga, Ontario, Canada, and analyses for radium were subcontracted to Pace Analytical Services, Inc. in Greensburg, Pennsylvania.

The United States Environmental Protection Agency (EPA) has established National Primary Drinking Water Regulations that set mandatory water quality standards for drinking water contaminants to protect the

public against consumption of drinking water contaminants that present a risk to human health. EPA has also established National Secondary Drinking Water Regulations that set non-mandatory water quality standards for 15 contaminants; these contaminants are not considered to present a risk to human health at the secondary standard. The State of California has established mandatory secondary drinking water standards based on EPA's secondary standards. The results indicate that the water meets primary drinking water standards for all analytes; however, the water does not meet the State of California's secondary drinking water standards for total dissolved solids, specific conductance, chloride, or sulfate. The State of California has established ranges of maximum contaminant levels for these constituents including Recommended, Upper, and Short Term levels as shown in Table 1. According to comments provided by the State Water Resources Control Board Division of Drinking Water, both primary and secondary water quality standards apply. The observed concentrations for all four constituents exceed all of the established contaminant level ranges. Thus, the water does not meet drinking water standards and treatment would be required for use as a potable water supply. Although sodium is not regulated as a drinking water contaminant, the U.S. EPA recommends that sodium concentration in drinking water not exceed a range of 30 to 60 mg/L and has stated that sodium concentrations greater than 120 mg/L can have an effect on blood pressure (U.S. EPA Drinking Water Advisory: Consumer Acceptability Advice and Health Effects Analysis on Sodium, 2003). The observed concentration of 1,100 mg/L is almost ten times higher than the benchmark level of 120 mg/L.

In addition, the use of this water for irrigation would be severely restricted based on the salinity of the water (United States Department of Agriculture National Engineering Handbook, Part 623). Based on the total dissolved solids concentration, the water would be considered satisfactory for livestock watering although it may cause temporary diarrhea or be refused by animals not accustomed to the water, and would be considered poor for poultry causing watery feces, increasing mortality, and decreased growth (National Research Council Water Quality Criteria 1972).

Table 1. Secondary Maximum Contaminant Level Ranges and Reported Data

Constituent, Units	Recommended	Upper	Short Term	Reported Value
Total Dissolved Solids, mg/L	500	1,000	1,500	3,200
Specific Conductance, $\mu$ S/cm	900	1,600	2,200	5,600
Chloride, mg/L	250	500	600	1,100
Sulfate, mg/L	250	500	600	750

Treatment options for lowering total dissolved solids content in drinking water include reverse osmosis, electro dialysis, and distillation processes. Both reverse osmosis and electro dialysis generate highly

Mr. Salkhi  
Grand Petroleum, Inc.  
August 7, 2017

Page 4

concentrated brine waste because a portion of the water entering the treatment unit is discharged as waste carrying the concentrated salts removed from the product water. Because a portion of the raw water is lost as concentrate from the treatment process, treatment may also significantly increase the volume of raw water required to meet demands. For example, reverse osmosis systems typically recover about 50 to 90 percent of the raw water as treated product water meaning that the volume of raw water required could be from 11 to 100 percent greater than the projected potable water demand. Reverse osmosis systems with higher recovery produce a brine waste that is more highly concentrated with removed salt, e.g. a reverse osmosis system with 90 percent recovery generates a brine that is ten times more concentrated than the raw feed water. Although distillation processes produce less waste, these systems have much greater energy, space, and maintenance requirements.

Disposal of the brine waste is a primary factor in selection of a treatment technology to reduce total dissolved solids. Disposal options include discharge to the onsite wastewater treatment system, onsite evaporation ponds, subsurface disposal such as deep well injection or percolation, and storage and offsite disposal. All of these options include potential environmental concerns such as failure of the onsite wastewater treatment system or groundwater contamination. Therefore, the proposed brine waste discharge method should be reviewed by the Regional Water Quality Control Board. No discussion of potential water treatment technologies, potential impact on projected potable water demands, or brine/salt waste management was found in the Conditional Use Permit application.

Sincerely,



Jeff Stovall, Ph.D.



Bronwyn Kelly, P.G.  
CAROLLO ENGINEERS, INC.

cc: Mr. Kenneth B. Finney, Beveridge & Diamond, P. C.  
Ms. Kaitlyn D. Shannon, Beveridge & Diamond P. C.

# **EXHIBIT 12**

## Chambers, Derek

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**From:** Lichti, Betsy@Waterboards <Betsy.Lichti@waterboards.ca.gov>  
**Sent:** Monday, May 09, 2016 9:27 AM  
**To:** Chambers, Derek  
**Cc:** Hatton, Scott@Waterboards; Gardner, Janet; Motta, Chris; Allen, Glenn; Tsuda, Kevin; Wass, Lonnie@Waterboards; Chauhan, Kassy@Waterboards  
**Subject:** RE: SWRCB-DDW Comments to IS 7104 and CUP 3528  
**Attachments:** 2015 NCSGA - (GWVLT33NewSource).pdf

Derek – please replace my prior email comments with these. There was one minor correction related to the water quality monitoring requirements, and I have attached the required monitoring schedule.

Betsy Lichti, PE

District Engineer, Fresno District  
State Water Resources Control Board  
Direct 559.447.3485 Main Ofc 559.447.3300 Fax 559.447.3304

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**From:** Lichti, Betsy@Waterboards  
**Sent:** Monday, May 09, 2016 8:57 AM  
**To:** Chambers, Derek  
**Cc:** Hatton, Scott@Waterboards; Gardner, Janet@co.fresno.ca.us; Motta, Chris; Allen, Glenn; Tsuda, Kevin; Wass, Lonnie@Waterboards; Chauhan, Kassy  
**Subject:** RE: SWRCB-DDW Comments to IS 7104 and CUP 3528

Derek – in addition to the RWQCB comments provided below, the SWRCB-Division of Drinking Water (DDW) has the following comments:

***At Time of Permitting by SWRCB-DDW:***

1. The planned facility will be a public water system, classified as a **nontransient noncommunity** water system. As such, the facility must be permitted by the State Water Resources Control Board's Division of Drinking Water (SWRCB-DDW) as a public water system. A domestic water supply permit application, technical report and application fee must be submitted prior to operation of the water system.
2. The SWRCB-DDW must review the plans for the well construction and water distribution system prior to construction. The proponent should submit the permit application, accompanied by the plans for the domestic water system distribution mains and water system facilities prior to construction. All of the permit application forms may be obtained from our office.
3. As the legal owner of a public water system, **Millennium Acquisitions** must be able to demonstrate that it has adequate technical, managerial and financial capacity to operate and maintain the water system in compliance with all state and federal laws and regulations. An assessment of the Technical, Managerial and Financial (TMF) capacity of the proposed water system must be completed and submitted with the permit application

***As condition of receiving CUP approval:***

4. The proposed well(s) planned for use as a domestic source of water must be constructed in accordance with the California Well Standards and County well requirements. The applicant must be able to document the construction features of the well(s) by submittal of the Well Completion Report or Well Drillers Report. Additionally, the following separation criteria apply to any well(s) proposed for use as a domestic source of water:

Potential Pollution or Contamination Source	Minimum Horizontal Separation Distance Between Well and Known or Potential Source
Any sewer line (sanitary, industrial, or storm; main or lateral)	50 feet
Watertight septic tank or subsurface sewage leaching field	100 feet
Cesspool or seepage pit	150 feet
Animal or fowl enclosure	100 feet

(Information obtained from the DWR California Water Well Standards Bulletin 74-90.)

5. The proposed well(s) planned for use as a domestic source of water must be demonstrated to meet drinking water standards. The applicant shall conduct water quality testing of the proposed well(s) in accordance with the requirements for a nontransient noncommunity water system (see attached). Where water quality standards are not met, treatment or an alternative solution must be proposed.
6. The SWRCB-DDW strongly encourages the applicant to consider construction of at least two wells to ensure reliability of supply. Additionally, the California Waterworks Standards requires water systems serving fewer than 1,000 service connections to have a storage capacity equal to or greater than the maximum day demand (MDD), unless the system can demonstrate that it has an additional source of supply that can meet the MDD requirement.
7. The TMF assessment identified in comment no. 2 above requires the evaluation of the feasibility of consolidation with another public water system. It is noted that the proposed facility is adjacent to the **Firebaugh Travel Plaza**, which is a regulated transient noncommunity water system. The applicant must evaluate the feasibility of obtaining its domestic forming a consolidated water supply with this existing water system. The Firebaugh Travel Plaza uses surface water treated through an aging surface water treatment plant, and a consolidated water system using the groundwater supply proposed by Millennium Acquisitions would provide improved public health protection.

Please contact me for any needed clarification or questions regarding these comments.

*Betsy Lichti, PE*

District Engineer, Fresno District  
 State Water Resources Control Board  
 Direct 559.447.3485 Main Ofc 559.447.3300 Fax 559.447.3304

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**From:** Hatton, Scott@Waterboards  
**Sent:** Wednesday, April 13, 2016 4:24 PM  
**To:** Chambers, Derek  
**Cc:** Gardner, Janet@co.fresno.ca.us; Motta, Chris; Allen, Glenn; Lichti, Betsy@Waterboards; Tsuda, Kevin; Wass, Lonnie@Waterboards  
**Subject:** RE: Documents for review and request for comments - IS 7104 and CUP 3528

It appears the applicant for the proposed project could get coverage under General Waste Discharge Requirements for Small Domestic Wastewater Treatment Systems, Order No. WQ 2014-0153-DWQ, which would require the submittal of a complete Report of Waste Discharge (as described in the General Order). A copy of the General Order is found at the following link:

[http://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/water\\_quality/2014/wqo2014\\_0153\\_dwq.pdf](http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2014/wqo2014_0153_dwq.pdf)

If they propose to use the treated domestic wastewater (or recycled water) on land, they would need to get coverage under General Order WQ 2014-0090-DWQ, which can be found here:

[http://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/water\\_quality/2014/wqo2014\\_0090\\_dwq\\_revised.pdf](http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2014/wqo2014_0090_dwq_revised.pdf)

Please note that an updated General Order for recycled water reuse is currently in draft form. See the link below for the status of the draft permit.

[http://www.waterboards.ca.gov/drinking\\_water/certlic/drinkingwater/requirements.shtml](http://www.waterboards.ca.gov/drinking_water/certlic/drinkingwater/requirements.shtml)

The Resolution (found at the following link) would support this facility and the one just to the north to consolidate wastewater treatment and disposal.

[http://www.waterboards.ca.gov/centralvalley/board\\_decisions/adopted\\_orders/resolutions/r5-2009-0028.pdf](http://www.waterboards.ca.gov/centralvalley/board_decisions/adopted_orders/resolutions/r5-2009-0028.pdf)

Please call or email if you have any questions.

Scott J. Hatton, PE  
Senior Engineer  
CA Regional Water Quality Control Board  
1685 E Street  
Fresno, CA 93706  
(559) 445-5116 Main  
(559) 444-2502 Direct  
(559) 445-5910 Fax  
[scott.hatton@waterboards.ca.gov](mailto:scott.hatton@waterboards.ca.gov)

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**From:** Chambers, Derek [<mailto:dchambers@co.fresno.ca.us>]

**Sent:** Wednesday, March 30, 2016 9:29 AM

**To:** Kettler, William; Motta, Chris; Khorsand, Mohammad; Ramirez, Augustine; Navarro, Thomas; Janes, Jeff; Ishii, Randy; Daniele, Frank; Lopez, Nadia; Alimi, Mohammad; Siemer, Dale; Allen, Glenn; Gardner, [Janet@co.fresno.ca.us](mailto:Janet@co.fresno.ca.us); Tsuda, Kevin; Wright, Les@CDPR; Gularte, Greg; Reynolds, John; Hernandez, Louis; Curtice, Kathy@Fresno; Hushaw, Ryan; [thomas\\_leeman@fws.gov](mailto:thomas_leeman@fws.gov); [dana\\_herman@fws.gov](mailto:dana_herman@fws.gov); WB-RB5F-CentralValleyFresno; Padilla, Dave@DOT; Lichti, Betsy@Waterboards; [rpennell@tmr.org](mailto:rpennell@tmr.org); CEQA E-mail; Watkins, Eric@CALFIRE; [dfalaschi@aol.com](mailto:dfalaschi@aol.com); Bob Shockley

**Subject:** Documents for review and request for comments - IS 7104 and CUP 3528

Good day,

The Department of Public Works and Planning, Development Services Division is reviewing the subject applications proposing to allow an Interstate Freeway Interchange Commercial Development comprised of a restaurant, market, automobile fueling station, truck fueling station, laundry facility, shower facility, Liquefied Petroleum Gas (LPG) sales, photovoltaic solar power generation system to provide electricity to the proposal, and a 100-foot tall marquee sign on a 10.10-acre parcel in the AE-40 (Exclusive Agricultural, 40-acre minimum parcel size) Zone District.

The subject parcel is located on the northwest corner of Interstate 5 (I-5) and Nees Avenue, approximately 17 miles west of the nearest city limits of the City of Firebaugh (Sup. Dist. 1) (APN 005-100-47s).

Please utilize the following hyperlink to access information regarding this proposal:

[-CUP3528 Routing Pkg.pdf](#)

We must have your comments by **April 14, 2016** and comments received after this date may not be used.

Please address any correspondence or questions related to environmental and/or policy/design issues to me, Derek Chambers, Planner, Development Services Division, Fresno County Department of Public Works and Planning, 2220 Tulare Street, Sixth Floor, Fresno, CA 93721, or call (559) 600-4205, or email [dchambers@co.fresno.ca.us](mailto:dchambers@co.fresno.ca.us)

Thank you,

Derek Chambers, Planner II  
Development Services Division  
Fresno County Public Works and Planning  
(559) 600-4205 voice  
(559) 600-4200 fax

Public Works and Planning is continuing to work to improve customer services provided by the Department. Your feed back on how we are doing would be greatly appreciated. Please take a few minutes to complete our short Customer Service Survey at the following link: [Short Customer Service Survey](#)

**NEW WELL WATER QUALITY MONITORING SCHEDULE**  
Comm. System, ≤3300 pop., groundwater/agriculture (NCSGA)  
UPDATED September 2015

Chemical - Title 22	MCL (mg/L)	EPA Method	Frequency (1)
<b>Primary Inorganics - Section 64432</b>			
Aluminum	1		Every 3 years
Antimony	0.006		Every 3 years
Arsenic	0.010		Every 3 years
Barium	1		Every 3 years
Beryllium	0.004		Every 3 years
Cadmium	0.005		Every 3 years
Chromium (Total Chromium)	0.05		Every 3 years (2)
Hexavalent Chromium (Chrome 6)	0.010	218.6 or 218.7	1 sample (2) (3)
Cyanide	0.15		Waived
Fluoride	2.0		Every 3 years
Mercury	0.002		Every 3 years
Nickel	0.1		Every 3 years
Perchlorate	0.006		2 Samples, 5 to 7 months apart (4)
Selenium	0.05		Every 3 years
Thallium	0.002		Every 3 years
<b>Asbestos - Section 64432.2</b>			
Asbestos - Source Water	7 MFL		Waived
Asbestos - Distribution System sampling if Asbestos-Cement pipe used	7 MFL		Every 9 years if Aggressive Index < 11.5
<b>Nitrate/Nitrite - Section 64432.1</b>			
Nitrate (as N)	10		Annually if < 5 mg/L (5)
Nitrite (as nitrogen)	1		Every 3 years if < 0.5 mg/L (6)
Nitrate + Nitrite (sum as nitrogen)	10		N/A
<b>Secondary Standards - Table 64449-A</b>			
Aluminum	0.2		Every 3 years
Color	15		Every 3 years
Copper	1.0		Every 3 years
Foaming Agents	0.5		Every 3 years
Iron	0.3		Every 3 years
Manganese	0.05		Every 3 years
Methyl-tert-butyl ether (MTBE)	0.005	502.2, 524.2	See MTBE frequency on page 2
Odor	3		Every 3 years
Silver	0.1		Every 3 years
Thiobencarb	0.001		Waived
Turbidity	5		Every 3 years
Zinc	5		Every 3 years
<b>General Minerals - Section 64449</b>			
Bicarbonate	N/A		Every 3 years
Carbonate	N/A		Every 3 years
Hydroxide Alkalinity	N/A		Every 3 years
Calcium	N/A		Every 3 years
Magnesium	N/A		Every 3 years
Sodium	N/A		Every 3 years
Hardness	N/A		Every 3 years
pH	N/A		Every 3 years
<b>Secondary Standards - Table 64449-B</b>			
TDS	500-1000;1500		Every 3 years
Specific Conductance	900-1600; 2200		Every 3 years
Chloride	250-500;600		Every 3 years
Sulfate	250-500;600		Every 3 years

MCL = Maximum Contaminant Level

Contact your district office with any questions.

- (1) Sampling shall be increased to quarterly following any result > MCL.
- (2) After initial hexavalent chromium monitoring, total chromium may be used if total chromium results are < 0.010 mg/L. If total chromium result is ≥ 0.010 mg/L, monitoring for hexavalent chromium will be required.
- (3) Hexavalent chromium shall be increased to quarterly sampling following any result > 0.010 mg/L.
- (4) Perchlorate: At least 1 sample must be collected during the period from May 1 through September 30. If none detected, subsequent monitoring frequency will be every 3 years.
- (5) Nitrate (as N) replaces Nitrate (as NO<sub>3</sub>). Nitrate (as N) sampling shall increase to quarterly following any result ≥ 5 mg/L. Upon request, this may be reduced to an annual frequency after 4 quarters of monitoring. Beginning with Jan. 1, 2016, water systems shall comply with the Nitrate (as N) requirement.
- (6) Nitrite sampling shall be increased to quarterly following any result ≥ 0.5 mg/L. Upon request, this may be reduced to an annual frequency after 4 quarters of monitoring.

**NEW WELL WATER QUALITY MONITORING SCHEDULE**  
 Comm. System, ≤3300 pop., groundwater/agriculture (NCSGA)  
 UPDATED September 2015

Chemical - Title 22	MCL (mg/L)	EPA Method	Frequency (1)
<b>VOCs - Table 64444-A (a)</b>			
Benzene	0.001	502.2, 524.2	3 annual samples, then every 6 years
Carbon Tetrachloride	0.0005	502.2, 524.2	3 annual samples, then every 6 years
1,2-Dichlorobenzene	0.6	502.2, 524.2	3 annual samples, then every 6 years
1,4-Dichlorobenzene	0.005	502.2, 524.2	3 annual samples, then every 6 years
1,1-Dichloroethane	0.005	502.2, 524.2	3 annual samples, then every 6 years
1,2-Dichloroethane	0.0005	502.2, 524.2	3 annual samples, then every 6 years
1,1-Dichloroethylene	0.006	502.2, 524.2	3 annual samples, then every 6 years
cis-1,2-Dichloroethylene	0.006	502.2, 524.2	3 annual samples, then every 6 years
trans-1,2-Dichloroethylene	0.01	502.2, 524.2	3 annual samples, then every 6 years
Dichloromethane	0.005	502.2, 524.2	3 annual samples, then every 6 years
1,2-Dichloropropane	0.005	502.2, 524.2	3 annual samples, then every 6 years
1,3-Dichloropropane	0.0005	502.2, 524.2	3 annual samples, then every 6 years
Ethylbenzene	0.3	502.2, 524.2	3 annual samples, then every 6 years
Methyl-tert-butyl ether (MTBE)	0.013	502.2, 524.2	3 annual samples, then every 6 years
Monochlorobenzene	0.07	502.2, 524.2	3 annual samples, then every 6 years
Styrene	0.1	502.2, 524.2	3 annual samples, then every 6 years
1,1,2,2-Tetrachloroethane	0.001	502.2, 524.2	3 annual samples, then every 6 years
Tetrachloroethylene (PCE)	0.005	502.2, 524.2	3 annual samples, then every 6 years
Toluene	0.15	502.2, 524.2	3 annual samples, then every 6 years
1,2,4-Trichlorobenzene	0.005	502.2, 524.2	3 annual samples, then every 6 years
1,1,1-Trichloroethane	0.200	502.2, 524.2	3 annual samples, then every 6 years
1,1,2-Trichloroethane	0.005	502.2, 524.2	3 annual samples, then every 6 years
Trichloroethylene (TCE)	0.005	502.2, 524.2	3 annual samples, then every 6 years
Trichlorofluoromethane	0.15	502.2, 524.2	3 annual samples, then every 6 years
1,1,2-Trichloro-1,2,2-Trifluoroethane	1.2	502.2, 524.2	3 annual samples, then every 6 years
Vinyl Chloride	0.0005	502.2, 524.2	3 annual samples, then every 6 years
Xylenes (total)	1.750	502.2, 524.2	3 annual samples, then every 6 years
<b>SOCs - Table 64444-A (b)</b>			
Alachlor	0.002	505, 507, 508.1, 525.2	3 annual samples, then every 3 years
Atrazine	0.001	505, 507, 508.1, 525.2	3 annual samples, then every 3 years
Bentazon	0.018		Waived
Benzo(a)pyrene	0.0002		Waived
Carbofuran	0.018		Waived
Chlordane	0.0001		Waived
2,4-D	0.07		Waived
Dalapon	0.2		Waived
Dibromochloropropane (DBCP)	0.0002	504.1, 551.1	3 annual samples, then every 3 years
Di(2-ethylhexyl)adipate	0.4		Waived
Di(2-ethylhexyl)phthalate	0.004		Waived
Dinoseb	0.007		Waived
Diquat	0.02		Waived
Endothall	0.1		Waived
Endrin	0.002		Waived
Ethylene Dibromide (EDB)	0.00005	504.1, 551.1	3 annual samples, then every 3 years
Glyphosate	0.7		Waived
Heptachlor	0.00001		Waived
Heptachlor Epoxide	0.00001		Waived
Hexachlorobenzene	0.001		Waived
Hexachlorocyclopentadiene	0.05		Waived
Lindane	0.0002		Waived
Methoxychlor	0.03		Waived
Molinate	0.02		Waived
Oxamyl	0.05		Waived
Pentachlorophenol	0.001		Waived
Picloram	0.5		Waived
Polychlorinated Biphenyls	0.0005		Waived
Simazine	0.004	505, 507, 508.1, 525.2	3 annual samples, then every 3 years
Thiobencarb	0.07		Waived
Toxaphene	0.003		Waived
2,3,7,8-TCDD (Dioxin)	0.0000003		Waived
2,4,5-TP (Silvex)	0.05		Waived

(1) This frequency applies only to chemicals for which previous results have shown no detectable results (ND). Contact your district office for a special monitoring schedule when detectable results are found. Also, please contact your district office if you would like to collect 4 consecutive quarters in lieu of 3 annual samples to satisfy the initial monitoring requirement.

**NEW WELL WATER QUALITY MONITORING SCHEDULE**  
 Comm. System, ≤3300 pop., groundwater/agriculture (NCSGA)  
 UPDATED September 2015

**Radiological Monitoring**

**Initial Monitoring Requirements**

<b>Radioactivity - Section 64442</b>	<b>MCL</b>	<b>EPA Method</b>	<b>Frequency</b>
Gross Alpha	15 pCi/L		4 quarters initial monitoring * (1)
Radium-226	5 pCi/L Combined		When (GA-Uranium) > 5 pCi/L (2)
Radium-228	Radium-226 + 228		4 quarters initial monitoring * (1)
Uranium	20 pCi/L		When GA > 5 pCi/L (2)
<b>Man Made Radioactivity - Section 64443</b>			
Tritium	20000 pCi/L		Not Required
Strontium	8 pCi/L		Not Required
Gross Beta	50 pCi/L		Not Required

\* If the results from the first two (2) quarters of initial monitoring are below the detection limit for the purposes of reporting (DLR), the final two (2) quarters of initial monitoring may be waived.

**1. Routine Monitoring**

a) Subsequent monitoring frequency for Gross Alpha is based on last sample collected.

<b>Gross Alpha</b>	<b>Monitoring Frequency</b>
Less than 3 pCi/L	1 sample every 9 years
≥ 3 and ≤ 7.5 pCi/L	1 sample every 6 years
> 7.5 and ≤ 15 pCi/L	1 sample every 3 years

b) Subsequent monitoring frequency for Radium-228 will be waived if there is no MCL exceedance.

**2. Triggered Monitoring**

A frequency is generally not assigned to radium-226 or uranium as the monitoring for these constituents is dependent on the gross alpha results.

- a) If the Gross Alpha particle activity is less than or equal to 5 pCi/L, analysis for Uranium is not required.
- b) If the Gross Alpha particle activity for any single sample is greater than 5 pCi/L, analysis for Uranium in that same sample is required. If any single sample for Uranium is greater than 20 pCi/L, monitor at least 4 quarters for Uranium.
- c) If the Gross Alpha particle activity is > 5 pCi/L, analysis for uranium may be used to obtain the radium-226 activity (GA - Uranium = Radium-226). If GA - Uranium > 0, contact your district office. If GA - Uranium < 0, report only the GA and Uranium results.

**Contact your district office if the MCL is exceeded, or for clarification on monitoring frequencies.**

# **EXHIBIT 13**

August 17, 2017

**CONFIDENTIAL – ATTORNEY WORK PRODUCT**

Mr. Amin Salkhi, President  
Grand Petroleum, Inc.  
1451 Danville Boulevard, Suite 201  
Alamo, CA 94507

**Subject: Review of Applicant's Wastewater System Planning  
Proposed E-Z Trip Travel Center, Fresno County, California**

Dear Mr. Salkhi:

As requested, Carollo Engineers, Inc. has reviewed and analyzed the Applicant's wastewater system plan for the proposed travel center facility in Fresno County, California. Our review included a review of documents associated with the Applicant's Conditional Use Permit Application No. 3528. The documents reviewed include, but are not limited to, the following:

1. Soils Analysis and Sewage Feasibility for the Proposed E-Z Trip Travel Center Located at the N/W Corner of I-5 and West Nees Avenue, Firebaugh CA, County of Fresno dated July 5, 2016 (herein after referred to as the sewage feasibility report) and prepared by O.S.T. System Designs, Inc. ("O.S.T.") It should be noted that the cover letter for the report is presumably incorrectly dated as July 5, 2015.
2. The Applicant's Operation Statement dated February 3, 2017.
3. The Applicant's Site Plan dated January 15, 2017
4. The Applicant's Floor Plan dated January 31, 2017

The sewage feasibility report calculates the daily wastewater flow rate of 10,692 gpd which exceeds the permit level of the Fresno County Environmental Health Department and therefore the onsite wastewater treatment system will have to be permitted through the California Water Resources Control Board Discharge Order WQ 2014-0153-DWQ.

This letter provides our opinion regarding the accuracy of the findings in the sewage feasibility report and the wastewater treatment needs at the highway travel center.

1. Review of Applicant's Planned Wastewater System

O.S.T.'s sewage feasibility report indicates that the project will generate an estimated wastewater flow rate of 10,692 gallons per day. As explained in detail below, this daily wastewater flow rate is considerably lower than what would be expected at major travel center. The implications of this lower than expected value potentially include insufficient land area set aside to provide adequate wastewater treatment and disposal in full compliance with regulatory requirements.

However, there are inconsistencies and inaccuracies with O.S.T.'s calculations, even using the 10,692 gallon per day value.

#### 1A - Daily Wastewater Flow Estimation

In *Table C – Estimated Daily Flow Rate*, O.S.T. relied on the 2013 Edition of the California Plumbing Code, Appendix H, Page 407, Table H.2 (1) to calculate the daily wastewater flow. However 4 of the 10 estimated flow rate unit line items used are not California Plumbing Code published flow rates, and no citation is provided for the source of the flow rates used.

The following four line items are not included in the California Plumbing Code referenced by O.S.T:

1. Auto Mini-Mart of 2120 square feet at 1 gpd/10 sq. ft = 240 gpd
2. Trucker Mini-Mart of 2400 square feet at 1 gpd/sq. ft. = 240 gpd
3. Trucker Showers 15 showers/day at 20 gpd/shower = 600 gpd
4. Laundry 2 units at 100 gpd/washing machines = 200 gpd.

Additionally, the square footage of mini-mart space is different than the mini-mart square footage indicated on the Applicant's floor plan. The 4,520 square feet of mini-mart space (provided in Table C) does not match the floor plan provided by the applicant which indicates 7,050 +/-square feet of mini-mart floor space. The smaller square footage that was used results in underestimation of the wastewater flow rate of the facility and in turn under-sizing of the septic tank effluent disposal area.

#### 1B - Leach Field Line Length and Areal Requirement Calculations

O.S.T.'s calculation of the minimum leach line length is incorrect in section 10 of their report. The calculations correctly establish the minimum square footage of absorption area required as 9,144 square feet. However in calculating the required minimum leach line length (based on the minimum square footage of absorption area required) the calculations transpose the 9,144 number with the number 10,692, which is in fact the daily wastewater flow rate. This results in an incorrectly calculated required leach line length of 763 linear feet. The required leach line length is 651 linear feet. A corrected calculation and the calculation methodology is attached as *Septic Tank and Leach Field Sizing Calculation Sheet – 10,692 gpd*.

#### 1C - Wastewater Dispersal Method

Section 8 of O.S.T.'s report titled *Wastewater Dispersal Recommendation* states it "recommends using time and pressure dosed Rock Leach Lines to treat and disperse the wastewater generated by the proposed Travel Center". However the absorption field (aka leach field) sizing is based on gravity distribution because no calculations are provided for dosing tank sizing, dosing rates, or dosing pump flow and head requirements. Thus the supporting calculations are incomplete for the recommended dispersal method. The dosing rate has an affect on the required absorption area and in turn the space to be set aside for wastewater management.

## 2. Impacts of Actual Daily Water Use on the Planned Wastewater System

The daily water demand has a direct relationship to the amount of wastewater generated. For planning purposes it is relatively common to assume a certain percentage of water supplied will become wastewater flow and often a 90% "to sewer" factor is used as the amount of wastewater generated of total water supplied. Changing the amount of wastewater generated impacts the size of the septic tank needed as well as the amount of land set aside for wastewater disposal/dispersal to provide effective, regulatory compliant wastewater management.

Regarding daily water use, the Applicant indicated in their first operations statement submitted with their conditional use permit application to Fresno County that the daily water use is 2,000 gallons per day. Applying the 90% factor the daily wastewater flow is 1,800 gallons per day.

The sewage feasibility report calculated a daily wastewater flow of 10,692 gallons per day which requires a daily water demand of more than 10,692 gallons per day. The Applicant later submitted to Fresno County an updated daily water use of 26,179 gallons per day. In Carollo's water demand analysis we calculated a daily water demand of 43,585 gallons per day not including irrigation demand.

Applying the 90% to sewer factor to the Applicant's updated 26,179 gallon per day water use results in a daily wastewater flow rate of 23,561 gallons per day, which is more than double the flow rate of the planned wastewater system. Applying the same 90% factor to Carollo's calculated water use 43,585 gallons per day results in a daily wastewater flow of 39,227 gallons per day, which is nearly four times the flow rate of the planned wastewater system.

O.S.T.'s sewage feasibility report does not indicate the amount of land required for leach disposal, but the Sewage Feasibility Report Site Plan attached to the O. S. T. report provides a layout of the leach lines along the southwestern edge of the site. The Sewage Feasibility Report Site Plan shows a total of eight leach lines grouped two side by side with leach line spacing of 15 feet. The actual amount of land set aside for wastewater management is not indicated and had to be derived. To assess the impact on the site of higher wastewater flow rates based upon O.S.T.'s wastewater daily volume calculation, the Applicant's revised water use estimate, and Carollo's calculated daily water use, Carollo prepared a calculation sheet that determines the leach field requirements using the same formula used in the O. S. T. sewage feasibility report. Carollo also calculated the land area required for four different leach line configuration layouts. For comparative purposes Carollo also calculated the land area requirement for the 10,692 gallon per day daily wastewater flow rate used in the O.S.T. Report. The calculation sheet for three different flow rates are provided as enclosures to this letter report with the results tabulated in Table 1. The average daily wastewater flow values presented in Table 1 include (1) 10,692 gpd as estimated in the sewage feasibility report prepared by OST, (2) 23,561 gpd, which is 90% of the daily water use of 26,179 gpd recently provided by the Application and (3) 39,227 gpd, which is 90% of Carollo's calculated daily wastewater flow rate.

Table 1 – Leach Field Land Area Required for Various Daily Wastewater Flow Rates						
Average Daily Wastewater Flow (gallons per day)	Length of Leach Line Required (linear feet)	Number of Leach Lines (count)	Area Required (1) (acres)	Area Required (2) (acres)	Area Required (3) (acres)	Area Required (4) (acres)
10,692	651	7	0.22	0.30	0.36	0.33
23,561	1,337	14	0.44	0.53	0.60	0.65
39,227	2,173	22	0.69	0.83	1.03	0.98

**Table Notes:**

1. Area Required (1) is based on a leach line configuration of one single long line of leach line installation
2. Area Required (2) is based on a leach line configuration of two leach lines side by side
3. Area Required (3) is based on a leach line configuration of three leach lines side by side
4. Area Required (4) is based on a leach line configuration of four leach lines side by side

The leach line spacing used for the development of Table 1 is based on regulatory requirements as provided in the 2016 edition of the California Plumbing Code, Appendix H. Section H 601.9 requires 4 foot minimum leach line spacing plus two feet for each additional foot of depth in excess of 1 foot below the bottom of the leach line. Table H 101.6 *Location of Sewage Disposal Field*, requires a minimum side clearance of 5 feet to property lines and other features. The leach line length regulation is provided in the 2016 edition of the California Plumbing Code, Appendix H Table H 601.9 *General Disposal Field Requirements* which allows a maximum leach line length of 100 feet.

Analysis of Table 1 indicates designing a wastewater treatment system to handle the daily wastewater flow calculated by Carollo requires approximately three times the amount of land area that O.S.T. identified.

Fresno County requires that an amount of land equal to the calculated amount of land required for the leach field be set aside and reserved for potential future use for septic tank effluent disposal. The requirement is provided in the 2016 California Plumbing Code Appendix H, Article H 101.6. Thus, regardless of leach line configuration, double the amount of area identified in Table 1 will be required to construct a compliant wastewater management area.

3. The Applicant's Planned Wastewater System May Not Comply with California Water Resources Control Board Requirements

O.S.T.'s sewage feasibility report assumes that a wastewater management system using a septic tank and leach field will be acceptable to regulators. This may not be an accurate assumption. As indicated in O.S.T.'s Sewage Feasibility Report, the wastewater system must be permitted through the California Water Resources Control Board Discharge Order WQ 2014-0153-DWQ. This discharge order is applicable to wastewater generators with flow rates less than 100,000 gallons per day. For wastewater systems handling more than 20,000 gallons per day, the discharge order requires a nitrogen effluent limit evaluation. The

Mr. Amin Salkhi  
Grand Petroleum, Inc.  
August 17, 2017

Page 5

results of a nitrogen effluent limit evaluation determines the allowable amount of nitrogen in the treated wastewater and essentially determines the necessary wastewater treatment method to be utilized. If the evaluation determines that nitrogen control is required then the planned septic tank leach field system will not be permitted and aerobic treatment or some other treatment method will be required to meet nitrogen limits on the treated wastewater effluent. The O.S.T. report does not address this potential requirement.

The conclusion in the O.S.T. Report that there is adequate primary and secondary area for sewage dispersal using conventional time and pressured dosed rock leach lines, is only valid based upon the daily flow rate contained in the report. "In the event that changes occur in the design of the project, this report's recommendations will not be considered valid unless the changes are reviewed with O.S.T. System Designs, Inc. and the conclusions and recommendations are modified or verified in writing." There is nothing in the record indicating that O.S.T. has reviewed the Applicant's higher daily water use estimate or confirmed that the associated higher wastewater flows can be properly managed onsite.

Please feel free to contact at me at your convenience if you have any questions or need additional information related to Carollo's analysis of the planned wastewater system for the Applicant's proposed travel center.

Sincerely,

CAROLLO ENGINEERS, INC.



Eric McGrath P. E.  
Project Manager

ETM : etm

Enclosures:

Septic Tank and Leach Field Sizing Calculation Sheet – 10,692 gpd  
Septic Tank and Leach Field Sizing Calculation Sheet – 23,561 gpd  
Septic Tank and Leach Field Sizing Calculation Sheet – 39,227 gpd

cc: Mr. Kenneth B. Finney, Beveridge & Diamond, P. C.  
Ms. Kaitlyn D. Shannon, Beveridge & Diamond P. C.

**CONFIDENTIAL - ATTORNEY WORK PRODUCT**  
**EZ Trip Travel Center - Fresno County, California**  
**Septic Tank and Leach Field Sizing - 10,692 GPD**

**Average Day Flow (ADF)**

ADF= 10,692 gallons/day From: Soils Analysis and Sewage Feasibility Report  
prepared by OST Systems Designs, Inc. Dated July 5, 2016

**Septic Tank Sizing**

Per 2016 California Plumbing Code Appendix H Table H201.1 (2) Note 1(b)

$$V_{\min} = (\text{ADF}) \times 0.75 + 1125$$

Where:

$V_{\min}$  = Minimum Septic Tank Volume (gallons)

ADF = Average Day Flow (gallons/day)

$$V_{\min} = 9,144 \text{ gallons}$$

**Leach Field Sizing**

Per County of Fresno Department of Public Health  
Guidance Document for the Preparation of Engineered Sewage Disposal System and Sewage Feasibility Reports  
and the California Plumbing Code

**Leach Field Application Rate - Q**

$$Q = 5/vt$$

Where:

Q = Leach Field Application Rate (gpd/ft<sup>2</sup>)

t = Average Percolation Rate (minutes/inch)

$$t = 24.81 \text{ minutes/inch}$$

From Soils Analysis and Sewage Feasibility Report  
for the Proposed E-Z Trip Travel Center  
Located at the N/W Corner of I-15 and West Nees Avenue  
Firebaugh, CA County of Fresno  
Dated July 5, 2016

$$Q = 1.00 \text{ gpd/ft}^2$$

**Leach Field Loading Factor - C**

$$C = 100/Q$$

Where:

C = Loading Factor (ft<sup>2</sup>/100 gallons of septic tank capacity)

Q = Leach Field Application Rate (gpd/ft<sup>2</sup>)

$$C = 99.6 \text{ ft}^2/100 \text{ gallons of septic tank capacity}$$

**Leach Field Absorption Area - A**

$$A = C \times \text{Septic Tank Volume}/100$$

Where:

A = Absorption Area (ft<sup>2</sup>)

C = Loading Factor (ft<sup>2</sup>/100 gallons of septic tank capacity)

$$A = 9,109.2 \text{ ft}^2$$

### Leach Line Sizing

$w_{max}$	= 3	feet	Leach Line Trench Width (2016 CPC Table H 601.9)
$d$	= 6.5	feet	Depth of Drain Rock (under leach line)
$d_{max}$	= NA	feet	Governed by distance from the groundwater table or bedrock and is not applicable
$l_{max}$	= 100	feet	Maximum Leach Line Length (2016 CPC Table H 601.9)
$d_{dsn}$	= 5.5	feet	Absorption Area of Leach Line Trench Sidewall (per Guidance Document Section III Other Criteria)
$A$	= 14	ft <sup>2</sup> /foot of trench	Absorption area per foot of leach line trench
$L$	= 651	ft	Total length of Leach Lines Required
$n$	= 7	count	Number of Leach Lines Use
$S_{min}$	= 4	feet	Minimum spacing between leach lines (2016 CPC Section H 601.9)
$S_{add}$	= 2	feet	Add 2 feet for each additional foot of depth in excess of 1 foot below the bottom of the drain pipe (2016 CPC Appendix H Section H 6.9)
$S_{dsn}$	= 15	feet	Center to center design spacing of leach line trenches
$S_{side}$	= 5	feet	Minimum side clearance from property (2016 CPC Table H 101.8)

### Leach Area Sizing (One Long Line Layout)

$L_1$	= 740	feet	Length of one leach line long layout area
$W_1$	= 13	feet	Width of one leach line long layout area
$A_1$	= 9,620	square feet	Area of one leach line long layout area
$A_1$	= 0.22	acres	Area of one leach line long layout area

### Leach Area Sizing (Two Side by Side Layout)

$L_2$	= 425	feet	Length of two leach line long layout area
$W_2$	= 31	feet	Width of two leach line long layout area
$A_2$	= 13,175	square feet	Area of two leach line long layout area
$A_2$	= 0.30	acres	Area of two leach line long layout area

### Leach Area Sizing (Three Side by Side Layout)

$L_3$	= 320	feet	Length of three leach line long layout area
$W_3$	= 49	feet	Width of three leach line long layout area
$A_3$	= 15,680	square feet	Area of three leach line long layout area
$A_3$	= 0.36	acres	Area of three leach line long layout area

### Leach Area Sizing (Four Side by Side Layout)

$L_4$	= 215	feet	Length of four leach line long layout area
$W_4$	= 67	feet	Width of four leach line long layout area
$A_4$	= 14,405	square feet	Area of four leach line long layout area
$A_4$	= 0.33	acres	Area of four leach line long layout area

**CONFIDENTIAL - ATTORNEY WORK PRODUCT**  
**EZ Trip Travel Center - Fresno County, California**  
**Septic Tank and Leach Field Sizing - 23,561 GPD**

**Average Day Flow (ADF)**

Daily Water Use= 26179	gallons/day	From: Applicant's Updated Water Usage Estimate (not dated)
To Sewer Factor= 90%	percent	Conservative estimate based on engineering judgement
ADF= 23,561	gallons/day	Calculated from Daily Water Use and To Sewer Factor

**Septic Tank Sizing**

Per 2016 California Plumbing Code Appendix H Table H201.1 (2) Note 1(b)

$$V_{\min} = (\text{ADF}) \times 0.75 + 1125$$

Where:

$V_{\min}$  = Minimum Septic Tank Volume (gallons)

ADF = Average Day Flow (gallons/day)

$$V_{\min} = 18,796 \quad \text{gallons}$$

**Leach Field Sizing**

Per County of Fresno Department of Public Health

Guidance Document for the Preparation of Engineered Sewage Disposal System and Sewage Feasibility Reports and the California Plumbing Code

**Leach Field Application Rate - Q**

$$Q = 5/vt$$

Where:

Q = Leach Field Application Rate (gpd/ft<sup>2</sup>)

t = Average Percolation Rate (minutes/inch)

$$t = 24.81 \quad \text{minutes/inch} \quad \begin{array}{l} \text{From Soils Analysis and Sewage Feasibility Report} \\ \text{for the Proposed E-Z Trip Travel Center} \\ \text{Located at the N/W Corner of I-15 and West Nees Avenue} \\ \text{Firebaugh, CA County of Fresno} \\ \text{Dated July 5, 2016} \end{array}$$

$$Q = 1.00 \quad \text{gpd/ft}^2$$

**Leach Field Loading Factor - C**

$$C = 100/Q$$

Where:

C = Loading Factor (ft<sup>2</sup>/100 gallons of septic tank capacity)

Q = Leach Field Application Rate (gpd/ft<sup>2</sup>)

$$C = 99.6 \quad \text{ft}^2/100 \text{ gallons of septic tank capacity}$$

**Leach Field Absorption Area - A**

$$A = C \times \text{Septic Tank Volume}/100$$

Where:

A = Absorption Area (ft<sup>2</sup>)

C = Loading Factor (ft<sup>2</sup>/100 gallons of septic tank capacity)

$$A = 18,724.3 \quad \text{ft}^2$$

### Leach Line Sizing

$w_{max}$	= 3	feet	Leach Line Trench Width (2016 CPC Table H 601.9)
$d$	= 6.5	feet	Depth of Drain Rock (under leach line)
$d_{max}$	= NA	feet	Governed by distance from the groundwater table bedrock and is not applicable
$l_{max}$	= 100	feet	Maximum Leach Line Length (2016 CPC Table H 601.9)
$d_{dsn}$	= 5.5	feet	Absorption Area of Leach Line Trench Sidewall (per Guidance Document Section III Other Criteria)
$A$	= 14	ft <sup>2</sup> /foot of trench	Absorption area per foot of leach line trench
$L$	= 1337	ft	Total length of Leach Lines Required
$n$	= 14	count	Number of Leach Lines Used
$S_{min}$	= 4	feet	Minimum spacing between leach lines (2016 CPC Section H 601.9)
$S_{add}$	= 2	feet	Add 2 feet for each additional foot of depth in excess of 1 foot below the bottom of the drain pipe (2016 CPC Appendix H Section H 601.9)
$S_{dsn}$	= 15	feet	Center to center design spacing of leach line trenches
$S_{side}$	= 5	feet	Minimum side clearance from property (2016 CPC Table H 101.8)

### Leach Area Sizing (One Long Line Layout)

$L_1$	= 1475	feet	Length of one leach line long layout area
$W_1$	= 13	feet	Width of one leach line long layout area
$A_1$	= 19,175	square feet	Area of one leach line long layout area
$A_1$	= 0.44	acres	Area of one leach line long layout area

### Leach Area Sizing (Two Side by Side Layout)

$L_2$	= 740	feet	Length of two leach line long layout area
$W_2$	= 31	feet	Width of two leach line long layout area
$A_2$	= 22,940	square feet	Area of two leach line long layout area
$A_2$	= 0.53	acres	Area of two leach line long layout area

### Leach Area Sizing (Three Side by Side Layout)

$L_3$	= 530	feet	Length of three leach line long layout area
$W_3$	= 49	feet	Width of three leach line long layout area
$A_3$	= 25,970	square feet	Area of three leach line long layout area
$A_3$	= 0.60	acres	Area of three leach line long layout area

### Leach Area Sizing (Four Side by Side Layout)

$L_4$	= 425	feet	Length of four leach line long layout area
$W_4$	= 67	feet	Width of four leach line long layout area
$A_4$	= 28,475	square feet	Area of four leach line long layout area
$A_4$	= 0.65	acres	Area of four leach line long layout area

**CONFIDENTIAL - ATTORNEY WORK PRODUCT**  
**EZ Trip Travel Center - Fresno County, California**  
**Septic Tank and Leach Field Sizing - 39,227 GPD**

**Average Day Flow (ADF)**

Daily Water Use= 43585	gallons/day	From Carollo's water use calculation sheet
To Sewer Factor= 90%	percent	Conservative estimate baaed on engineering judgement
ADF= 39,227	gallons/day	Calculated from daily water use and to sewer factor

**Septic Tank Sizing**

Per 2016 California Plumbing Code Appendix H Table H201.1 (2) Note 1(b)

$$V_{\min} = (\text{ADF}) \times 0.75 + 1125$$

Where:

$V_{\min}$  = Minimum Septic Tank Volume (gallons)

ADF = Average Day Flow (gallons/day)

$$V_{\min} = 30,545 \quad \text{gallons}$$

**Leach Field Sizing**

Per County of Fresno Department of Public Health

Guidance Document for the Preparation of Engineered Sewage Disposal System and Sewage Feasibility Reports and the 2016 California Plumbing Code

**Leach Field Application Rate - Q**

$$Q = 5/vt$$

Where:

Q = Leach Field Application Rate (gpd/ft<sup>2</sup>)

t = Average Percolation Rate (minutes/inch)

$$t = 24.81 \quad \text{minutes/inch} \quad \text{From Soils Analysis and Sewage Feasibility Report for the Proposed E-Z Trip Travel Center Located at the N/W Corner of I-15 and West Nees Avenue Firebaugh, CA County of Fresno Dated July 5, 2016}$$

$$Q = 1.00 \quad \text{gpd/ft}^2$$

**Leach Field Loading Factor - C**

$$C = 100/Q$$

Where:

C = Loading Factor (ft<sup>2</sup>/100 gallons of septic tank capacity)

Q = Leach Field Application Rate (gpd/ft<sup>2</sup>)

$$C = 99.6 \quad \text{ft}^2/100 \text{ gallons of septic tank capacity}$$

**Leach Field Absorption Area - A**

$$A = C \times \text{Septic Tank Volume}/100$$

Where:

A = Absorption Area (ft<sup>2</sup>)

C = Loading Factor (ft<sup>2</sup>/100 gallons of septic tank capacity)

$$A = 30,428.6 \quad \text{ft}^2$$

### Leach Line Sizing

$w_{\max}$	= 3	feet	Leach Line Trench Width (2016 CPC Table H 601.9)
$d$	= 6.5	feet	Depth of Drain Rock (under leach line)
$d_{\max}$	= NA	feet	Governed by distance from groundwater table or bedrock and is not applicable
$l_{\max}$	= 100	feet	Maximum Leach Line Length (2016 CPC Table H 601.9)
$d_{\text{dsn}}$	= 5.5	feet	Absorption Area of Leach Line Trench Sidewall (per Guidance Document Section III Other Criteria)
$A$	= 14	ft <sup>2</sup> /foot of trench	Absorption area per foot of leach line trench
$L$	= 2173	ft	Total length of Leach Lines Required
$n$	= 22	count	Number of Leach Lines Used
$S_{\min}$	= 4	feet	Minimum spacing between leach lines (2016 CPC Section H 601.9)
$S_{\text{add}}$	= 2	feet	Add 2 feet for each additional foot of depth in excess of 1 foot below the bottom of the drain pipe (2016 CPC Appendix H Section H 601.9)
$S_{\text{dsn}}$	= 15	feet	Center to center design spacing of leach line trenches
$S_{\text{side}}$	= 5	feet	Minimum side clearance from property (2016 CPC Table H 101.8)

### Leach Area Sizing (One Long Line Layout)

$L_1$	= 2315	feet	Length of one leach line long layout area
$W_1$	= 13	feet	Width of one leach line long layout area
$A_1$	= 30,095	square feet	Area of one leach line long layout area
$A_1$	= 0.69	acres	Area of one leach line long layout area

### Leach Area Sizing (Two Side by Side Layout)

$L_2$	= 1160	feet	Length of two leach line long layout area
$W_2$	= 31	feet	Width of two leach line long layout area
$A_2$	= 35,960	square feet	Area of two leach line long layout area
$A_2$	= 0.83	acres	Area of two leach line long layout area

### Leach Area Sizing (Three Side by Side Layout)

$L_3$	= 915	feet	Length of three leach line long layout area
$W_3$	= 49	feet	Width of three leach line long layout area
$A_3$	= 44,835	square feet	Area of three leach line long layout area
$A_3$	= 1.03	acres	Area of three leach line long layout area

### Leach Area Sizing (Four Side by Side Layout)

$L_4$	= 635	feet	Length of four leach line long layout area
$W_4$	= 67	feet	Width of four leach line long layout area
$A_4$	= 42,545	square feet	Area of four leach line long layout area
$A_4$	= 0.98	acres	Area of four leach line long layout area

# **EXHIBIT 14**

June 29, 2017

**PRIVILEGED AND CONFIDENTIAL  
ATTORNEY/CLIENT COMMUNICATION  
ATTORNEY WORK PRODUCT**

Mr. Amin Salkhi, President  
Grand Petroleum, Inc.  
1451 Danville Blvd., Suite 201  
Alamo, CA 94507

Subject: ***Review of Traffic Impact Analysis –  
Proposed E-Z Trip Travel Center, Fresno County, California***

Dear Mr. Salkhi:

As requested, MRO Engineers, Inc., (MRO) has reviewed the traffic impact analysis prepared with respect to the proposed E-Z Trip Travel Center project (“Project”) in Fresno County, California. (Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016). Our review focused on the technical adequacy of the analysis, including the detailed procedures and conclusions documented in the Peters Engineering Group (“PEG”) study.

### **BACKGROUND**

The Project will consist of a highway travel center at the northwest quadrant of the Interstate 5/Nees Avenue interchange in Fresno County, California. According to the PEG study (p. 1) and information provided by the applicant, specific components of the Project include:

- A 12,550-square-foot (SF) building, including:
  - Mini-mart oriented toward automobile patrons – 2,120 SF,
  - Mini-mart oriented toward truck drivers – 2,400 SF,
  - Truckers’ services – 3,240 SF,
  - Sit-down restaurant – 4,800 SF,
- 24 automobile fueling positions, and
- 10 diesel fueling positions.

A total of 174 parking spaces will be provided, including 83 for automobiles and 91 for trucks, buses, and recreational vehicles.

Vehicular access is proposed via four driveways to be located along Paul Negra Road.

### **TRAFFIC IMPACT ANALYSIS REVIEW**

Our review of the traffic impact analysis revealed the following potentially significant deficiencies that should be addressed prior to approval of the Project by Fresno County.

1. ***Analysis Time Periods*** – The PEG traffic impact analysis addressed conditions in a single peak-hour period – Sundays between 4:00 and 5:00 PM. (PEG, pp. 5 – 6) This determination was based on the results of 24-hour traffic volume counts, which are summarized in PEG Table 4 (p. 6). As shown in that table, the total daily traffic volume on Nees Avenue west of the Interstate 5

(I-5) interchange on the count day (September 18, 2016) was 2,564 vehicles. The table also shows that on Friday, September 16, 2016, the total daily volume between the northbound and southbound I-5 ramps was 2,578 vehicles, a slightly higher volume.

This raises the obvious question as to why the Friday peak hour was not also analyzed.

The detailed traffic count data sheets are presented in Appendix A of the PEG report. Because the 24-hour count sheets are extremely difficult to read, we have excerpted key information and summarized it in a table, which is presented as Attachment A.

The daily totals shown in the table match those described above. Highlighted within the table is the analysis period of Sunday between 4:00 and 5:00 PM (west of the I-5 interchange), when a total of 204 vehicles were counted. Interestingly, the previous hour (3:00 – 4:00 PM) at the same location actually had a higher traffic volume (213 vs. 204). However, when we examined the intersection turning movement counts that were presented in PEG Appendix A, we found that the Sunday 3:00 – 4:00 PM hour was not even counted, as the counts were performed from 3:30 – 6:00 PM. Thus, the analysis didn't even address the true peak hour on a Sunday.

Also highlighted on the table in Attachment A is the 5:00 – 6:00 PM hour between the I-5 ramps on Friday. The total volume during that hour was 200 vehicles, which is approximately the same as the total during the selected analysis period. However, the directional orientation of the vehicles in this period was somewhat different from that shown during the analysis period. In particular, about three-quarters of the Friday volume is eastbound at the count location, whereas the Sunday volumes are approximately evenly split between the eastbound and westbound directions.

The information presented here strongly suggests that, in order to ensure a conservative analysis and, in particular, to ensure that all potential traffic impacts are identified, traffic operations during the Friday peak hour should also be evaluated. In addition to the fact that the total volumes are very similar to the Sunday analysis peak hour, the different directional distribution of the traffic during the Friday peak hour suggests the possibility that additional impacts would be identified, as different critical movements would likely be found at the study intersections.

Consequently, the traffic impact analysis should be revised to incorporate an analysis of traffic operations during the actual Sunday peak hour (3:00 – 4:00 PM), as well as the Friday peak hour (5:00 – 6:00 PM).

2. **Project Trip Generation** – The trip generation estimates for the Project are presented in PEG Table 6 (p. 8). The trip generation rates for the automobile and truck fueling facilities were developed based on counts conducted at the existing Chevron station on Paul Negra Road, a short distance north of the Project site. We have several concerns regarding the validity of the Project trip generation estimates.

#### *A. Sample Size and Data Collection Requirements*

First, we are concerned that the trip rates for the two fueling facilities are based on a sample size of one; that is, the data used to develop the trip rates was collected at a single location on a single occasion. The Institute of Transportation Engineers (ITE) *Trip Generation Handbook* (Third Edition, August 2014, p. 26) says to collect local data when the:

*Data plot has only one or two data points (and, preferably, when five or fewer)[.]*

Further, the *Trip Generation Handbook* (p. 29) addresses the preferred sample size for selecting appropriate trip generation rates from those available in the *ITE Trip Generation Manual* (ITE, Ninth Edition, 2012):

- *If the number of data points is **one or two**, either (1) consider the use of a different independent variable and its associated data pages, or (2) collect local data and establish a local or consolidated rate. Refer to Chapter 9 for guidance.*
- *If the number of data points is **three, four, or five**, the analyst is encouraged to collect local data and establish a local or consolidated rate . . . [Emphasis not added]*

In summary, only if the sample size is six or more does the ITE handbook indicate that it is acceptable to proceed with the analysis. Obviously, a single data point is inadequate to represent a valid indication of the trip generation characteristics of any land use.

#### *B. Existing Gas Station is Not Comparable to Project*

We also question whether the existing Chevron station is sufficiently similar to the Project. For example, the Project includes over 3,200 SF for “truckers’ services.” This represents about one-quarter of the total square footage of the Project. Does the existing station include any such services? If not, then substantial questions could be raised regarding the appropriateness of the derived trip generation rates.

#### *C. Improper Trip Generation Analysis for Truckers’ Services and Restaurant*

Moreover, we note that the Project trip generation estimate presented in PEG Table 6 fails to account for the truckers’ services component of the Project. It seems to suggest that this activity is fully accounted for within the 3.00 trips per diesel fueling position trip rate, but this assumption is unsubstantiated. Similarly, the 2,400 SF mini-mart/convenience store oriented toward the truck/diesel fuel pumps is unaccounted for, as there is no certainty that the small trip rate directly associated with the diesel fuel pumps fully accounts for activity within the mini-mart. Ignoring these two key components of the Project will likely lead to underestimation of the Project’s trip generation, which could, in turn, result in understatement of the Project’s traffic impacts.

We also question the approach taken with regard to estimating the number of trips generated by the proposed 4,800 SF sit-down restaurant. For trip generation purposes, the size of the proposed restaurant has been arbitrarily reduced by 1,000 SF to reflect an apparent guess concerning the size of the existing Subway sandwich shop within the Chevron station where trip data was collected. In other words, the traffic analysis addresses a 3,800 SF restaurant, instead of the actual 4,800 SF facility. While the intent is to account for the fact that the Subway trips are included within the total number of trips counted at the Chevron driveway, the validity of the specific adjustment is not adequately demonstrated.

Further, the trip generation rate applied to the proposed restaurant, which was taken from the *ITE Trip Generation Manual*, is based on data collected at only three locations, with trip rates ranging from 9.79 to 43.20 trips per 1,000 SF. (For ease of reference, the pertinent page from the ITE document is presented here as Attachment B.) The PEG traffic study used the weighted average rate of 18.46 trips per 1,000 SF, which is less than half of the highest rate documented in the ITE publication. While we are not suggesting that the highest trip rate should be used, this

huge disparity among the highest, lowest, and average rates provides further evidence as to the importance of having an adequate sample size. As described above, the *ITE Trip Generation Handbook* calls for a minimum sample size of six data points. In fact, the excerpt presented in Attachment B contains the notation, “Caution – Use Carefully – Small Sample Size.”

Considering the two previous points, if the proposed restaurant generated trips at the highest rate documented in the *ITE Trip Generation Manual*, the resulting trip generation estimate would be 207 Sunday peak-hour trips instead of the 71 trips shown in PEG Table 6. While we again acknowledge that it might not be appropriate to employ the highest documented trip rate, insufficient data are available to ensure that the weighted average rate used in the analysis is meaningful.

#### D. *Internal Trip Reduction*

The PEG trip generation estimate also includes a 20 percent internal trip reduction, based on information presented in Tables 7.1 and 7.2 in Second Edition (June 2004) of the *ITE Trip Generation Handbook*. However, the only 20 percent values in the referenced tables are for trips from one retail use to another retail use in the weekday PM peak hour of adjacent street traffic. Of course, the PEG study addresses the Sunday peak hour, so it would appear that the assumed 20 percent value does not apply.

#### E. *Pass-by Trips*

Finally, the PEG analysis assumes that 15 percent of the trips at the Project will be “pass-by” trips; that is, they represent vehicles that were already passing by the site on Paul Negra Road, which enter the site rather than continuing on to the existing Chevron station. While the PEG study correctly recognizes that the standard pass-by trip rates documented in the *ITE Trip Generation Handbook* do not apply (because of the limited volume of traffic passing by the site), it does not adequately describe the derivation of or justify the use of the 15 percent value employed in the analysis.

In summary, we believe that the trip generation estimate prepared for the Project lacks credibility, as it is based on insufficient data. Further, several of the specific factors applied in developing the estimate have not been adequately substantiated and are, therefore, speculative. These numerous deficiencies raise significant questions regarding the validity of the Project trip generation estimate.

3. ***Project-Generated Vehicle Classification*** – Appendix A of the PEG traffic study report presents the results of vehicle classification counts performed in conjunction with the analysis. Such counts indicate the types and sizes of vehicles passing by the count location.

In addition, the peak-hour turning movement counts performed at the two study intersections indicated the truck percentages at those locations. At the Nees Avenue/I-5 Southbound Ramps intersection, 13.7 percent of the vehicles counted were trucks during the Sunday PM peak hour. At Nees Avenue/I-5 Northbound Ramps, 16.9 percent of the peak-hour vehicles were trucks.

Based on this, the PEG analysis applied a 17 percent “heavy vehicle” factor at both locations in the intersection level of service calculations; the same factor was applied for all analysis scenarios. This parameter is intended to reflect the reduced operating characteristics of trucks relative to passenger vehicles (e.g., slower acceleration, greater braking distances, etc.).

While this would seem to represent a conservative approach to consideration of truck traffic within the analysis, it fails to recognize that the Project is a “truck stop.” As such, a significant proportion of the traffic attracted to the Project will be trucks and other heavy vehicles (e.g., buses and recreation vehicles). This suggests that the truck percentage will be higher in the “with project” analysis scenarios than was found for existing conditions.

By using a consistent truck percentage in all analysis scenarios, the analysis fails to reflect the type of traffic to be generated by the Project, particularly with respect to increased truck volumes. In doing so, it understates the impacts of the Project at the study intersections.

4. **Project Traffic Assignment is Flawed** – Figure 5 in the PEG study illustrates the assignment of Project-generated trips to the study intersections. For ease of reference, that figure is presented here as Attachment C, with the total peak-hour volume of Project-generated traffic west of the Nees Avenue/I-5 Southbound Ramps intersection noted in red. As shown there, Figure 5 shows 223 westbound project trips traveling toward the Project site and 215 eastbound trips departing the Project site.

However, PEG Table 6 (p. 8), which summarizes the Project trip generation estimate employed in the analysis, shows that the Project is estimated to generate 228 inbound trips and 222 outbound trips. Consequently, the Project traffic assignment values shown in Figure 5 represent a shortage of 5 inbound trips and 7 outbound trips. This is summarized in Table 1 below.

Source	Project Trips		
	In	Out	Total
PEG Table 6 <sup>2</sup>	228	222	450
PEG Figure 5 <sup>3</sup>	223	215	438
Difference	5	7	12

Notes:

<sup>1</sup> Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016.

<sup>2</sup> Ibid., “Table 6 - Sunday Peak-Hour Project Trip Generation,” p. 8.

<sup>3</sup> Ibid., “Figure 5 - Sunday Peak-Hour Project Traffic Volumes,” p. 28.

Although these are seemingly small differences, the lack of consistency within the analysis is a concern, as it raises additional questions regarding the accuracy of the work. Furthermore, because the Project-related traffic volumes assigned to the study intersections are less than the actual estimate of Project-generated traffic, the impacts of the Project are understated.

5. **Pending Project Trip Generation Estimate** – PEG Table 7 (p. 9) presents the trip generation estimate for the one assumed pending project, a 2,000 SF fast food restaurant to be located north of the Project on Paul Negra Road. Similar to the Project, the estimate includes application of a 15 percent pass-by trip reduction. As noted in Comment 2.E. above (p. 4), this pass-by trip reduction factor is unsubstantiated.

6. **Cumulative Traffic Volumes** – The approach to estimating year 2037 traffic volumes is described at PEG p. 9:

*The Fresno Council of Governments (COG) maintains a travel model that is typically used to forecast future traffic volumes. The model predicts no growth in traffic volumes on Nees Avenue between 2015 and 2035. . . . Since some regional growth typically occurs, the analyses assume an annual growth rate of 1.0 percent applied to the existing traffic volumes through the year 2037.*

But this approach ignores the fact that traffic volumes on Paul Negra Road and Nees Avenue in the study area are directly linked to traffic volumes on I-5, as there are virtually no other land uses nearby to act as origins for trips using those roadways. In fact, at this time, virtually the only reason to be on Paul Negra Road is to travel to or from the existing Chevron station, and the bulk of the traffic doing so is oriented to/from I-5. This is confirmed by the Project trip distribution presented at PEG Figure 4, which shows 90 percent of the Project-related traffic being oriented to/from I-5. It is reasonable to expect that as traffic volumes on I-5 grow, so will traffic volumes on Paul Negra Road.

The primary source of information regarding projected traffic growth on I-5 is the *Interstate 5 Transportation Concept Report* (Caltrans, Office of System Planning, District 6, February 2013). That document provides daily and peak-hour traffic volume information for the years 2011, 2020, and 2035. For the segment of I-5 containing the Project (i.e., Segment 16, from Russell Avenue to the Merced County line), Table 2 summarizes the traffic volume information presented in Summary Chart 2A in the *Transportation Concept Report* (which is presented here as Attachment D).

Year	Annual Average Daily Traffic (AADT)			Peak Hour Traffic		
	Traffic Volume	Traffic Growth	Percent Growth <sup>2</sup>	Traffic Volume	Traffic Growth	Percent Growth <sup>2</sup>
2011	34,500	--	--	5,200	--	--
2020	49,700	15,200	44.1% (4.9%/Year)	7,500	2,300	44.2% (4.9%/Year)
2035	96,600	62,100	180.0% (7.5%/Year)	14,560	9,360	180.0% (7.5%/Year)

Notes:  
<sup>1</sup> Reference: Caltrans, Office of System Planning, District 6, *Interstate 5 Transportation Concept Report*, February 2013.  
<sup>2</sup> Overall growth percentage and average annual growth percentage (shown in parentheses).

For both daily and peak hour periods, Caltrans projects the volume on I-5 to grow by 180 percent between 2011 and 2035. Over that 24-year period, that equates to an annual growth rate of 7.5 percent. This is obviously considerably higher than the 1.0 percent per year assumption in the PEG traffic analysis.

Consequently, PEG's analysis substantially underestimated the year 2037 traffic volumes on Nees Avenue and Paul Negra Road. This will lead, in turn, to understatement of the vehicular delay values at the study intersections, so that no meaningful indication of the future level of service is provided for those locations. The degraded "no project" level of service that is certain to result from the use of more realistic future traffic estimates increases the probability that addition of the Project-generated traffic will result in a significant impact under Fresno County significance criteria. That is, as traffic increases on Nees Avenue and the I-5 freeway ramps, it becomes increasingly likely that the critical movements at the study intersections will operate at unacceptable levels of service and that addition of the Project traffic will cause the delays on those critical movements to increase by 5.0 seconds or more.

The analysis must be revised to reflect the level of traffic growth projected by Caltrans and to provide an accurate indication of the operating conditions at the study intersections.

7. **Cumulative Project Trip Generation** – The volume of Project-generated traffic is also directly linked to the volume of traffic on I-5, as 90 percent of the vehicles traveling to or from the Project originate on I-5, according to the PEG study. Because of the extremely rural nature of the area surrounding the project site, virtually no one is on Paul Negra Road unless they are passing by on I-5 and need fuel or food.

This direct linkage between I-5 and Project-related traffic volumes means that as traffic grows on I-5, the Project will attract more patrons. The PEG traffic analysis, though, assumes that Project-generated traffic will not change over time, no matter how many potential patrons are passing by the site on I-5. This assumption is illogical and inappropriate. If, as described above, the pool of potential patrons increases at an average rate of 7.5 percent per year, it is reasonable to expect that the number of customers at the Project will increase at approximately the same rate. This suggests that between now and the year 2037, traffic at the Project (and, therefore, at the study intersections) will increase by 150 percent (i.e., 20 years at an average rate of 7.5 percent per year).

Because the Project trip generation has been underestimated, the cumulative traffic impacts of the Project have been substantially understated. A revised traffic analysis must be prepared, which more accurately reflects the future volume of traffic at the Project.

8. **Queue Length Results Are Not Credible** – Table 10 (p. 10) in the PEG report provides the "Intersection Queuing Summary" for Existing Conditions. At the Nees Avenue/I-5 Southbound Ramps intersection, the table indicates a 13-foot queue on the southbound approach. At the Nees Avenue/Northbound Ramps intersection, a 5-foot queue is shown on the eastbound approach and a 10-foot queue on the northbound approach.

These results lack credibility, as there are no vehicles on the American road system that are as little as 5, 10, or even 13 feet long. Similar errors are evident in PEG Table 11 (p. 10), which presents the Existing Plus Project queue lengths (13 feet, for example). Even the Cumulative 2037 With Project queue lengths presented in PEG Table 14 (p. 11) are as short as 15 feet (on the eastbound approach at Nees Avenue/I-5 Northbound Ramps).

We note that the "passenger car" design vehicle designated in Exhibit 2-3 (p. 21) in the document, *A Policy on Geometric Design of Highways and Streets* (American Association of State Highway and Transportation Officials, 2004) is 19-feet long. According to the User Guide for the Synchro 9 software used to calculate the intersection levels of service, the standard

convention is to assume that a passenger car in a queue consumes 25 feet. (Reference: Trafficware, *Synchro Studio 9 User Guide*, August 18, 2015)

Of course, as noted in the PEG traffic study, 17 percent of the existing traffic at the study intersections consists of trucks. According to Caltrans, trucks are as long as 72 feet. (Reference: Caltrans, *Highway Design Manual*, May 7, 2012, Figures 404.5A and 404.5B, pp. 400-15 and 400-16) Such a vehicle would consume at least 75 feet in a queue.

Claiming that the queues associated with development of the Project will be less than the length of an average passenger car represents a substantial deficiency in the analysis. Such an irrational result raises questions regarding the credibility of the analysis as a whole.

9. **Project Driveway Operations** – Four driveways are planned to serve the Project, all of which will be on Paul Negra Road. Page 1 of the PEG traffic report says that:

*The southernmost driveway will be the first driveway encountered by vehicles driving from the interchange and will be an entrance only for trucks only.*

Recognizing that a large proportion of the patrons at the Project will be first-time or, perhaps, occasional visitors, it is unclear how the restrictions described here will be enforced or controlled.

Passenger car drivers approaching the site from I-5 will naturally be inclined to enter at the first available opportunity, as they will be unfamiliar with the layout of the project. Review of the Project site plan suggests that such drivers might have difficulty finding their way to the automobile fuel pumps. What will be the effect of mixing confused automobile drivers with the large number of trucks expected on-site?

Moreover, we note that no analysis was presented in the PEG study to address traffic operations at the four driveways. Such an analysis would, at a minimum, address the following questions:

- How long will delays be for drivers exiting the site?
- How long will queues be for both entering and exiting traffic?
- Is there adequate sight distance at the driveways to ensure safe operation for entering and exiting drivers?

The failure to provide such an analysis is a substantial deficiency in the analysis, which must be revised to provide pertinent information.

10. **Freeway Merge/Diverge Analyses** – Two issues afflict the analysis of freeway merge and diverge areas. The results of those analyses are summarized in PEG Table 17 (p. 19).

First, the analysis results are inadequately documented, as follows:

- No analysis results are shown for Near-Term No Project conditions, so it is impossible to determine the incremental impact of the Project in the near-term scenario.
- Although levels of service (LOS) are presented, the traffic density values that lead to determination of the LOS are not. Again, this makes it impossible to identify the specific incremental impact of the Project.

The second issue is that the analysis results are wrong. Review of the merge/diverge calculations presented in PEG Appendix F reveals that the addition of the project traffic results in lower density values at the two off-ramps than under “no project” conditions (i.e., the additional traffic results in improved operations). This is true for both Existing Plus Project and Cumulative Plus Project conditions. (Because Near-Term No Project results were not provided, it is not possible to establish whether this issue applies to that time frame, as well.) To illustrate this point, we have prepared Table 3, which presents the detailed density values for existing and cumulative conditions, both with and without the Project.

We have highlighted in yellow the cells within the table that indicate improved operations following the addition of Project-generated traffic. This result is illogical and should have represented a red flag for the analyst that something is wrong.

Ramp	Existing		Existing Plus Project		2037 No Project		2037 Plus Project	
	Density <sup>2</sup>	LOS <sup>3</sup>	Density	LOS	Density	LOS	Density	LOS
NB Off-Ramp	32.5	D	31.3	D	72.9	F	71.7	F
NB On-Ramp	29.0	D	29.0	D	65.7	F	65.7	F
SB Off-Ramp	26.8	C	25.7	C	61.8	F	60.6	F
SB On-Ramp	22.9	C	22.9	C	54.5	F	54.5	F

Notes:

<sup>1</sup> Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016, Table 17, p. 19.

<sup>2</sup> Passenger cars/mile/lane.

<sup>3</sup> Level of service.

The analysis results presented above are incorrect because the traffic volumes used in the analyses are wrong. The procedures for evaluating the merge (i.e., on-ramp) and diverge (i.e., off-ramp) areas are presented in Chapter 13 of the *Highway Capacity Manual 2010* (Transportation Research Board, Fifth Edition, December 2010). Exhibit 13-4 (p. 13-8) in that document provides a flow chart summarizing the analysis procedures for on- and off-ramps. With respect to off-ramps, Step 2 is to:

*Compute demand flow rate [i.e., traffic volume] in Lanes 1 and 2 immediately upstream of the diverge influence area.*

In other words, the critical freeway volume for analysis of the off-ramps is the volume just prior to reaching the off-ramp; it includes the traffic that will be exiting the freeway. (The second key volume parameter is the amount of traffic actually using the ramp to exit the freeway.)

In this case, the freeway volume upstream of the off-ramp is unchanged by implementation of the Project. In fact, no Project traffic is added to the freeway, as it is all derived from traffic already on I-5. For that reason, the freeway traffic volumes in all of the off-ramp analyses should be the same; only the off-ramp volumes will change as additional drivers choose to exit the freeway for fuel or food at the Project.

However, that is not how the off-ramp analyses were performed. Instead, the freeway volumes used in the analyses were derived by subtracting the additional off-ramp traffic from the freeway volume. To illustrate this, Table 4 summarizes the values used in the analysis, as well as the correct values, for Existing and Existing Plus Project conditions.

<b>Table 4</b>				
<b>Diverge Analysis Traffic Volumes<sup>1</sup></b>				
<b>Existing Conditions</b>				
	Northbound Off-Ramp		Southbound Off-Ramp	
	Existing	Existing Plus Project	Existing	Existing Plus Project
Off-Ramp Volume	75	175 (+100)	83	183 (+100)
Freeway Volume As Analyzed	2,514	2,414 (-100)	2,032	1,932 (-100)
Correct Freeway Volume	2,514	2,514	2,032	2,032
Notes:				
<sup>1</sup> Reference: Peters Engineering Group, <i>Traffic Impact Analysis – Proposed E-Z Trip Travel Center</i> , November 16, 2016, Appendix F.				

Table 5 shows similar information for cumulative conditions.

<b>Table 5</b>				
<b>Diverge Analysis Traffic Volumes<sup>1</sup></b>				
<b>Cumulative Conditions</b>				
	Northbound Off-Ramp		Southbound Off-Ramp	
	Cumulative No Project	Cumulative Plus Project	Cumulative No Project	Cumulative Plus Project
Off-Ramp Volume	102	202 (+100)	119	219 (+100)
Freeway Volume As Analyzed	5,940	5,840 (-100)	5,000	4,900 (-100)
Correct Freeway Volume	5,940	5,940	5,000	5,000
Notes:				
<sup>1</sup> Reference: Peters Engineering Group, <i>Traffic Impact Analysis – Proposed E-Z Trip Travel Center</i> , November 16, 2016, Appendix F.				

Although we have focused on the off-ramp analyses, the freeway volumes employed in the on-ramp analyses are also flawed, although not to the same extent.

In summary, because the “with project” freeway volumes used in the merge/diverge analyses are wrong, the analysis results are wrong and misleading. Consequently, there is no certainty that the conclusion presented in the PEG report (p. 19) is valid. That conclusion states that:

*The construction of the Project and pending project is not expected to cause a reduction in the LOS. Therefore, the Project does not cause a significant impact with respect to merging and diverging at the ramps.*

We should also note that this conclusion seems to reflect a misinterpretation of the Caltrans significance standard for facilities that operate at deficient levels of service under “no project” conditions. That standard is presented at page 1 in the *Caltrans Guide for the Preparation of Traffic Impact Studies* (December 2002):

*If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE [Measure of Effectiveness] should be maintained.*

In this case, the MOE (as described above) is density and the target LOS is the transition between LOS C and LOS D (PEG, p. 5). As shown in Table 3 above (and PEG Table 17, p. 19), all of the ramps will operate at LOS F in 2037, both with and without the Project, thereby falling short of the target LOS. Thus, if addition of the Project-generated traffic were to cause an increase in density (i.e., cause the MOE not to be maintained), then a significant impact would occur. This will not be known until the merge/diverge calculations are corrected, as described above.

Therefore, as noted above, the PEG conclusion with respect to impacts related to merging and diverging at the ramps is incorrect. Until the analysis has been corrected to incorporate accurate freeway traffic volumes, the extent of any Project-related impact will be unknown.

Finally, review of the freeway traffic volumes shown in Tables 4 and 5 above reveals one interesting side note. Comparison of the Existing volumes and the Cumulative No Project volumes indicates that substantial traffic growth was assumed, as suggested in our earlier comments. Specifically, at the northbound off-ramp, the increase in traffic from 2,514 “Existing” vehicles (see Table 4) to 5,940 “Cumulative No Project” vehicles (see Table 5) represents growth of 136 percent between now and 2037. In the southbound direction, growth from 2,032 “Existing” vehicles (see Table 4) to 5,000 “Cumulative No Project” vehicles (see Table 5) indicates a 146 percent increase.

Although these factors are slightly lower than indicated in the *Interstate 5 Transportation Concept Report*, they generally confirm our point regarding the magnitude of future traffic on I-5, which we assert will lead to greater traffic on Nees Avenue and Paul Negra Road as well as greater patronage at the Project, neither of which has been accounted for in the PEG analysis.

11. **Traffic Index Analysis** – According to the PEG report (p. 21):

*The Project is expected to cause the traffic index to increase by a significant amount on Nees Avenue between the Project site and the I-5 northbound ramps. Mitigation will include pavement improvements on Nees Avenue.*

The report fails to state the Project responsibility for this mitigation measure. Is the Project fully responsible for the cost of the required pavement improvements? This must be clarified.

**CONCLUSION**

Our review of the traffic impact study prepared for the proposed E-Z Trip Travel Center project on Paul Negra Road in Fresno County, California revealed several issues affecting the validity of the conclusions presented in that document. A modified traffic impact analysis must be prepared.

We hope this information is useful. If you have questions concerning anything presented here, please feel free to contact me at (916) 783-3838.

Sincerely,

**MRO ENGINEERS, INC.**



Neal K. Liddicoat, P.E.  
Traffic Engineering Manager

cc: Mr. David H. McCray, Beveridge & Diamond, P.C.  
Ms. Kaitlyn D. Shannon, Beveridge & Diamond, P.C.



**ATTACHMENT A**  
**TRAFFIC COUNT SUMMARY TABLE**

**ATTACHMENT A**  
**EXISTING TRAFFIC COUNTS**  
**September 16 & 18, 2016**

TIME	WEST OF I-5 INTERCHANGE						BETWEEN THE I-5 RAMPS		
	FRIDAY			SUNDAY			FRIDAY		
	EB	WB	TOTAL	EB	WB	TOTAL	EB	WB	TOTAL
Mid	28	38	66	24	23	47	39	32	71
1:00	21	16	37	17	16	33	22	12	34
2:00	28	24	52	20	16	36	29	18	47
3:00	18	27	45	12	11	23	21	21	42
4:00	31	16	47	13	13	26	28	9	37
5:00	23	22	45	3	7	10	27	14	41
6:00	25	23	48	12	15	27	46	17	63
7:00	32	32	64	30	33	63	58	19	77
8:00	44	45	89	31	30	61	55	20	75
9:00	45	63	108	35	40	75	58	51	109
10:00	58	54	112	49	61	110	54	30	84
11:00	60	56	116	100	94	194	89	27	116
Noon	64	68	132	91	81	172	92	34	126
1:00	67	64	131	67	77	144	115	35	150
2:00	69	77	146	79	90	169	110	50	160
3:00	89	81	170	110	103	213	138	58	196
4:00	73	85	158	99	105	204	149	45	194
5:00	88	69	157	109	89	198	153	47	200
6:00	62	68	130	83	98	181	136	29	165
7:00	75	83	158	92	77	169	111	45	156
8:00	71	61	132	65	64	129	77	31	108
9:00	58	62	120	51	49	100	66	30	96
10:00	46	39	85	36	36	72	118	27	145
11:00	41	42	83	50	58	108	56	30	86
<b>TOTAL</b>	<b>1,216</b>	<b>1,215</b>	<b>2,431</b>	<b>1,278</b>	<b>1,286</b>	<b>2,564</b>	<b>1,847</b>	<b>731</b>	<b>2,578</b>

<<== Analyzed

**ATTACHMENT B**

**HIGH TURNOVER (SIT-DOWN) RESTAURANT TRIP GENERATION  
SUNDAY PEAK HOUR OF GENERATOR**

**(Reference: Institute of Transportation Engineers,  
*Trip Generation Manual*, Ninth Edition, 2012.)**



# TRIP GENERATION MANUAL

9th Edition • Volume 3: Data

## Trip Generation Rates, Plots and Equations

- Institutional (Land Uses 500–599)
- Medical (Land Uses 600–699)
- Office (Land Uses 700–799)
- Retail (Land Uses 800–899)
- Services (Land Uses 900–999)

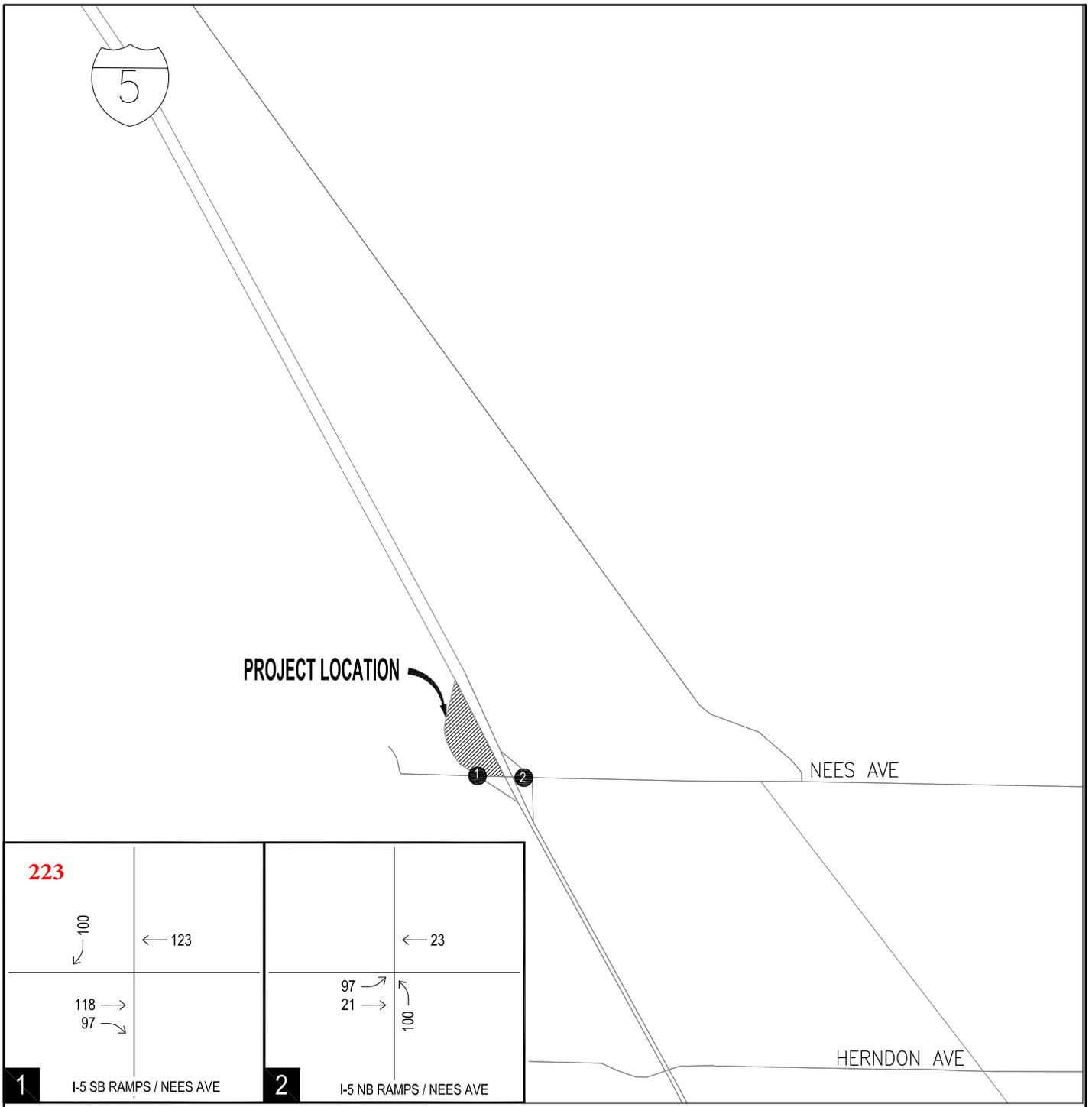


Institute of Transportation Engineers

**ATTACHMENT C**

**FIGURE 5 – SUNDAY PEAK-HOUR PROJECT TRAFFIC VOLUMES**

**(Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016)**

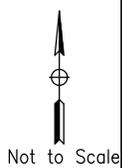


<b>215</b>	<b>223</b>				
	100 ↙	← 123			← 23
	118 → 97 ↘		97 ↗ 21 →		100 ↖
	<b>1</b>	<b>2</b>			
	I-5 SB RAMPS / NEES AVE	I-5 NB RAMPS / NEES AVE			

- LEGEND**
- ⊗ STUDY AREA INTERSECTIONS
  - XX SUNDAY PM VOLUMES
  - ▨ PROJECT SITE

Proposed E-Z Trip Travel Center  
Fresno County, California

**SUNDAY PEAK-HOUR PROJECT TRAFFIC VOLUMES**



**M R O**



**ENGINEERS**

**ATTACHMENT D**

**SUMMARY CHART 2A**

**(Reference: Caltrans, Office of System Planning, District 6,  
*Interstate 5 Transportation Concept Report*, February 2013.)**



LEGEND

**Existing Lanes** **Freeway**

**Planned or Programmed by 2035**

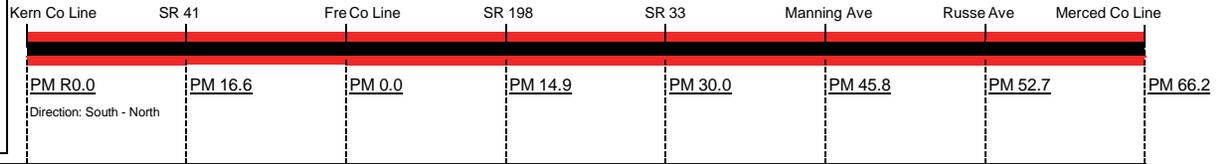
**Add Through Lanes** **Add Auxiliary Lanes**

**Number of Lanes**

4

8

\* Length of segments not to scale



**Segment:** Is self-explanatory except for several data sets:

**Rural/Urban:** Indicates whether the segment is in a rural area or city limits.

**Terrain:** Shows the general highway grade: minimal grade = level; moderate grade = rolling; and severe grade = mountainous.

**ROW:** Portrays Right-of-Way (ROW) and geometric data in feet.

**Shoulder Range:** Is a range of treated surface (8' standard), both inside and outside shoulders.

**Ultimate Transportation Corridor (UTC):** Is the typical ROW needed for the ultimate facility, i.e., 8 lane freeway(8F) 218 feet is the standard typical UTC ROW - will be updated upon corridor plan lining by specific sections of highway.

**Facility:** Shows the Existing Facility, the desired facility type (2035 Concept) by 2035- RTPA's and Caltrans, and the Ultimate Facility to preserve ROW and plan line beyond 2035. 2C(I) indicates that the highway has been improved in select locations with operational or safety improvements.

**LOS:** The current (2011) LOS (level of service), along with the expected calculated LOS in 2020 and 2035. The 2035 Concept is the target LOS desired, i.e., LOS C, for attainment by 2035 Caltrans.

**Deficiency:** Occurs when the target LOS is degraded, i.e., LOS D worse than LOS C, with the year of occurrence shown. It also shows whether a capacity improving project is in the STIP, and what the LOS would be with the 2035 Concept improvement.

**Directional Split:** Denotes the split in the peak hour traffic flow on a directional basis (NB/SB or WB/EB) either in the morning (AM) or evening (PM).

**AUX++** Auxiliary lanes are Truck Climbing lanes.

**AAADT:** signifies Annual Average Daily Traffic.

**Peak Hour:** Indicates a representation of the maximum hour of traffic flow during the day.

(-) Deficient with Improvement

**N/A\*** - Deficient, no project recommended.

+ The Ultimate ROW is generally the same as the existing ROW

**99P** Median is variable width greater than 100 feet

\* Concept Facility meets Concept LOS.

SEGMENT	10	11	12	13	14	15	16
County / Interstate	KINGS / 5	KINGS / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5
Description Begin	KERN CO LINE	SR 41 SEPARATION	KINGS CO LINE	SR 198 SEPARATION	SR 33 SEPARATION	MANNING AVE	RUSSELL AVE
Description End	SR 41 SEPARATION	FRESNO CO LINE	SR 198 SEPARATION	SR 33 SEPARATION	MANNING AVE	RUSSELL AVE	MERCED COUNTY LINE
Postmile Limits Begin/End (PM)	R0.0 / 16.6	16.6 / 26.7	0.0 / 14.9	14.9 / 30.0	30.0 / 45.8	45.8 / 52.7	52.7 / 66.2
Length (MI)	16.6	10.1	14.9	15.1	15.8	6.9	13.5
Rural / Urban	Rural	Rural	Rural	Rural	Rural	Rural	Rural
Terrain	Flat	Flat	Flat	Flat	Flat	Flat	Flat
ROW: Range Existing (FT)	208 / 208	208 / 240	208 / 208	208 / 208	208 / 208	208 / 208	208 / 208
Median Range (FT)	84 / 84	74 / 84	82 / 84	84 / 99P	84 / 99P	84 / 84	84 / 84
Shoulder Range (FT) - Treated	5 / 10	5 / 10	10 / 10	2 / 10	5 / 10	5 / 10	5 / 10
Lane Width (FT)	12	12	12	12	12	12	12
Ultimate ROW (FT)	+	+	+	+	+	+	+
Facility: Existing	4F	4F	4F	4F	4F	4F	4F
2035 Concept	6F	6F	6F	6F	6F	6F	6F
UTC	8F	8F	8F	8F	8F	8F	8F
LOS: 2011	C	C	C	C	C	C	C
LOS: 2020	D	D	D	E	D	D	D
LOS: 2035	F	F	F	F	F	F	F
LOS: Concept 2035	C	C	C	C	C	C	C
Deficiency/Year Deficient Project in STIP/RTP (Y/N)	2020	2020	2020	2020	2020	2020	2020
LOS W/ Concept Improvement	No	No	No	No	No	No	No
Directional Split (Peak Hour)	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
AAADT: 2011	52/48	52/48	52/48	52/48	52/48	52/48	55/45
AAADT: 2020	32,500	33,500	33,500	34,000	33,500	33,000	34,500
AAADT: 2035	45,300	47,800	47,800	50,800	47,800	47,100	49,700
Peak Hour: 2011	68,500	74,400	74,400	83,800	74,400	73,300	96,600
Peak Hour: 2020	5,200	5,400	5,400	5,500	4,800	5,100	5,200
Peak Hour: 2035	7,240	7,700	7,700	9,080	6,840	7,270	7,500
% Trucks: AADT	10,960	11,990	11,990	15,070	10,660	11,330	14,560
% Trucks: Peak Hour	30%	30%	30%	30%	30%	30%	30%
	7%	7%	8%	8%	8%	8%	8%

**August 23, 2017 Response to  
Comments by Applicant's Traffic  
Engineer**

**Peters Engineering**

**73 Pages with Attachments**



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**MEMORANDUM**

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**To:** Mr. Shawn Shiralian

**From:** John Rowland, PE, TE

**Subject:** Response to Comments on Traffic Impact Study  
Proposed E-Z Trip Travel Center

**Date:** August 23, 2017

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**Introduction**

This memorandum presents responses to the Beveridge & Diamond comment letter dated August 18, 2017 (attached). Peters Engineering Group prepared a traffic impact study for the project and presented the results in a report dated November 16, 2016 (TIS). The comment letter identifies six concerns that are generally identified in the list below and addressed in the following sections.

1. Peak Hour
2. Trip Generation and Pass-By Adjustments
3. Queue Lengths
4. Merge / Diverge Analysis
5. Growth Rates
6. Mitigation Measures Based on Traffic Index Analysis

**Responses**

1. Peak Hour

The peak hours counted and analyzed are appropriate. Typical traffic studies are performed for the weekday a.m. and p.m. peak hours. However, for this study it was acknowledged that the actual peak hours likely occur either on a Friday or Sunday. Therefore, careful consideration was given to choosing the appropriate weekend peak periods.

The intersection turning movement counts were performed between 3:30 p.m. and 6:00 p.m. on Sunday, September 25, 2016. The count time period was selected after review of the 24-hour traffic counts performed Friday, September 15, 2016 through Sunday, September 18, 2016, and after a review of Interstate 5 (I-5) mainline traffic volumes north of Nees Avenue provided by Caltrans staff for portions of April and May 2016. The Caltrans data revealed that the combined (northbound plus southbound) mainline peak hour on I-5 near Nees Avenue typically occurs between 4:00 and 6:00 p.m. on Sundays, with the 5:00 to 6:00 hour

typically being greater than the 3:00 to 4:00 hour. In coordination with Caltrans it was determined that the manual intersection turning movement counts should begin at 3:30 p.m. on a Sunday to maximize the chances of capturing the peak hour. The intersection turning movement counts at both ramp intersections clearly revealed a peak hour that began at 4:00 p.m. for the interchange as a whole and for each of the individual intersections within the interchange.

If the traffic counts had revealed a peak hour beginning at 3:30 p.m., there would have been cause for concern. However, since the peak hour was captured within time period counted there is no cause for concern and Caltrans, the owner of the facility, did not dispute the peak hours analyzed.

It is also worth noting that the magnitude of the difference between the 3:00 and 4:00 peak hours is insignificant, and is well within the fluctuation that would be expected from one day to the next. The commenter points out that the combined eastbound and westbound volume west of the interchange is 213 vehicles during the 3:00 to 4:00 peak hour, and the volume at the same location during the 4:00 to 5:00 p.m. peak hour is 204 vehicles. The difference is only nine vehicles during an entire hour. Considering that the volumes are for both directions combined, the difference is an average of about four to five vehicles in each direction over the course of an hour. This volume is within anticipated fluctuations and would likely be imperceptible to motorists who regularly travel the roadway. Furthermore, the peak hour of the facility as a whole (the interchange) does not necessarily coincide with the peak hour of every individual leg or approach.

The peak hour analyzed was appropriate and represents a worst-case scenario for traffic analyses within expected fluctuations in traffic volumes. Traffic volumes on the order of 200 trips per hour were identified west of the interchange, which is actually a very low volume of traffic adjacent to a freeway interchange. Therefore, the TIS does not need to be revised based on the peak hour analyzed.

## 2. Trip Generation

Very little data is available for travel centers such as the proposed project, and particularly those located in remote locations such as the I-5/Nees Avenue interchange. Trip generation estimates have utilized the best available information, including trip generation characteristics of an existing gas station near the project site, which likely provides the best estimation of trip generation characteristics at a similar site for a similar use.

We have reviewed available trip generation data for three Love's Travel Stop facilities referenced in the traffic analysis performed for the Madera Love's Travel Stop and found that the trip generation information used in the TIS (480 trips before the pass-by reduction was applied) is very similar to the value that would have been calculated using the Love's p.m. peak hour trip generation rate of 39.00 trips per 1,000 square feet, which would have been 490 trips before pass by reduction. This is a difference of only 10 peak hour trips. This is well within the range that could be expected when estimating trip generation using typical ITE averages. Therefore, it is our opinion that the trip generation rates and methods used in the traffic study report are appropriate and do not require revision.

With respect to the use of a 15-percent pass-by reduction, such a pass-by reduction is not uncommon, and the Caltrans *Guide for the Preparation of Traffic Impact Studies* states that the use of pass-by percentages greater than 15 percent “requires consultation and acceptance by Caltrans. The justification for exceeding a 15% reduction should be discussed in the TIS.” The use of a 15-percent pass-by reduction requires no justification per the Caltrans *Guide for the Preparation of Traffic Impact Studies*. Therefore, it is our opinion that the trip generation rates and methods used in the traffic study report are appropriate and do not require revision.

### 3. Queue Lengths

The 95<sup>th</sup>-percentile queue length is a calculated value that can be interpreted as a maximum probable queue length based on a statistical equation presented in the Highway Capacity Manual 2010 (see Attachment 2). Most traffic engineering software programs commonly used nationwide report the 95<sup>th</sup>-percentile queue length to the nearest foot. Other traffic engineers do so as well. As an example, the traffic impact study prepared for the El Paseo Project EIR in northwest Fresno, which was prepared by the reputable traffic engineering firm DKS & Associates, reports 95<sup>th</sup>-percentile queue lengths to the nearest foot.

The 95<sup>th</sup>-percentile queue length is useful for designing turn lanes and as a tool for estimating probable maximum queues. The TIS does not purport that the calculated 95<sup>th</sup>-percentile queue length reported to the nearest foot represents the actual queue length that would be measured at an intersection, or that some vehicles are “5, 10, or even 13 feet long” as the commenter suggests. The TIS reports the values as “calculated” because they are obtained directly from the software analysis output attached to the report.

The calculated 95<sup>th</sup>-percentile queue is also useful for estimating how a project will impact an intersection. For example, if the calculated 95<sup>th</sup>-percentile queue length in a no-project scenario is 13 feet, and the calculated 95<sup>th</sup>-percentile queue length with a project is 48 feet, the hypothetical project has increased the calculated maximum probable queue length by  $48 - 13 = 35$  feet, which best corresponds to two vehicles. If the value for the no-project queue is reported as 25 feet by rounding up from 13 (as the commenter suggests) and the with-project queue length is reported as 50 feet by rounding up from 48, the apparent impact of the hypothetical project would only be one additional vehicle, thereby understating the impact.

It is the responsibility of the traffic engineer and designer to interpret the calculated 95<sup>th</sup>-percentile queue length correctly. Traffic engineers typically assume that a passenger vehicle requires 25 feet of storage length, with adjustments for larger trucks if necessary. As an example, if the calculated 95<sup>th</sup>-percentile queue length is 90 feet, the designer of a turn lane would typically round up to the nearest 25-foot increment and design a 100-foot-long turn lane. Section 16 of the TIS discusses queue lengths in 25-foot increments. Therefore, it is better to work with actual calculated values for purposes of impact studies and then round up to the nearest 25-foot increment for purposes of design or stating the number of vehicles in a queue.

The discussion above illustrates that the analyses are based on typical engineering practices, including statistical calculations and their interpretation, and are neither incorrect nor irrational. Therefore, the TIS does not need to be revised based queue lengths.

4. Merge / Diverge Analysis

Based on the comments provided, a review of the merge/diverge analyses was conducted and revised merge/diverge analyses have been performed because  $v_{12}$  was inadvertently transposed with  $v_f$  in the data entry for the with-project diverge analyses. The revised analyses are attached and are summarized in the table below. No changes from the LOS presented in the TIS occurred, and the conclusions and recommendations presented in the TIS remain unchanged.

**Table 17 (Revised)**  
**Freeway Merge/Diverge Analysis Summary – I-5 / Nees Avenue Interchange**

Ramp	LOS (Density)				
	Existing	Existing Plus Project	Near-Term With Project	2037 No-Project Conditions	2037 With-Project Conditions
NB Off ramp	D (32.5)	D (32.5)	D (32.5)	F (72.9)	F (72.9)
NB On ramp	D (29.0)	D (29.0)	D (29.1)	F (65.7)	F (65.7)
SB Off ramp	C (26.8)	C (26.8)	C (26.8)	F (61.8)	F (61.8)
SB On Ramp	C (22.9)	C (22.9)	C (22.8)	F (54.5)	F (54.8)

It is noted that there is a decrease in calculated density between the existing-plus-Project and near-term with-Project conditions because the mainline freeway volume decreases as trips to the travel center and pending restaurant are primarily taken from freeway traffic. This result is not indicative of an oversight or error, and similar results have been published and explained by other traffic engineers, including the reputable firm of Kittelson & Associates, Inc. in a Freeway and Ramps analysis performed for the City of Alameda dated June 30, 2013.

5. Growth Rates

The TIS used a growth rate of one percent per year for trips that access Nees Avenue and a growth rate in excess of four percent per year for the freeway mainline. The four-percent annual growth rate can be observed by reviewing the freeway volumes in the merge and diverge data sheets. Those volumes were obtained from information in the Transportation Concept Report as discussed in the TIS. The Fresno County travel model does not provide evidence that growth rates on Nees Avenue will exceed one percent per year. Furthermore, the additional growth on Nees Avenue within the interchange and west of the interchange is being generated primarily by the proposed Project and the pending restaurant project included in the study, and those increases are in response to the larger increases projected on the freeway mainline. Therefore, the future traffic volume projections presented in the report are appropriate both on Nees Avenue and on the freeway mainline, and no revision of the report is required based on growth rates.

6. Mitigation Measures Based on Traffic Index Analysis

The commenter questions the mitigation measure requiring a pavement overlay on Nees Avenue to mitigate the Traffic Index impact because it does not address additional traffic at the project. Since the Traffic Index is a measure of the volume of truck traffic and is directly related to the required pavement thickness, the required mitigation measure to increase the

pavement thickness on Nees Avenue appears to specifically mitigate the impact to less than significant.

Attachments: Attachment 1: Beveridge & Diamond comment letter dated August 18, 2017  
(with Exhibit 14)

Attachment 2: Highway Capacity Manual 2010, page 19-30

Attachment 3: Merge / Diverge Analyses

## ATTACHMENT 1





David H. McCray  
456 Montgomery Street, Suite 1800  
San Francisco, CA 94104-1251  
Direct: (415) 262-4025  
DMccray@bdlaw.com

August 18, 2017

**Submitted via email to dchambers@co.fresno.ca.us**

Fresno County Department of Public Works and Planning  
Development Services Division  
Attn: Derek Chambers  
2220 Tulare Street, Suite A  
Fresno, CA 93721

**Re: Comments on Initial Study 7104 relating to Conditional Use Permit  
Application 3528**

Dear Mr. Chambers:

We write on behalf of Grand Petroleum Inc., (“Grand Petroleum”) to comment on Initial Study 7104 (“IS”) and the Mitigated Negative Declaration prepared by the Fresno County Planning Department (“County”) for the Conditional Use Permit Application 3528 (“CUP 3528”). The Applicant for CUP 3528, Shawn Shiralian, seeks to construct a large highway travel center at the northwest quadrant of the Interstate 5/Nees Avenue interchange in Fresno County, California (the “Project”). There are several deficiencies in the Initial Study, and we urge the Planning Commission to reject the Mitigated Negative Declaration and require the County to either 1) prepare a revised initial study to determine whether a negative declaration, mitigated negative declaration, or environmental impact report (“EIR”) is required or 2) require the County to prepare an EIR because there is substantial evidence to support a fair argument that the Project may cause significant adverse environmental impacts.

Several of the materials the applicant submitted in support of the Project are incomplete or inaccurate and thus, the Initial Study and accompanying Mitigated Negative Declaration are not supported by substantial evidence in the record. The decision as to whether a project may have one or more significant effects must be based on substantial evidence in the record of the lead agency. 14 CCR § 15064(f). The County’s Traffic Impact Study is flawed. Serious questions exist about the water demands of the Project, the availability of water, the quality of that water, and how wastewater will be managed for the Project. In these respects, the Applicant

August 18, 2017

Page 2

failed to put forth sufficient facts to enable the agency to meaningfully evaluate the potential environmental impacts of the Project.

The deficiencies of the Initial Study extend beyond the supporting documentation provided by the Applicant. There are multiple instances in which the County did not respond to the checklist questions it was required to address in the Initial Study. Elsewhere, the County relied upon improper mitigation measures. Additionally, the County abdicated its responsibility to analyze and determine whether cumulative impacts exist by merely stating in a single sentence that no “cumulatively considerable impacts” were identified.

One purpose “of the initial study is to help to inform the choice between a negative declaration and an environmental impact report.” *Joshua Tree Downtown Business Alliance v. County of San Bernardino* (2016) 1 Cal.App. 5th 677, 684 (internal citations removed). A core function of the initial study, is thus, meaningfully analyzing the questions presented based on reliable evidence to determine whether an EIR, a negative declaration, or a mitigated negative declaration is required. *See generally* 14 CCR § 15063. The initial study provides “documentation of the factual basis for finding” that a mitigated negative declaration is appropriate. 14 CCR § 15063.

An initial study is deficient if it fails to analyze a component of the Project. *Lighthouse Field Beach Rescue v. City of Santa Cruz* (2005) 131 Cal.App.4th 1170, 1195. Moreover, an initial study is inadequate if there is insufficient factual support for conclusions reached. *City of Redlands v. County of San Bernardino* (2002) 96 Cal.App.4th 398, 404 (“the County failed to gather facts necessary to perform an adequate environmental analysis”).

“When the informational requirements of CEQA are not complied with, an agency has failed to proceed in a manner required by law and has therefore abused its discretion.” *Lighthouse*, 131 Cal.App.4th at 1200 (internal citations removed).

For these reasons and for all the reasons more fully explained below, the County’s efforts have fallen below what is required under CEQA. Accordingly, the Planning Commission should not adopt the mitigated negative declaration or approve the CUP. The Applicant must be required to submit additional accurate data and information, and the County should prepare either a revised Initial Study or an EIR for this Project incorporating the issues raised below.

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August 18, 2017

Page 3

## Comments

### 1. There are Serious Deficiencies with the Applicant's Information and Analysis Regarding Water Use, Source, Quantity, and Quality Which Resulted in the County's Inability to Accurately Determine the Environmental Impacts Associated with the Project

An initial study which omits material necessary to informed decision making subverts the purpose of CEQA and is an abuse of agency discretion. *Lighthouse*, 131 Cal.App.4th at 1202. As explained below, there are several instances in which the County's analysis and conclusions regarding the water demands and requirements of the Project are incomplete and inaccurate and fail to provide substantial evidence to support the conclusion that the Project will not cause significant environmental impacts.

#### *Water Use*

Originally the Applicant stated that it would use approximately 2000 gallons of water per day. **Exhibit 1.** This conclusion was unsupported except for a single sentence that "[b]ased on similar uses along I-5," the Project would use 2000 gallons of fresh water. The County received comments from various state agencies that the water estimate was too low. For example, on April 6, 2016, the Environmental Health Division estimated wastewater flow of 15,980 gallons/day, not including proposed laundry and shower facilities. **Exhibit 2.** That is nearly eight-times the daily water use the applicant proposed. On March 6, 2017, the Environmental Health Division commented that "[f]rom experience on other Travel Centers along I-5, the number of visitors per day is grossly underestimated at 1500 leading to water and wastewater estimates to also be significantly underestimated." **Exhibit 3.** Despite these comments, no revised water use estimate was provided.

On May 25, 2017, the Water, Geology and Natural Resources Division requested "additional information" as to how a water use estimate of 2000 gallons/day was calculated. **Exhibit 4.** On June 2, 2017, the County requested the Applicant provide "data to support the 2,000 gallons per day usage." **Exhibit 5.** The applicant replied that same day: "We drilled a well that pumps 300 gallons a minute. I don't know what CEQA is but whatever it is we should be able to provide that. We didn't wait for Water Board." **Exhibit 6.** The County explained how critical water use and supply analysis and estimates were, as the Project is located in a water-short area. **Exhibit 7.**

Finally, the applicant provided an updated water use estimate to the County on June 7, 2017, which has been included as part of the Initial Study Routing Package. Now the Applicant

August 18, 2017

Page 4

estimates that the Project will use 26,179 gallons per day.<sup>1</sup> There is no explanation for why the water use estimate is now 10-times greater than it was previously. Tellingly, the Applicant did not provide additional information to the County in support of its original 2000 gallon/day water use estimate, which the Applicant appears to have abandoned.

The Applicant's revised calculation is a single page and allegedly supported by IAPMO Water Usage Tables. Grand Petroleum retained Carollo Engineers ("Carollo") to review several aspects of the Applicant's Project relating to water. As Carollo explains, IAPMO tables are not typically used to calculate a daily water use amount. Rather, these tables are used to identify maximum flow rates in a building structure which in turn are used for sizing the plumbing pipelines and fixtures. *See Exhibit 8.* Accordingly, Applicant's revised estimate is also not supported by substantial evidence. 14 CCR § 15064(f)(5).

Using the site plans provided by the Applicant, Carollo calculated the daily water use for a Project of this size with the number of visitors that the Applicant has estimated. Carollo calculated that the Project would use 43,585 gallons per day, and that number increases to 46,938 gallons per day with irrigation. This is nearly twice as many gallons per day as the Applicant estimated. Carollo identified activities with water demands that the Applicant failed to consider entirely. *See Exhibit 8.* Most obviously, Applicant's estimate does not identify any water use associated with restrooms; it only calculated water used with showers. But certainly at a truck stop and restaurant facility, the majority of individuals will use the restroom before departing. Oversights such as these underscore the unreliability of the Applicant's water use estimate. As a result, the conclusion that the Project will not have a significant environmental impact on hydrology is not supported by substantial evidence.

Furthermore, comments in the record indicate that the number of Project trips is underestimated, meaning that Carollo's water usage estimate is likely too conservative because more people will come to the Project and utilize its facilities. *Exhibit 3.* Carollo based its water use estimates on the site plan provided by the Applicant. Therefore, to the extent the number of visitors is underestimated, Carollo's water use calculation is conservative even though the calculation is almost double that of the Applicant's estimate.

As a result of the Applicant using unsupported and inaccurate estimates of the daily water use, the Initial Study is fatally flawed. The County concluded that the Project would have either a "less than significant impact with mitigation incorporated" or a "less than significant impact"

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<sup>1</sup> From our review of the administrative record based on frequent Public Records Act Requests, state and federal agencies have not previously had an opportunity to comment on the Applicant's revised water use estimate as this material was not circulated as a part of a previous "Routing Package."

August 18, 2017

Page 5

for all topics regarding hydrology and water quality (section IX of the Initial Study). The County never analyzed the environmental impact of a realistic daily water use. CEQA requires the County to obtain a factual basis to support its conclusions as to the environmental effect of the project and to engage in fully informed decision-making. *Deep Creek Agr. Ass'n v. County of San Bernardino* (Cal. App. 4th 2008) 2008 WL 2316322, \* 11. Such efforts were thwarted here by the Applicant declining to provide the necessary underlying facts. The mitigated negative declaration should be rejected and additional analysis should be conducted regarding the environmental impact associated with an accurate daily water use.

### *Water Source and Supply*

The Project is located in a Water Short Area. (Initial Study section IX.B.) San Luis Water District has unequivocally stated that it will not provide water to the Project:

Upon review of the application, it appears that the proposed project is anticipating utilizing a groundwater well for its water supply and will not need to depend upon the San Luis Water District for a supply or conveyance. Although the San Luis Water District is not requested to provide a Municipal and Infrastructure (M&I) water supply, and to make is abundantly clear to the applicant, the District will not provide a "can and will serve" letter to the development if requested. The property in question does not receive an M&I allocation from the United States Bureau of Reclamation's Central Valley Project. This property may be eligible to receive an agricultural allocation. However, the planned use as contemplated by the conditional use permit is not an agricultural operation therefore the agricultural water supply is not an adequate supply.

In summary, and in accordance with District policy, the District will not provide any new development water supply from its current allocation and/or supplemental water supplies; it is the responsibility of the project proponent to secure its own supply of water outside of the District. The project proponent must independently secure an adequate water supply (quality and quantity) for the life of the project.

**Exhibit 9.**<sup>2</sup> The Applicant has stated that it will rely on groundwater from two wells drilled onsite to support the Project.

The Applicant asserts, and the County accepts in the Initial Study, that the public water well will produce 300 gallons of water per minute. However, the well completion report was not enclosed with the Initial Study Routing Package, and it is unclear if other agencies and interested individuals providing comments have ever had the opportunity to review this material.

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<sup>2</sup> The date on the letter from the San Luis Water District conflicts with the date Fresno County received the letter. The letter is dated March 14, 2016, but the letter was received by Fresno County March 6, 2017.

August 18, 2017

Page 6

Beveridge & Diamond PC obtained the public well drilling completion report and drilling permits for both the public and private well at the Project through a California Public Records Act Request (“CPRA”). **Exhibit 10.** While the well completion report does estimate well yield at 300 gallons per minute, there are flaws with this conclusion and also significant shortcomings in the County’s Initial Study regarding water supply.

As Carollo explains, best practices support conducting a pumping test at a constant rate for 24 hours and recording the drawdown levels during the test. **Exhibit 11.** Pumping tests are conducted to determine the yield of the well and hydraulic parameters of the aquifer. The duration of the pumping test may be shortened if equilibrium conditions are reached before 24 hours, but there are no notes to indicate why the pumping test was conducted for only 12 hours. Without drawdown data, neither the adequacy of the pumping test data nor the estimated well yield can be objectively assessed.

This lack of information prevented the County from analyzing the potential environmental impacts associated with drawing ground water for the Project. In Section IX.B. of the Initial Study, the County had to determine if the Project would substantially deplete the groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in the aquifer volume or a lowering of the local groundwater table. The County’s response, which is included below in its entirety, failed to even address, let alone answer, the question presented:

*The subject parcel is located in a designated Water-Short Area and is currently devoid of structural improvements; however, a Private water well and a Public water well have been permitted and constructed thereon. Further, according to the Well Completion Report prepared for the Public water well, said well has an estimated yield of 300 gallons of water per minute. According to the Operational Statement provided for this project, it is estimated that the proposed Interstate Freeway Interchange Commercial Development will utilize approximately 26,179 gallons of water per day.*

The County concluded that the project would have a “less than significant impact” on groundwater supplies or groundwater recharge, but the County reached this conclusion with no factual information or analysis. There are no materials accompanying the Initial Study that analyze whether the wells would, or would not, interfere with the groundwater supply or recharge. This illustrates both that the Applicant failed to put forward substantial evidence on this issue and also that the County did not undertake a serious review of the associated environmental impacts of using this groundwater supply. The County’s defunct conclusion falls short of the environmental review required by CEQA in an Initial Study. *Lighthouse*, 131 Cal.App.4th at 1195 (an initial study is deficient if it fails to analyze a component of the project);

August 18, 2017

Page 7

*City of Redlands*, 96 Cal.App.4th at 404 (an initial study is inadequate if there is insufficient factual support for conclusions reached).

*Water Quality*

The Applicant included a report for water quality analyses from BSK Associates to support its Conditional Use Permit Application. There are inconsistencies with the report itself and issues raised by the report that the Applicant, and the County, overlook.

First, there is nothing in the BSK Report that allows a reviewer to determine if the water quality sample BSK analyzed is actually from the Project Site. The report identifies the location of the sample as a “New Well” associated with “Gridley Farm Labor Camp.” No other materials associated with this Conditional Use Permit application that our office received through CPRA Requests or materials the County distributed as a part of the Initial Study Routing Package, use the phrase “Gridley Farm Labor Camp” to describe the location of the Project. Indeed, the city of Gridley, CA is approximately 200 miles north of Fresno, CA.

Second, Carollo reviewed the BSK data and identified internal discrepancies with the chain of custody of the water sample:

The Sample Integrity checklist included with the laboratory report indicates that the measured temperature of the samples at the time of receipt was less than 6 °C, but the sample temperature noted on the chain of custody and case narrative is 12.9 °C. The sample integrity checklist also indicates that information on the bottle labels agree with the chain of custody. However, a separate sample condition checklist completed by Pace Analytical for subcontracted radiological analyses indicates that the sample labels did not match the chain of custody and the sample date and time was not recorded on the sample bottles. The Pace Analytical checklist also notes that no custody seal was present on the shipping container.

**Exhibit 11.**

Third, assuming that the well data is from a well drilled at the Project, there are significant water quality issues that the Applicant does not address. Notably in the operations statement, the Applicant passively acknowledged that the well water will be “tested and treated.” However, the application lacks any meaningful acknowledgment of why the water needs to be treated and how it will actually be treated, and the Initial Study does not evaluate the environmental impacts associated with treatment.

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August 18, 2017

Page 8

Carollo reviewed the BSK Report and concluded that total dissolved solids, specific conductance, chloride, and sulfate were found in concentrations in excess of California’s secondary drinking water standards. Table 1 below, prepared by Carollo, summarizes the exceedances for these constituents and the full report is included as **Exhibit 11**.

Table 1. Secondary Maximum Contaminant Level Ranges and Reported Data

Constituent, Units	Recommended	Upper	Short Term	Reported Value
Total Dissolved Solids, mg/L	500	1,000	1,500	3,200
Specific Conductance, uS/cm	900	1,600	2,200	5,600
Chloride, mg/L	250	500	600	1,100
Sulfate, mg/L	250	500	600	750

At a minimum, the water needs to be treated to a point where the values of total dissolved solids, specific conductance, chloride, and sulfate comply with secondary drinking water standards before the groundwater is suitable for potable uses. The Applicant was notified that these requirements apply at least as far back as May 9, 2016, but no steps appear to have been taken to address these exceedances. **Exhibit 12**. The Applicant did not provide information about how the water is to be treated, and therefore, the County failed to analyze whether such treatment will have a significant impact on the environment.

Additionally, the water is highly saline. While sodium is not regulated as a drinking water contaminant, the United States Environmental Protection Agency recommends that sodium concentration in drinking water not exceed a range of 30 to 60 mg/L. **Exhibit 11**. BSK’s analysis shows that the water sample had an observed concentration of 1,100 mg/L. To illustrate how saline the water is, its use even for irrigation or for livestock would be severely restricted. *Id.*

If the BSK analysis is in fact representative of water that will be drawn from the well at the site, then the water needs to be treated before it can be used as potable water. The County acknowledged that the Applicant needed to comply with all requirements for the operation of a Non-Transient Non-Community Water System. (Initial Study section XVII.D.) However, there is no analysis of how treatment will be performed or whether that treatment will have a significant impact on the environment.

August 18, 2017

Page 9

Moreover, using either reverse osmosis or electrodialysis to treat the water will result in the generation of a highly concentrated brine waste. **Exhibit 11.** The amount of water the Project uses, the method of treatment used, and the efficiency of the treatment method will impact how much brine waste is generated. Highly saline brine waste must be properly handled to prevent adverse environmental impacts, such as groundwater contamination, but these are not discussed by the Applicant or in the Initial Study. *See id.* Brine waste can be handled and disposed of in a variety of ways, but currently, the Applicant does not identify how the waste will be managed. Handling concentrated brine water may cause significant adverse impacts to the environment and both the Applicant and the County overlook this substantive issue entirely. The Applicant has not designed a system that addresses the water quality issues associated with groundwater use and the County never evaluated the environmental impacts associated with the use and treatment of groundwater to support the Project.

Finally, as Carollo explains, “[b]ecause a portion of the raw water is lost as concentrate from the treatment process, treatment may also significantly increase the volume of raw water required to meet demands.” **Exhibit 11.** As explained in detail above, the Applicant has significantly underestimated the daily water demands of the Project. Because the groundwater is highly saline and has concentrations of contaminants in excess of California’s secondary drinking water standards, it must be treated, and this treatment causes some portion of raw water to be lost. This in turn drives the daily water demands of the Project even higher. Both the Applicant and the County declined to engage with these facts or honestly assess their environmental impact.

#### *Handling Wastewater*

The Project will manage its wastewater onsite. The Applicant submitted a report prepared by O.S.T. System Designs, Inc. to demonstrate that it could manage the Project’s wastewater by using a septic tank and a leach field. O.S.T. estimated the peak flow rate for wastewater as 10,692 gallons per day and then based its calculations on designing a system that could accommodate that amount of daily wastewater. For several reasons, O.S.T.’s conclusions from July 5, 2016 cannot be relied upon in the Initial Study released in July 2017.

First, O.S.T. based its estimation for the peak flow rate of wastewater by referring to the California Plumbing Code. However, four of the activities identified are not in the plumbing code, and thus, are not supported by citation. **Exhibit 13.** Furthermore, the square-footage of mini-mart space is different than the mini-mart square footage on the Applicant’s floor plan, resulting in an inaccurate wastewater flow estimate. *Id.*

August 18, 2017

Page 10

Second, in Section 8, O.S.T. recommended “using time and pressure dosed Rock Leach Lines to treat and disperse the wastewater generated by the proposed Travel Center.” However, throughout the report, O.S.T. presents calculations, including the size of the leach field, based on using gravity distribution. The O.S.T. report does not include a recommended volume for a dosing tank or the design flow rate and discharge head of the associated dosing pump. O.S.T. has made a recommendation about how to handle the wastewater, but then the report does not actually explain how to design a system that comports with its recommendation. **Exhibit 13.**

Third, O.S.T.’s wastewater daily flow rate estimate is internally inconsistent with the daily water use estimate eventually put forward by the Applicant. As explained above, the Applicant now estimates that the Project will use 26,179 gallons of water per day. The Applicant’s revised daily water use estimates will generate approximately two-and-a-half times as much wastewater as O.S.T. estimated and then designed a system to accommodate. *See Exhibit 13* (explaining the use of a 90% “to sewer” calculation). As O.S.T. admitted, its conclusions about the ability of the Project to support the needed wastewater treatment system are dependent on the amount of wastewater the Project generates, and its conclusions are not valid if the wastewater flows change.

In the event that changes occur in the design of the project, this report’s recommendations will not be considered valid unless the changes are reviewed with O.S.T. System Designs, Inc. and the conclusions and recommendations are modified or verified in writing. Examples of such changes would include location and/or changes in the type of wastewater characteristics and an increase in wastewater flows.

O.S.T. Report, section 2.0. Therefore, for this reason alone, the County’s conclusion that the use of septic tanks or alternative disposal systems would have a “less than significant impact with mitigation incorporated” is not supported by substantial evidence.

Further, in April 6, 2016, the Environmental Health Department commented that: “An evaluation of the Operations Statement provided by the applicant and 2013 California Plumbing Code Appendix H yields an estimated wastewater flow of 15,980 gallons per day not including proposed laundry and shower facilities.” **Exhibit 2.** The O.S.T. report never considers this higher estimate put forward by the Environmental Health Department or explains why its lower estimate of approximately 10,700 gallons is more accurate.

Carollo reviewed the O.S.T. Report and calculated the size requirements for a wastewater treatment system to accommodate both the daily water use estimated by the Applicant and the daily water use calculated by Carollo. Carollo prepared the following table demonstrating the

August 18, 2017

Page 11

size requirements for leach fields in four different layouts based upon how the leach lines are installed.

<b>Average Daily Wastewater Flow (gallons per day)</b>	<b>Length of Leach Line Required (linear feet)</b>	<b>Number of Leach Lines (count)</b>	<b>Area Required (1) (acres)</b>	<b>Area Required (2) (acres)</b>	<b>Area Required (3) (acres)</b>	<b>Area Required (4) (acres)</b>
10,692	651	7	0.22	0.30	0.36	0.33
23,561	1,337	14	0.44	0.53	0.60	0.65
39,227	2,173	22	0.69	0.83	1.03	0.98

Table Notes:

1. Area Required (1) is based on a leach line configuration of one single long line of leach line installation
2. Area Required (2) is based on a leach line configuration of two leach lines side by side
3. Area Required (3) is based on a leach line configuration of three leach lines side by side
4. Area Required (4) is based on a leach line configuration of four leach lines side by side

**Exhibit 13.** Furthermore, Fresno County mandates that an equal amount of land required for the leach field be set aside and reserved for potential future use for septic tank effluent disposal. *Id.* Therefore, the Applicant needs to identify additional acreage to comply with the Fresno County requirement.

CEQA requires Agencies to make informed decision-making and to make an honest assessment of environmental impacts associated with proposed projects. *See San Lorenzo Valley Community Advocates for Responsible Educ. v. San Lorenzo Valley Unified School Dist.* (2006) 139 Cal.App.4th 1356, 1375 (“an agency’s failure to comply with the procedural requirements of CEQA is prejudicial when the violation thwarts the Act’s goals by precluding informed decision-making and public participation.”). Here, the Applicant needs to revise its soils analysis and sewage feasibility report to accurately reflect realistic wastewater flow projections for the Project. Then the County needs to evaluate whether there will be a significant environmental impact from this wastewater treatment. The construction of a significantly larger leach field and septic tank may pose a substantial environmental impact that needs to be meaningfully evaluated. O.S.T.’s wastewater treatment system also does not address how brine water, or the other liquid generated after treating water to make it suitable for potable use, will be handled. The Applicant must be required to put forward a plan for adequately managing all wastewater generated the Site so the associated environmental impacts can be analyzed.

August 18, 2017

Page 12

Finally, the California Water Resources Control Board Discharge Order WQ 2014-0153-DWQ requires that for wastewater flow rates greater than 20,000 gallons/day, the discharge must be evaluated to determine if nitrogen effluent limits are required. As Carollo explains, the results of a nitrogen effluent limit evaluation impacts the required wastewater treatment method.

**Exhibit 13.** For example, if the evaluation determines that nitrogen control is required then the planned septic tank leach field system will not be permitted and aerobic treatment will be required. As the wastewater flow rates will exceed 20,000 gallons/day based even on the Applicant's revised daily water use estimate, this additional type of wastewater treatment needs to be evaluated at the Initial Study stage because handling wastewater with high nitrogen concentration may have a significant environmental impact.

## **2. The Traffic Impact Study Prepared by the Applicant and Relied Upon by the County is Flawed**

In support of the Project, the Applicant submitted a Traffic Impact Study prepared by Peters Engineer Group ("PEG"). PEG's Traffic Impact Study has significant shortcomings and several conclusions are based on inaccurate, incomplete, or misrepresented data. Elsewhere, PEG failed to provide needed analysis, which results in substantial deficiencies in its Traffic Impact Study. As a result of these inaccurate data issues, the County's conclusions about the environmental impacts associated with the transportation effects of the Project are not based on substantial evidence. 14 CCR § 15064(f)(5).

Grand Petroleum retained MRO Engineers ("MRO") to review PEG's traffic impact study. MRO's report is attached as **Exhibit 14**. MRO identified several deficiencies in PEG's analysis, which are summarized below.

First, PEG did not analyze the correct peak traffic rates in its traffic impact study. PEG addressed conditions using traffic data from 4:00 – 5:00 p.m. on Sunday, which it represented as a peak-hour period. However, the vehicle count was slightly higher on Fridays, which raises the question why the Friday peak hour was not analyzed. *See Attachment A to Exhibit 14*. Moreover, based on PEG's traffic count, Sunday from 3:00 – 4:00 p.m. actually had a higher traffic volume than Sunday from 4:00 – 5:00 p.m., yet this timeframe on Sunday was excluded. To accurately determine the environmental impacts of the Project associated with traffic, the impacts associated with peak traffic rates must be analyzed. The traffic impact analysis should be revised to incorporate an analysis of the actual Sunday peak hour as well as the Friday peak hour.

August 18, 2017

Page 13

Also, highlighted on the table in Attachment A is the 5:00 – 6:00 PM hour between the I-5 ramps on Friday. The total volume during that hour was 200 vehicles, which is approximately the same as the total during the selected analysis period. However, the directional orientation of the vehicles in this period was somewhat different from that shown during the analysis period. In particular, about three-quarters of the Friday volume is eastbound at the current location, whereas the Sunday volumes are approximately evenly split between the eastbound and westbound directions. PEG did not analyze the impacts associated with these changes in traffic direction.

Second, there are several flaws regarding the Project trip estimates, which are presented in PEG Table 6. PEG’s trip generation estimates for the Project were developed based upon traffic counts conducted at an existing Chevron gas station on Paul Negra Road, just north of the proposed Project site. Relying on a single data set is contrary to the Institute of Transportation Engineers’ *Trip Generation Handbook*. The *Trip Generation Handbook* (p. 29) addresses the preferred sample size for selecting appropriate trip generation rates from those available in the *ITE Trip Generation Manual* (ITE, Ninth Edition 2012):

- *If the number of data points is one or two, either (1) consider the use of a different independent variable and its associated data pages, or (2) collect local data and establish a local or consolidated rate. Refer to Chapter 9 for guidance.*
- *If the number of data points is three, four, or five, the analyst is encouraged to collect local data and establish a local or consolidated rate . . . [Emphasis not added]*

**Exhibit 14.** Furthermore, PEG does not explain why the Chevron gas station is a comparable travel center to the Project. Specifically, the Project is designed to include a restaurant and additional truckers’ services, such as laundry, a large restaurant, and showers, and nothing in the record indicates that the Chevron station has similar services such that it is an appropriate comparison. The MRO report states:

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August 18, 2017

Page 14

Moreover, we note that the Project trip generation estimate presented in PEG Table 6 fails to account for the truckers' services component of the Project. It seems to suggest that this activity is fully accounted for within the 3.00 trips per diesel fueling position trip rate, but this assumption is unsubstantiated. Similarly, the 2,400 SF mini-mart/convenience store oriented toward the truck/diesel fuel pumps is unaccounted for, as there is no certainty that the small trip rate directly associated with the diesel fuel pumps fully accounts for activity within the mini-mart. Ignoring these two key components of the Project will likely lead to underestimation of the Project's trip generation, which could, in turn, result in understatement of the Project's traffic impacts.

We also question the approach taken with regard to estimating the number of trips generated by the proposed 4,800 SF sit-down restaurant. For trip generation purposes, the size of the proposed restaurant has been arbitrarily reduced by 1,000 SF to reflect an apparent guess concerning the size of the existing Subway sandwich shop within the Chevron station where trip data was collected. In other words, the traffic analysis addresses a 3,800 SF restaurant, instead of the actual 4,800 SF facility. While the intent is to account for the fact that the Subway trips are included within the total number of trips counted at the Chevron driveway, the validity of the specific adjustment is not adequately demonstrated.

**Exhibit 14.** As MRO explains, PEG has taken steps to arbitrarily reduce the number of trips to the Project for purposes of the Traffic Impact Study, resulting in an analysis that does not allow for an honest assessment of the associated environmental impacts.

Third, PEG's queue length results are not credible. As MRO explains in detail, PEG used queue lengths of 5, 10, and 13 feet. However, no cars are this length, which results in inaccurate conclusions.

*Queue Length Results Are Not Credible* – Table 10 (p. 10) in the PEG report provides the "Intersection Queuing Summary" for Existing Conditions. At the Nees Avenue/I-5 Southbound Ramps intersection, the table indicates a 13-foot queue on the southbound approach. At the Nees Avenue/Northbound Ramps intersection, a 5-foot queue is shown on the eastbound approach and a 10-foot queue on the northbound approach.

These results lack credibility, as there are no vehicles on the American road system that are as little as 5, 10, or even 13 feet long. Similar errors are evident in PEG Table 11 (p. 10), which presents the Existing Plus Project queue lengths (13 feet, for example). Even the Cumulative 2037 With Project queue lengths presented in PEG Table 14 (p. 11) are as short as 15 feet (on the eastbound approach at Nees Avenue/I-5 Northbound Ramps).

We note that the "passenger car" design vehicle designated in Exhibit 2-3 (p. 21) in the document, *A Policy on Geometric Design of Highways and Streets* (American Association of State Highway and Transportation Officials, 2004) is 19-feet long. According to the User Guide for the Synchro 9 software used to calculate the intersection levels of service, the standard

August 18, 2017

Page 15

convention is to assume that a passenger car in a queue consumes 25 feet. (Reference: Trafficware, *Synchro Studio 9 User Guide*, August 18, 2015)

Of course, as noted in the PEG traffic study, 17 percent of the existing traffic at the study intersections consists of trucks. According to Caltrans, trucks are as long as 72 feet. (Reference: Caltrans, *Highway Design Manual*, May 7, 2012, Figures 404.5A and 404.5B, pp. 400-15 and 400-16) Such a vehicle would consume at least 75 feet in a queue.

Claiming that the queues associated with development of the Project will be less than the length of an average passenger car represents a substantial deficiency in the analysis. Such an irrational result raises questions regarding the credibility of the analysis as a whole.

Queuing is a serious potential safety issue for the proposed Project, which is a truck stop. Trucks are slow to stop and start and occupy significantly more length of a highway off-ramp than passenger cars. If queues extend beyond highway off-ramps, it poses a safety concern on the ramp and mainline freeway as well as the County roads. PEG's incorrect queue length calculations prohibit a meaningful analysis of whether a queuing issue is associated with the Project.

Fourth, there are deficiencies with PEG's freeway merge/diverge analysis. The analysis results are simply wrong. Based on PEG's analysis, the merge/diverge density is lower with the Project being built than what exists currently:

The second issue is that the analysis results are wrong. Review of the merge/diverge calculations presented in PEG Appendix F reveals that the addition of the project traffic results in lower density values at the two off-ramps than under "no project" conditions (i.e., the additional traffic results in improved operations). This is true for both Existing Plus Project and Cumulative Plus Project conditions. (Because Near-Term No Project results were not provided, it is not possible to establish whether this issue applies to that time frame, as well.) To illustrate this point, we have prepared Table 3, which presents the detailed density values for existing and cumulative conditions, both with and without the Project.

We have highlighted in yellow the cells within the table that indicate improved operations following the addition of Project-generated traffic. This result is illogical and should have represented a red flag for the analyst that something is wrong.

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August 18, 2017

Page 16

Table 3 Detailed Freeway Merge/Diverge Analysis Results <sup>1</sup>								
Ramp	Existing		Existing Plus Project		2037 No Project		2037 Plus Project	
	Density <sup>2</sup>	LOS <sup>3</sup>	Density	LOS	Density	LOS	Density	LOS
NB Off-Ramp	32.5	D	31.3	D	72.9	F	71.7	F
NB On-Ramp	29.0	D	29.0	D	65.7	F	65.7	F
SB Off-Ramp	26.8	C	25.7	C	61.8	F	60.6	F
SB On-Ramp	22.9	C	22.9	C	54.5	F	54.5	F

Notes:  
<sup>1</sup> Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016, Table 17, p. 19.  
<sup>2</sup> Passenger cars/mile/lane.  
<sup>3</sup> Level of service.

**Exhibit 14.** Plainly, the construction of the Project will not result in fewer merges or diverges from the highway. This fundamental flaw calls into question PEG’s conclusion that “[t]he construction of the Project and pending project is not expected to cause a reduction in the [levels of service]. Therefore, the Project does not cause a significant impact with respect to merging and diverging at the ramps.”

Fifth, PEG failed to consider how traffic growth on I-5, the main (indeed, nearly exclusive) source of visitors to the Project would impact cumulative traffic volumes at the Project. PEG used an annual growth rate of 1.0 to estimate traffic volumes in 2037. This approach ignores the fact that traffic volumes on Paul Negra Road and Nees Avenue are linked to traffic volumes on I-5. As MRO explains, PEG’s analysis in Figure 4 of the PEG report acknowledges this point, as it shows that 90 percent of the Project-related traffic is oriented to/from I-5. Therefore, as traffic on I-5 grows, traffic volumes on Paul Negra Road will also grow.

For both daily and peak hour periods, Caltrans projects the volume on I-5 to grow by 180 percent between 2011 and 2035. Over that 24-year period, that equates to an annual growth rate of 7.5 percent. This is obviously considerably higher than the 1.0 percent per year assumption in the PEG traffic analysis.

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August 18, 2017

Page 17

Consequently, PEG's analysis substantially underestimated the year 2037 traffic volumes on Nees Avenue and Paul Negra Road. This will lead, in turn, to understatement of the vehicular delay values at the study intersections, so that no meaningful indication of the future level of service is provided for those locations. The degraded "no project" level of service that is certain to result from the use of more realistic future traffic estimates increases the probability that addition of the Project-generated traffic will result in a significant impact under Fresno County significance criteria. That is, as traffic increases on Nees Avenue and the I-5 freeway ramps, it becomes increasingly likely that the critical movements at the study intersections will operate at unacceptable levels of service and that addition of the Project traffic will cause the delays on those critical movements to increase by 5.0 seconds or more.

The analysis must be revised to reflect the level of traffic growth projected by Caltrans and to provide an accurate indication of the operating conditions at the study intersections.

Sixth, the MRO report identifies issues with PEG's analysis of the internal trip reduction rates and the pass-by trips. The PEG trip generation estimate also includes a 20 percent internal trip reduction, based on information presented in Tables 7.1 and 7.2 in Second Edition (June 2004) of the *ITE Trip Generation Handbook*. However, the only 20 percent values in the referenced tables are for trips from one retail use to another retail use in the weekday PM peak hour of adjacent street traffic. Of course, the PEG study addresses the Sunday peak hour, so it would appear that the assumed 20 percent value does not apply.

The PEG analysis assumes that 15 percent of the trips at the Project will be "pass-by" trips; that is, they represent vehicles that were already passing by the site on Paul Negra Road, which enter the site rather than continuing on to the existing Chevron station. While the PEG study correctly recognizes that the standard pass-by trip rates documented in the *ITE Trip Generation Handbook* do not apply (because of the limited volume of traffic passing by the site), it does not adequately describe the derivation of or justify the use of the 15 percent value employed in the analysis.

The MRO Report thoroughly explains the shortcomings of the PEG report. In several instances, the PEG report relies on "evidence that is clearly inaccurate or erroneous or evidence that is not credible," which does constitute substantial evidence. § 15064(f)(5).

Based on the PEG report, the County concluded that the "proposed Interstate Freeway Interchange Commercial Development will cause a "significant traffic impact by increasing the Traffic Index (TI) on Nees Avenue between the subject parcel and the Interstate Highway 5 northbound ramps by a significant amount (at least 0.5)." However, the County fails to identify responsive mitigation for this impact as required by CEQA. The only mitigation measure required was to add a two-inch Hot Mix Asphalt overlay on Nees Avenue and Paul Negra Road

August 18, 2017

Page 18

between the subject parcel and the I-5 northbound ramps and therefore, no analysis exists in the PEG report or by the County that this mitigation measure will address the impacts associated with additional traffic at the Project. Therefore, the County's conclusion that with mitigation, traffic would cause a less than significant impact is unsupported and flawed.

### **3. The County Failed to Respond to Questions Posed in the Initial Study**

Using an "Initial Study Environmental Checklist Form," the County completed an "Evaluation of Environmental Impacts" and concluded that a mitigated negative declaration was appropriate for the Project. Both documents include the same series of questions to which the County must respond. In several instances, the County failed to respond to the questions proposed in the "Evaluation of Environmental Impacts" document.

First, as already explained above, the County failed to address the question presented about the impact a groundwater well would have on the existing aquifer and groundwater recharge. *See* Comment 1.

Second, in Section IX.E of the Initial Study, the County similarly failed to analyze or answer the question put before it. In this section, the County had to determine if the project would create or contribute run-off which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted run-off. The County concluded that there would be a "less than significant impact" by stating:

*According to the Development Engineering Section of the Fresno County Department of Public Works and Planning, any additional runoff generated by development of the proposed Interstate Freeway Interchange Commercial Development cannot be drained across property lines and must be retained onsite per County Standards. This mandatory requirement will be included as a Project Note.*

The County's response does not address how the water would be retained onsite and disposed. There is no analysis of potential environmental impacts associated with polluted runoff.

Third, the County's conclusion to section II titled Agricultural and Forestry Resources similarly fails to address the questions presented. Here too, the County concluded that the Project would have a "less than significant impact" on agricultural and forestry resources, but its response does not address several of the questions presented. The County wrote that it will require that "prior to occupancy, the owner of the subject parcel shall acknowledge the inconveniences and discomforts associated with agricultural land uses." Having a property owner acknowledge the Fresno County Right-to-Farm Notice does not respond to the questions posed.

August 18, 2017

Page 19

An initial study must meaningfully analyze the questions presented based on reliable evidence to determine whether an EIR, a negative declaration, or a mitigated negative declaration is required. *See generally* 14 CCR § 15063. The Initial study provides “documentation of the factual basis for finding” that a mitigated negative declaration is appropriate. 14 CCR § 15063. The County’s Initial Study must honestly assess the questions presented to determine if the Project will have a significant impact or not. An initial study is deficient if it fails to analyze a component of the Project. *Lighthouse*, 131 Cal.App.4th 1170 at 1195 (initial study did not reflect that the City ever considered or assessed the environmental effect of the revisions on city plans regarding future off-leash dog use at park).

“When the informational requirements of CEQA are not complied with, an agency has failed to proceed in a manner required by law and has therefore abused its discretion.” *Id.* at 1200 (internal citations removed). The County’s efforts here have fallen short in many regards. Accordingly, the decision to propose a mitigated negative declaration is based on incomplete conclusions and should not be adopted.

#### **4. The County Has Improperly Deferred Mitigation Measures**

In Section XVII.D of the Initial Study, the County analyzed whether the project had sufficient water supplies available from existing entitlements and resources or whether new or expanded entitlements are needed. The County concluded that the Project would have a “less than significant impact with mitigation incorporated.” However, to mitigate the significant impact, the County relied solely on the Applicant obtaining a permit from the State Water Resources Control Board, Division of Drinking Water:

*Prior to completion of the Site Plan Review (SPR) required for the proposed Interstate Freeway Interchange Commercial Development, the Applicant shall submit for any permits required by the State Water Resources Control Board, Division of Drinking Water for operation of a Non-Transient Non-Community Water System. Additionally, the Applicant shall comply with State mandatory permitting requirements as listed in the Project Notes for Unclassified Conditional Use Permit No. 3528. Further, proof of acceptance by the State regarding the design of the Non-Transient Non-Community Water System, and authorization from the State to operate the Non-Transient Non-Community Water System must be provided to the County prior to granting occupancy to the proposed Interstate Freeway Interchange Commercial Development.*

This response does not address the fundamental issue that there is no evidence to show that the Project has sufficient water supplies available from existing entitlements and resources. The San Luis Water District stated it will not issue a “will-serve” letter for the Project. **Exhibit**

August 18, 2017

Page 20

9. The County did not evaluate the environmental impacts associated with pumping groundwater to meet the daily water demand of the Project nor how to treat the water, given its salinity and concentrations in excess of California's Secondary Drinking Water Standards, and thus the mitigation measures are unresponsive to environmental impacts associated with those activities.

Similarly, in section VI.E, the County included a mitigation measure requiring the Applicant to submit "[s]pecific design and capacity details for the" onsite wastewater treatment system. As already explained above, there are serious shortcomings with the O.S.T. Report. By including as a mitigation measure the requirement that the Applicant design and construct an onsite wastewater treatment system that can address grey water and black water treatment, the County is improperly using mitigation by allowing the Applicant to conduct another study at a later time that will be free from public scrutiny and a robust inquiry into environmental effects. *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 307.

Generally, it's improper for an Agency to defer mitigation by relying on future planning or studies. *Id.* at 306-07; *see also* 14 CCR § 15126.4 ("formation of mitigation measures should not be deferred until some future time."). The ability to treat the wastewater onsite should be meaningfully evaluated now, as a part of the Initial Study, and not deferred to a later date. "A study conducted after approval of a project will inevitably have a diminished influence on decision making. Even if the study is subject to administrative approval, it is analogous to the sort of post hoc rationalization of agency actions that has been repeatedly condemned in decisions construing CEQA." *Sundstrom*, 202 Cal.App.3d at 306.

Finally, as explained in comment 2, the mitigation measure proposed for addressing the significant impact relating to traffic is non-responsive to the impact identified. The County concluded that the "proposed Interstate Freeway Interchange Commercial Development will cause a "significant traffic impact by increasing the Traffic Index (TI) on Nees Avenue between the subject parcel and the Interstate Highway 5 northbound ramps by a significant amount (at least 0.5)." The only mitigation measure required was to add a two-inch Hot Mix Asphalt overlay on Nees Avenue and Paul Negra Road between the subject parcel and the I-5 northbound ramps. This mitigation measure is unresponsive to the impact identified because it does nothing to alleviate the increase in traffic.

5. **The County Failed to Meaningfully Analyze Whether the Project has Cumulatively Considerable Impacts**

The Initial Study concludes that "[n]o cumulatively considerable impacts were identified in the project analysis." (IS section XVII.B.) Such a conclusory statement does not satisfy the lead agency's requirement to evaluate whether the Project would have a cumulative impact or

August 18, 2017

Page 21

presents cumulatively considerable impacts. The lead agency must analyze whether potentially significant environmental impacts would have a cumulative impact—not merely state whether the Applicant identified cumulatively considerable impacts in the project analysis.

Initial Studies are used to “[p]rovide documentation of the factual basis for the finding in a Negative Declaration that a project will not have a significant effect on the environment.” 14 CCR § 15063(c)(5). Regarding cumulative impacts, the lead agency must consider whether the cumulative impact is significant and whether the project’s incremental effect, though individually limited, is cumulatively considerable. 14 CCR § 15064(h)(1). This includes an evaluation of the effects of probable future projects. *Id.*

Here, the County’s analysis is merely perfunctory. In a single sentence the County stated that cumulatively considerable impacts were not identified. This sentence appears to shift the burden to the applicant to identify a cumulatively considerable impact for the County’s consideration. But the County, as the lead agency, is charged with determining whether cumulatively considerable impacts exists on such issues as water, air and traffic. *Id.* The County failed to do so.

**6. The County Did Not Address All Identified Endangered Species in the Proposed Mitigation Measures**

The Initial Study cited to a United States Fish and Wildlife Service (“USFWS”) comment letter dated May 17, 2016, which explained that the subject parcel contains vegetation indicative of habitat suitable for the federally-listed endangered species San Joaquin Kit Fox, Blunt-Nosed Leopard Lizard and Giant Kangaroo. (IS section IV.F.) The County summarized the Endangered Species Habitat Assessment that was performed and then identified some mitigation measures so that the Project would have a “less than significant impact with mitigation incorporated”:

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August 18, 2017

Page 22

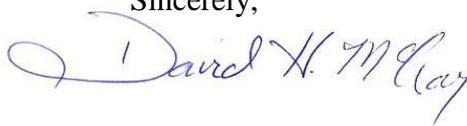
*An Endangered Species Habitat Assessment was prepared for this proposal by Colibri Ecological Consulting, LLC based upon literature review, database review [including the California Natural Diversity Database (CNDDDB) and California Native Plant Society Database (CNPS)], and a reconnaissance-level field survey of the subject parcel which included a 250-foot area around the perimeter of the subject parcel. According to the Endangered Species Habitat Assessment prepared by Colibri Ecological Consulting, LLC, no plant or wildlife species listed as endangered was observed within the boundaries of the survey area. However, due to the potential for special status wildlife species to occur on or adjacent to the subject parcel, Mitigation Measures are recommended to ensure that project impacts to sensitive biological resources are reduced to a less than significant level. These Mitigation Measures pertain to San Joaquin Kit Fox, American Badger, Burrowing Owl and nesting birds.*

The mitigation measures proposed by the County do not address the Blunt-Nosed Leopard Lizard or the Giant Kangaroo Rat. The County provided no support for why pre-construction surveys were required for the San Joaquin Kit Fox, the American Badger, the Burrowing Owl, and nesting birds but not for the Blunt-Nosed Leopard Lizard or the Giant Kangaroo Rat even though there is “potential for special status wildlife species to occur on or adjacent to the subject parcel.” Failure to provide an explanation for why there will be no significant effect on biological resources, even at the initial study phase, is impermissible. *See Deep Creek*, 2008 WL 2316322, at \*11 (“[T]he initial study’s conclusion that the project will have no significant effect on biological resources, apart from the three species as to which it concluded mitigation is or may be necessary, is based solely on general information that there is a low probability that members of the identified plant and animal species will be found on or near the project[,] which was found inadequate to discharge the “county’s duty under CEQA to engage in fully informed decisionmaking.”).

## **Conclusion**

For all of the reasons explained above, the County’s efforts have fallen below what is required under CEQA. Accordingly, the Planning Commission should not adopt the mitigated negative declaration or approve the CUP. The Applicant must be required to submit additional accurate data and information and the County should prepare either a revised Initial Study or an EIR for this Project incorporating the issues raised above.

Sincerely,



David H. McCray

Enclosures

# **EXHIBIT 14**

June 29, 2017

**PRIVILEGED AND CONFIDENTIAL  
ATTORNEY/CLIENT COMMUNICATION  
ATTORNEY WORK PRODUCT**

Mr. Amin Salkhi, President  
Grand Petroleum, Inc.  
1451 Danville Blvd., Suite 201  
Alamo, CA 94507

Subject: ***Review of Traffic Impact Analysis –  
Proposed E-Z Trip Travel Center, Fresno County, California***

Dear Mr. Salkhi:

As requested, MRO Engineers, Inc., (MRO) has reviewed the traffic impact analysis prepared with respect to the proposed E-Z Trip Travel Center project (“Project”) in Fresno County, California. (Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016). Our review focused on the technical adequacy of the analysis, including the detailed procedures and conclusions documented in the Peters Engineering Group (“PEG”) study.

### **BACKGROUND**

The Project will consist of a highway travel center at the northwest quadrant of the Interstate 5/Nees Avenue interchange in Fresno County, California. According to the PEG study (p. 1) and information provided by the applicant, specific components of the Project include:

- A 12,550-square-foot (SF) building, including:
  - Mini-mart oriented toward automobile patrons – 2,120 SF,
  - Mini-mart oriented toward truck drivers – 2,400 SF,
  - Truckers’ services – 3,240 SF,
  - Sit-down restaurant – 4,800 SF,
- 24 automobile fueling positions, and
- 10 diesel fueling positions.

A total of 174 parking spaces will be provided, including 83 for automobiles and 91 for trucks, buses, and recreational vehicles.

Vehicular access is proposed via four driveways to be located along Paul Negra Road.

### **TRAFFIC IMPACT ANALYSIS REVIEW**

Our review of the traffic impact analysis revealed the following potentially significant deficiencies that should be addressed prior to approval of the Project by Fresno County.

1. ***Analysis Time Periods*** – The PEG traffic impact analysis addressed conditions in a single peak-hour period – Sundays between 4:00 and 5:00 PM. (PEG, pp. 5 – 6) This determination was based on the results of 24-hour traffic volume counts, which are summarized in PEG Table 4 (p. 6). As shown in that table, the total daily traffic volume on Nees Avenue west of the Interstate 5

(I-5) interchange on the count day (September 18, 2016) was 2,564 vehicles. The table also shows that on Friday, September 16, 2016, the total daily volume between the northbound and southbound I-5 ramps was 2,578 vehicles, a slightly higher volume.

This raises the obvious question as to why the Friday peak hour was not also analyzed.

The detailed traffic count data sheets are presented in Appendix A of the PEG report. Because the 24-hour count sheets are extremely difficult to read, we have excerpted key information and summarized it in a table, which is presented as Attachment A.

The daily totals shown in the table match those described above. Highlighted within the table is the analysis period of Sunday between 4:00 and 5:00 PM (west of the I-5 interchange), when a total of 204 vehicles were counted. Interestingly, the previous hour (3:00 – 4:00 PM) at the same location actually had a higher traffic volume (213 vs. 204). However, when we examined the intersection turning movement counts that were presented in PEG Appendix A, we found that the Sunday 3:00 – 4:00 PM hour was not even counted, as the counts were performed from 3:30 – 6:00 PM. Thus, the analysis didn't even address the true peak hour on a Sunday.

Also highlighted on the table in Attachment A is the 5:00 – 6:00 PM hour between the I-5 ramps on Friday. The total volume during that hour was 200 vehicles, which is approximately the same as the total during the selected analysis period. However, the directional orientation of the vehicles in this period was somewhat different from that shown during the analysis period. In particular, about three-quarters of the Friday volume is eastbound at the count location, whereas the Sunday volumes are approximately evenly split between the eastbound and westbound directions.

The information presented here strongly suggests that, in order to ensure a conservative analysis and, in particular, to ensure that all potential traffic impacts are identified, traffic operations during the Friday peak hour should also be evaluated. In addition to the fact that the total volumes are very similar to the Sunday analysis peak hour, the different directional distribution of the traffic during the Friday peak hour suggests the possibility that additional impacts would be identified, as different critical movements would likely be found at the study intersections.

Consequently, the traffic impact analysis should be revised to incorporate an analysis of traffic operations during the actual Sunday peak hour (3:00 – 4:00 PM), as well as the Friday peak hour (5:00 – 6:00 PM).

2. **Project Trip Generation** – The trip generation estimates for the Project are presented in PEG Table 6 (p. 8). The trip generation rates for the automobile and truck fueling facilities were developed based on counts conducted at the existing Chevron station on Paul Negra Road, a short distance north of the Project site. We have several concerns regarding the validity of the Project trip generation estimates.

#### *A. Sample Size and Data Collection Requirements*

First, we are concerned that the trip rates for the two fueling facilities are based on a sample size of one; that is, the data used to develop the trip rates was collected at a single location on a single occasion. The Institute of Transportation Engineers (ITE) *Trip Generation Handbook* (Third Edition, August 2014, p. 26) says to collect local data when the:

*Data plot has only one or two data points (and, preferably, when five or fewer)[.]*

Further, the *Trip Generation Handbook* (p. 29) addresses the preferred sample size for selecting appropriate trip generation rates from those available in the *ITE Trip Generation Manual* (ITE, Ninth Edition, 2012):

- *If the number of data points is **one or two**, either (1) consider the use of a different independent variable and its associated data pages, or (2) collect local data and establish a local or consolidated rate. Refer to Chapter 9 for guidance.*
- *If the number of data points is **three, four, or five**, the analyst is encouraged to collect local data and establish a local or consolidated rate . . . [Emphasis not added]*

In summary, only if the sample size is six or more does the ITE handbook indicate that it is acceptable to proceed with the analysis. Obviously, a single data point is inadequate to represent a valid indication of the trip generation characteristics of any land use.

#### *B. Existing Gas Station is Not Comparable to Project*

We also question whether the existing Chevron station is sufficiently similar to the Project. For example, the Project includes over 3,200 SF for “truckers’ services.” This represents about one-quarter of the total square footage of the Project. Does the existing station include any such services? If not, then substantial questions could be raised regarding the appropriateness of the derived trip generation rates.

#### *C. Improper Trip Generation Analysis for Truckers’ Services and Restaurant*

Moreover, we note that the Project trip generation estimate presented in PEG Table 6 fails to account for the truckers’ services component of the Project. It seems to suggest that this activity is fully accounted for within the 3.00 trips per diesel fueling position trip rate, but this assumption is unsubstantiated. Similarly, the 2,400 SF mini-mart/convenience store oriented toward the truck/diesel fuel pumps is unaccounted for, as there is no certainty that the small trip rate directly associated with the diesel fuel pumps fully accounts for activity within the mini-mart. Ignoring these two key components of the Project will likely lead to underestimation of the Project’s trip generation, which could, in turn, result in understatement of the Project’s traffic impacts.

We also question the approach taken with regard to estimating the number of trips generated by the proposed 4,800 SF sit-down restaurant. For trip generation purposes, the size of the proposed restaurant has been arbitrarily reduced by 1,000 SF to reflect an apparent guess concerning the size of the existing Subway sandwich shop within the Chevron station where trip data was collected. In other words, the traffic analysis addresses a 3,800 SF restaurant, instead of the actual 4,800 SF facility. While the intent is to account for the fact that the Subway trips are included within the total number of trips counted at the Chevron driveway, the validity of the specific adjustment is not adequately demonstrated.

Further, the trip generation rate applied to the proposed restaurant, which was taken from the *ITE Trip Generation Manual*, is based on data collected at only three locations, with trip rates ranging from 9.79 to 43.20 trips per 1,000 SF. (For ease of reference, the pertinent page from the ITE document is presented here as Attachment B.) The PEG traffic study used the weighted average rate of 18.46 trips per 1,000 SF, which is less than half of the highest rate documented in the ITE publication. While we are not suggesting that the highest trip rate should be used, this

huge disparity among the highest, lowest, and average rates provides further evidence as to the importance of having an adequate sample size. As described above, the *ITE Trip Generation Handbook* calls for a minimum sample size of six data points. In fact, the excerpt presented in Attachment B contains the notation, “Caution – Use Carefully – Small Sample Size.”

Considering the two previous points, if the proposed restaurant generated trips at the highest rate documented in the *ITE Trip Generation Manual*, the resulting trip generation estimate would be 207 Sunday peak-hour trips instead of the 71 trips shown in PEG Table 6. While we again acknowledge that it might not be appropriate to employ the highest documented trip rate, insufficient data are available to ensure that the weighted average rate used in the analysis is meaningful.

#### D. *Internal Trip Reduction*

The PEG trip generation estimate also includes a 20 percent internal trip reduction, based on information presented in Tables 7.1 and 7.2 in Second Edition (June 2004) of the *ITE Trip Generation Handbook*. However, the only 20 percent values in the referenced tables are for trips from one retail use to another retail use in the weekday PM peak hour of adjacent street traffic. Of course, the PEG study addresses the Sunday peak hour, so it would appear that the assumed 20 percent value does not apply.

#### E. *Pass-by Trips*

Finally, the PEG analysis assumes that 15 percent of the trips at the Project will be “pass-by” trips; that is, they represent vehicles that were already passing by the site on Paul Negra Road, which enter the site rather than continuing on to the existing Chevron station. While the PEG study correctly recognizes that the standard pass-by trip rates documented in the *ITE Trip Generation Handbook* do not apply (because of the limited volume of traffic passing by the site), it does not adequately describe the derivation of or justify the use of the 15 percent value employed in the analysis.

In summary, we believe that the trip generation estimate prepared for the Project lacks credibility, as it is based on insufficient data. Further, several of the specific factors applied in developing the estimate have not been adequately substantiated and are, therefore, speculative. These numerous deficiencies raise significant questions regarding the validity of the Project trip generation estimate.

3. ***Project-Generated Vehicle Classification*** – Appendix A of the PEG traffic study report presents the results of vehicle classification counts performed in conjunction with the analysis. Such counts indicate the types and sizes of vehicles passing by the count location.

In addition, the peak-hour turning movement counts performed at the two study intersections indicated the truck percentages at those locations. At the Nees Avenue/I-5 Southbound Ramps intersection, 13.7 percent of the vehicles counted were trucks during the Sunday PM peak hour. At Nees Avenue/I-5 Northbound Ramps, 16.9 percent of the peak-hour vehicles were trucks.

Based on this, the PEG analysis applied a 17 percent “heavy vehicle” factor at both locations in the intersection level of service calculations; the same factor was applied for all analysis scenarios. This parameter is intended to reflect the reduced operating characteristics of trucks relative to passenger vehicles (e.g., slower acceleration, greater braking distances, etc.).

While this would seem to represent a conservative approach to consideration of truck traffic within the analysis, it fails to recognize that the Project is a “truck stop.” As such, a significant proportion of the traffic attracted to the Project will be trucks and other heavy vehicles (e.g., buses and recreation vehicles). This suggests that the truck percentage will be higher in the “with project” analysis scenarios than was found for existing conditions.

By using a consistent truck percentage in all analysis scenarios, the analysis fails to reflect the type of traffic to be generated by the Project, particularly with respect to increased truck volumes. In doing so, it understates the impacts of the Project at the study intersections.

4. **Project Traffic Assignment is Flawed** – Figure 5 in the PEG study illustrates the assignment of Project-generated trips to the study intersections. For ease of reference, that figure is presented here as Attachment C, with the total peak-hour volume of Project-generated traffic west of the Nees Avenue/I-5 Southbound Ramps intersection noted in red. As shown there, Figure 5 shows 223 westbound project trips traveling toward the Project site and 215 eastbound trips departing the Project site.

However, PEG Table 6 (p. 8), which summarizes the Project trip generation estimate employed in the analysis, shows that the Project is estimated to generate 228 inbound trips and 222 outbound trips. Consequently, the Project traffic assignment values shown in Figure 5 represent a shortage of 5 inbound trips and 7 outbound trips. This is summarized in Table 1 below.

Source	Project Trips		
	In	Out	Total
PEG Table 6 <sup>2</sup>	228	222	450
PEG Figure 5 <sup>3</sup>	223	215	438
Difference	5	7	12

Notes:

<sup>1</sup> Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016.

<sup>2</sup> Ibid., “Table 6 - Sunday Peak-Hour Project Trip Generation,” p. 8.

<sup>3</sup> Ibid., “Figure 5 - Sunday Peak-Hour Project Traffic Volumes,” p. 28.

Although these are seemingly small differences, the lack of consistency within the analysis is a concern, as it raises additional questions regarding the accuracy of the work. Furthermore, because the Project-related traffic volumes assigned to the study intersections are less than the actual estimate of Project-generated traffic, the impacts of the Project are understated.

5. **Pending Project Trip Generation Estimate** – PEG Table 7 (p. 9) presents the trip generation estimate for the one assumed pending project, a 2,000 SF fast food restaurant to be located north of the Project on Paul Negra Road. Similar to the Project, the estimate includes application of a 15 percent pass-by trip reduction. As noted in Comment 2.E. above (p. 4), this pass-by trip reduction factor is unsubstantiated.

6. **Cumulative Traffic Volumes** – The approach to estimating year 2037 traffic volumes is described at PEG p. 9:

*The Fresno Council of Governments (COG) maintains a travel model that is typically used to forecast future traffic volumes. The model predicts no growth in traffic volumes on Nees Avenue between 2015 and 2035. . . . Since some regional growth typically occurs, the analyses assume an annual growth rate of 1.0 percent applied to the existing traffic volumes through the year 2037.*

But this approach ignores the fact that traffic volumes on Paul Negra Road and Nees Avenue in the study area are directly linked to traffic volumes on I-5, as there are virtually no other land uses nearby to act as origins for trips using those roadways. In fact, at this time, virtually the only reason to be on Paul Negra Road is to travel to or from the existing Chevron station, and the bulk of the traffic doing so is oriented to/from I-5. This is confirmed by the Project trip distribution presented at PEG Figure 4, which shows 90 percent of the Project-related traffic being oriented to/from I-5. It is reasonable to expect that as traffic volumes on I-5 grow, so will traffic volumes on Paul Negra Road.

The primary source of information regarding projected traffic growth on I-5 is the *Interstate 5 Transportation Concept Report* (Caltrans, Office of System Planning, District 6, February 2013). That document provides daily and peak-hour traffic volume information for the years 2011, 2020, and 2035. For the segment of I-5 containing the Project (i.e., Segment 16, from Russell Avenue to the Merced County line), Table 2 summarizes the traffic volume information presented in Summary Chart 2A in the *Transportation Concept Report* (which is presented here as Attachment D).

Year	Annual Average Daily Traffic (AADT)			Peak Hour Traffic		
	Traffic Volume	Traffic Growth	Percent Growth <sup>2</sup>	Traffic Volume	Traffic Growth	Percent Growth <sup>2</sup>
2011	34,500	--	--	5,200	--	--
2020	49,700	15,200	44.1% (4.9%/Year)	7,500	2,300	44.2% (4.9%/Year)
2035	96,600	62,100	180.0% (7.5%/Year)	14,560	9,360	180.0% (7.5%/Year)

Notes:  
<sup>1</sup> Reference: Caltrans, Office of System Planning, District 6, *Interstate 5 Transportation Concept Report*, February 2013.  
<sup>2</sup> Overall growth percentage and average annual growth percentage (shown in parentheses).

For both daily and peak hour periods, Caltrans projects the volume on I-5 to grow by 180 percent between 2011 and 2035. Over that 24-year period, that equates to an annual growth rate of 7.5 percent. This is obviously considerably higher than the 1.0 percent per year assumption in the PEG traffic analysis.

Consequently, PEG's analysis substantially underestimated the year 2037 traffic volumes on Nees Avenue and Paul Negra Road. This will lead, in turn, to understatement of the vehicular delay values at the study intersections, so that no meaningful indication of the future level of service is provided for those locations. The degraded "no project" level of service that is certain to result from the use of more realistic future traffic estimates increases the probability that addition of the Project-generated traffic will result in a significant impact under Fresno County significance criteria. That is, as traffic increases on Nees Avenue and the I-5 freeway ramps, it becomes increasingly likely that the critical movements at the study intersections will operate at unacceptable levels of service and that addition of the Project traffic will cause the delays on those critical movements to increase by 5.0 seconds or more.

The analysis must be revised to reflect the level of traffic growth projected by Caltrans and to provide an accurate indication of the operating conditions at the study intersections.

7. **Cumulative Project Trip Generation** – The volume of Project-generated traffic is also directly linked to the volume of traffic on I-5, as 90 percent of the vehicles traveling to or from the Project originate on I-5, according to the PEG study. Because of the extremely rural nature of the area surrounding the project site, virtually no one is on Paul Negra Road unless they are passing by on I-5 and need fuel or food.

This direct linkage between I-5 and Project-related traffic volumes means that as traffic grows on I-5, the Project will attract more patrons. The PEG traffic analysis, though, assumes that Project-generated traffic will not change over time, no matter how many potential patrons are passing by the site on I-5. This assumption is illogical and inappropriate. If, as described above, the pool of potential patrons increases at an average rate of 7.5 percent per year, it is reasonable to expect that the number of customers at the Project will increase at approximately the same rate. This suggests that between now and the year 2037, traffic at the Project (and, therefore, at the study intersections) will increase by 150 percent (i.e., 20 years at an average rate of 7.5 percent per year).

Because the Project trip generation has been underestimated, the cumulative traffic impacts of the Project have been substantially understated. A revised traffic analysis must be prepared, which more accurately reflects the future volume of traffic at the Project.

8. **Queue Length Results Are Not Credible** – Table 10 (p. 10) in the PEG report provides the "Intersection Queuing Summary" for Existing Conditions. At the Nees Avenue/I-5 Southbound Ramps intersection, the table indicates a 13-foot queue on the southbound approach. At the Nees Avenue/Northbound Ramps intersection, a 5-foot queue is shown on the eastbound approach and a 10-foot queue on the northbound approach.

These results lack credibility, as there are no vehicles on the American road system that are as little as 5, 10, or even 13 feet long. Similar errors are evident in PEG Table 11 (p. 10), which presents the Existing Plus Project queue lengths (13 feet, for example). Even the Cumulative 2037 With Project queue lengths presented in PEG Table 14 (p. 11) are as short as 15 feet (on the eastbound approach at Nees Avenue/I-5 Northbound Ramps).

We note that the "passenger car" design vehicle designated in Exhibit 2-3 (p. 21) in the document, *A Policy on Geometric Design of Highways and Streets* (American Association of State Highway and Transportation Officials, 2004) is 19-feet long. According to the User Guide for the Synchro 9 software used to calculate the intersection levels of service, the standard

convention is to assume that a passenger car in a queue consumes 25 feet. (Reference: Trafficware, *Synchro Studio 9 User Guide*, August 18, 2015)

Of course, as noted in the PEG traffic study, 17 percent of the existing traffic at the study intersections consists of trucks. According to Caltrans, trucks are as long as 72 feet. (Reference: Caltrans, *Highway Design Manual*, May 7, 2012, Figures 404.5A and 404.5B, pp. 400-15 and 400-16) Such a vehicle would consume at least 75 feet in a queue.

Claiming that the queues associated with development of the Project will be less than the length of an average passenger car represents a substantial deficiency in the analysis. Such an irrational result raises questions regarding the credibility of the analysis as a whole.

9. **Project Driveway Operations** – Four driveways are planned to serve the Project, all of which will be on Paul Negra Road. Page 1 of the PEG traffic report says that:

*The southernmost driveway will be the first driveway encountered by vehicles driving from the interchange and will be an entrance only for trucks only.*

Recognizing that a large proportion of the patrons at the Project will be first-time or, perhaps, occasional visitors, it is unclear how the restrictions described here will be enforced or controlled.

Passenger car drivers approaching the site from I-5 will naturally be inclined to enter at the first available opportunity, as they will be unfamiliar with the layout of the project. Review of the Project site plan suggests that such drivers might have difficulty finding their way to the automobile fuel pumps. What will be the effect of mixing confused automobile drivers with the large number of trucks expected on-site?

Moreover, we note that no analysis was presented in the PEG study to address traffic operations at the four driveways. Such an analysis would, at a minimum, address the following questions:

- How long will delays be for drivers exiting the site?
- How long will queues be for both entering and exiting traffic?
- Is there adequate sight distance at the driveways to ensure safe operation for entering and exiting drivers?

The failure to provide such an analysis is a substantial deficiency in the analysis, which must be revised to provide pertinent information.

10. **Freeway Merge/Diverge Analyses** – Two issues afflict the analysis of freeway merge and diverge areas. The results of those analyses are summarized in PEG Table 17 (p. 19).

First, the analysis results are inadequately documented, as follows:

- No analysis results are shown for Near-Term No Project conditions, so it is impossible to determine the incremental impact of the Project in the near-term scenario.
- Although levels of service (LOS) are presented, the traffic density values that lead to determination of the LOS are not. Again, this makes it impossible to identify the specific incremental impact of the Project.

The second issue is that the analysis results are wrong. Review of the merge/diverge calculations presented in PEG Appendix F reveals that the addition of the project traffic results in lower density values at the two off-ramps than under “no project” conditions (i.e., the additional traffic results in improved operations). This is true for both Existing Plus Project and Cumulative Plus Project conditions. (Because Near-Term No Project results were not provided, it is not possible to establish whether this issue applies to that time frame, as well.) To illustrate this point, we have prepared Table 3, which presents the detailed density values for existing and cumulative conditions, both with and without the Project.

We have highlighted in yellow the cells within the table that indicate improved operations following the addition of Project-generated traffic. This result is illogical and should have represented a red flag for the analyst that something is wrong.

Ramp	Existing		Existing Plus Project		2037 No Project		2037 Plus Project	
	Density <sup>2</sup>	LOS <sup>3</sup>	Density	LOS	Density	LOS	Density	LOS
NB Off-Ramp	32.5	D	31.3	D	72.9	F	71.7	F
NB On-Ramp	29.0	D	29.0	D	65.7	F	65.7	F
SB Off-Ramp	26.8	C	25.7	C	61.8	F	60.6	F
SB On-Ramp	22.9	C	22.9	C	54.5	F	54.5	F

Notes:

<sup>1</sup> Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016, Table 17, p. 19.

<sup>2</sup> Passenger cars/mile/lane.

<sup>3</sup> Level of service.

The analysis results presented above are incorrect because the traffic volumes used in the analyses are wrong. The procedures for evaluating the merge (i.e., on-ramp) and diverge (i.e., off-ramp) areas are presented in Chapter 13 of the *Highway Capacity Manual 2010* (Transportation Research Board, Fifth Edition, December 2010). Exhibit 13-4 (p. 13-8) in that document provides a flow chart summarizing the analysis procedures for on- and off-ramps. With respect to off-ramps, Step 2 is to:

*Compute demand flow rate [i.e., traffic volume] in Lanes 1 and 2 immediately upstream of the diverge influence area.*

In other words, the critical freeway volume for analysis of the off-ramps is the volume just prior to reaching the off-ramp; it includes the traffic that will be exiting the freeway. (The second key volume parameter is the amount of traffic actually using the ramp to exit the freeway.)

In this case, the freeway volume upstream of the off-ramp is unchanged by implementation of the Project. In fact, no Project traffic is added to the freeway, as it is all derived from traffic already on I-5. For that reason, the freeway traffic volumes in all of the off-ramp analyses should be the same; only the off-ramp volumes will change as additional drivers choose to exit the freeway for fuel or food at the Project.

However, that is not how the off-ramp analyses were performed. Instead, the freeway volumes used in the analyses were derived by subtracting the additional off-ramp traffic from the freeway volume. To illustrate this, Table 4 summarizes the values used in the analysis, as well as the correct values, for Existing and Existing Plus Project conditions.

<b>Table 4</b>				
<b>Diverge Analysis Traffic Volumes<sup>1</sup></b>				
<b>Existing Conditions</b>				
	Northbound Off-Ramp		Southbound Off-Ramp	
	Existing	Existing Plus Project	Existing	Existing Plus Project
Off-Ramp Volume	75	175 (+100)	83	183 (+100)
Freeway Volume As Analyzed	2,514	2,414 (-100)	2,032	1,932 (-100)
Correct Freeway Volume	2,514	2,514	2,032	2,032
Notes:				
<sup>1</sup> Reference: Peters Engineering Group, <i>Traffic Impact Analysis – Proposed E-Z Trip Travel Center</i> , November 16, 2016, Appendix F.				

Table 5 shows similar information for cumulative conditions.

<b>Table 5</b>				
<b>Diverge Analysis Traffic Volumes<sup>1</sup></b>				
<b>Cumulative Conditions</b>				
	Northbound Off-Ramp		Southbound Off-Ramp	
	Cumulative No Project	Cumulative Plus Project	Cumulative No Project	Cumulative Plus Project
Off-Ramp Volume	102	202 (+100)	119	219 (+100)
Freeway Volume As Analyzed	5,940	5,840 (-100)	5,000	4,900 (-100)
Correct Freeway Volume	5,940	5,940	5,000	5,000
Notes:				
<sup>1</sup> Reference: Peters Engineering Group, <i>Traffic Impact Analysis – Proposed E-Z Trip Travel Center</i> , November 16, 2016, Appendix F.				

Although we have focused on the off-ramp analyses, the freeway volumes employed in the on-ramp analyses are also flawed, although not to the same extent.

In summary, because the “with project” freeway volumes used in the merge/diverge analyses are wrong, the analysis results are wrong and misleading. Consequently, there is no certainty that the conclusion presented in the PEG report (p. 19) is valid. That conclusion states that:

*The construction of the Project and pending project is not expected to cause a reduction in the LOS. Therefore, the Project does not cause a significant impact with respect to merging and diverging at the ramps.*

We should also note that this conclusion seems to reflect a misinterpretation of the Caltrans significance standard for facilities that operate at deficient levels of service under “no project” conditions. That standard is presented at page 1 in the *Caltrans Guide for the Preparation of Traffic Impact Studies* (December 2002):

*If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE [Measure of Effectiveness] should be maintained.*

In this case, the MOE (as described above) is density and the target LOS is the transition between LOS C and LOS D (PEG, p. 5). As shown in Table 3 above (and PEG Table 17, p. 19), all of the ramps will operate at LOS F in 2037, both with and without the Project, thereby falling short of the target LOS. Thus, if addition of the Project-generated traffic were to cause an increase in density (i.e., cause the MOE not to be maintained), then a significant impact would occur. This will not be known until the merge/diverge calculations are corrected, as described above.

Therefore, as noted above, the PEG conclusion with respect to impacts related to merging and diverging at the ramps is incorrect. Until the analysis has been corrected to incorporate accurate freeway traffic volumes, the extent of any Project-related impact will be unknown.

Finally, review of the freeway traffic volumes shown in Tables 4 and 5 above reveals one interesting side note. Comparison of the Existing volumes and the Cumulative No Project volumes indicates that substantial traffic growth was assumed, as suggested in our earlier comments. Specifically, at the northbound off-ramp, the increase in traffic from 2,514 “Existing” vehicles (see Table 4) to 5,940 “Cumulative No Project” vehicles (see Table 5) represents growth of 136 percent between now and 2037. In the southbound direction, growth from 2,032 “Existing” vehicles (see Table 4) to 5,000 “Cumulative No Project” vehicles (see Table 5) indicates a 146 percent increase.

Although these factors are slightly lower than indicated in the *Interstate 5 Transportation Concept Report*, they generally confirm our point regarding the magnitude of future traffic on I-5, which we assert will lead to greater traffic on Nees Avenue and Paul Negra Road as well as greater patronage at the Project, neither of which has been accounted for in the PEG analysis.

11. **Traffic Index Analysis** – According to the PEG report (p. 21):

*The Project is expected to cause the traffic index to increase by a significant amount on Nees Avenue between the Project site and the I-5 northbound ramps. Mitigation will include pavement improvements on Nees Avenue.*

The report fails to state the Project responsibility for this mitigation measure. Is the Project fully responsible for the cost of the required pavement improvements? This must be clarified.

**CONCLUSION**

Our review of the traffic impact study prepared for the proposed E-Z Trip Travel Center project on Paul Negra Road in Fresno County, California revealed several issues affecting the validity of the conclusions presented in that document. A modified traffic impact analysis must be prepared.

We hope this information is useful. If you have questions concerning anything presented here, please feel free to contact me at (916) 783-3838.

Sincerely,

**MRO ENGINEERS, INC.**



Neal K. Liddicoat, P.E.  
Traffic Engineering Manager

cc: Mr. David H. McCray, Beveridge & Diamond, P.C.  
Ms. Kaitlyn D. Shannon, Beveridge & Diamond, P.C.



**ATTACHMENT A**  
**TRAFFIC COUNT SUMMARY TABLE**

**ATTACHMENT A  
EXISTING TRAFFIC COUNTS  
September 16 & 18, 2016**

TIME	WEST OF I-5 INTERCHANGE						BETWEEN THE I-5 RAMPS		
	FRIDAY			SUNDAY			FRIDAY		
	EB	WB	TOTAL	EB	WB	TOTAL	EB	WB	TOTAL
Mid	28	38	66	24	23	47	39	32	71
1:00	21	16	37	17	16	33	22	12	34
2:00	28	24	52	20	16	36	29	18	47
3:00	18	27	45	12	11	23	21	21	42
4:00	31	16	47	13	13	26	28	9	37
5:00	23	22	45	3	7	10	27	14	41
6:00	25	23	48	12	15	27	46	17	63
7:00	32	32	64	30	33	63	58	19	77
8:00	44	45	89	31	30	61	55	20	75
9:00	45	63	108	35	40	75	58	51	109
10:00	58	54	112	49	61	110	54	30	84
11:00	60	56	116	100	94	194	89	27	116
Noon	64	68	132	91	81	172	92	34	126
1:00	67	64	131	67	77	144	115	35	150
2:00	69	77	146	79	90	169	110	50	160
3:00	89	81	170	110	103	213	138	58	196
4:00	73	85	158	99	105	204	149	45	194
5:00	88	69	157	109	89	198	153	47	200
6:00	62	68	130	83	98	181	136	29	165
7:00	75	83	158	92	77	169	111	45	156
8:00	71	61	132	65	64	129	77	31	108
9:00	58	62	120	51	49	100	66	30	96
10:00	46	39	85	36	36	72	118	27	145
11:00	41	42	83	50	58	108	56	30	86
<b>TOTAL</b>	<b>1,216</b>	<b>1,215</b>	<b>2,431</b>	<b>1,278</b>	<b>1,286</b>	<b>2,564</b>	<b>1,847</b>	<b>731</b>	<b>2,578</b>

<<== Analyzed

**ATTACHMENT B**

**HIGH TURNOVER (SIT-DOWN) RESTAURANT TRIP GENERATION  
SUNDAY PEAK HOUR OF GENERATOR**

**(Reference: Institute of Transportation Engineers,  
*Trip Generation Manual*, Ninth Edition, 2012.)**



# **TRIP GENERATION MANUAL**

**9th Edition • Volume 3: Data**

## **Trip Generation Rates, Plots and Equations**

- Institutional (Land Uses 500–599)
- Medical (Land Uses 600–699)
- Office (Land Uses 700–799)
- Retail (Land Uses 800–899)
- Services (Land Uses 900–999)

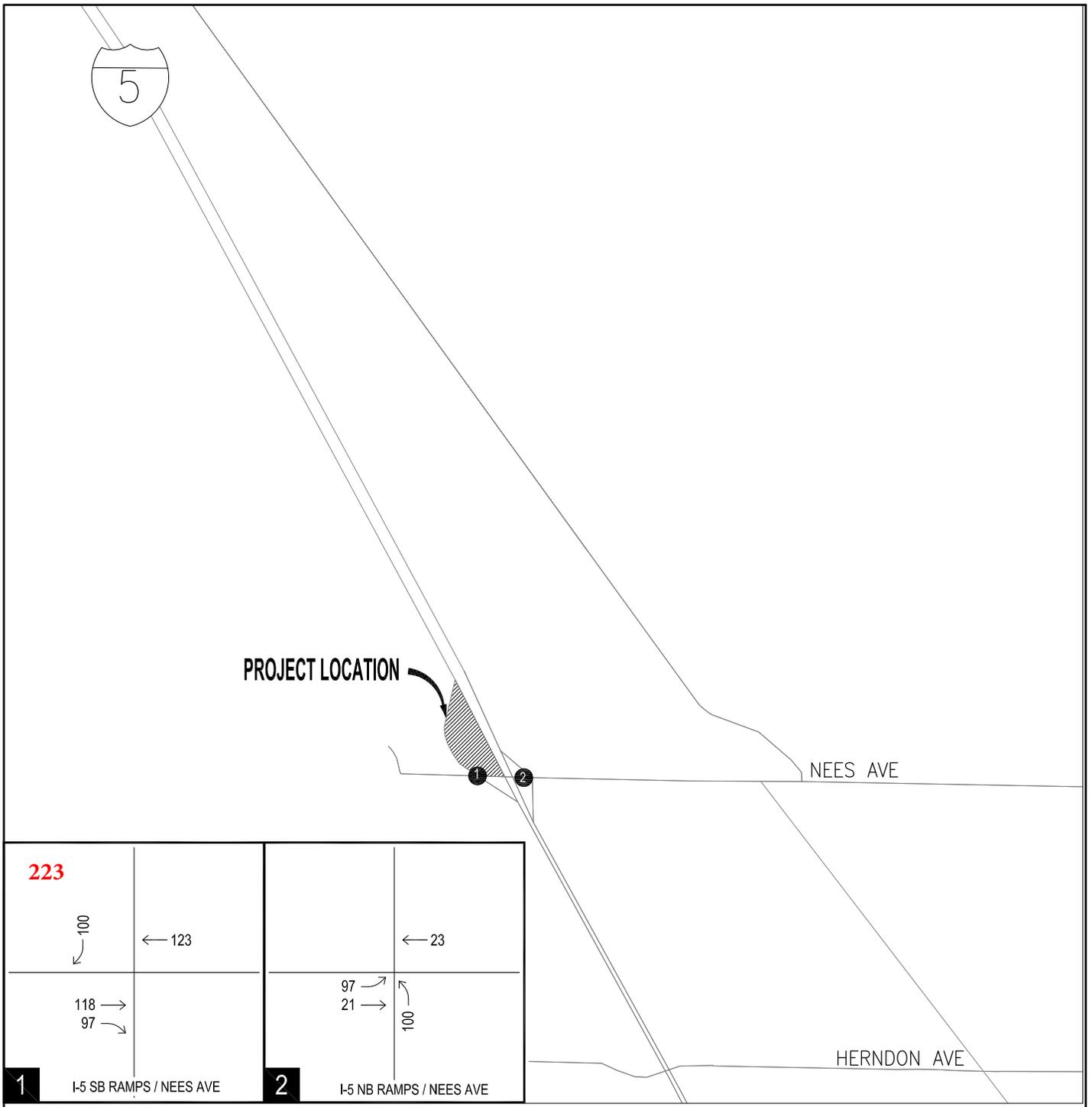


Institute of Transportation Engineers

**ATTACHMENT C**

**FIGURE 5 – SUNDAY PEAK-HOUR PROJECT TRAFFIC VOLUMES**

**(Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016)**



<b>215</b>	<b>223</b>				
	100 ↙	← 123			← 23
	118 → 97 ↘		97 ↗ 21 →		100 ↖
	<b>1</b>	I-5 SB RAMPS / NEES AVE	<b>2</b>	I-5 NB RAMPS / NEES AVE	

- LEGEND**
- ⊗ STUDY AREA INTERSECTIONS
  - XX SUNDAY PM VOLUMES
  - ▨ PROJECT SITE

Proposed E-Z Trip Travel Center  
Fresno County, California

**SUNDAY PEAK-HOUR PROJECT TRAFFIC VOLUMES**



**M R O**



**ENGINEERS**

**ATTACHMENT D**

**SUMMARY CHART 2A**

**(Reference: Caltrans, Office of System Planning, District 6,  
*Interstate 5 Transportation Concept Report*, February 2013.)**



LEGEND

**Existing Lanes**

**Planned or Programmed by 2035**

**Add Through Lanes**

**Add Auxiliary Lanes**

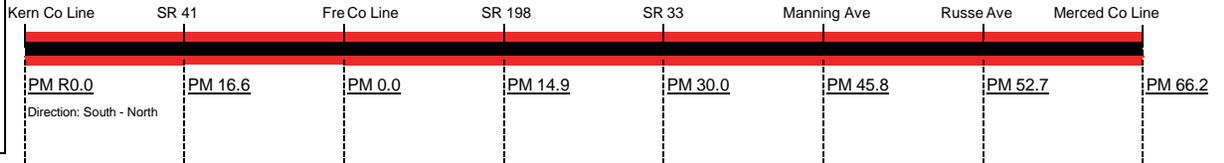
**Freeway**

**Number of Lanes**

4

8

\* Length of segments not to scale



**Segment:** Is self-explanatory except for several data sets:

**Rural/Urban:** Indicates whether the segment is in a rural area or city limits.

**Terrain:** Shows the general highway grade: minimal grade = level; moderate grade = rolling; and severe grade = mountainous.

**ROW:** Portrays Right-of-Way (ROW) and geometric data in feet.

**Shoulder Range:** Is a range of treated surface (8' standard), both inside and outside shoulders.

**Ultimate Transportation Corridor (UTC):** Is the typical ROW needed for the ultimate facility, i.e., 8 lane freeway(8F) 218 feet is the standard typical UTC ROW - will be updated upon corridor plan lining by specific sections of highway.

**Facility:** Shows the Existing Facility, the desired facility type (2035 Concept) by 2035- RTPA's and Caltrans, and the Ultimate Facility to preserve ROW and plan line beyond 2035. 2C(I) indicates that the highway has been improved in select locations with operational or safety improvements.

**LOS:** The current (2011) LOS (level of service), along with the expected calculated LOS in 2020 and 2035. The 2035 Concept is the target LOS desired, i.e., LOS C, for attainment by 2035 Caltrans.

**Deficiency:** Occurs when the target LOS is degraded, i.e., LOS D worse than LOS C, with the year of occurrence shown. It also shows whether a capacity improving project is in the STIP, and what the LOS would be with the 2035 Concept improvement.

**Directional Split:** Denotes the split in the peak hour traffic flow on a directional basis (NB/SB or WB/EB) either in the morning (AM) or evening (PM).

**AUX++** Auxiliary lanes are Truck Climbing lanes.

**AAADT:** signifies Annual Average Daily Traffic.

**Peak Hour:** Indicates a representation of the maximum hour of traffic flow during the day.

(-) Deficient with Improvement

**N/A\*** - Deficient, no project recommended.

+ The Ultimate ROW is generally the same as the existing ROW

**99P** Median is variable width greater than 100 feet

\* Concept Facility meets Concept LOS.

SEGMENT	10	11	12	13	14	15	16
County / Interstate	KINGS / 5	KINGS / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5
Description Begin	KERN CO LINE	SR 41 SEPARATION	KINGS CO LINE	SR 198 SEPARATION	SR 33 SEPARATION	MANNING AVE	RUSSELL AVE
Description End	SR 41 SEPARATION	FRESNO CO LINE	SR 198 SEPARATION	SR 33 SEPARATION	MANNING AVE	RUSSELL AVE	MERCED COUNTY LINE
Postmile Limits Begin/End (PM)	R0.0 / 16.6	16.6 / 26.7	0.0 / 14.9	14.9 / 30.0	30.0 / 45.8	45.8 / 52.7	52.7 / 66.2
Length (MI)	16.6	10.1	14.9	15.1	15.8	6.9	13.5
Rural / Urban	Rural	Rural	Rural	Rural	Rural	Rural	Rural
Terrain	Flat	Flat	Flat	Flat	Flat	Flat	Flat
ROW: Range Existing (FT)	208 / 208	208 / 240	208 / 208	208 / 208	208 / 208	208 / 208	208 / 208
Median Range (FT)	84 / 84	74 / 84	82 / 84	84 / 99P	84 / 99P	84 / 84	84 / 84
Shoulder Range (FT) - Treated	5 / 10	5 / 10	10 / 10	2 / 10	5 / 10	5 / 10	5 / 10
Lane Width (FT)	12	12	12	12	12	12	12
Ultimate ROW (FT)	+	+	+	+	+	+	+
Facility: Existing	4F	4F	4F	4F	4F	4F	4F
2035 Concept	6F	6F	6F	6F	6F	6F	6F
UTC	8F	8F	8F	8F	8F	8F	8F
LOS: 2011	C	C	C	C	C	C	C
LOS: 2020	D	D	D	E	D	D	D
LOS: 2035	F	F	F	F	F	F	F
LOS: Concept 2035	C	C	C	C	C	C	C
Deficiency/Year Deficient Project in STIP/RTP (Y/N)	2020	2020	2020	2020	2020	2020	2020
LOS W/ Concept Improvement	No	No	No	No	No	No	No
Directional Split (Peak Hour)	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
AAADT: 2011	52/48	52/48	52/48	52/48	52/48	52/48	55/45
AAADT: 2020	32,500	33,500	33,500	34,000	33,500	33,000	34,500
AAADT: 2035	45,300	47,800	47,800	50,800	47,800	47,100	49,700
Peak Hour: 2011	68,500	74,400	74,400	83,800	74,400	73,300	96,600
Peak Hour: 2020	5,200	5,400	5,400	5,500	4,800	5,100	5,200
Peak Hour: 2035	7,240	7,700	7,700	9,080	6,840	7,270	7,500
% Trucks: AADT	10,960	11,990	11,990	15,070	10,660	11,330	14,560
% Trucks: Peak Hour	30%	30%	30%	30%	30%	30%	30%
	7%	7%	8%	8%	8%	8%	8%

## ATTACHMENT 2



In applying Equation 19-66 and Equation 19-67, the delay for all Rank 1 major-street movements is assumed to be 0 s/veh. LOS is not defined for an overall intersection because major-street movements with 0 s of delay typically result in a weighted average delay that is extremely low. As such, total intersection control delay calculations are typically used only when comparing control delay among different types of traffic control, such as two-way STOP control versus all-way STOP control.

### Step 13: Compute 95th Percentile Queue Lengths

Queue length is an important consideration at unsignalized intersections. Theoretical studies and empirical observations have demonstrated that the probability distribution of queue lengths for any minor movement at an unsignalized intersection is a function of the capacity of the movement and the volume of traffic being served during the analysis period. Equation 19-68 can be used to estimate the 95th percentile queue length for any minor movement at an unsignalized intersection during the peak 15-min period on the basis of these two parameters as follows (9):

Equation 19-68

$$Q_{95} \approx 900T \left[ \frac{v_x}{c_{m,x}} - 1 + \sqrt{\left( \frac{v_x}{c_{m,x}} - 1 \right)^2 + \frac{\left( \frac{3,600}{c_{m,x}} \right) \left( \frac{v_x}{c_{m,x}} \right)}{150T}} \right] \left( \frac{c_{m,x}}{3,600} \right)$$

where

$Q_{95}$  = 95th percentile queue (veh),

$v_x$  = flow rate for movement  $x$  (veh/h),

$c_{m,x}$  = capacity of movement  $x$  (veh/h), and

$T$  = analysis time period (0.25 h for a 15-min period) (h).

The mean queue length is computed as the product of the average delay per vehicle and the flow rate for the movement of interest. The expected total delay (vehicle hours per hour) equals the expected number of vehicles in the average queue; that is, the total hourly delay and the average queue are numerically identical. For example, four vehicle hours per hour of delay can be used interchangeably with an average queue length of four vehicles during the hour.

### PEDESTRIAN MODE

The TWSC intersection methodology for the pedestrian mode is applied through a series of steps requiring input data related to vehicle and pedestrian volumes, geometric conditions, and motorist yield rates to pedestrians. These data are used to calculate the average pedestrian delay associated with pedestrian crossings of unsignalized and non-STOP-controlled roadways. The required steps are illustrated in Exhibit 19-16.

ATTACHMENT 3



## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2016

Project Description Existing Conditions

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =        ft V <sub>u</sub> =        veh/h	Freeway Number of Lanes, N        2 Ramp Number of Lanes, N            1 Acceleration Lane Length, L <sub>A</sub> 600 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> 2439 Ramp Volume, V <sub>R</sub> 116 Freeway Free-Flow Speed, S <sub>FF</sub> 75.0 Ramp Free-Flow Speed, S <sub>FR</sub> 35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =        ft V <sub>D</sub> =        veh/h	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2439	0.95	Level	23	3	0.809	0.95	3340
Ramp	116	0.85	Level	15	3	0.865	0.95	166
UpStream								
DownStream								

Merge Areas

Diverge Areas

### Estimation of v<sub>12</sub>

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 3340 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> = pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>	3506	Exhibit 13-8	No
		Exhibit 13-8	
		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>	3506	Exhibit 13-8	4600:All No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 29.0 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
---	--

### Speed Determination

M <sub>S</sub> = 0.409 (Exhibit 13-11) S <sub>R</sub> = 61.5 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 61.5 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
---	---

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Existing Plus Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	600	<input type="checkbox"/> No <input checked="" type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2342	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	213	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2342	0.95	Level	23	3	0.809	0.95	3207
Ramp	213	0.85	Level	15	3	0.865	0.95	305
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)	P <sub>FD</sub> = using Equation (Exhibit 13-7)
V <sub>12</sub> = 3207 pc/h	V <sub>12</sub> = pc/h
V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V <sub>FO</sub>	3512	Exhibit 13-8	No	V <sub>F</sub>	Exhibit 13-8		
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	Exhibit 13-8		
				V <sub>R</sub>	Exhibit 13-10		

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V <sub>R12</sub>	3512	Exhibit 13-8	4600:All	No	V <sub>12</sub>	Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 29.0 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
--	---

### Speed Determination

M <sub>S</sub> = 0.410 (Exhibit 13-11) S <sub>R</sub> = 61.5 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 61.5 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
---	---

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Near-Term Plus Project Conditions

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =        ft V <sub>u</sub> =        veh/h	Freeway Number of Lanes, N        2 Ramp Number of Lanes, N            1 Acceleration Lane Length, L <sub>A</sub> 600 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> 2325 Ramp Volume, V <sub>R</sub> 238 Freeway Free-Flow Speed, S <sub>FF</sub> 75.0 Ramp Free-Flow Speed, S <sub>FR</sub> 35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =        ft V <sub>D</sub> =        veh/h	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2325	0.95	Level	23	3	0.809	0.95	3184
Ramp	238	0.85	Level	15	3	0.865	0.95	341
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 3184 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> =        pc/h V <sub>3</sub> or V <sub>av34</sub> =        pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual		Capacity		LOS F?
V <sub>FO</sub>	3525	Exhibit 13-8	4600:All	No	V <sub>F</sub>
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>
					V <sub>R</sub>

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>	3525	Exhibit 13-8	4600:All No

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D <sub>R</sub> = 29.1 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination Speed Determination

M <sub>S</sub> = 0.411 (Exhibit 13-11) S <sub>R</sub> = 61.4 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 61.4 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
---	---

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 No-Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	600	<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	5838	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	154	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	5838	0.95	Level	23	3	0.809	0.95	7995
Ramp	154	0.85	Level	15	3	0.865	0.95	220
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)	P <sub>FD</sub> = using Equation (Exhibit 13-7)
V <sub>12</sub> = 7995 pc/h	V <sub>12</sub> = pc/h
V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = 7995 pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V <sub>FO</sub>	8215	Exhibit 13-8	Yes	V <sub>F</sub>	Exhibit 13-8		
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	Exhibit 13-8		
				V <sub>R</sub>	Exhibit 13-10		

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V <sub>R12</sub>	8215	Exhibit 13-8	4600:All	Yes	V <sub>12</sub>	Exhibit 13-8	

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 65.7 (pc/mi/ln) LOS = F (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination Speed Determination

M <sub>S</sub> = 14.693 (Exhibit 13-11) S <sub>R</sub> = -409.9 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = -409.9 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 With-Project Conditions

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =        ft V <sub>u</sub> =        veh/h	Freeway Number of Lanes, N        2 Ramp Number of Lanes, N            1 Acceleration Lane Length, L <sub>A</sub> 600 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> 5741 Ramp Volume, V <sub>R</sub> 251 Freeway Free-Flow Speed, S <sub>FF</sub> 75.0 Ramp Free-Flow Speed, S <sub>FR</sub> 35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =        ft V <sub>D</sub> =        veh/h	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	5741	0.95	Level	23	3	0.809	0.95	7862
Ramp	251	0.85	Level	15	3	0.865	0.95	359
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 7862 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = 7862 pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> = pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V <sub>FO</sub>	8221	Exhibit 13-8	Yes	V <sub>F</sub>	Exhibit 13-8		
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	Exhibit 13-8		
				V <sub>R</sub>	Exhibit 13-10		

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V <sub>R12</sub>	8221	Exhibit 13-8	4600:All	Yes	V <sub>12</sub>	Exhibit 13-8	

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 65.7 (pc/mi/ln) LOS = F (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination Speed Determination

M <sub>S</sub> = 14.780 (Exhibit 13-11) S <sub>R</sub> = -412.7 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = -412.7 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2016

Project Description Existing Conditions

### Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, $L_A$	600	<input type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length $L_D$		$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, $V_F$	1949	$V_D =$ veh/h
	Ramp Volume, $V_R$	32	
	Freeway Free-Flow Speed, $S_{FF}$	75.0	
	Ramp Free-Flow Speed, $S_{FR}$	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	1949	0.95	Level	23	3	0.809	0.95	2669
Ramp	32	0.85	Level	15	3	0.865	0.95	46
UpStream								
DownStream								

Merge Areas

Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ $P_{FM} =$ 1.000 using Equation (Exhibit 13-6) $V_{12} =$ 2669 pc/h $V_3$ or $V_{av34}$ 0 pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h $V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ $P_{FM} =$ 1.000 using Equation (Exhibit 13-6) $V_{12} =$ 2669 pc/h $V_3$ or $V_{av34}$ 0 pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ $P_{FD} =$ using Equation (Exhibit 13-7) $V_{12} =$ pc/h $V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)
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### Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$	2715	Exhibit 13-8	No

### Capacity Checks

	Actual	Capacity	LOS F?
$V_F$		Exhibit 13-8	
$V_{FO} = V_F - V_R$		Exhibit 13-8	
$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	2715	Exhibit 13-8	4600:All No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 22.9 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ 22.9 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination

$M_S =$ 0.338 (Exhibit 13-11) $S_R =$ 63.8 mph (Exhibit 13-11) $S_0 =$ N/A mph (Exhibit 13-11) $S =$ 63.8 mph (Exhibit 13-13)	$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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### Speed Determination

$M_S =$ 0.338 (Exhibit 13-11) $S_R =$ 63.8 mph (Exhibit 13-11) $S_0 =$ N/A mph (Exhibit 13-11) $S =$ 63.8 mph (Exhibit 13-13)	$D_S =$ (Exhibit 13-12) $S_R =$ mph (Exhibit 13-12) $S_0 =$ mph (Exhibit 13-12) $S =$ mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	JR	Freeway/Dir of Travel	I-5 SB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Existing Plus Project Conditions

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =        ft V <sub>u</sub> =        veh/h	Freeway Number of Lanes, N        2 Ramp Number of Lanes, N            1 Acceleration Lane Length, L <sub>A</sub> 600 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> 1852 Ramp Volume, V <sub>R</sub> 129 Freeway Free-Flow Speed, S <sub>FF</sub> 75.0 Ramp Free-Flow Speed, S <sub>FR</sub> 35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =        ft V <sub>D</sub> =        veh/h
---	---	---

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1852	0.95	Level	23	3	0.809	0.95	2536
Ramp	129	0.85	Level	15	3	0.865	0.95	185
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 2536 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> =        pc/h V <sub>3</sub> or V <sub>av34</sub> =        pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)
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### Capacity Checks

	Actual	Capacity	LOS F?		
V <sub>FO</sub>	2721	Exhibit 13-8	No		
				V <sub>F</sub>	Exhibit 13-8
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	Exhibit 13-8
		Exhibit 13-10			

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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	Actual	Max Desirable	Violation?
V <sub>R12</sub>	2721	Exhibit 13-8	4600:All No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 22.9 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = 0.338 (Exhibit 13-11) S <sub>R</sub> = 63.8 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 63.8 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Near-Term Plus Project Conditions

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =        ft V <sub>u</sub> =        veh/h	Freeway Number of Lanes, N        2 Ramp Number of Lanes, N            1 Acceleration Lane Length, L <sub>A</sub> 600 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> 1824 Ramp Volume, V <sub>R</sub> 157 Freeway Free-Flow Speed, S <sub>FF</sub> 75.0 Ramp Free-Flow Speed, S <sub>FR</sub> 35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =        ft V <sub>D</sub> =        veh/h	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1824	0.95	Level	23	3	0.809	0.95	2498
Ramp	157	0.85	Level	15	3	0.865	0.95	225
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 2498 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> =        pc/h V <sub>3</sub> or V <sub>av34</sub> =        pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>	2723	Exhibit 13-8	No
		Exhibit 13-8	
		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>	2723	Exhibit 13-8    4600:All	No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 22.8 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = 0.338 (Exhibit 13-11) S <sub>R</sub> = 63.8 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 63.8 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 No-Project Conditions

### Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	600	<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	4881	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	60	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	4881	0.95	Level	23	3	0.809	0.95	6685
Ramp	60	0.85	Level	15	3	0.865	0.95	86
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)

L<sub>EQ</sub> =  
 P<sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)

V<sub>12</sub> = 6685 pc/h

V<sub>3</sub> or V<sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17)

Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No

Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No

If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)

L<sub>EQ</sub> =  
 P<sub>FD</sub> = using Equation (Exhibit 13-7)

V<sub>12</sub> = pc/h

V<sub>3</sub> or V<sub>av34</sub> = pc/h (Equation 13-14 or 13-17)

Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No

Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No

If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>	6771	Exhibit 13-8	Yes

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>		Exhibit 13-8	
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8	
V <sub>R</sub>		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>	6771	Exhibit 13-8	4600:All Yes

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D<sub>R</sub> = 54.5 (pc/mi/ln)

LOS = F (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D<sub>R</sub> = (pc/mi/ln)

LOS = (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = 3.681 (Exhibit 13-11)

S<sub>R</sub> = -46.5 mph (Exhibit 13-11)

S<sub>0</sub> = N/A mph (Exhibit 13-11)

S = -46.5 mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = (Exhibit 13-12)

S<sub>R</sub> = mph (Exhibit 13-12)

S<sub>0</sub> = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 With-Project Conditions

### Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	600	<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	4784	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	157	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	4784	0.95	Level	23	3	0.809	0.95	6552
Ramp	157	0.85	Level	15	3	0.865	0.95	225
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of v<sub>12</sub>

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)

L<sub>EQ</sub> =  
 P<sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)

V<sub>12</sub> = 6552 pc/h

V<sub>3</sub> or V<sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17)

Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No

Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No

If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of v<sub>12</sub>

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)

L<sub>EQ</sub> =  
 P<sub>FD</sub> = using Equation (Exhibit 13-7)

V<sub>12</sub> = pc/h

V<sub>3</sub> or V<sub>av34</sub> = pc/h (Equation 13-14 or 13-17)

Is V<sub>3</sub> or V<sub>av34</sub> > 2,700 pc/h?  Yes  No

Is V<sub>3</sub> or V<sub>av34</sub> > 1.5 \* V<sub>12</sub>/2  Yes  No

If Yes, V<sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>	6777	Exhibit 13-8	Yes

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>F</sub>		Exhibit 13-8	
V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8	
V <sub>R</sub>		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>	6777	Exhibit 13-8	4600:All Yes

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

D<sub>R</sub> = 54.5 (pc/mi/ln)

LOS = F (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

D<sub>R</sub> = (pc/mi/ln)

LOS = (Exhibit 13-2)

### Speed Determination

M<sub>S</sub> = 3.701 (Exhibit 13-11)

S<sub>R</sub> = -47.1 mph (Exhibit 13-11)

S<sub>0</sub> = N/A mph (Exhibit 13-11)

S = -47.1 mph (Exhibit 13-13)

### Speed Determination

D<sub>S</sub> = (Exhibit 13-12)

S<sub>R</sub> = mph (Exhibit 13-12)

S<sub>0</sub> = mph (Exhibit 13-12)

S = mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2016

Project Description Existing Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2514	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	75	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2514	0.95	Level	23	3	0.809	0.95	3443
Ramp	75	0.85	Level	15	3	0.865	0.95	107
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 3443 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>	V <sub>F</sub>	3443	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	3336	Exhibit 13-8 4800 No
	V <sub>R</sub>	107	Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3443	Exhibit 13-8 4400:All	No

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 32.5 (pc/mi/ln)
LOS = (Exhibit 13-2)	LOS = D (Exhibit 13-2)

### Speed Determination Speed Determination

M <sub>S</sub> = (Exhibit 13-11)	D <sub>S</sub> = 0.438 (Exhibit 13-12)
S <sub>R</sub> = mph (Exhibit 13-11)	S <sub>R</sub> = 60.6 mph (Exhibit 13-12)
S <sub>0</sub> = mph (Exhibit 13-11)	S <sub>0</sub> = N/A mph (Exhibit 13-12)
S = mph (Exhibit 13-13)	S = 60.6 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Existing Plus Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2514	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	175	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2514	0.95	Level	23	3	0.809	0.95	3443
Ramp	175	0.85	Level	15	3	0.865	0.95	251
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 3443 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	3443	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	3192	Exhibit 13-8 4800 No
		V <sub>R</sub>	251 Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	
	V <sub>12</sub>	3443	Exhibit 13-8 4400:All No

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 32.5 (pc/mi/ln)
LOS = (Exhibit 13-2)	LOS = D (Exhibit 13-2)

### Speed Determination Speed Determination

M <sub>S</sub> = (Exhibit 13-11)	D <sub>S</sub> = 0.451 (Exhibit 13-12)
S <sub>R</sub> = mph (Exhibit 13-11)	S <sub>R</sub> = 60.1 mph (Exhibit 13-12)
S <sub>0</sub> = mph (Exhibit 13-11)	S <sub>0</sub> = N/A mph (Exhibit 13-12)
S = mph (Exhibit 13-13)	S = 60.1 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Near-Term Plus Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2514	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	199	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2514	0.95	Level	23	3	0.809	0.95	3443
Ramp	199	0.85	Level	15	3	0.865	0.95	285
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 3443 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	3443	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	3158	Exhibit 13-8 4800 No
		V <sub>R</sub>	285 Exhibit 13-10 2000 No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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Actual	Max Desirable	Violation?	Actual	Max Desirable	Violation?
V <sub>R12</sub>	Exhibit 13-8		V <sub>12</sub>	3443	Exhibit 13-8 4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 32.5 (pc/mi/ln) LOS = D (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = (Exhibit 13-11) S <sub>R</sub> = mph (Exhibit 13-11) S <sub>0</sub> = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D <sub>S</sub> = 0.454 (Exhibit 13-12) S <sub>R</sub> = 60.0 mph (Exhibit 13-12) S <sub>0</sub> = N/A mph (Exhibit 13-12) S = 60.0 mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 No-Project Conditions

### Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, $L_A$		<input type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length $L_D$	150	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, $V_F$	5940	$V_D =$ veh/h
	Ramp Volume, $V_R$	102	
	Freeway Free-Flow Speed, $S_{FF}$	75.0	
	Ramp Free-Flow Speed, $S_{FR}$	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5940	0.95	Level	23	3	0.809	0.95	8135
Ramp	102	0.85	Level	15	3	0.865	0.95	146
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
(Equation 13-6 or 13-7)

$L_{EQ} =$  using Equation (Exhibit 13-6)

$P_{FM} =$  using Equation (Exhibit 13-6)

$V_{12} =$  pc/h

$V_3$  or  $V_{av34}$  pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
(Equation 13-12 or 13-13)

$L_{EQ} =$  (Equation 13-12 or 13-13)

$P_{FD} =$  1.000 using Equation (Exhibit 13-7)

$V_{12} =$  8135 pc/h

$V_3$  or  $V_{av34}$  0 pc/h (Equation 13-14 or 13-17)

Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No

Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No

If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$		Exhibit 13-8	

### Capacity Checks

	Actual	Capacity	LOS F?
$V_F$	8135	Exhibit 13-8	4800
$V_{FO} = V_F - V_R$	7989	Exhibit 13-8	4800
$V_R$	146	Exhibit 13-10	2000

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$		Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$	8135	Exhibit 13-8	4400:All

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$

$D_R =$  (pc/mi/ln)

LOS = (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$

$D_R =$  72.9 (pc/mi/ln)

LOS = F (Exhibit 13-2)

### Speed Determination

$M_S =$  (Exhibit 13-11)

$S_R =$  mph (Exhibit 13-11)

$S_0 =$  mph (Exhibit 13-11)

$S =$  mph (Exhibit 13-13)

### Speed Determination

$D_S =$  0.441 (Exhibit 13-12)

$S_R =$  60.4 mph (Exhibit 13-12)

$S_0 =$  N/A mph (Exhibit 13-12)

$S =$  60.4 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 With-Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	5940	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	202	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	5940	0.95	Level	23	3	0.809	0.95	8135
Ramp	202	0.85	Level	15	3	0.865	0.95	289
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 8135 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	8135	Exhibit 13-8 4800 Yes
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	7846	Exhibit 13-8 4800 Yes
	V <sub>R</sub>	289	Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	
V <sub>12</sub>	8135	Exhibit 13-8 4400:All	Yes

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 72.9 (pc/mi/ln) LOS = F (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = (Exhibit 13-11) S <sub>R</sub> = mph (Exhibit 13-11) S <sub>0</sub> = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D <sub>S</sub> = 0.454 (Exhibit 13-12) S <sub>R</sub> = 60.0 mph (Exhibit 13-12) S <sub>0</sub> = N/A mph (Exhibit 13-12) S = 60.0 mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2016

Project Description Existing Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2032	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	83	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2032	0.95	Level	23	3	0.809	0.95	2783
Ramp	83	0.85	Level	15	3	0.865	0.95	119
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 2783 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	2783	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2664	Exhibit 13-8 4800 No
		V <sub>R</sub>	119 Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area

Actual	Max Desirable	Violation?
V <sub>R12</sub>	Exhibit 13-8	

### Flow Entering Diverge Influence Area

Actual	Max Desirable	Violation?
V <sub>12</sub>	2783 Exhibit 13-8 4400:All	No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 26.8 (pc/mi/ln) LOS = C (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = (Exhibit 13-11) S <sub>R</sub> = mph (Exhibit 13-11) S <sub>0</sub> = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D <sub>S</sub> = 0.439 (Exhibit 13-12) S <sub>R</sub> = 60.5 mph (Exhibit 13-12) S <sub>0</sub> = N/A mph (Exhibit 13-12) S = 60.5 mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Existing Plus Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2032	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	183	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2032	0.95	Level	23	3	0.809	0.95	2783
Ramp	183	0.85	Level	15	3	0.865	0.95	262
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 2783 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	2783	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2521	Exhibit 13-8 4800 No
		V <sub>R</sub>	262 Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	
	V <sub>12</sub>	2783	Exhibit 13-8 4400:All No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 26.8 (pc/mi/ln) LOS = C (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = (Exhibit 13-11) S <sub>R</sub> = mph (Exhibit 13-11) S <sub>0</sub> = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D <sub>S</sub> = 0.452 (Exhibit 13-12) S <sub>R</sub> = 60.1 mph (Exhibit 13-12) S <sub>0</sub> = N/A mph (Exhibit 13-12) S = 60.1 mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Near-Term Plus Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2032	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	209	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2032	0.95	Level	23	3	0.809	0.95	2783
Ramp	209	0.85	Level	15	3	0.865	0.95	299
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 2783 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	2783	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2484	Exhibit 13-8 4800 No
		V <sub>R</sub>	299 Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area

Actual	Max Desirable	Violation?
V <sub>R12</sub>	Exhibit 13-8	

### Flow Entering Diverge Influence Area

Actual	Max Desirable	Violation?
V <sub>12</sub>	Exhibit 13-8 4400:All	No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 26.8 (pc/mi/ln) LOS = C (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = (Exhibit 13-11) S <sub>R</sub> = mph (Exhibit 13-11) S <sub>0</sub> = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D <sub>S</sub> = 0.455 (Exhibit 13-12) S <sub>R</sub> = 60.0 mph (Exhibit 13-12) S <sub>0</sub> = N/A mph (Exhibit 13-12) S = 60.0 mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 No-Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, $L_A$		<input type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length $L_D$	150	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, $V_F$	5000	$V_D =$ veh/h
	Ramp Volume, $V_R$	119	
	Freeway Free-Flow Speed, $S_{FF}$	75.0	
	Ramp Free-Flow Speed, $S_{FR}$	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5000	0.95	Level	23	3	0.809	0.95	6848
Ramp	119	0.85	Level	15	3	0.865	0.95	170
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of $v_{12}$	Estimation of $v_{12}$
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ using Equation (Exhibit 13-6) $P_{FM} =$ $V_{12} =$ pc/h $V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ $P_{FD} =$ 1.000 using Equation (Exhibit 13-7) $V_{12} =$ 6848 pc/h $V_3$ or $V_{av34}$ 0 pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$		Exhibit 13-8	
	$V_F$	6848	Exhibit 13-8 4800 Yes
	$V_{FO} = V_F - V_R$	6678	Exhibit 13-8 4800 Yes
		$V_R$	170 Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$		Exhibit 13-8	
	$V_{12}$	6848	Exhibit 13-8 4400:All Yes

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 61.8 (pc/mi/ln) LOS = F (Exhibit 13-2)
---	--

### Speed Determination Speed Determination

$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_S =$ 0.443 (Exhibit 13-12) $S_R =$ 60.4 mph (Exhibit 13-12) $S_0 =$ N/A mph (Exhibit 13-12) $S =$ 60.4 mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 With-Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, $L_A$		<input type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length $L_D$	150	$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, $V_F$	5000	$V_D =$ veh/h
	Ramp Volume, $V_R$	219	
	Freeway Free-Flow Speed, $S_{FF}$	75.0	
	Ramp Free-Flow Speed, $S_{FR}$	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5000	0.95	Level	23	3	0.809	0.95	6848
Ramp	219	0.85	Level	15	3	0.865	0.95	314
UpStream								
DownStream								

Merge Areas	Diverge Areas
-------------	---------------

Estimation of $v_{12}$	Estimation of $v_{12}$
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) $L_{EQ} =$ using Equation (Exhibit 13-6) $P_{FM} =$ $V_{12} =$ pc/h $V_3$ or $V_{av34}$ pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) $L_{EQ} =$ using Equation (Exhibit 13-7) $P_{FD} =$ 1.000 $V_{12} =$ 6848 pc/h $V_3$ or $V_{av34}$ 0 pc/h (Equation 13-14 or 13-17) Is $V_3$ or $V_{av34} > 2,700$ pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No Is $V_3$ or $V_{av34} > 1.5 * V_{12}/2$ <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, $V_{12a} =$ pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$		Exhibit 13-8	
	$V_F$	6848	Exhibit 13-8 4800 Yes
	$V_{FO} = V_F - V_R$	6534	Exhibit 13-8 4800 Yes
		$V_R$	314 Exhibit 13-10 2000 No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
------------------------------------	--------------------------------------

Actual	Max Desirable	Violation?	Actual	Max Desirable	Violation?
$V_{R12}$	Exhibit 13-8		$V_{12}$	6848	Exhibit 13-8 4400:All Yes

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ $D_R =$ (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ $D_R =$ 61.8 (pc/mi/ln) LOS = F (Exhibit 13-2)
---	--

### Speed Determination

$M_S =$ (Exhibit 13-11) $S_R =$ mph (Exhibit 13-11) $S_0 =$ mph (Exhibit 13-11) $S =$ mph (Exhibit 13-13)	$D_S =$ 0.456 (Exhibit 13-12) $S_R =$ 59.9 mph (Exhibit 13-12) $S_0 =$ N/A mph (Exhibit 13-12) $S =$ 59.9 mph (Exhibit 13-13)
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**August 25, 2017 Letter**  
**Beveridge and Diamond**  
**Two Pages**



David H. McCray  
456 Montgomery Street, Suite 1800  
San Francisco, CA 94104-1251  
Direct: (415) 262-4025  
Dmccray@bdlaw.com

August 25, 2017

**VIA EMAIL**

Art Wille  
Fresno County Counsel  
[awille@co.fresno.ca.us](mailto:awille@co.fresno.ca.us)

Derek Chambers  
Fresno County Public Works and Planning  
[dchambers@co.fresno.ca.us](mailto:dchambers@co.fresno.ca.us)

Re: Documents Not Provided to Beveridge & Diamond PC Regarding Initial Study  
7104/Conditional Use Permit Application 3528

Dear Art and Derek,

I attended the August 24, 2017 Fresno County Planning Commission Meeting on behalf of Grand Petroleum, Inc. During the discussion of Initial Study 7104 and Conditional Use Permit 3528 (“CUP 3528”), there was reference to new information and revised documents relating to water and traffic issues that Fresno County received but that Beveridge & Diamond (“B&D”) had not been provided. I write to object to Fresno County’s and the Planning Commission’s use and reliance on information that was neither shared publicly nor made available for public comment through the circulated Initial Study and Mitigated Negative Declaration.

B&D had continuously sought information from the Fresno County Planning Department about CUP 3528. B&D submitted five California Public Records Act (“CPRA”) requests seeking documents the County has sent or received relating to CUP 3528. Specifically, B&D sent CPRA requests on December 20, 2016, February 2, 2017, May 12, 2017, June 12, 2017, and July 25, 2017. B&D received documents in response to all five CPRA requests. B&D also requested, and received confirmation that it was placed on the notice list for CUP 3528.

Certainly through B&D’s multiple CPRA requests and its request to be placed on the notice list, Fresno County was aware that B&D had an interest in this matter and B&D should have been provided with new information regarding the proposed project as it became available.

Art Wille  
Fresno County Counsel  
August 25, 2017  
Page 2

Furthermore, the County had a legal obligation to provide to the public at the time of its initiation of the 30-day public comment period all documents that it would present to the Planning Commission in support of the staff recommendation that the proposed project be approved. While B&D received the Initial Study Routing Package, the Notice of Intent to Adopt a Mitigated Negative Declaration, and the Notice of Public Hearing relating to the Initial Study and CUP 3528, those documents were apparently incomplete. It was the circulation to the public and the submission to the State Clearinghouse of this – now understood to be incomplete – set of documents that triggered a 30-day public comment period.

B&D prepared detailed comments raising issues that the environmental review undertaken by Fresno County violated the California Environmental Quality Act (“CEQA”). These comments were based upon the documents B&D received through its numerous CPRA requests and the Initial Study materials and the documents triggering the 30-day comment period. If the County Planning Department or the Planning Commission relied on documents and information that were not publicly circulated and made available for comment, B&D objects to the reliance on such information. A core tenant of CEQA is to make the public aware of proposed projects and the associated environmental impacts as well as ensuring informed decision making by requiring a lead agency to solicit comments from local, state, and federal government agencies. Any circumvention of that process, even if it was not deliberate, violates the Administrative Procedures Act and CEQA. We believe that the Planning Commission is obligated to re-notice and reconsider the Project application and related documents.

B&D will be filing an appeal of the Planning Commission decision to grant the CUP application to the Board of Supervisors. B&D will raise this issue as a component of the forthcoming appeal. Please let me know if you would like to discuss this issue further.

Best regards,



David H. McCray

**September 5, 2017 Response to  
August 25, 2017 Beveridge and  
Diamond Letter**

**County of Fresno Department of  
Public Works and Planning**

**79 Pages with Attachments**



# County of Fresno

DEPARTMENT OF PUBLIC WORKS AND PLANNING  
STEVEN E. WHITE, DIRECTOR

September 5, 2017

## VIA EMAIL

David H. McCray  
Beveridge & Diamond PC  
456 Montgomery Street, Suite 1800  
San Francisco, CA 94104-1251

**Subject: Letter from Beveridge & Diamond PC concerning Initial Study Application No. 7104 and Conditional Use Permit Application No. 3528 (the "Application")**

Dear Mr. McCray:

This letter responds to your letter regarding the Application, dated August 25, 2017<sup>1</sup>. In addition, I am informed that you have requested a copy of the audio recording of the August 24 Planning Commission meeting at which the Application was considered. Enclosed you will find a DVD with copy of the audio recording saved to it.

Your letter concludes that the Planning Commission's approval of the Application on August 24, violated the California Environmental Quality Act ("CEQA") and the Administrative Procedures Act, and must be reconsidered by the Planning Commission. In reaching this conclusion, your letter makes several factual and legal assertions, which are in error, as explained below. If your client wishes to challenge the Planning Commission's approval of the application your client may file an appeal with the Clerk to the Board of Supervisors.<sup>2</sup>

## Assertions Regarding Production and Public Review of Documents

In your August 24 letter, you make the following assertions in support of your claims of error:

1. "there was reference to new information and revised documents relating to water and traffic issues that Fresno County received but that Beveridge & Diamond ("B&D") had not been provided." (Letter dated August 25 by David McCray ["Letter"], p. 1, ¶ 1.)
2. You object to the Planning Commission's use and reliance on information that was neither shared publicly nor made available for public comment through the circulated Initial Study and Mitigated Negative Declaration. (Letter, p. 1, ¶ 1.)

<sup>1</sup> All date references are to 2017 unless otherwise noted.

<sup>2</sup> I am informed that the Clerk to the Board received your client's appeal documents earlier today.

3. B&D should have been provided with the information which you claim was not provided to B&D either through one of your firm's five Public Records Act requests, or as a result of "its request to be placed on a notice list" as such information became available.
4. The "County had a legal obligation to provide to the public at the time of its initiation of the 30-day public comment period all documents that it would present to the Planning Commission in support of the staff recommendation that the proposed project be approved. . . It was the circulation to the public and the submission to the State Clearinghouse of this – now understood to be incomplete – set of documents that triggered a 30-day public comment period."
5. "If the County Planning Department or the Planning Commission relied on documents and information that were not publicly circulated and made available for comment, B&D objects to the reliance on such information. A core tenant of CEQA is to make the public aware of proposed projects and the associated environmental impacts as well as ensuring informed decision making by requiring a lead agency to solicit comments from local, state, and federal government agencies. Any circumvention of that process, even if it was not deliberate, violates the Administrative Procedures Act and CEQA. We believe that the Planning Commission is obligated to re-notice and reconsider the Project application and related documents."

**Assertions 1, 2, and 5** – Information/documents about traffic and water not received by B&D

Staff with the Fresno County Department of Public Works and Planning ("Department") provided B&D with copies of all the documents submitted by the Applicant in support of the Application to the Department. This was accomplished by Staff through its responses to Public Records Act (PRA) Requests made by B&D on the following dates: December 20, 2016, February 2, May 12, June 12, and July 25. In addition, Staff sent an email to you, Kaitlyn D. Shannon of B&D and Kenneth B. Finney of B&D on August 18 which provided a hyperlink by which an electronic copy of the finalized Staff Report with Exhibits could be accessed.

With regard to water, the Applicant provided the Department with a revised water usage estimate (the "Revised Water Estimate") of 26,179 gallons-per-day (GPD) on June 7, which was utilized by Staff in its preparation of the California Environmental Quality Act (CEQA) analysis. Staff provided a copy of this Revised Water Estimate to B&D on June 27, in satisfaction of B&D's June 12 PRA request.

Further, the CEQA analysis prepared by Staff identifies 26,179 GPD as the estimated water usage for the project. Additionally, the Applicant provided a revised Operational Statement on June 28, identifying the Revised Water Estimate of 26,179 GPD, which was utilized by Staff for preparation of the Staff Report. A copy of the Revised Water Estimate was included as Exhibit 8 in the finalized Staff Report made available to B&D on August 18 via emailed hyperlink.

Staff acknowledges that the estimated water usage was mistakenly identified as 21,000 GPD by an advocate for approval of the Application at the August 24 Planning Commission hearing. However, as discussed above, 26,179 GPD was the estimated water usage utilized by

Staff from the Fresno County Department of Public Works and Planning for preparation of the IS CEQA analysis and Staff Report.

With regard to traffic, the Applicant provided a Traffic Impact Study (TIS) on November 17, 2016, prepared by Peters Engineering Group, which was utilized by Staff in its preparation of the IS CEQA analysis and the Staff Report. Staff produced a copy of the TIS to B&D on December 22, 2016, in satisfaction of B&D's December 20, 2016, PRA Request.

On August 18 after the Staff Report had been finalized and mailed to the Planning Commissioners, you sent a letter to the attention of the undersigned, asserting that the TIS was flawed. A copy of this letter was provided to the Applicant, and in response, Peters Engineering Group provided a letter to Staff and David Padilla with the California Department of Transportation (Caltrans) on August 23, defending the TIS methodology. Copies of the August 23, response letter from Peters Engineering Group, were provided to the public at the August 24 Planning Commission hearing, and to the Planning Commissioners prior to the commencement of that hearing.

Staff is not aware of any other documents referred to during the aforementioned Planning Commission hearing. Therefore, staff is confident you received all documents that you requested in a timely manner. As a result, there was no attendant procedural or substantive flaw in the August 24 Planning Commission hearing.

**Assertion 3 – County responses to PRA requests and request for notice**

As explained in detail above, Staff believes you and/or B&D were provided with copies of all documents submitted by the Applicant in support of the Application to the Department. Staff understands your reference to being placed on a “notice list” to be your request made pursuant to Public Resources Code (“PRC”) section 21092.2 to receive copies of notices required by PRC sections 21080.4, 21083.9, 21092, 21108, 21152, and 21161. Staff's records indicate you were provided with applicable notices and your letter acknowledges that you received them.

Again, you received all records you requested from the Department in a timely manner.

**Assertion 4 – “legal obligation to provide to the public at the time of its initiation of the 30-day public comment period all documents that it would present to the Planning Commission in support of the staff recommendation that the proposed project be approved”.**

You cite no legal authority for the statement above. It appears you are claiming that when the Department initiated the public review period for the proposed Mitigated Negative Declaration, it was required to publish all documents to the public that it would rely upon for its recommendation that the Planning Commission adopt the MND. If this is your contention, Staff is not aware of any provision of CEQA or other applicable law which supports it.

Staff satisfied the requirements of CEQA in preparing and circulating the Notice of Intent to Adopt a Mitigated Negative Declaration in compliance with the requirements of CEQA. Moreover, any interested person or organization was able to request and receive documents from the Application file through PRA requests, as your firm did on five separate occasions.

\*\*\*

In conclusion, Staff is unaware of any procedural or substantive errors which would affect the validity of the Planning Commission's approval of the Application. Nevertheless, when your client's appeal is heard, the Board of Supervisors will conduct a de novo review of the Application and available evidence and reach its own decision.

Sincerely,



Derek Chambers, Planner  
Development Services Division

Enclosures

C: William M. Kettler, Development Services Division Manager  
Arthur Wille, Sr. Deputy County Counsel

DC:  
G:\4360Devs&Pln\PROJSEC\PROJDOCS\CUP\3500-3599\3528\CUP3528 Response to BD 8-25-2017 Ltr.doc



David H. McCray  
456 Montgomery Street, Suite 1800  
San Francisco, CA 94104-1251  
Direct: (415) 262-4025  
Dmccray@bdlaw.com

August 25, 2017

**VIA EMAIL**

Art Wille  
Fresno County Counsel  
[awille@co.fresno.ca.us](mailto:awille@co.fresno.ca.us)

Derek Chambers  
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Art Wille  
Fresno County Counsel  
August 25, 2017  
Page 2

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Best regards,



David H. McCray



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**MEMORANDUM**

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**To:** Mr. Shawn Shiralian

**From:** John Rowland, PE, TE

**Subject:** Response to Comments on Traffic Impact Study  
Proposed E-Z Trip Travel Center

**Date:** August 23, 2017

---

**Introduction**

This memorandum presents responses to the Beveridge & Diamond comment letter dated August 18, 2017 (attached). Peters Engineering Group prepared a traffic impact study for the project and presented the results in a report dated November 16, 2016 (TIS). The comment letter identifies six concerns that are generally identified in the list below and addressed in the following sections.

1. Peak Hour
2. Trip Generation and Pass-By Adjustments
3. Queue Lengths
4. Merge / Diverge Analysis
5. Growth Rates
6. Mitigation Measures Based on Traffic Index Analysis

**Responses**

1. Peak Hour

The peak hours counted and analyzed are appropriate. Typical traffic studies are performed for the weekday a.m. and p.m. peak hours. However, for this study it was acknowledged that the actual peak hours likely occur either on a Friday or Sunday. Therefore, careful consideration was given to choosing the appropriate weekend peak periods.

The intersection turning movement counts were performed between 3:30 p.m. and 6:00 p.m. on Sunday, September 25, 2016. The count time period was selected after review of the 24-hour traffic counts performed Friday, September 15, 2016 through Sunday, September 18, 2016, and after a review of Interstate 5 (I-5) mainline traffic volumes north of Nees Avenue provided by Caltrans staff for portions of April and May 2016. The Caltrans data revealed that the combined (northbound plus southbound) mainline peak hour on I-5 near Nees Avenue typically occurs between 4:00 and 6:00 p.m. on Sundays, with the 5:00 to 6:00 hour

typically being greater than the 3:00 to 4:00 hour. In coordination with Caltrans it was determined that the manual intersection turning movement counts should begin at 3:30 p.m. on a Sunday to maximize the chances of capturing the peak hour. The intersection turning movement counts at both ramp intersections clearly revealed a peak hour that began at 4:00 p.m. for the interchange as a whole and for each of the individual intersections within the interchange.

If the traffic counts had revealed a peak hour beginning at 3:30 p.m., there would have been cause for concern. However, since the peak hour was captured within time period counted there is no cause for concern and Caltrans, the owner of the facility, did not dispute the peak hours analyzed.

It is also worth noting that the magnitude of the difference between the 3:00 and 4:00 peak hours is insignificant, and is well within the fluctuation that would be expected from one day to the next. The commenter points out that the combined eastbound and westbound volume west of the interchange is 213 vehicles during the 3:00 to 4:00 peak hour, and the volume at the same location during the 4:00 to 5:00 p.m. peak hour is 204 vehicles. The difference is only nine vehicles during an entire hour. Considering that the volumes are for both directions combined, the difference is an average of about four to five vehicles in each direction over the course of an hour. This volume is within anticipated fluctuations and would likely be imperceptible to motorists who regularly travel the roadway. Furthermore, the peak hour of the facility as a whole (the interchange) does not necessarily coincide with the peak hour of every individual leg or approach.

The peak hour analyzed was appropriate and represents a worst-case scenario for traffic analyses within expected fluctuations in traffic volumes. Traffic volumes on the order of 200 trips per hour were identified west of the interchange, which is actually a very low volume of traffic adjacent to a freeway interchange. Therefore, the TIS does not need to be revised based on the peak hour analyzed.

## 2. Trip Generation

Very little data is available for travel centers such as the proposed project, and particularly those located in remote locations such as the I-5/Nees Avenue interchange. Trip generation estimates have utilized the best available information, including trip generation characteristics of an existing gas station near the project site, which likely provides the best estimation of trip generation characteristics at a similar site for a similar use.

We have reviewed available trip generation data for three Love's Travel Stop facilities referenced in the traffic analysis performed for the Madera Love's Travel Stop and found that the trip generation information used in the TIS (480 trips before the pass-by reduction was applied) is very similar to the value that would have been calculated using the Love's p.m. peak hour trip generation rate of 39.00 trips per 1,000 square feet, which would have been 490 trips before pass by reduction. This is a difference of only 10 peak hour trips. This is well within the range that could be expected when estimating trip generation using typical ITE averages. Therefore, it is our opinion that the trip generation rates and methods used in the traffic study report are appropriate and do not require revision.

With respect to the use of a 15-percent pass-by reduction, such a pass-by reduction is not uncommon, and the Caltrans *Guide for the Preparation of Traffic Impact Studies* states that the use of pass-by percentages greater than 15 percent “requires consultation and acceptance by Caltrans. The justification for exceeding a 15% reduction should be discussed in the TIS.” The use of a 15-percent pass-by reduction requires no justification per the Caltrans *Guide for the Preparation of Traffic Impact Studies*. Therefore, it is our opinion that the trip generation rates and methods used in the traffic study report are appropriate and do not require revision.

### 3. Queue Lengths

The 95<sup>th</sup>-percentile queue length is a calculated value that can be interpreted as a maximum probable queue length based on a statistical equation presented in the Highway Capacity Manual 2010 (see Attachment 2). Most traffic engineering software programs commonly used nationwide report the 95<sup>th</sup>-percentile queue length to the nearest foot. Other traffic engineers do so as well. As an example, the traffic impact study prepared for the El Paseo Project EIR in northwest Fresno, which was prepared by the reputable traffic engineering firm DKS & Associates, reports 95<sup>th</sup>-percentile queue lengths to the nearest foot.

The 95<sup>th</sup>-percentile queue length is useful for designing turn lanes and as a tool for estimating probable maximum queues. The TIS does not purport that the calculated 95<sup>th</sup>-percentile queue length reported to the nearest foot represents the actual queue length that would be measured at an intersection, or that some vehicles are “5, 10, or even 13 feet long” as the commenter suggests. The TIS reports the values as “calculated” because they are obtained directly from the software analysis output attached to the report.

The calculated 95<sup>th</sup>-percentile queue is also useful for estimating how a project will impact an intersection. For example, if the calculated 95<sup>th</sup>-percentile queue length in a no-project scenario is 13 feet, and the calculated 95<sup>th</sup>-percentile queue length with a project is 48 feet, the hypothetical project has increased the calculated maximum probable queue length by  $48 - 13 = 35$  feet, which best corresponds to two vehicles. If the value for the no-project queue is reported as 25 feet by rounding up from 13 (as the commenter suggests) and the with-project queue length is reported as 50 feet by rounding up from 48, the apparent impact of the hypothetical project would only be one additional vehicle, thereby understating the impact.

It is the responsibility of the traffic engineer and designer to interpret the calculated 95<sup>th</sup>-percentile queue length correctly. Traffic engineers typically assume that a passenger vehicle requires 25 feet of storage length, with adjustments for larger trucks if necessary. As an example, if the calculated 95<sup>th</sup>-percentile queue length is 90 feet, the designer of a turn lane would typically round up to the nearest 25-foot increment and design a 100-foot-long turn lane. Section 16 of the TIS discusses queue lengths in 25-foot increments. Therefore, it is better to work with actual calculated values for purposes of impact studies and then round up to the nearest 25-foot increment for purposes of design or stating the number of vehicles in a queue.

The discussion above illustrates that the analyses are based on typical engineering practices, including statistical calculations and their interpretation, and are neither incorrect nor irrational. Therefore, the TIS does not need to be revised based queue lengths.

4. Merge / Diverge Analysis

Based on the comments provided, a review of the merge/diverge analyses was conducted and revised merge/diverge analyses have been performed because  $v_{12}$  was inadvertently transposed with  $v_f$  in the data entry for the with-project diverge analyses. The revised analyses are attached and are summarized in the table below. No changes from the LOS presented in the TIS occurred, and the conclusions and recommendations presented in the TIS remain unchanged.

**Table 17 (Revised)**  
**Freeway Merge/Diverge Analysis Summary – I-5 / Nees Avenue Interchange**

Ramp	LOS (Density)				
	Existing	Existing Plus Project	Near-Term With Project	2037 No-Project Conditions	2037 With-Project Conditions
NB Off ramp	D (32.5)	D (32.5)	D (32.5)	F (72.9)	F (72.9)
NB On ramp	D (29.0)	D (29.0)	D (29.1)	F (65.7)	F (65.7)
SB Off ramp	C (26.8)	C (26.8)	C (26.8)	F (61.8)	F (61.8)
SB On Ramp	C (22.9)	C (22.9)	C (22.8)	F (54.5)	F (54.8)

It is noted that there is a decrease in calculated density between the existing-plus-Project and near-term with-Project conditions because the mainline freeway volume decreases as trips to the travel center and pending restaurant are primarily taken from freeway traffic. This result is not indicative of an oversight or error, and similar results have been published and explained by other traffic engineers, including the reputable firm of Kittelson & Associates, Inc. in a Freeway and Ramps analysis performed for the City of Alameda dated June 30, 2013.

5. Growth Rates

The TIS used a growth rate of one percent per year for trips that access Nees Avenue and a growth rate in excess of four percent per year for the freeway mainline. The four-percent annual growth rate can be observed by reviewing the freeway volumes in the merge and diverge data sheets. Those volumes were obtained from information in the Transportation Concept Report as discussed in the TIS. The Fresno County travel model does not provide evidence that growth rates on Nees Avenue will exceed one percent per year. Furthermore, the additional growth on Nees Avenue within the interchange and west of the interchange is being generated primarily by the proposed Project and the pending restaurant project included in the study, and those increases are in response to the larger increases projected on the freeway mainline. Therefore, the future traffic volume projections presented in the report are appropriate both on Nees Avenue and on the freeway mainline, and no revision of the report is required based on growth rates.

6. Mitigation Measures Based on Traffic Index Analysis

The commenter questions the mitigation measure requiring a pavement overlay on Nees Avenue to mitigate the Traffic Index impact because it does not address additional traffic at the project. Since the Traffic Index is a measure of the volume of truck traffic and is directly related to the required pavement thickness, the required mitigation measure to increase the

pavement thickness on Nees Avenue appears to specifically mitigate the impact to less than significant.

Attachments: Attachment 1: Beveridge & Diamond comment letter dated August 18, 2017  
(with Exhibit 14)

Attachment 2: Highway Capacity Manual 2010, page 19-30

Attachment 3: Merge / Diverge Analyses

## ATTACHMENT 1





David H. McCray  
456 Montgomery Street, Suite 1800  
San Francisco, CA 94104-1251  
Direct: (415) 262-4025  
DMccray@bdlaw.com

August 18, 2017

**Submitted via email to dchambers@co.fresno.ca.us**

Fresno County Department of Public Works and Planning  
Development Services Division  
Attn: Derek Chambers  
2220 Tulare Street, Suite A  
Fresno, CA 93721

**Re: Comments on Initial Study 7104 relating to Conditional Use Permit  
Application 3528**

Dear Mr. Chambers:

We write on behalf of Grand Petroleum Inc., (“Grand Petroleum”) to comment on Initial Study 7104 (“IS”) and the Mitigated Negative Declaration prepared by the Fresno County Planning Department (“County”) for the Conditional Use Permit Application 3528 (“CUP 3528”). The Applicant for CUP 3528, Shawn Shiralian, seeks to construct a large highway travel center at the northwest quadrant of the Interstate 5/Nees Avenue interchange in Fresno County, California (the “Project”). There are several deficiencies in the Initial Study, and we urge the Planning Commission to reject the Mitigated Negative Declaration and require the County to either 1) prepare a revised initial study to determine whether a negative declaration, mitigated negative declaration, or environmental impact report (“EIR”) is required or 2) require the County to prepare an EIR because there is substantial evidence to support a fair argument that the Project may cause significant adverse environmental impacts.

Several of the materials the applicant submitted in support of the Project are incomplete or inaccurate and thus, the Initial Study and accompanying Mitigated Negative Declaration are not supported by substantial evidence in the record. The decision as to whether a project may have one or more significant effects must be based on substantial evidence in the record of the lead agency. 14 CCR § 15064(f). The County’s Traffic Impact Study is flawed. Serious questions exist about the water demands of the Project, the availability of water, the quality of that water, and how wastewater will be managed for the Project. In these respects, the Applicant

August 18, 2017

Page 2

failed to put forth sufficient facts to enable the agency to meaningfully evaluate the potential environmental impacts of the Project.

The deficiencies of the Initial Study extend beyond the supporting documentation provided by the Applicant. There are multiple instances in which the County did not respond to the checklist questions it was required to address in the Initial Study. Elsewhere, the County relied upon improper mitigation measures. Additionally, the County abdicated its responsibility to analyze and determine whether cumulative impacts exist by merely stating in a single sentence that no “cumulatively considerable impacts” were identified.

One purpose “of the initial study is to help to inform the choice between a negative declaration and an environmental impact report.” *Joshua Tree Downtown Business Alliance v. County of San Bernardino* (2016) 1 Cal.App. 5th 677, 684 (internal citations removed). A core function of the initial study, is thus, meaningfully analyzing the questions presented based on reliable evidence to determine whether an EIR, a negative declaration, or a mitigated negative declaration is required. *See generally* 14 CCR § 15063. The initial study provides “documentation of the factual basis for finding” that a mitigated negative declaration is appropriate. 14 CCR § 15063.

An initial study is deficient if it fails to analyze a component of the Project. *Lighthouse Field Beach Rescue v. City of Santa Cruz* (2005) 131 Cal.App.4th 1170, 1195. Moreover, an initial study is inadequate if there is insufficient factual support for conclusions reached. *City of Redlands v. County of San Bernardino* (2002) 96 Cal.App.4th 398, 404 (“the County failed to gather facts necessary to perform an adequate environmental analysis”).

“When the informational requirements of CEQA are not complied with, an agency has failed to proceed in a manner required by law and has therefore abused its discretion.” *Lighthouse*, 131 Cal.App.4th at 1200 (internal citations removed).

For these reasons and for all the reasons more fully explained below, the County’s efforts have fallen below what is required under CEQA. Accordingly, the Planning Commission should not adopt the mitigated negative declaration or approve the CUP. The Applicant must be required to submit additional accurate data and information, and the County should prepare either a revised Initial Study or an EIR for this Project incorporating the issues raised below.

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August 18, 2017

Page 3

## Comments

### 1. There are Serious Deficiencies with the Applicant's Information and Analysis Regarding Water Use, Source, Quantity, and Quality Which Resulted in the County's Inability to Accurately Determine the Environmental Impacts Associated with the Project

An initial study which omits material necessary to informed decision making subverts the purpose of CEQA and is an abuse of agency discretion. *Lighthouse*, 131 Cal.App.4th at 1202. As explained below, there are several instances in which the County's analysis and conclusions regarding the water demands and requirements of the Project are incomplete and inaccurate and fail to provide substantial evidence to support the conclusion that the Project will not cause significant environmental impacts.

#### *Water Use*

Originally the Applicant stated that it would use approximately 2000 gallons of water per day. **Exhibit 1.** This conclusion was unsupported except for a single sentence that "[b]ased on similar uses along I-5," the Project would use 2000 gallons of fresh water. The County received comments from various state agencies that the water estimate was too low. For example, on April 6, 2016, the Environmental Health Division estimated wastewater flow of 15,980 gallons/day, not including proposed laundry and shower facilities. **Exhibit 2.** That is nearly eight-times the daily water use the applicant proposed. On March 6, 2017, the Environmental Health Division commented that "[f]rom experience on other Travel Centers along I-5, the number of visitors per day is grossly underestimated at 1500 leading to water and wastewater estimates to also be significantly underestimated." **Exhibit 3.** Despite these comments, no revised water use estimate was provided.

On May 25, 2017, the Water, Geology and Natural Resources Division requested "additional information" as to how a water use estimate of 2000 gallons/day was calculated. **Exhibit 4.** On June 2, 2017, the County requested the Applicant provide "data to support the 2,000 gallons per day usage." **Exhibit 5.** The applicant replied that same day: "We drilled a well that pumps 300 gallons a minute. I don't know what CEQA is but whatever it is we should be able to provide that. We didn't wait for Water Board." **Exhibit 6.** The County explained how critical water use and supply analysis and estimates were, as the Project is located in a water-short area. **Exhibit 7.**

Finally, the applicant provided an updated water use estimate to the County on June 7, 2017, which has been included as part of the Initial Study Routing Package. Now the Applicant

August 18, 2017

Page 4

estimates that the Project will use 26,179 gallons per day.<sup>1</sup> There is no explanation for why the water use estimate is now 10-times greater than it was previously. Tellingly, the Applicant did not provide additional information to the County in support of its original 2000 gallon/day water use estimate, which the Applicant appears to have abandoned.

The Applicant's revised calculation is a single page and allegedly supported by IAPMO Water Usage Tables. Grand Petroleum retained Carollo Engineers ("Carollo") to review several aspects of the Applicant's Project relating to water. As Carollo explains, IAPMO tables are not typically used to calculate a daily water use amount. Rather, these tables are used to identify maximum flow rates in a building structure which in turn are used for sizing the plumbing pipelines and fixtures. *See Exhibit 8.* Accordingly, Applicant's revised estimate is also not supported by substantial evidence. 14 CCR § 15064(f)(5).

Using the site plans provided by the Applicant, Carollo calculated the daily water use for a Project of this size with the number of visitors that the Applicant has estimated. Carollo calculated that the Project would use 43,585 gallons per day, and that number increases to 46,938 gallons per day with irrigation. This is nearly twice as many gallons per day as the Applicant estimated. Carollo identified activities with water demands that the Applicant failed to consider entirely. *See Exhibit 8.* Most obviously, Applicant's estimate does not identify any water use associated with restrooms; it only calculated water used with showers. But certainly at a truck stop and restaurant facility, the majority of individuals will use the restroom before departing. Oversights such as these underscore the unreliability of the Applicant's water use estimate. As a result, the conclusion that the Project will not have a significant environmental impact on hydrology is not supported by substantial evidence.

Furthermore, comments in the record indicate that the number of Project trips is underestimated, meaning that Carollo's water usage estimate is likely too conservative because more people will come to the Project and utilize its facilities. *Exhibit 3.* Carollo based its water use estimates on the site plan provided by the Applicant. Therefore, to the extent the number of visitors is underestimated, Carollo's water use calculation is conservative even though the calculation is almost double that of the Applicant's estimate.

As a result of the Applicant using unsupported and inaccurate estimates of the daily water use, the Initial Study is fatally flawed. The County concluded that the Project would have either a "less than significant impact with mitigation incorporated" or a "less than significant impact"

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<sup>1</sup> From our review of the administrative record based on frequent Public Records Act Requests, state and federal agencies have not previously had an opportunity to comment on the Applicant's revised water use estimate as this material was not circulated as a part of a previous "Routing Package."

August 18, 2017

Page 5

for all topics regarding hydrology and water quality (section IX of the Initial Study). The County never analyzed the environmental impact of a realistic daily water use. CEQA requires the County to obtain a factual basis to support its conclusions as to the environmental effect of the project and to engage in fully informed decision-making. *Deep Creek Agr. Ass'n v. County of San Bernardino* (Cal. App. 4th 2008) 2008 WL 2316322, \* 11. Such efforts were thwarted here by the Applicant declining to provide the necessary underlying facts. The mitigated negative declaration should be rejected and additional analysis should be conducted regarding the environmental impact associated with an accurate daily water use.

### *Water Source and Supply*

The Project is located in a Water Short Area. (Initial Study section IX.B.) San Luis Water District has unequivocally stated that it will not provide water to the Project:

Upon review of the application, it appears that the proposed project is anticipating utilizing a groundwater well for its water supply and will not need to depend upon the San Luis Water District for a supply or conveyance. Although the San Luis Water District is not requested to provide a Municipal and Infrastructure (M&I) water supply, and to make is abundantly clear to the applicant, the District will not provide a "can and will serve" letter to the development if requested. The property in question does not receive an M&I allocation from the United States Bureau of Reclamation's Central Valley Project. This property may be eligible to receive an agricultural allocation. However, the planned use as contemplated by the conditional use permit is not an agricultural operation therefore the agricultural water supply is not an adequate supply.

In summary, and in accordance with District policy, the District will not provide any new development water supply from its current allocation and/or supplemental water supplies; it is the responsibility of the project proponent to secure its own supply of water outside of the District. The project proponent must independently secure an adequate water supply (quality and quantity) for the life of the project.

**Exhibit 9.**<sup>2</sup> The Applicant has stated that it will rely on groundwater from two wells drilled onsite to support the Project.

The Applicant asserts, and the County accepts in the Initial Study, that the public water well will produce 300 gallons of water per minute. However, the well completion report was not enclosed with the Initial Study Routing Package, and it is unclear if other agencies and interested individuals providing comments have ever had the opportunity to review this material.

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<sup>2</sup> The date on the letter from the San Luis Water District conflicts with the date Fresno County received the letter. The letter is dated March 14, 2016, but the letter was received by Fresno County March 6, 2017.

August 18, 2017

Page 6

Beveridge & Diamond PC obtained the public well drilling completion report and drilling permits for both the public and private well at the Project through a California Public Records Act Request (“CPRA”). **Exhibit 10.** While the well completion report does estimate well yield at 300 gallons per minute, there are flaws with this conclusion and also significant shortcomings in the County’s Initial Study regarding water supply.

As Carollo explains, best practices support conducting a pumping test at a constant rate for 24 hours and recording the drawdown levels during the test. **Exhibit 11.** Pumping tests are conducted to determine the yield of the well and hydraulic parameters of the aquifer. The duration of the pumping test may be shortened if equilibrium conditions are reached before 24 hours, but there are no notes to indicate why the pumping test was conducted for only 12 hours. Without drawdown data, neither the adequacy of the pumping test data nor the estimated well yield can be objectively assessed.

This lack of information prevented the County from analyzing the potential environmental impacts associated with drawing ground water for the Project. In Section IX.B. of the Initial Study, the County had to determine if the Project would substantially deplete the groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in the aquifer volume or a lowering of the local groundwater table. The County’s response, which is included below in its entirety, failed to even address, let alone answer, the question presented:

*The subject parcel is located in a designated Water-Short Area and is currently devoid of structural improvements; however, a Private water well and a Public water well have been permitted and constructed thereon. Further, according to the Well Completion Report prepared for the Public water well, said well has an estimated yield of 300 gallons of water per minute. According to the Operational Statement provided for this project, it is estimated that the proposed Interstate Freeway Interchange Commercial Development will utilize approximately 26,179 gallons of water per day.*

The County concluded that the project would have a “less than significant impact” on groundwater supplies or groundwater recharge, but the County reached this conclusion with no factual information or analysis. There are no materials accompanying the Initial Study that analyze whether the wells would, or would not, interfere with the groundwater supply or recharge. This illustrates both that the Applicant failed to put forward substantial evidence on this issue and also that the County did not undertake a serious review of the associated environmental impacts of using this groundwater supply. The County’s defunct conclusion falls short of the environmental review required by CEQA in an Initial Study. *Lighthouse*, 131 Cal.App.4th at 1195 (an initial study is deficient if it fails to analyze a component of the project);

August 18, 2017

Page 7

*City of Redlands*, 96 Cal.App.4th at 404 (an initial study is inadequate if there is insufficient factual support for conclusions reached).

*Water Quality*

The Applicant included a report for water quality analyses from BSK Associates to support its Conditional Use Permit Application. There are inconsistencies with the report itself and issues raised by the report that the Applicant, and the County, overlook.

First, there is nothing in the BSK Report that allows a reviewer to determine if the water quality sample BSK analyzed is actually from the Project Site. The report identifies the location of the sample as a “New Well” associated with “Gridley Farm Labor Camp.” No other materials associated with this Conditional Use Permit application that our office received through CPRA Requests or materials the County distributed as a part of the Initial Study Routing Package, use the phrase “Gridley Farm Labor Camp” to describe the location of the Project. Indeed, the city of Gridley, CA is approximately 200 miles north of Fresno, CA.

Second, Carollo reviewed the BSK data and identified internal discrepancies with the chain of custody of the water sample:

The Sample Integrity checklist included with the laboratory report indicates that the measured temperature of the samples at the time of receipt was less than 6 °C, but the sample temperature noted on the chain of custody and case narrative is 12.9 °C. The sample integrity checklist also indicates that information on the bottle labels agree with the chain of custody. However, a separate sample condition checklist completed by Pace Analytical for subcontracted radiological analyses indicates that the sample labels did not match the chain of custody and the sample date and time was not recorded on the sample bottles. The Pace Analytical checklist also notes that no custody seal was present on the shipping container.

**Exhibit 11.**

Third, assuming that the well data is from a well drilled at the Project, there are significant water quality issues that the Applicant does not address. Notably in the operations statement, the Applicant passively acknowledged that the well water will be “tested and treated.” However, the application lacks any meaningful acknowledgment of why the water needs to be treated and how it will actually be treated, and the Initial Study does not evaluate the environmental impacts associated with treatment.

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August 18, 2017

Page 8

Carollo reviewed the BSK Report and concluded that total dissolved solids, specific conductance, chloride, and sulfate were found in concentrations in excess of California’s secondary drinking water standards. Table 1 below, prepared by Carollo, summarizes the exceedances for these constituents and the full report is included as **Exhibit 11**.

Table 1. Secondary Maximum Contaminant Level Ranges and Reported Data

Constituent, Units	Recommended	Upper	Short Term	Reported Value
Total Dissolved Solids, mg/L	500	1,000	1,500	3,200
Specific Conductance, uS/cm	900	1,600	2,200	5,600
Chloride, mg/L	250	500	600	1,100
Sulfate, mg/L	250	500	600	750

At a minimum, the water needs to be treated to a point where the values of total dissolved solids, specific conductance, chloride, and sulfate comply with secondary drinking water standards before the groundwater is suitable for potable uses. The Applicant was notified that these requirements apply at least as far back as May 9, 2016, but no steps appear to have been taken to address these exceedances. **Exhibit 12**. The Applicant did not provide information about how the water is to be treated, and therefore, the County failed to analyze whether such treatment will have a significant impact on the environment.

Additionally, the water is highly saline. While sodium is not regulated as a drinking water contaminant, the United States Environmental Protection Agency recommends that sodium concentration in drinking water not exceed a range of 30 to 60 mg/L. **Exhibit 11**. BSK’s analysis shows that the water sample had an observed concentration of 1,100 mg/L. To illustrate how saline the water is, its use even for irrigation or for livestock would be severely restricted. *Id.*

If the BSK analysis is in fact representative of water that will be drawn from the well at the site, then the water needs to be treated before it can be used as potable water. The County acknowledged that the Applicant needed to comply with all requirements for the operation of a Non-Transient Non-Community Water System. (Initial Study section XVII.D.) However, there is no analysis of how treatment will be performed or whether that treatment will have a significant impact on the environment.

August 18, 2017

Page 9

Moreover, using either reverse osmosis or electro dialysis to treat the water will result in the generation of a highly concentrated brine waste. **Exhibit 11.** The amount of water the Project uses, the method of treatment used, and the efficiency of the treatment method will impact how much brine waste is generated. Highly saline brine waste must be properly handled to prevent adverse environmental impacts, such as groundwater contamination, but these are not discussed by the Applicant or in the Initial Study. *See id.* Brine waste can be handled and disposed of in a variety of ways, but currently, the Applicant does not identify how the waste will be managed. Handling concentrated brine water may cause significant adverse impacts to the environment and both the Applicant and the County overlook this substantive issue entirely. The Applicant has not designed a system that addresses the water quality issues associated with groundwater use and the County never evaluated the environmental impacts associated with the use and treatment of groundwater to support the Project.

Finally, as Carollo explains, “[b]ecause a portion of the raw water is lost as concentrate from the treatment process, treatment may also significantly increase the volume of raw water required to meet demands.” **Exhibit 11.** As explained in detail above, the Applicant has significantly underestimated the daily water demands of the Project. Because the groundwater is highly saline and has concentrations of contaminants in excess of California’s secondary drinking water standards, it must be treated, and this treatment causes some portion of raw water to be lost. This in turn drives the daily water demands of the Project even higher. Both the Applicant and the County declined to engage with these facts or honestly assess their environmental impact.

#### *Handling Wastewater*

The Project will manage its wastewater onsite. The Applicant submitted a report prepared by O.S.T. System Designs, Inc. to demonstrate that it could manage the Project’s wastewater by using a septic tank and a leach field. O.S.T. estimated the peak flow rate for wastewater as 10,692 gallons per day and then based its calculations on designing a system that could accommodate that amount of daily wastewater. For several reasons, O.S.T.’s conclusions from July 5, 2016 cannot be relied upon in the Initial Study released in July 2017.

First, O.S.T. based its estimation for the peak flow rate of wastewater by referring to the California Plumbing Code. However, four of the activities identified are not in the plumbing code, and thus, are not supported by citation. **Exhibit 13.** Furthermore, the square-footage of mini-mart space is different than the mini-mart square footage on the Applicant’s floor plan, resulting in an inaccurate wastewater flow estimate. *Id.*

August 18, 2017

Page 10

Second, in Section 8, O.S.T. recommended “using time and pressure dosed Rock Leach Lines to treat and disperse the wastewater generated by the proposed Travel Center.” However, throughout the report, O.S.T. presents calculations, including the size of the leach field, based on using gravity distribution. The O.S.T. report does not include a recommended volume for a dosing tank or the design flow rate and discharge head of the associated dosing pump. O.S.T. has made a recommendation about how to handle the wastewater, but then the report does not actually explain how to design a system that comports with its recommendation. **Exhibit 13.**

Third, O.S.T.’s wastewater daily flow rate estimate is internally inconsistent with the daily water use estimate eventually put forward by the Applicant. As explained above, the Applicant now estimates that the Project will use 26,179 gallons of water per day. The Applicant’s revised daily water use estimates will generate approximately two-and-a-half times as much wastewater as O.S.T. estimated and then designed a system to accommodate. *See Exhibit 13* (explaining the use of a 90% “to sewer” calculation). As O.S.T. admitted, its conclusions about the ability of the Project to support the needed wastewater treatment system are dependent on the amount of wastewater the Project generates, and its conclusions are not valid if the wastewater flows change.

In the event that changes occur in the design of the project, this report’s recommendations will not be considered valid unless the changes are reviewed with O.S.T. System Designs, Inc. and the conclusions and recommendations are modified or verified in writing. Examples of such changes would include location and/or changes in the type of wastewater characteristics and an increase in wastewater flows.

O.S.T. Report, section 2.0. Therefore, for this reason alone, the County’s conclusion that the use of septic tanks or alternative disposal systems would have a “less than significant impact with mitigation incorporated” is not supported by substantial evidence.

Further, in April 6, 2016, the Environmental Health Department commented that: “An evaluation of the Operations Statement provided by the applicant and 2013 California Plumbing Code Appendix H yields an estimated wastewater flow of 15,980 gallons per day not including proposed laundry and shower facilities.” **Exhibit 2.** The O.S.T. report never considers this higher estimate put forward by the Environmental Health Department or explains why its lower estimate of approximately 10,700 gallons is more accurate.

Carollo reviewed the O.S.T. Report and calculated the size requirements for a wastewater treatment system to accommodate both the daily water use estimated by the Applicant and the daily water use calculated by Carollo. Carollo prepared the following table demonstrating the

August 18, 2017

Page 11

size requirements for leach fields in four different layouts based upon how the leach lines are installed.

<b>Average Daily Wastewater Flow (gallons per day)</b>	<b>Length of Leach Line Required (linear feet)</b>	<b>Number of Leach Lines (count)</b>	<b>Area Required (1) (acres)</b>	<b>Area Required (2) (acres)</b>	<b>Area Required (3) (acres)</b>	<b>Area Required (4) (acres)</b>
10,692	651	7	0.22	0.30	0.36	0.33
23,561	1,337	14	0.44	0.53	0.60	0.65
39,227	2,173	22	0.69	0.83	1.03	0.98

Table Notes:

1. Area Required (1) is based on a leach line configuration of one single long line of leach line installation
2. Area Required (2) is based on a leach line configuration of two leach lines side by side
3. Area Required (3) is based on a leach line configuration of three leach lines side by side
4. Area Required (4) is based on a leach line configuration of four leach lines side by side

**Exhibit 13.** Furthermore, Fresno County mandates that an equal amount of land required for the leach field be set aside and reserved for potential future use for septic tank effluent disposal. *Id.* Therefore, the Applicant needs to identify additional acreage to comply with the Fresno County requirement.

CEQA requires Agencies to make informed decision-making and to make an honest assessment of environmental impacts associated with proposed projects. *See San Lorenzo Valley Community Advocates for Responsible Educ. v. San Lorenzo Valley Unified School Dist.* (2006) 139 Cal.App.4th 1356, 1375 (“an agency’s failure to comply with the procedural requirements of CEQA is prejudicial when the violation thwarts the Act’s goals by precluding informed decision-making and public participation.”). Here, the Applicant needs to revise its soils analysis and sewage feasibility report to accurately reflect realistic wastewater flow projections for the Project. Then the County needs to evaluate whether there will be a significant environmental impact from this wastewater treatment. The construction of a significantly larger leach field and septic tank may pose a substantial environmental impact that needs to be meaningfully evaluated. O.S.T.’s wastewater treatment system also does not address how brine water, or the other liquid generated after treating water to make it suitable for potable use, will be handled. The Applicant must be required to put forward a plan for adequately managing all wastewater generated the Site so the associated environmental impacts can be analyzed.

August 18, 2017

Page 12

Finally, the California Water Resources Control Board Discharge Order WQ 2014-0153-DWQ requires that for wastewater flow rates greater than 20,000 gallons/day, the discharge must be evaluated to determine if nitrogen effluent limits are required. As Carollo explains, the results of a nitrogen effluent limit evaluation impacts the required wastewater treatment method.

**Exhibit 13.** For example, if the evaluation determines that nitrogen control is required then the planned septic tank leach field system will not be permitted and aerobic treatment will be required. As the wastewater flow rates will exceed 20,000 gallons/day based even on the Applicant's revised daily water use estimate, this additional type of wastewater treatment needs to be evaluated at the Initial Study stage because handling wastewater with high nitrogen concentration may have a significant environmental impact.

## **2. The Traffic Impact Study Prepared by the Applicant and Relied Upon by the County is Flawed**

In support of the Project, the Applicant submitted a Traffic Impact Study prepared by Peters Engineer Group ("PEG"). PEG's Traffic Impact Study has significant shortcomings and several conclusions are based on inaccurate, incomplete, or misrepresented data. Elsewhere, PEG failed to provide needed analysis, which results in substantial deficiencies in its Traffic Impact Study. As a result of these inaccurate data issues, the County's conclusions about the environmental impacts associated with the transportation effects of the Project are not based on substantial evidence. 14 CCR § 15064(f)(5).

Grand Petroleum retained MRO Engineers ("MRO") to review PEG's traffic impact study. MRO's report is attached as **Exhibit 14**. MRO identified several deficiencies in PEG's analysis, which are summarized below.

First, PEG did not analyze the correct peak traffic rates in its traffic impact study. PEG addressed conditions using traffic data from 4:00 – 5:00 p.m. on Sunday, which it represented as a peak-hour period. However, the vehicle count was slightly higher on Fridays, which raises the question why the Friday peak hour was not analyzed. *See Attachment A to Exhibit 14*. Moreover, based on PEG's traffic count, Sunday from 3:00 – 4:00 p.m. actually had a higher traffic volume than Sunday from 4:00 – 5:00 p.m., yet this timeframe on Sunday was excluded. To accurately determine the environmental impacts of the Project associated with traffic, the impacts associated with peak traffic rates must be analyzed. The traffic impact analysis should be revised to incorporate an analysis of the actual Sunday peak hour as well as the Friday peak hour.

August 18, 2017  
Page 13

Also, highlighted on the table in Attachment A is the 5:00 – 6:00 PM hour between the I-5 ramps on Friday. The total volume during that hour was 200 vehicles, which is approximately the same as the total during the selected analysis period. However, the directional orientation of the vehicles in this period was somewhat different from that shown during the analysis period. In particular, about three-quarters of the Friday volume is eastbound at the current location, whereas the Sunday volumes are approximately evenly split between the eastbound and westbound directions. PEG did not analyze the impacts associated with these changes in traffic direction.

Second, there are several flaws regarding the Project trip estimates, which are presented in PEG Table 6. PEG’s trip generation estimates for the Project were developed based upon traffic counts conducted at an existing Chevron gas station on Paul Negra Road, just north of the proposed Project site. Relying on a single data set is contrary to the Institute of Transportation Engineers’ *Trip Generation Handbook*. The *Trip Generation Handbook* (p. 29) addresses the preferred sample size for selecting appropriate trip generation rates from those available in the *ITE Trip Generation Manual* (ITE, Ninth Edition 2012):

- *If the number of data points is one or two, either (1) consider the use of a different independent variable and its associated data pages, or (2) collect local data and establish a local or consolidated rate. Refer to Chapter 9 for guidance.*
- *If the number of data points is three, four, or five, the analyst is encouraged to collect local data and establish a local or consolidated rate . . . [Emphasis not added]*

**Exhibit 14.** Furthermore, PEG does not explain why the Chevron gas station is a comparable travel center to the Project. Specifically, the Project is designed to include a restaurant and additional truckers’ services, such as laundry, a large restaurant, and showers, and nothing in the record indicates that the Chevron station has similar services such that it is an appropriate comparison. The MRO report states:

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August 18, 2017

Page 14

Moreover, we note that the Project trip generation estimate presented in PEG Table 6 fails to account for the truckers' services component of the Project. It seems to suggest that this activity is fully accounted for within the 3.00 trips per diesel fueling position trip rate, but this assumption is unsubstantiated. Similarly, the 2,400 SF mini-mart/convenience store oriented toward the truck/diesel fuel pumps is unaccounted for, as there is no certainty that the small trip rate directly associated with the diesel fuel pumps fully accounts for activity within the mini-mart. Ignoring these two key components of the Project will likely lead to underestimation of the Project's trip generation, which could, in turn, result in understatement of the Project's traffic impacts.

We also question the approach taken with regard to estimating the number of trips generated by the proposed 4,800 SF sit-down restaurant. For trip generation purposes, the size of the proposed restaurant has been arbitrarily reduced by 1,000 SF to reflect an apparent guess concerning the size of the existing Subway sandwich shop within the Chevron station where trip data was collected. In other words, the traffic analysis addresses a 3,800 SF restaurant, instead of the actual 4,800 SF facility. While the intent is to account for the fact that the Subway trips are included within the total number of trips counted at the Chevron driveway, the validity of the specific adjustment is not adequately demonstrated.

**Exhibit 14.** As MRO explains, PEG has taken steps to arbitrarily reduce the number of trips to the Project for purposes of the Traffic Impact Study, resulting in an analysis that does not allow for an honest assessment of the associated environmental impacts.

Third, PEG's queue length results are not credible. As MRO explains in detail, PEG used queue lengths of 5, 10, and 13 feet. However, no cars are this length, which results in inaccurate conclusions.

*Queue Length Results Are Not Credible* – Table 10 (p. 10) in the PEG report provides the "Intersection Queuing Summary" for Existing Conditions. At the Nees Avenue/I-5 Southbound Ramps intersection, the table indicates a 13-foot queue on the southbound approach. At the Nees Avenue/Northbound Ramps intersection, a 5-foot queue is shown on the eastbound approach and a 10-foot queue on the northbound approach.

These results lack credibility, as there are no vehicles on the American road system that are as little as 5, 10, or even 13 feet long. Similar errors are evident in PEG Table 11 (p. 10), which presents the Existing Plus Project queue lengths (13 feet, for example). Even the Cumulative 2037 With Project queue lengths presented in PEG Table 14 (p. 11) are as short as 15 feet (on the eastbound approach at Nees Avenue/I-5 Northbound Ramps).

We note that the "passenger car" design vehicle designated in Exhibit 2-3 (p. 21) in the document, *A Policy on Geometric Design of Highways and Streets* (American Association of State Highway and Transportation Officials, 2004) is 19-feet long. According to the User Guide for the Synchro 9 software used to calculate the intersection levels of service, the standard

August 18, 2017

Page 15

convention is to assume that a passenger car in a queue consumes 25 feet. (Reference: Trafficware, *Synchro Studio 9 User Guide*, August 18, 2015)

Of course, as noted in the PEG traffic study, 17 percent of the existing traffic at the study intersections consists of trucks. According to Caltrans, trucks are as long as 72 feet. (Reference: Caltrans, *Highway Design Manual*, May 7, 2012, Figures 404.5A and 404.5B, pp. 400-15 and 400-16) Such a vehicle would consume at least 75 feet in a queue.

Claiming that the queues associated with development of the Project will be less than the length of an average passenger car represents a substantial deficiency in the analysis. Such an irrational result raises questions regarding the credibility of the analysis as a whole.

Queuing is a serious potential safety issue for the proposed Project, which is a truck stop. Trucks are slow to stop and start and occupy significantly more length of a highway off-ramp than passenger cars. If queues extend beyond highway off-ramps, it poses a safety concern on the ramp and mainline freeway as well as the County roads. PEG's incorrect queue length calculations prohibit a meaningful analysis of whether a queuing issue is associated with the Project.

Fourth, there are deficiencies with PEG's freeway merge/diverge analysis. The analysis results are simply wrong. Based on PEG's analysis, the merge/diverge density is lower with the Project being built than what exists currently:

The second issue is that the analysis results are wrong. Review of the merge/diverge calculations presented in PEG Appendix F reveals that the addition of the project traffic results in lower density values at the two off-ramps than under "no project" conditions (i.e., the additional traffic results in improved operations). This is true for both Existing Plus Project and Cumulative Plus Project conditions. (Because Near-Term No Project results were not provided, it is not possible to establish whether this issue applies to that time frame, as well.) To illustrate this point, we have prepared Table 3, which presents the detailed density values for existing and cumulative conditions, both with and without the Project.

We have highlighted in yellow the cells within the table that indicate improved operations following the addition of Project-generated traffic. This result is illogical and should have represented a red flag for the analyst that something is wrong.

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August 18, 2017

Page 16

Table 3 Detailed Freeway Merge/Diverge Analysis Results <sup>1</sup>								
Ramp	Existing		Existing Plus Project		2037 No Project		2037 Plus Project	
	Density <sup>2</sup>	LOS <sup>3</sup>	Density	LOS	Density	LOS	Density	LOS
NB Off-Ramp	32.5	D	31.3	D	72.9	F	71.7	F
NB On-Ramp	29.0	D	29.0	D	65.7	F	65.7	F
SB Off-Ramp	26.8	C	25.7	C	61.8	F	60.6	F
SB On-Ramp	22.9	C	22.9	C	54.5	F	54.5	F

Notes:  
<sup>1</sup> Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016, Table 17, p. 19.  
<sup>2</sup> Passenger cars/mile/lane.  
<sup>3</sup> Level of service.

**Exhibit 14.** Plainly, the construction of the Project will not result in fewer merges or diverges from the highway. This fundamental flaw calls into question PEG’s conclusion that “[t]he construction of the Project and pending project is not expected to cause a reduction in the [levels of service]. Therefore, the Project does not cause a significant impact with respect to merging and diverging at the ramps.”

Fifth, PEG failed to consider how traffic growth on I-5, the main (indeed, nearly exclusive) source of visitors to the Project would impact cumulative traffic volumes at the Project. PEG used an annual growth rate of 1.0 to estimate traffic volumes in 2037. This approach ignores the fact that traffic volumes on Paul Negra Road and Nees Avenue are linked to traffic volumes on I-5. As MRO explains, PEG’s analysis in Figure 4 of the PEG report acknowledges this point, as it shows that 90 percent of the Project-related traffic is oriented to/from I-5. Therefore, as traffic on I-5 grows, traffic volumes on Paul Negra Road will also grow.

For both daily and peak hour periods, Caltrans projects the volume on I-5 to grow by 180 percent between 2011 and 2035. Over that 24-year period, that equates to an annual growth rate of 7.5 percent. This is obviously considerably higher than the 1.0 percent per year assumption in the PEG traffic analysis.

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August 18, 2017

Page 17

Consequently, PEG's analysis substantially underestimated the year 2037 traffic volumes on Nees Avenue and Paul Negra Road. This will lead, in turn, to understatement of the vehicular delay values at the study intersections, so that no meaningful indication of the future level of service is provided for those locations. The degraded "no project" level of service that is certain to result from the use of more realistic future traffic estimates increases the probability that addition of the Project-generated traffic will result in a significant impact under Fresno County significance criteria. That is, as traffic increases on Nees Avenue and the I-5 freeway ramps, it becomes increasingly likely that the critical movements at the study intersections will operate at unacceptable levels of service and that addition of the Project traffic will cause the delays on those critical movements to increase by 5.0 seconds or more.

The analysis must be revised to reflect the level of traffic growth projected by Caltrans and to provide an accurate indication of the operating conditions at the study intersections.

Sixth, the MRO report identifies issues with PEG's analysis of the internal trip reduction rates and the pass-by trips. The PEG trip generation estimate also includes a 20 percent internal trip reduction, based on information presented in Tables 7.1 and 7.2 in Second Edition (June 2004) of the *ITE Trip Generation Handbook*. However, the only 20 percent values in the referenced tables are for trips from one retail use to another retail use in the weekday PM peak hour of adjacent street traffic. Of course, the PEG study addresses the Sunday peak hour, so it would appear that the assumed 20 percent value does not apply.

The PEG analysis assumes that 15 percent of the trips at the Project will be "pass-by" trips; that is, they represent vehicles that were already passing by the site on Paul Negra Road, which enter the site rather than continuing on to the existing Chevron station. While the PEG study correctly recognizes that the standard pass-by trip rates documented in the *ITE Trip Generation Handbook* do not apply (because of the limited volume of traffic passing by the site), it does not adequately describe the derivation of or justify the use of the 15 percent value employed in the analysis.

The MRO Report thoroughly explains the shortcomings of the PEG report. In several instances, the PEG report relies on "evidence that is clearly inaccurate or erroneous or evidence that is not credible," which does constitute substantial evidence. § 15064(f)(5).

Based on the PEG report, the County concluded that the "proposed Interstate Freeway Interchange Commercial Development will cause a "significant traffic impact by increasing the Traffic Index (TI) on Nees Avenue between the subject parcel and the Interstate Highway 5 northbound ramps by a significant amount (at least 0.5)." However, the County fails to identify responsive mitigation for this impact as required by CEQA. The only mitigation measure required was to add a two-inch Hot Mix Asphalt overlay on Nees Avenue and Paul Negra Road

August 18, 2017

Page 18

between the subject parcel and the I-5 northbound ramps and therefore, no analysis exists in the PEG report or by the County that this mitigation measure will address the impacts associated with additional traffic at the Project. Therefore, the County's conclusion that with mitigation, traffic would cause a less than significant impact is unsupported and flawed.

### **3. The County Failed to Respond to Questions Posed in the Initial Study**

Using an "Initial Study Environmental Checklist Form," the County completed an "Evaluation of Environmental Impacts" and concluded that a mitigated negative declaration was appropriate for the Project. Both documents include the same series of questions to which the County must respond. In several instances, the County failed to respond to the questions proposed in the "Evaluation of Environmental Impacts" document.

First, as already explained above, the County failed to address the question presented about the impact a groundwater well would have on the existing aquifer and groundwater recharge. *See* Comment 1.

Second, in Section IX.E of the Initial Study, the County similarly failed to analyze or answer the question put before it. In this section, the County had to determine if the project would create or contribute run-off which would exceed the capacity of existing or planned storm water drainage systems or provide substantial additional sources of polluted run-off. The County concluded that there would be a "less than significant impact" by stating:

*According to the Development Engineering Section of the Fresno County Department of Public Works and Planning, any additional runoff generated by development of the proposed Interstate Freeway Interchange Commercial Development cannot be drained across property lines and must be retained onsite per County Standards. This mandatory requirement will be included as a Project Note.*

The County's response does not address how the water would be retained onsite and disposed. There is no analysis of potential environmental impacts associated with polluted runoff.

Third, the County's conclusion to section II titled Agricultural and Forestry Resources similarly fails to address the questions presented. Here too, the County concluded that the Project would have a "less than significant impact" on agricultural and forestry resources, but its response does not address several of the questions presented. The County wrote that it will require that "prior to occupancy, the owner of the subject parcel shall acknowledge the inconveniences and discomforts associated with agricultural land uses." Having a property owner acknowledge the Fresno County Right-to-Farm Notice does not respond to the questions posed.

August 18, 2017

Page 19

An initial study must meaningfully analyze the questions presented based on reliable evidence to determine whether an EIR, a negative declaration, or a mitigated negative declaration is required. *See generally* 14 CCR § 15063. The Initial study provides “documentation of the factual basis for finding” that a mitigated negative declaration is appropriate. 14 CCR § 15063. The County’s Initial Study must honestly assess the questions presented to determine if the Project will have a significant impact or not. An initial study is deficient if it fails to analyze a component of the Project. *Lighthouse*, 131 Cal.App.4th 1170 at 1195 (initial study did not reflect that the City ever considered or assessed the environmental effect of the revisions on city plans regarding future off-leash dog use at park).

“When the informational requirements of CEQA are not complied with, an agency has failed to proceed in a manner required by law and has therefore abused its discretion.” *Id.* at 1200 (internal citations removed). The County’s efforts here have fallen short in many regards. Accordingly, the decision to propose a mitigated negative declaration is based on incomplete conclusions and should not be adopted.

#### **4. The County Has Improperly Deferred Mitigation Measures**

In Section XVII.D of the Initial Study, the County analyzed whether the project had sufficient water supplies available from existing entitlements and resources or whether new or expanded entitlements are needed. The County concluded that the Project would have a “less than significant impact with mitigation incorporated.” However, to mitigate the significant impact, the County relied solely on the Applicant obtaining a permit from the State Water Resources Control Board, Division of Drinking Water:

*Prior to completion of the Site Plan Review (SPR) required for the proposed Interstate Freeway Interchange Commercial Development, the Applicant shall submit for any permits required by the State Water Resources Control Board, Division of Drinking Water for operation of a Non-Transient Non-Community Water System. Additionally, the Applicant shall comply with State mandatory permitting requirements as listed in the Project Notes for Unclassified Conditional Use Permit No. 3528. Further, proof of acceptance by the State regarding the design of the Non-Transient Non-Community Water System, and authorization from the State to operate the Non-Transient Non-Community Water System must be provided to the County prior to granting occupancy to the proposed Interstate Freeway Interchange Commercial Development.*

This response does not address the fundamental issue that there is no evidence to show that the Project has sufficient water supplies available from existing entitlements and resources. The San Luis Water District stated it will not issue a “will-serve” letter for the Project. **Exhibit**

August 18, 2017

Page 20

9. The County did not evaluate the environmental impacts associated with pumping groundwater to meet the daily water demand of the Project nor how to treat the water, given its salinity and concentrations in excess of California's Secondary Drinking Water Standards, and thus the mitigation measures are unresponsive to environmental impacts associated with those activities.

Similarly, in section VI.E, the County included a mitigation measure requiring the Applicant to submit "[s]pecific design and capacity details for the" onsite wastewater treatment system. As already explained above, there are serious shortcomings with the O.S.T. Report. By including as a mitigation measure the requirement that the Applicant design and construct an onsite wastewater treatment system that can address grey water and black water treatment, the County is improperly using mitigation by allowing the Applicant to conduct another study at a later time that will be free from public scrutiny and a robust inquiry into environmental effects. *Sundstrom v. County of Mendocino* (1988) 202 Cal.App.3d 296, 307.

Generally, it's improper for an Agency to defer mitigation by relying on future planning or studies. *Id.* at 306-07; *see also* 14 CCR § 15126.4 ("formation of mitigation measures should not be deferred until some future time."). The ability to treat the wastewater onsite should be meaningfully evaluated now, as a part of the Initial Study, and not deferred to a later date. "A study conducted after approval of a project will inevitably have a diminished influence on decision making. Even if the study is subject to administrative approval, it is analogous to the sort of post hoc rationalization of agency actions that has been repeatedly condemned in decisions construing CEQA." *Sundstrom*, 202 Cal.App.3d at 306.

Finally, as explained in comment 2, the mitigation measure proposed for addressing the significant impact relating to traffic is non-responsive to the impact identified. The County concluded that the "proposed Interstate Freeway Interchange Commercial Development will cause a "significant traffic impact by increasing the Traffic Index (TI) on Nees Avenue between the subject parcel and the Interstate Highway 5 northbound ramps by a significant amount (at least 0.5)." The only mitigation measure required was to add a two-inch Hot Mix Asphalt overlay on Nees Avenue and Paul Negra Road between the subject parcel and the I-5 northbound ramps. This mitigation measure is unresponsive to the impact identified because it does nothing to alleviate the increase in traffic.

5. **The County Failed to Meaningfully Analyze Whether the Project has Cumulatively Considerable Impacts**

The Initial Study concludes that "[n]o cumulatively considerable impacts were identified in the project analysis." (IS section XVII.B.) Such a conclusory statement does not satisfy the lead agency's requirement to evaluate whether the Project would have a cumulative impact or

August 18, 2017

Page 21

presents cumulatively considerable impacts. The lead agency must analyze whether potentially significant environmental impacts would have a cumulative impact—not merely state whether the Applicant identified cumulatively considerable impacts in the project analysis.

Initial Studies are used to “[p]rovide documentation of the factual basis for the finding in a Negative Declaration that a project will not have a significant effect on the environment.” 14 CCR § 15063(c)(5). Regarding cumulative impacts, the lead agency must consider whether the cumulative impact is significant and whether the project’s incremental effect, though individually limited, is cumulatively considerable. 14 CCR § 15064(h)(1). This includes an evaluation of the effects of probable future projects. *Id.*

Here, the County’s analysis is merely perfunctory. In a single sentence the County stated that cumulatively considerable impacts were not identified. This sentence appears to shift the burden to the applicant to identify a cumulatively considerable impact for the County’s consideration. But the County, as the lead agency, is charged with determining whether cumulatively considerable impacts exists on such issues as water, air and traffic. *Id.* The County failed to do so.

**6. The County Did Not Address All Identified Endangered Species in the Proposed Mitigation Measures**

The Initial Study cited to a United States Fish and Wildlife Service (“USFWS”) comment letter dated May 17, 2016, which explained that the subject parcel contains vegetation indicative of habitat suitable for the federally-listed endangered species San Joaquin Kit Fox, Blunt-Nosed Leopard Lizard and Giant Kangaroo. (IS section IV.F.) The County summarized the Endangered Species Habitat Assessment that was performed and then identified some mitigation measures so that the Project would have a “less than significant impact with mitigation incorporated”:

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August 18, 2017

Page 22

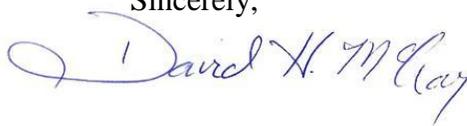
*An Endangered Species Habitat Assessment was prepared for this proposal by Colibri Ecological Consulting, LLC based upon literature review, database review [including the California Natural Diversity Database (CNDDDB) and California Native Plant Society Database (CNPS)], and a reconnaissance-level field survey of the subject parcel which included a 250-foot area around the perimeter of the subject parcel. According to the Endangered Species Habitat Assessment prepared by Colibri Ecological Consulting, LLC, no plant or wildlife species listed as endangered was observed within the boundaries of the survey area. However, due to the potential for special status wildlife species to occur on or adjacent to the subject parcel, Mitigation Measures are recommended to ensure that project impacts to sensitive biological resources are reduced to a less than significant level. These Mitigation Measures pertain to San Joaquin Kit Fox, American Badger, Burrowing Owl and nesting birds.*

The mitigation measures proposed by the County do not address the Blunt-Nosed Leopard Lizard or the Giant Kangaroo Rat. The County provided no support for why pre-construction surveys were required for the San Joaquin Kit Fox, the American Badger, the Burrowing Owl, and nesting birds but not for the Blunt-Nosed Leopard Lizard or the Giant Kangaroo Rat even though there is “potential for special status wildlife species to occur on or adjacent to the subject parcel.” Failure to provide an explanation for why there will be no significant effect on biological resources, even at the initial study phase, is impermissible. *See Deep Creek*, 2008 WL 2316322, at \*11 (“[T]he initial study’s conclusion that the project will have no significant effect on biological resources, apart from the three species as to which it concluded mitigation is or may be necessary, is based solely on general information that there is a low probability that members of the identified plant and animal species will be found on or near the project[,] which was found inadequate to discharge the “county’s duty under CEQA to engage in fully informed decisionmaking.”).

## **Conclusion**

For all of the reasons explained above, the County’s efforts have fallen below what is required under CEQA. Accordingly, the Planning Commission should not adopt the mitigated negative declaration or approve the CUP. The Applicant must be required to submit additional accurate data and information and the County should prepare either a revised Initial Study or an EIR for this Project incorporating the issues raised above.

Sincerely,



David H. McCray

Enclosures

# **EXHIBIT 14**

June 29, 2017

**PRIVILEGED AND CONFIDENTIAL  
ATTORNEY/CLIENT COMMUNICATION  
ATTORNEY WORK PRODUCT**

Mr. Amin Salkhi, President  
Grand Petroleum, Inc.  
1451 Danville Blvd., Suite 201  
Alamo, CA 94507

Subject: ***Review of Traffic Impact Analysis –  
Proposed E-Z Trip Travel Center, Fresno County, California***

Dear Mr. Salkhi:

As requested, MRO Engineers, Inc., (MRO) has reviewed the traffic impact analysis prepared with respect to the proposed E-Z Trip Travel Center project (“Project”) in Fresno County, California. (Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016). Our review focused on the technical adequacy of the analysis, including the detailed procedures and conclusions documented in the Peters Engineering Group (“PEG”) study.

### **BACKGROUND**

The Project will consist of a highway travel center at the northwest quadrant of the Interstate 5/Nees Avenue interchange in Fresno County, California. According to the PEG study (p. 1) and information provided by the applicant, specific components of the Project include:

- A 12,550-square-foot (SF) building, including:
  - Mini-mart oriented toward automobile patrons – 2,120 SF,
  - Mini-mart oriented toward truck drivers – 2,400 SF,
  - Truckers’ services – 3,240 SF,
  - Sit-down restaurant – 4,800 SF,
- 24 automobile fueling positions, and
- 10 diesel fueling positions.

A total of 174 parking spaces will be provided, including 83 for automobiles and 91 for trucks, buses, and recreational vehicles.

Vehicular access is proposed via four driveways to be located along Paul Negra Road.

### **TRAFFIC IMPACT ANALYSIS REVIEW**

Our review of the traffic impact analysis revealed the following potentially significant deficiencies that should be addressed prior to approval of the Project by Fresno County.

1. ***Analysis Time Periods*** – The PEG traffic impact analysis addressed conditions in a single peak-hour period – Sundays between 4:00 and 5:00 PM. (PEG, pp. 5 – 6) This determination was based on the results of 24-hour traffic volume counts, which are summarized in PEG Table 4 (p. 6). As shown in that table, the total daily traffic volume on Nees Avenue west of the Interstate 5

(I-5) interchange on the count day (September 18, 2016) was 2,564 vehicles. The table also shows that on Friday, September 16, 2016, the total daily volume between the northbound and southbound I-5 ramps was 2,578 vehicles, a slightly higher volume.

This raises the obvious question as to why the Friday peak hour was not also analyzed.

The detailed traffic count data sheets are presented in Appendix A of the PEG report. Because the 24-hour count sheets are extremely difficult to read, we have excerpted key information and summarized it in a table, which is presented as Attachment A.

The daily totals shown in the table match those described above. Highlighted within the table is the analysis period of Sunday between 4:00 and 5:00 PM (west of the I-5 interchange), when a total of 204 vehicles were counted. Interestingly, the previous hour (3:00 – 4:00 PM) at the same location actually had a higher traffic volume (213 vs. 204). However, when we examined the intersection turning movement counts that were presented in PEG Appendix A, we found that the Sunday 3:00 – 4:00 PM hour was not even counted, as the counts were performed from 3:30 – 6:00 PM. Thus, the analysis didn't even address the true peak hour on a Sunday.

Also highlighted on the table in Attachment A is the 5:00 – 6:00 PM hour between the I-5 ramps on Friday. The total volume during that hour was 200 vehicles, which is approximately the same as the total during the selected analysis period. However, the directional orientation of the vehicles in this period was somewhat different from that shown during the analysis period. In particular, about three-quarters of the Friday volume is eastbound at the count location, whereas the Sunday volumes are approximately evenly split between the eastbound and westbound directions.

The information presented here strongly suggests that, in order to ensure a conservative analysis and, in particular, to ensure that all potential traffic impacts are identified, traffic operations during the Friday peak hour should also be evaluated. In addition to the fact that the total volumes are very similar to the Sunday analysis peak hour, the different directional distribution of the traffic during the Friday peak hour suggests the possibility that additional impacts would be identified, as different critical movements would likely be found at the study intersections.

Consequently, the traffic impact analysis should be revised to incorporate an analysis of traffic operations during the actual Sunday peak hour (3:00 – 4:00 PM), as well as the Friday peak hour (5:00 – 6:00 PM).

2. **Project Trip Generation** – The trip generation estimates for the Project are presented in PEG Table 6 (p. 8). The trip generation rates for the automobile and truck fueling facilities were developed based on counts conducted at the existing Chevron station on Paul Negra Road, a short distance north of the Project site. We have several concerns regarding the validity of the Project trip generation estimates.

#### *A. Sample Size and Data Collection Requirements*

First, we are concerned that the trip rates for the two fueling facilities are based on a sample size of one; that is, the data used to develop the trip rates was collected at a single location on a single occasion. The Institute of Transportation Engineers (ITE) *Trip Generation Handbook* (Third Edition, August 2014, p. 26) says to collect local data when the:

*Data plot has only one or two data points (and, preferably, when five or fewer)[.]*

Further, the *Trip Generation Handbook* (p. 29) addresses the preferred sample size for selecting appropriate trip generation rates from those available in the *ITE Trip Generation Manual* (ITE, Ninth Edition, 2012):

- *If the number of data points is **one or two**, either (1) consider the use of a different independent variable and its associated data pages, or (2) collect local data and establish a local or consolidated rate. Refer to Chapter 9 for guidance.*
- *If the number of data points is **three, four, or five**, the analyst is encouraged to collect local data and establish a local or consolidated rate . . . [Emphasis not added]*

In summary, only if the sample size is six or more does the ITE handbook indicate that it is acceptable to proceed with the analysis. Obviously, a single data point is inadequate to represent a valid indication of the trip generation characteristics of any land use.

#### *B. Existing Gas Station is Not Comparable to Project*

We also question whether the existing Chevron station is sufficiently similar to the Project. For example, the Project includes over 3,200 SF for “truckers’ services.” This represents about one-quarter of the total square footage of the Project. Does the existing station include any such services? If not, then substantial questions could be raised regarding the appropriateness of the derived trip generation rates.

#### *C. Improper Trip Generation Analysis for Truckers’ Services and Restaurant*

Moreover, we note that the Project trip generation estimate presented in PEG Table 6 fails to account for the truckers’ services component of the Project. It seems to suggest that this activity is fully accounted for within the 3.00 trips per diesel fueling position trip rate, but this assumption is unsubstantiated. Similarly, the 2,400 SF mini-mart/convenience store oriented toward the truck/diesel fuel pumps is unaccounted for, as there is no certainty that the small trip rate directly associated with the diesel fuel pumps fully accounts for activity within the mini-mart. Ignoring these two key components of the Project will likely lead to underestimation of the Project’s trip generation, which could, in turn, result in understatement of the Project’s traffic impacts.

We also question the approach taken with regard to estimating the number of trips generated by the proposed 4,800 SF sit-down restaurant. For trip generation purposes, the size of the proposed restaurant has been arbitrarily reduced by 1,000 SF to reflect an apparent guess concerning the size of the existing Subway sandwich shop within the Chevron station where trip data was collected. In other words, the traffic analysis addresses a 3,800 SF restaurant, instead of the actual 4,800 SF facility. While the intent is to account for the fact that the Subway trips are included within the total number of trips counted at the Chevron driveway, the validity of the specific adjustment is not adequately demonstrated.

Further, the trip generation rate applied to the proposed restaurant, which was taken from the *ITE Trip Generation Manual*, is based on data collected at only three locations, with trip rates ranging from 9.79 to 43.20 trips per 1,000 SF. (For ease of reference, the pertinent page from the ITE document is presented here as Attachment B.) The PEG traffic study used the weighted average rate of 18.46 trips per 1,000 SF, which is less than half of the highest rate documented in the ITE publication. While we are not suggesting that the highest trip rate should be used, this

huge disparity among the highest, lowest, and average rates provides further evidence as to the importance of having an adequate sample size. As described above, the *ITE Trip Generation Handbook* calls for a minimum sample size of six data points. In fact, the excerpt presented in Attachment B contains the notation, “Caution – Use Carefully – Small Sample Size.”

Considering the two previous points, if the proposed restaurant generated trips at the highest rate documented in the *ITE Trip Generation Manual*, the resulting trip generation estimate would be 207 Sunday peak-hour trips instead of the 71 trips shown in PEG Table 6. While we again acknowledge that it might not be appropriate to employ the highest documented trip rate, insufficient data are available to ensure that the weighted average rate used in the analysis is meaningful.

#### *D. Internal Trip Reduction*

The PEG trip generation estimate also includes a 20 percent internal trip reduction, based on information presented in Tables 7.1 and 7.2 in Second Edition (June 2004) of the *ITE Trip Generation Handbook*. However, the only 20 percent values in the referenced tables are for trips from one retail use to another retail use in the weekday PM peak hour of adjacent street traffic. Of course, the PEG study addresses the Sunday peak hour, so it would appear that the assumed 20 percent value does not apply.

#### *E. Pass-by Trips*

Finally, the PEG analysis assumes that 15 percent of the trips at the Project will be “pass-by” trips; that is, they represent vehicles that were already passing by the site on Paul Negra Road, which enter the site rather than continuing on to the existing Chevron station. While the PEG study correctly recognizes that the standard pass-by trip rates documented in the *ITE Trip Generation Handbook* do not apply (because of the limited volume of traffic passing by the site), it does not adequately describe the derivation of or justify the use of the 15 percent value employed in the analysis.

In summary, we believe that the trip generation estimate prepared for the Project lacks credibility, as it is based on insufficient data. Further, several of the specific factors applied in developing the estimate have not been adequately substantiated and are, therefore, speculative. These numerous deficiencies raise significant questions regarding the validity of the Project trip generation estimate.

3. ***Project-Generated Vehicle Classification*** – Appendix A of the PEG traffic study report presents the results of vehicle classification counts performed in conjunction with the analysis. Such counts indicate the types and sizes of vehicles passing by the count location.

In addition, the peak-hour turning movement counts performed at the two study intersections indicated the truck percentages at those locations. At the Nees Avenue/I-5 Southbound Ramps intersection, 13.7 percent of the vehicles counted were trucks during the Sunday PM peak hour. At Nees Avenue/I-5 Northbound Ramps, 16.9 percent of the peak-hour vehicles were trucks.

Based on this, the PEG analysis applied a 17 percent “heavy vehicle” factor at both locations in the intersection level of service calculations; the same factor was applied for all analysis scenarios. This parameter is intended to reflect the reduced operating characteristics of trucks relative to passenger vehicles (e.g., slower acceleration, greater braking distances, etc.).

While this would seem to represent a conservative approach to consideration of truck traffic within the analysis, it fails to recognize that the Project is a “truck stop.” As such, a significant proportion of the traffic attracted to the Project will be trucks and other heavy vehicles (e.g., buses and recreation vehicles). This suggests that the truck percentage will be higher in the “with project” analysis scenarios than was found for existing conditions.

By using a consistent truck percentage in all analysis scenarios, the analysis fails to reflect the type of traffic to be generated by the Project, particularly with respect to increased truck volumes. In doing so, it understates the impacts of the Project at the study intersections.

4. **Project Traffic Assignment is Flawed** – Figure 5 in the PEG study illustrates the assignment of Project-generated trips to the study intersections. For ease of reference, that figure is presented here as Attachment C, with the total peak-hour volume of Project-generated traffic west of the Nees Avenue/I-5 Southbound Ramps intersection noted in red. As shown there, Figure 5 shows 223 westbound project trips traveling toward the Project site and 215 eastbound trips departing the Project site.

However, PEG Table 6 (p. 8), which summarizes the Project trip generation estimate employed in the analysis, shows that the Project is estimated to generate 228 inbound trips and 222 outbound trips. Consequently, the Project traffic assignment values shown in Figure 5 represent a shortage of 5 inbound trips and 7 outbound trips. This is summarized in Table 1 below.

Source	Project Trips		
	In	Out	Total
PEG Table 6 <sup>2</sup>	228	222	450
PEG Figure 5 <sup>3</sup>	223	215	438
Difference	5	7	12

Notes:

<sup>1</sup> Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016.

<sup>2</sup> Ibid., “Table 6 - Sunday Peak-Hour Project Trip Generation,” p. 8.

<sup>3</sup> Ibid., “Figure 5 - Sunday Peak-Hour Project Traffic Volumes,” p. 28.

Although these are seemingly small differences, the lack of consistency within the analysis is a concern, as it raises additional questions regarding the accuracy of the work. Furthermore, because the Project-related traffic volumes assigned to the study intersections are less than the actual estimate of Project-generated traffic, the impacts of the Project are understated.

5. **Pending Project Trip Generation Estimate** – PEG Table 7 (p. 9) presents the trip generation estimate for the one assumed pending project, a 2,000 SF fast food restaurant to be located north of the Project on Paul Negra Road. Similar to the Project, the estimate includes application of a 15 percent pass-by trip reduction. As noted in Comment 2.E. above (p. 4), this pass-by trip reduction factor is unsubstantiated.

6. **Cumulative Traffic Volumes** – The approach to estimating year 2037 traffic volumes is described at PEG p. 9:

*The Fresno Council of Governments (COG) maintains a travel model that is typically used to forecast future traffic volumes. The model predicts no growth in traffic volumes on Nees Avenue between 2015 and 2035. . . . Since some regional growth typically occurs, the analyses assume an annual growth rate of 1.0 percent applied to the existing traffic volumes through the year 2037.*

But this approach ignores the fact that traffic volumes on Paul Negra Road and Nees Avenue in the study area are directly linked to traffic volumes on I-5, as there are virtually no other land uses nearby to act as origins for trips using those roadways. In fact, at this time, virtually the only reason to be on Paul Negra Road is to travel to or from the existing Chevron station, and the bulk of the traffic doing so is oriented to/from I-5. This is confirmed by the Project trip distribution presented at PEG Figure 4, which shows 90 percent of the Project-related traffic being oriented to/from I-5. It is reasonable to expect that as traffic volumes on I-5 grow, so will traffic volumes on Paul Negra Road.

The primary source of information regarding projected traffic growth on I-5 is the *Interstate 5 Transportation Concept Report* (Caltrans, Office of System Planning, District 6, February 2013). That document provides daily and peak-hour traffic volume information for the years 2011, 2020, and 2035. For the segment of I-5 containing the Project (i.e., Segment 16, from Russell Avenue to the Merced County line), Table 2 summarizes the traffic volume information presented in Summary Chart 2A in the *Transportation Concept Report* (which is presented here as Attachment D).

Year	Annual Average Daily Traffic (AADT)			Peak Hour Traffic		
	Traffic Volume	Traffic Growth	Percent Growth <sup>2</sup>	Traffic Volume	Traffic Growth	Percent Growth <sup>2</sup>
2011	34,500	--	--	5,200	--	--
2020	49,700	15,200	44.1% (4.9%/Year)	7,500	2,300	44.2% (4.9%/Year)
2035	96,600	62,100	180.0% (7.5%/Year)	14,560	9,360	180.0% (7.5%/Year)

Notes:  
<sup>1</sup> Reference: Caltrans, Office of System Planning, District 6, *Interstate 5 Transportation Concept Report*, February 2013.  
<sup>2</sup> Overall growth percentage and average annual growth percentage (shown in parentheses).

For both daily and peak hour periods, Caltrans projects the volume on I-5 to grow by 180 percent between 2011 and 2035. Over that 24-year period, that equates to an annual growth rate of 7.5 percent. This is obviously considerably higher than the 1.0 percent per year assumption in the PEG traffic analysis.

Consequently, PEG's analysis substantially underestimated the year 2037 traffic volumes on Nees Avenue and Paul Negra Road. This will lead, in turn, to understatement of the vehicular delay values at the study intersections, so that no meaningful indication of the future level of service is provided for those locations. The degraded "no project" level of service that is certain to result from the use of more realistic future traffic estimates increases the probability that addition of the Project-generated traffic will result in a significant impact under Fresno County significance criteria. That is, as traffic increases on Nees Avenue and the I-5 freeway ramps, it becomes increasingly likely that the critical movements at the study intersections will operate at unacceptable levels of service and that addition of the Project traffic will cause the delays on those critical movements to increase by 5.0 seconds or more.

The analysis must be revised to reflect the level of traffic growth projected by Caltrans and to provide an accurate indication of the operating conditions at the study intersections.

7. **Cumulative Project Trip Generation** – The volume of Project-generated traffic is also directly linked to the volume of traffic on I-5, as 90 percent of the vehicles traveling to or from the Project originate on I-5, according to the PEG study. Because of the extremely rural nature of the area surrounding the project site, virtually no one is on Paul Negra Road unless they are passing by on I-5 and need fuel or food.

This direct linkage between I-5 and Project-related traffic volumes means that as traffic grows on I-5, the Project will attract more patrons. The PEG traffic analysis, though, assumes that Project-generated traffic will not change over time, no matter how many potential patrons are passing by the site on I-5. This assumption is illogical and inappropriate. If, as described above, the pool of potential patrons increases at an average rate of 7.5 percent per year, it is reasonable to expect that the number of customers at the Project will increase at approximately the same rate. This suggests that between now and the year 2037, traffic at the Project (and, therefore, at the study intersections) will increase by 150 percent (i.e., 20 years at an average rate of 7.5 percent per year).

Because the Project trip generation has been underestimated, the cumulative traffic impacts of the Project have been substantially understated. A revised traffic analysis must be prepared, which more accurately reflects the future volume of traffic at the Project.

8. **Queue Length Results Are Not Credible** – Table 10 (p. 10) in the PEG report provides the "Intersection Queuing Summary" for Existing Conditions. At the Nees Avenue/I-5 Southbound Ramps intersection, the table indicates a 13-foot queue on the southbound approach. At the Nees Avenue/Northbound Ramps intersection, a 5-foot queue is shown on the eastbound approach and a 10-foot queue on the northbound approach.

These results lack credibility, as there are no vehicles on the American road system that are as little as 5, 10, or even 13 feet long. Similar errors are evident in PEG Table 11 (p. 10), which presents the Existing Plus Project queue lengths (13 feet, for example). Even the Cumulative 2037 With Project queue lengths presented in PEG Table 14 (p. 11) are as short as 15 feet (on the eastbound approach at Nees Avenue/I-5 Northbound Ramps).

We note that the "passenger car" design vehicle designated in Exhibit 2-3 (p. 21) in the document, *A Policy on Geometric Design of Highways and Streets* (American Association of State Highway and Transportation Officials, 2004) is 19-feet long. According to the User Guide for the Synchro 9 software used to calculate the intersection levels of service, the standard

convention is to assume that a passenger car in a queue consumes 25 feet. (Reference: Trafficware, *Synchro Studio 9 User Guide*, August 18, 2015)

Of course, as noted in the PEG traffic study, 17 percent of the existing traffic at the study intersections consists of trucks. According to Caltrans, trucks are as long as 72 feet. (Reference: Caltrans, *Highway Design Manual*, May 7, 2012, Figures 404.5A and 404.5B, pp. 400-15 and 400-16) Such a vehicle would consume at least 75 feet in a queue.

Claiming that the queues associated with development of the Project will be less than the length of an average passenger car represents a substantial deficiency in the analysis. Such an irrational result raises questions regarding the credibility of the analysis as a whole.

9. **Project Driveway Operations** – Four driveways are planned to serve the Project, all of which will be on Paul Negra Road. Page 1 of the PEG traffic report says that:

*The southernmost driveway will be the first driveway encountered by vehicles driving from the interchange and will be an entrance only for trucks only.*

Recognizing that a large proportion of the patrons at the Project will be first-time or, perhaps, occasional visitors, it is unclear how the restrictions described here will be enforced or controlled.

Passenger car drivers approaching the site from I-5 will naturally be inclined to enter at the first available opportunity, as they will be unfamiliar with the layout of the project. Review of the Project site plan suggests that such drivers might have difficulty finding their way to the automobile fuel pumps. What will be the effect of mixing confused automobile drivers with the large number of trucks expected on-site?

Moreover, we note that no analysis was presented in the PEG study to address traffic operations at the four driveways. Such an analysis would, at a minimum, address the following questions:

- How long will delays be for drivers exiting the site?
- How long will queues be for both entering and exiting traffic?
- Is there adequate sight distance at the driveways to ensure safe operation for entering and exiting drivers?

The failure to provide such an analysis is a substantial deficiency in the analysis, which must be revised to provide pertinent information.

10. **Freeway Merge/Diverge Analyses** – Two issues afflict the analysis of freeway merge and diverge areas. The results of those analyses are summarized in PEG Table 17 (p. 19).

First, the analysis results are inadequately documented, as follows:

- No analysis results are shown for Near-Term No Project conditions, so it is impossible to determine the incremental impact of the Project in the near-term scenario.
- Although levels of service (LOS) are presented, the traffic density values that lead to determination of the LOS are not. Again, this makes it impossible to identify the specific incremental impact of the Project.

The second issue is that the analysis results are wrong. Review of the merge/diverge calculations presented in PEG Appendix F reveals that the addition of the project traffic results in lower density values at the two off-ramps than under “no project” conditions (i.e., the additional traffic results in improved operations). This is true for both Existing Plus Project and Cumulative Plus Project conditions. (Because Near-Term No Project results were not provided, it is not possible to establish whether this issue applies to that time frame, as well.) To illustrate this point, we have prepared Table 3, which presents the detailed density values for existing and cumulative conditions, both with and without the Project.

We have highlighted in yellow the cells within the table that indicate improved operations following the addition of Project-generated traffic. This result is illogical and should have represented a red flag for the analyst that something is wrong.

Ramp	Existing		Existing Plus Project		2037 No Project		2037 Plus Project	
	Density <sup>2</sup>	LOS <sup>3</sup>	Density	LOS	Density	LOS	Density	LOS
NB Off-Ramp	32.5	D	31.3	D	72.9	F	71.7	F
NB On-Ramp	29.0	D	29.0	D	65.7	F	65.7	F
SB Off-Ramp	26.8	C	25.7	C	61.8	F	60.6	F
SB On-Ramp	22.9	C	22.9	C	54.5	F	54.5	F

Notes:

<sup>1</sup> Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016, Table 17, p. 19.

<sup>2</sup> Passenger cars/mile/lane.

<sup>3</sup> Level of service.

The analysis results presented above are incorrect because the traffic volumes used in the analyses are wrong. The procedures for evaluating the merge (i.e., on-ramp) and diverge (i.e., off-ramp) areas are presented in Chapter 13 of the *Highway Capacity Manual 2010* (Transportation Research Board, Fifth Edition, December 2010). Exhibit 13-4 (p. 13-8) in that document provides a flow chart summarizing the analysis procedures for on- and off-ramps. With respect to off-ramps, Step 2 is to:

*Compute demand flow rate [i.e., traffic volume] in Lanes 1 and 2 immediately upstream of the diverge influence area.*

In other words, the critical freeway volume for analysis of the off-ramps is the volume just prior to reaching the off-ramp; it includes the traffic that will be exiting the freeway. (The second key volume parameter is the amount of traffic actually using the ramp to exit the freeway.)

In this case, the freeway volume upstream of the off-ramp is unchanged by implementation of the Project. In fact, no Project traffic is added to the freeway, as it is all derived from traffic already on I-5. For that reason, the freeway traffic volumes in all of the off-ramp analyses should be the same; only the off-ramp volumes will change as additional drivers choose to exit the freeway for fuel or food at the Project.

However, that is not how the off-ramp analyses were performed. Instead, the freeway volumes used in the analyses were derived by subtracting the additional off-ramp traffic from the freeway volume. To illustrate this, Table 4 summarizes the values used in the analysis, as well as the correct values, for Existing and Existing Plus Project conditions.

<b>Table 4</b>				
<b>Diverge Analysis Traffic Volumes<sup>1</sup></b>				
<b>Existing Conditions</b>				
	Northbound Off-Ramp		Southbound Off-Ramp	
	Existing	Existing Plus Project	Existing	Existing Plus Project
Off-Ramp Volume	75	175 (+100)	83	183 (+100)
Freeway Volume As Analyzed	2,514	2,414 (-100)	2,032	1,932 (-100)
Correct Freeway Volume	2,514	2,514	2,032	2,032
Notes:				
<sup>1</sup> Reference: Peters Engineering Group, <i>Traffic Impact Analysis – Proposed E-Z Trip Travel Center</i> , November 16, 2016, Appendix F.				

Table 5 shows similar information for cumulative conditions.

<b>Table 5</b>				
<b>Diverge Analysis Traffic Volumes<sup>1</sup></b>				
<b>Cumulative Conditions</b>				
	Northbound Off-Ramp		Southbound Off-Ramp	
	Cumulative No Project	Cumulative Plus Project	Cumulative No Project	Cumulative Plus Project
Off-Ramp Volume	102	202 (+100)	119	219 (+100)
Freeway Volume As Analyzed	5,940	5,840 (-100)	5,000	4,900 (-100)
Correct Freeway Volume	5,940	5,940	5,000	5,000
Notes:				
<sup>1</sup> Reference: Peters Engineering Group, <i>Traffic Impact Analysis – Proposed E-Z Trip Travel Center</i> , November 16, 2016, Appendix F.				

Although we have focused on the off-ramp analyses, the freeway volumes employed in the on-ramp analyses are also flawed, although not to the same extent.

In summary, because the “with project” freeway volumes used in the merge/diverge analyses are wrong, the analysis results are wrong and misleading. Consequently, there is no certainty that the conclusion presented in the PEG report (p. 19) is valid. That conclusion states that:

*The construction of the Project and pending project is not expected to cause a reduction in the LOS. Therefore, the Project does not cause a significant impact with respect to merging and diverging at the ramps.*

We should also note that this conclusion seems to reflect a misinterpretation of the Caltrans significance standard for facilities that operate at deficient levels of service under “no project” conditions. That standard is presented at page 1 in the *Caltrans Guide for the Preparation of Traffic Impact Studies* (December 2002):

*If an existing State highway facility is operating at less than the appropriate target LOS, the existing MOE [Measure of Effectiveness] should be maintained.*

In this case, the MOE (as described above) is density and the target LOS is the transition between LOS C and LOS D (PEG, p. 5). As shown in Table 3 above (and PEG Table 17, p. 19), all of the ramps will operate at LOS F in 2037, both with and without the Project, thereby falling short of the target LOS. Thus, if addition of the Project-generated traffic were to cause an increase in density (i.e., cause the MOE not to be maintained), then a significant impact would occur. This will not be known until the merge/diverge calculations are corrected, as described above.

Therefore, as noted above, the PEG conclusion with respect to impacts related to merging and diverging at the ramps is incorrect. Until the analysis has been corrected to incorporate accurate freeway traffic volumes, the extent of any Project-related impact will be unknown.

Finally, review of the freeway traffic volumes shown in Tables 4 and 5 above reveals one interesting side note. Comparison of the Existing volumes and the Cumulative No Project volumes indicates that substantial traffic growth was assumed, as suggested in our earlier comments. Specifically, at the northbound off-ramp, the increase in traffic from 2,514 “Existing” vehicles (see Table 4) to 5,940 “Cumulative No Project” vehicles (see Table 5) represents growth of 136 percent between now and 2037. In the southbound direction, growth from 2,032 “Existing” vehicles (see Table 4) to 5,000 “Cumulative No Project” vehicles (see Table 5) indicates a 146 percent increase.

Although these factors are slightly lower than indicated in the *Interstate 5 Transportation Concept Report*, they generally confirm our point regarding the magnitude of future traffic on I-5, which we assert will lead to greater traffic on Nees Avenue and Paul Negra Road as well as greater patronage at the Project, neither of which has been accounted for in the PEG analysis.

11. **Traffic Index Analysis** – According to the PEG report (p. 21):

*The Project is expected to cause the traffic index to increase by a significant amount on Nees Avenue between the Project site and the I-5 northbound ramps. Mitigation will include pavement improvements on Nees Avenue.*

The report fails to state the Project responsibility for this mitigation measure. Is the Project fully responsible for the cost of the required pavement improvements? This must be clarified.

**CONCLUSION**

Our review of the traffic impact study prepared for the proposed E-Z Trip Travel Center project on Paul Negra Road in Fresno County, California revealed several issues affecting the validity of the conclusions presented in that document. A modified traffic impact analysis must be prepared.

We hope this information is useful. If you have questions concerning anything presented here, please feel free to contact me at (916) 783-3838.

Sincerely,

**MRO ENGINEERS, INC.**



Neal K. Liddicoat, P.E.  
Traffic Engineering Manager

cc: Mr. David H. McCray, Beveridge & Diamond, P.C.  
Ms. Kaitlyn D. Shannon, Beveridge & Diamond, P.C.



**ATTACHMENT A**  
**TRAFFIC COUNT SUMMARY TABLE**

**ATTACHMENT A  
EXISTING TRAFFIC COUNTS  
September 16 & 18, 2016**

TIME	WEST OF I-5 INTERCHANGE						BETWEEN THE I-5 RAMPS		
	FRIDAY			SUNDAY			FRIDAY		
	EB	WB	TOTAL	EB	WB	TOTAL	EB	WB	TOTAL
Mid	28	38	66	24	23	47	39	32	71
1:00	21	16	37	17	16	33	22	12	34
2:00	28	24	52	20	16	36	29	18	47
3:00	18	27	45	12	11	23	21	21	42
4:00	31	16	47	13	13	26	28	9	37
5:00	23	22	45	3	7	10	27	14	41
6:00	25	23	48	12	15	27	46	17	63
7:00	32	32	64	30	33	63	58	19	77
8:00	44	45	89	31	30	61	55	20	75
9:00	45	63	108	35	40	75	58	51	109
10:00	58	54	112	49	61	110	54	30	84
11:00	60	56	116	100	94	194	89	27	116
Noon	64	68	132	91	81	172	92	34	126
1:00	67	64	131	67	77	144	115	35	150
2:00	69	77	146	79	90	169	110	50	160
3:00	89	81	170	110	103	213	138	58	196
4:00	73	85	158	99	105	204	149	45	194
5:00	88	69	157	109	89	198	153	47	200
6:00	62	68	130	83	98	181	136	29	165
7:00	75	83	158	92	77	169	111	45	156
8:00	71	61	132	65	64	129	77	31	108
9:00	58	62	120	51	49	100	66	30	96
10:00	46	39	85	36	36	72	118	27	145
11:00	41	42	83	50	58	108	56	30	86
<b>TOTAL</b>	<b>1,216</b>	<b>1,215</b>	<b>2,431</b>	<b>1,278</b>	<b>1,286</b>	<b>2,564</b>	<b>1,847</b>	<b>731</b>	<b>2,578</b>

<<== Analyzed

**ATTACHMENT B**

**HIGH TURNOVER (SIT-DOWN) RESTAURANT TRIP GENERATION  
SUNDAY PEAK HOUR OF GENERATOR**

**(Reference: Institute of Transportation Engineers,  
*Trip Generation Manual*, Ninth Edition, 2012.)**

# High-Turnover (Sit-Down) Restaurant (932)

**Average Vehicle Trip Ends vs: 1000 Sq. Feet Gross Floor Area**  
**On a: Sunday,**  
**Peak Hour of Generator**

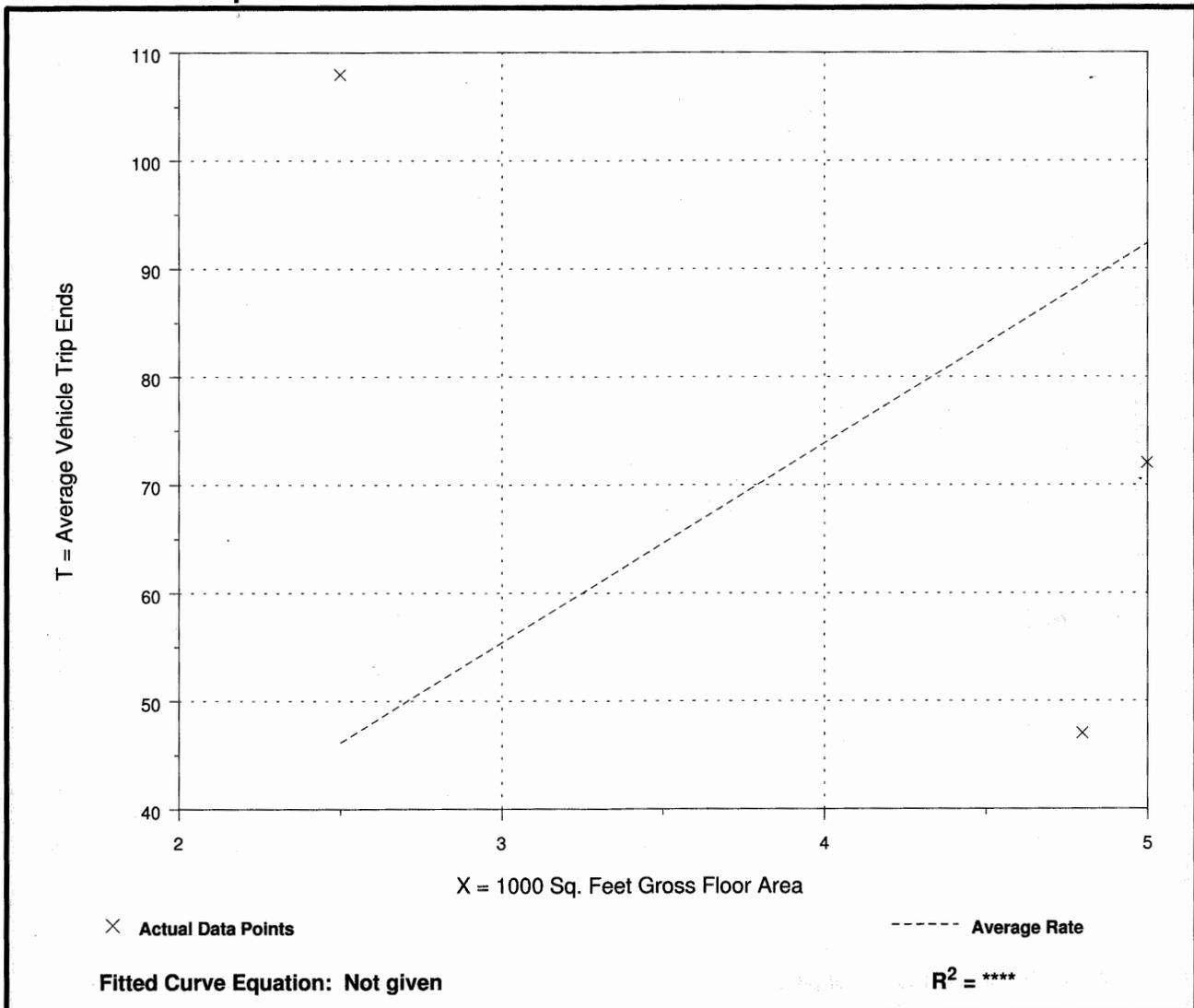
Number of Studies: 3  
 Average 1000 Sq. Feet GFA: 4  
 Directional Distribution: 55% entering, 45% exiting

## Trip Generation per 1000 Sq. Feet Gross Floor Area

Average Rate	Range of Rates	Standard Deviation
18.46	9.79 - 43.20	13.74

## Data Plot and Equation

*Caution - Use Carefully - Small Sample Size*



# TRIP GENERATION MANUAL

9th Edition • Volume 3: Data

## Trip Generation Rates, Plots and Equations

- Institutional (Land Uses 500–599)
- Medical (Land Uses 600–699)
- Office (Land Uses 700–799)
- Retail (Land Uses 800–899)
- Services (Land Uses 900–999)

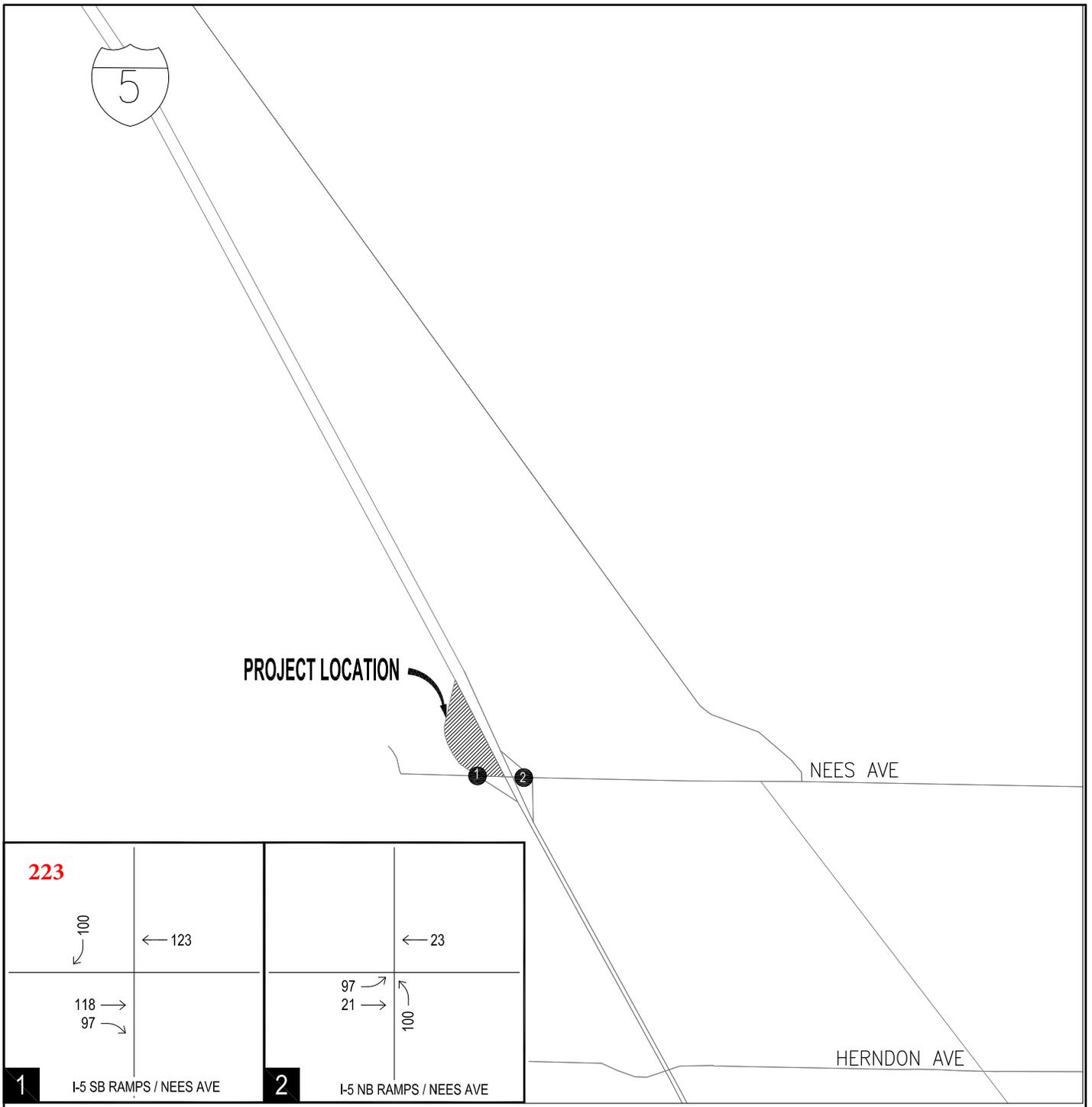


Institute of Transportation Engineers

**ATTACHMENT C**

**FIGURE 5 – SUNDAY PEAK-HOUR PROJECT TRAFFIC VOLUMES**

**(Reference: Peters Engineering Group, *Traffic Impact Analysis – Proposed E-Z Trip Travel Center*, November 16, 2016)**

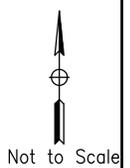


<b>215</b>	<b>223</b>				
	100 ↙ ← 123			← 23	
	118 → 97 ↘		97 ↗ 21 →		↖ 100
	<b>1</b>	<b>2</b>			
	I-5 SB RAMPS / NEES AVE	I-5 NB RAMPS / NEES AVE			

- LEGEND**
- ⊗ STUDY AREA INTERSECTIONS
  - XX SUNDAY PM VOLUMES
  - ▨ PROJECT SITE

Proposed E-Z Trip Travel Center  
Fresno County, California

**SUNDAY PEAK-HOUR PROJECT TRAFFIC VOLUMES**



**M R O**



**ENGINEERS**

**ATTACHMENT D**

**SUMMARY CHART 2A**

**(Reference: Caltrans, Office of System Planning, District 6,  
*Interstate 5 Transportation Concept Report*, February 2013.)**



Interstate

LEGEND

**Existing Lanes**

**Planned or Programmed by 2035**

**Add Through Lanes**

**Add Auxiliary Lanes**

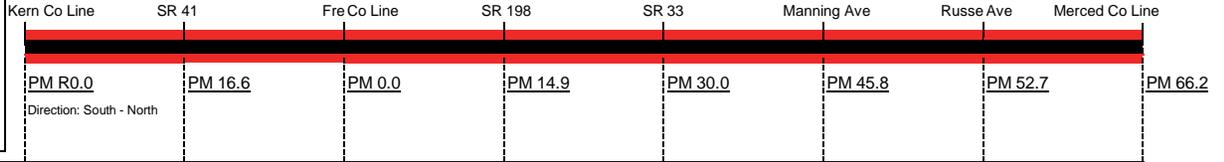
**Freeway**

**Number of Lanes**

4

8

\* Length of segments not to scale



**Segment:** Is self-explanatory except for several data sets:

**Rural/Urban:** Indicates whether the segment is in a rural area or city limits.

**Terrain:** Shows the general highway grade: minimal grade = level; moderate grade = rolling; and severe grade = mountainous.

**ROW:** Portrays Right-of-Way (ROW) and geometric data in feet.

**Shoulder Range:** Is a range of treated surface (8' standard), both inside and outside shoulders.

**Ultimate Transportation Corridor (UTC):** Is the typical ROW needed for the ultimate facility, i.e., 8 lane freeway(8F) 218 feet is the standard typical UTC ROW - will be updated upon corridor plan lining by specific sections of highway.

**Facility:** Shows the Existing Facility, the desired facility type (2035 Concept) by 2035- RTPA's and Caltrans, and the Ultimate Facility to preserve ROW and plan line beyond 2035. 2C(I) indicates that the highway has been improved in select locations with operational or safety improvements.

**LOS:** The current (2011) LOS (level of service), along with the expected calculated LOS in 2020 and 2035. The 2035 Concept is the target LOS desired, i.e., LOS C, for attainment by 2035 Caltrans.

**Deficiency:** Occurs when the target LOS is degraded, i.e., LOS D worse than LOS C, with the year of occurrence shown. It also shows whether a capacity improving project is in the STIP, and what the LOS would be with the 2035 Concept improvement.

**Directional Split:** Denotes the split in the peak hour traffic flow on a directional basis (NB/SB or WB/EB) either in the morning (AM) or evening (PM).

**AUX++** Auxiliary lanes are Truck Climbing lanes.

**AAADT:** signifies Annual Average Daily Traffic.

**Peak Hour:** Indicates a representation of the maximum hour of traffic flow during the day.

(-) Deficient with Improvement

**N/A\*** - Deficient, no project recommended.

+ The Ultimate ROW is generally the same as the existing ROW

**99P** Median is variable width greater than 100 feet

\* Concept Facility meets Concept LOS.

SEGMENT	10	11	12	13	14	15	16
County / Interstate	KINGS / 5	KINGS / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5	FRESNO / 5
Description Begin	KERN CO LINE	SR 41 SEPARATION	KINGS CO LINE	SR 198 SEPARATION	SR 33 SEPARATION	MANNING AVE	RUSSELL AVE
Description End	SR 41 SEPARATION	FRESNO CO LINE	SR 198 SEPARATION	SR 33 SEPARATION	MANNING AVE	RUSSELL AVE	MERCED COUNTY LINE
Postmile Limits Begin/End (PM)	R0.0 / 16.6	16.6 / 26.7	0.0 / 14.9	14.9 / 30.0	30.0 / 45.8	45.8 / 52.7	52.7 / 66.2
Length (MI)	16.6	10.1	14.9	15.1	15.8	6.9	13.5
Rural / Urban	Rural	Rural	Rural	Rural	Rural	Rural	Rural
Terrain	Flat	Flat	Flat	Flat	Flat	Flat	Flat
ROW: Range Existing (FT)	208 / 208	208 / 240	208 / 208	208 / 208	208 / 208	208 / 208	208 / 208
Median Range (FT)	84 / 84	74 / 84	82 / 84	84 / 99P	84 / 99P	84 / 84	84 / 84
Shoulder Range (FT) - Treated	5 / 10	5 / 10	10 / 10	2 / 10	5 / 10	5 / 10	5 / 10
Lane Width (FT)	12	12	12	12	12	12	12
Ultimate ROW (FT)	+	+	+	+	+	+	+
Facility: Existing	4F	4F	4F	4F	4F	4F	4F
2035 Concept	6F	6F	6F	6F	6F	6F	6F
UTC	8F	8F	8F	8F	8F	8F	8F
LOS: 2011	C	C	C	C	C	C	C
LOS: 2020	D	D	D	E	D	D	D
LOS: 2035	F	F	F	F	F	F	F
LOS: Concept 2035	C	C	C	C	C	C	C
Deficiency/Year Deficient Project in STIP/RTP (Y/N)	2020	2020	2020	2020	2020	2020	2020
LOS W/ Concept Improvement	No	No	No	No	No	No	No
Directional Split (Peak Hour)	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*	N/A*
AAADT: 2011	52/48	52/48	52/48	52/48	52/48	52/48	55/45
AAADT: 2020	32,500	33,500	33,500	34,000	33,500	33,000	34,500
AAADT: 2035	45,300	47,800	47,800	50,800	47,800	47,100	49,700
Peak Hour: 2011	68,500	74,400	74,400	83,800	74,400	73,300	96,600
Peak Hour: 2020	5,200	5,400	5,400	5,500	4,800	5,100	5,200
Peak Hour: 2035	7,240	7,700	7,700	9,080	6,840	7,270	7,500
% Trucks: AADT	10,960	11,990	11,990	15,070	10,660	11,330	14,560
% Trucks: Peak Hour	30%	30%	30%	30%	30%	30%	30%
	7%	7%	8%	8%	8%	8%	8%

## ATTACHMENT 2



In applying Equation 19-66 and Equation 19-67, the delay for all Rank 1 major-street movements is assumed to be 0 s/veh. LOS is not defined for an overall intersection because major-street movements with 0 s of delay typically result in a weighted average delay that is extremely low. As such, total intersection control delay calculations are typically used only when comparing control delay among different types of traffic control, such as two-way STOP control versus all-way STOP control.

### Step 13: Compute 95th Percentile Queue Lengths

Queue length is an important consideration at unsignalized intersections. Theoretical studies and empirical observations have demonstrated that the probability distribution of queue lengths for any minor movement at an unsignalized intersection is a function of the capacity of the movement and the volume of traffic being served during the analysis period. Equation 19-68 can be used to estimate the 95th percentile queue length for any minor movement at an unsignalized intersection during the peak 15-min period on the basis of these two parameters as follows (9):

Equation 19-68

$$Q_{95} \approx 900T \left[ \frac{v_x}{c_{m,x}} - 1 + \sqrt{\left( \frac{v_x}{c_{m,x}} - 1 \right)^2 + \frac{\left( \frac{3,600}{c_{m,x}} \right) \left( \frac{v_x}{c_{m,x}} \right)}{150T}} \right] \left( \frac{c_{m,x}}{3,600} \right)$$

where

$Q_{95}$  = 95th percentile queue (veh),

$v_x$  = flow rate for movement  $x$  (veh/h),

$c_{m,x}$  = capacity of movement  $x$  (veh/h), and

$T$  = analysis time period (0.25 h for a 15-min period) (h).

The mean queue length is computed as the product of the average delay per vehicle and the flow rate for the movement of interest. The expected total delay (vehicle hours per hour) equals the expected number of vehicles in the average queue; that is, the total hourly delay and the average queue are numerically identical. For example, four vehicle hours per hour of delay can be used interchangeably with an average queue length of four vehicles during the hour.

### PEDESTRIAN MODE

The TWSC intersection methodology for the pedestrian mode is applied through a series of steps requiring input data related to vehicle and pedestrian volumes, geometric conditions, and motorist yield rates to pedestrians. These data are used to calculate the average pedestrian delay associated with pedestrian crossings of unsignalized and non-STOP-controlled roadways. The required steps are illustrated in Exhibit 19-16.

## ATTACHMENT 3



## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2016

Project Description Existing Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	600	<input type="checkbox"/> No <input checked="" type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2439	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	116	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2439	0.95	Level	23	3	0.809	0.95	3340
Ramp	116	0.85	Level	15	3	0.865	0.95	166
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)	P <sub>FD</sub> = using Equation (Exhibit 13-7)
V <sub>12</sub> = 3340 pc/h	V <sub>12</sub> = pc/h
V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> = pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

Actual	Capacity	LOS F?	Actual	Capacity	LOS F?
V <sub>FO</sub>	3506	Exhibit 13-8	No	V <sub>F</sub>	Exhibit 13-8
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	Exhibit 13-8
				V <sub>R</sub>	Exhibit 13-10

### Flow Entering Merge Influence Area

Actual	Max Desirable	Violation?	Actual	Max Desirable	Violation?
V <sub>R12</sub>	3506	Exhibit 13-8	4600:All	No	

### Flow Entering Diverge Influence Area

Level of Service Determination (if not F)	Level of Service Determination (if not F)
$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D <sub>R</sub> = 29.0 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)

### Speed Determination

M <sub>S</sub> = 0.409 (Exhibit 13-11)	D <sub>S</sub> = (Exhibit 13-12)
S <sub>R</sub> = 61.5 mph (Exhibit 13-11)	S <sub>R</sub> = mph (Exhibit 13-12)
S <sub>0</sub> = N/A mph (Exhibit 13-11)	S <sub>0</sub> = mph (Exhibit 13-12)
S = 61.5 mph (Exhibit 13-13)	S = mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Existing Plus Project Conditions

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =        ft V <sub>u</sub> =        veh/h	Freeway Number of Lanes, N        2 Ramp Number of Lanes, N            1 Acceleration Lane Length, L <sub>A</sub> 600 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> 2342 Ramp Volume, V <sub>R</sub> 213 Freeway Free-Flow Speed, S <sub>FF</sub> 75.0 Ramp Free-Flow Speed, S <sub>FR</sub> 35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =        ft V <sub>D</sub> =        veh/h	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2342	0.95	Level	23	3	0.809	0.95	3207
Ramp	213	0.85	Level	15	3	0.865	0.95	305
UpStream								
DownStream								

Merge Areas

Diverge Areas

### Estimation of v<sub>12</sub>

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 3207 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> =        pc/h V <sub>3</sub> or V <sub>av34</sub> =        pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>	3512	Exhibit 13-8	No
		Exhibit 13-8	
		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>	3512	Exhibit 13-8    4600:All	No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D <sub>R</sub> = 29.0 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = 0.410 (Exhibit 13-11) S <sub>R</sub> = 61.5 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 61.5 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Near-Term Plus Project Conditions

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =        ft V <sub>u</sub> =        veh/h	Freeway Number of Lanes, N        2 Ramp Number of Lanes, N            1 Acceleration Lane Length, L <sub>A</sub> 600 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> 2325 Ramp Volume, V <sub>R</sub> 238 Freeway Free-Flow Speed, S <sub>FF</sub> 75.0 Ramp Free-Flow Speed, S <sub>FR</sub> 35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =        ft V <sub>D</sub> =        veh/h	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2325	0.95	Level	23	3	0.809	0.95	3184
Ramp	238	0.85	Level	15	3	0.865	0.95	341
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 3184 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> =        pc/h V <sub>3</sub> or V <sub>av34</sub> =        pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V <sub>FO</sub>	3525	Exhibit 13-8	No	V <sub>F</sub>		Exhibit 13-8	
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8	
				V <sub>R</sub>		Exhibit 13-10	

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V <sub>R12</sub>	3525	Exhibit 13-8	4600:All	No	V <sub>12</sub>	Exhibit 13-8	

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 v_{12} - 0.00627 L_A$ D <sub>R</sub> = 29.1 (pc/mi/ln) LOS = D (Exhibit 13-2)	$D_R = 4.252 + 0.0086 v_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
--	---

### Speed Determination Speed Determination

M <sub>S</sub> = 0.411 (Exhibit 13-11) S <sub>R</sub> = 61.4 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 61.4 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 No-Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	600	<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	5838	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	154	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	5838	0.95	Level	23	3	0.809	0.95	7995
Ramp	154	0.85	Level	15	3	0.865	0.95	220
UpStream								
DownStream								

Merge Areas Diverge Areas

### Estimation of v<sub>12</sub>

Merge Areas	Diverge Areas
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)	P <sub>FD</sub> = using Equation (Exhibit 13-7)
V <sub>12</sub> = 7995 pc/h	V <sub>12</sub> = pc/h
V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = 7995 pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V <sub>FO</sub>	8215	Exhibit 13-8	Yes	V <sub>F</sub>	Exhibit 13-8		
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	Exhibit 13-8		
				V <sub>R</sub>	Exhibit 13-10		

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V <sub>R12</sub>	8215	Exhibit 13-8	4600:All	Yes	V <sub>12</sub>	Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 65.7 (pc/mi/ln) LOS = F (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = 14.693 (Exhibit 13-11) S <sub>R</sub> = -409.9 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = -409.9 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 With-Project Conditions

### Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, $L_A$	600	<input type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length $L_D$		$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, $V_F$	5741	$V_D =$ veh/h
	Ramp Volume, $V_R$	251	
	Freeway Free-Flow Speed, $S_{FF}$	75.0	
	Ramp Free-Flow Speed, $S_{FR}$	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	5741	0.95	Level	23	3	0.809	0.95	7862
Ramp	251	0.85	Level	15	3	0.865	0.95	359
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 $L_{EQ} =$   
 $P_{FM} = 1.000$  using Equation (Exhibit 13-6)  
 $V_{12} = 7862$  pc/h  
 $V_3$  or  $V_{av34} = 0$  pc/h (Equation 13-14 or 13-17)  
 Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No  
 Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No  
 If Yes,  $V_{12a} = 7862$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 $L_{EQ} =$   
 $P_{FD} =$  using Equation (Exhibit 13-7)  
 $V_{12} =$  pc/h  
 $V_3$  or  $V_{av34} =$  pc/h (Equation 13-14 or 13-17)  
 Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No  
 Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No  
 If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
$V_{FO}$	8221	Exhibit 13-8	Yes	$V_F$	Exhibit 13-8		
				$V_{FO} = V_F - V_R$	Exhibit 13-8		
				$V_R$	Exhibit 13-10		

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	8221	Exhibit 13-8	4600:All Yes

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 $D_R = 65.7$  (pc/mi/ln)  
 LOS = F (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 $D_R =$  (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Speed Determination

$M_S = 14.780$  (Exhibit 13-11)  
 $S_R = -412.7$  mph (Exhibit 13-11)  
 $S_0 =$  N/A mph (Exhibit 13-11)  
 $S = -412.7$  mph (Exhibit 13-13)

### Speed Determination

$D_S =$  (Exhibit 13-12)  
 $S_R =$  mph (Exhibit 13-12)  
 $S_0 =$  mph (Exhibit 13-12)  
 $S =$  mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2016

Project Description Existing Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> On
<input type="checkbox"/> No <input checked="" type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	600	<input type="checkbox"/> No <input checked="" type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	1949	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	32	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1949	0.95	Level	23	3	0.809	0.95	2669
Ramp	32	0.85	Level	15	3	0.865	0.95	46
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)	P <sub>FD</sub> = using Equation (Exhibit 13-7)
V <sub>12</sub> = 2669 pc/h	V <sub>12</sub> = pc/h
V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> = pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual			Capacity			LOS F?
V <sub>FO</sub>	2715	Exhibit 13-8		No	V <sub>F</sub>	Exhibit 13-8	
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	Exhibit 13-8	
					V <sub>R</sub>	Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>	2715	Exhibit 13-8	4600:All No

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 22.9 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = 0.338 (Exhibit 13-11) S <sub>R</sub> = 63.8 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 63.8 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information	Site Information
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Analyst	JR	Freeway/Dir of Travel	I-5 SB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Existing Plus Project Conditions

### Inputs

Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =        ft V <sub>u</sub> =        veh/h	Freeway Number of Lanes, N        2 Ramp Number of Lanes, N            1 Acceleration Lane Length, L <sub>A</sub> 600 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> 1852 Ramp Volume, V <sub>R</sub> 129 Freeway Free-Flow Speed, S <sub>FF</sub> 75.0 Ramp Free-Flow Speed, S <sub>FR</sub> 35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =        ft V <sub>D</sub> =        veh/h
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### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1852	0.95	Level	23	3	0.809	0.95	2536
Ramp	129	0.85	Level	15	3	0.865	0.95	185
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
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$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 2536 pc/h V <sub>3</sub> or V <sub>av34</sub> = 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> =        pc/h V <sub>3</sub> or V <sub>av34</sub> =        pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)
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Capacity Checks	Capacity Checks
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	Actual		Capacity		LOS F?
V <sub>FO</sub>	2721	Exhibit 13-8	4600:All	No	V <sub>F</sub>
					V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>
					V <sub>R</sub>

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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		Actual	Max Desirable	Violation?
	V <sub>R12</sub>	2721	Exhibit 13-8    4600:All	No

Level of Service Determination (if not F)	Level of Service Determination (if not F)
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$D_R = 5.475 + 0.00734 V_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 22.9 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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Speed Determination	Speed Determination
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M <sub>S</sub> = 0.338 (Exhibit 13-11) S <sub>R</sub> = 63.8 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 63.8 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Near-Term Plus Project Conditions

Inputs			
Upstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>up</sub> =        ft V <sub>u</sub> =        veh/h	Freeway Number of Lanes, N        2 Ramp Number of Lanes, N            1 Acceleration Lane Length, L <sub>A</sub> 600 Deceleration Lane Length L <sub>D</sub> Freeway Volume, V <sub>F</sub> 1824 Ramp Volume, V <sub>R</sub> 157 Freeway Free-Flow Speed, S <sub>FF</sub> 75.0 Ramp Free-Flow Speed, S <sub>FR</sub> 35.0	Downstream Adj Ramp <input type="checkbox"/> Yes <input type="checkbox"/> On <input type="checkbox"/> No <input type="checkbox"/> Off L <sub>down</sub> =        ft V <sub>D</sub> =        veh/h	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	1824	0.95	Level	23	3	0.809	0.95	2498
Ramp	157	0.85	Level	15	3	0.865	0.95	225
UpStream								
DownStream								

Merge Areas

Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7) L <sub>EQ</sub> = P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6) V <sub>12</sub> = 2498 pc/h V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13) L <sub>EQ</sub> = P <sub>FD</sub> = using Equation (Exhibit 13-7) V <sub>12</sub> = pc/h V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17) Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, V <sub>12a</sub> =        pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?
V <sub>FO</sub>	2723	Exhibit 13-8	No	V <sub>F</sub>		Exhibit 13-8	
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>		Exhibit 13-8	
				V <sub>R</sub>		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?
V <sub>R12</sub>	2723	Exhibit 13-8	4600:All	No	V <sub>12</sub>	Exhibit 13-8	

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>	Exhibit 13-8		

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 22.8 (pc/mi/ln) LOS = C (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = 0.338 (Exhibit 13-11) S <sub>R</sub> = 63.8 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = 63.8 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 No-Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input checked="" type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> On
<input checked="" type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>	600	<input checked="" type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>		L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	4881	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	60	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	4881	0.95	Level	23	3	0.809	0.95	6685
Ramp	60	0.85	Level	15	3	0.865	0.95	86
UpStream								
DownStream								

Merge Areas Diverge Areas

### Estimation of v<sub>12</sub>

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = 1.000 using Equation (Exhibit 13-6)	P <sub>FD</sub> = using Equation (Exhibit 13-7)
V <sub>12</sub> = 6685 pc/h	V <sub>12</sub> = pc/h
V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>	6771	Exhibit 13-8	Yes
		Exhibit 13-8	
		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>	6771	Exhibit 13-8	4600:All Yes

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>12</sub>		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = 54.5 (pc/mi/ln) LOS = F (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = 3.681 (Exhibit 13-11) S <sub>R</sub> = -46.5 mph (Exhibit 13-11) S <sub>0</sub> = N/A mph (Exhibit 13-11) S = -46.5 mph (Exhibit 13-13)	D <sub>S</sub> = (Exhibit 13-12) S <sub>R</sub> = mph (Exhibit 13-12) S <sub>0</sub> = mph (Exhibit 13-12) S = mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 With-Project Conditions

### Inputs

Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, $L_A$	600	<input type="checkbox"/> No <input type="checkbox"/> Off
$L_{up} =$ ft	Deceleration Lane Length $L_D$		$L_{down} =$ ft
$V_u =$ veh/h	Freeway Volume, $V_F$	4784	$V_D =$ veh/h
	Ramp Volume, $V_R$	157	
	Freeway Free-Flow Speed, $S_{FF}$	75.0	
	Ramp Free-Flow Speed, $S_{FR}$	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	$f_{HV}$	$f_p$	$v = V/PHF \times f_{HV} \times f_p$
Freeway	4784	0.95	Level	23	3	0.809	0.95	6552
Ramp	157	0.85	Level	15	3	0.865	0.95	225
UpStream								
DownStream								

#### Merge Areas

#### Diverge Areas

### Estimation of $v_{12}$

$V_{12} = V_F (P_{FM})$   
 (Equation 13-6 or 13-7)  
 $L_{EQ} =$   
 $P_{FM} =$  1.000 using Equation (Exhibit 13-6)  
 $V_{12} =$  6552 pc/h  
 $V_3$  or  $V_{av34}$  0 pc/h (Equation 13-14 or 13-17)  
 Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No  
 Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No  
 If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Estimation of $v_{12}$

$V_{12} = V_R + (V_F - V_R)P_{FD}$   
 (Equation 13-12 or 13-13)  
 $L_{EQ} =$   
 $P_{FD} =$  using Equation (Exhibit 13-7)  
 $V_{12} =$  pc/h  
 $V_3$  or  $V_{av34}$  pc/h (Equation 13-14 or 13-17)  
 Is  $V_3$  or  $V_{av34} > 2,700$  pc/h?  Yes  No  
 Is  $V_3$  or  $V_{av34} > 1.5 * V_{12}/2$   Yes  No  
 If Yes,  $V_{12a} =$  pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
$V_{FO}$	6777	Exhibit 13-8	Yes

### Capacity Checks

	Actual	Capacity	LOS F?
$V_F$		Exhibit 13-8	
$V_{FO} = V_F - V_R$		Exhibit 13-8	
$V_R$		Exhibit 13-10	

### Flow Entering Merge Influence Area

	Actual	Max Desirable	Violation?
$V_{R12}$	6777	Exhibit 13-8	Yes

### Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
$V_{12}$		Exhibit 13-8	

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$   
 $D_R =$  54.5 (pc/mi/ln)  
 LOS = F (Exhibit 13-2)

### Level of Service Determination (if not F)

$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$   
 $D_R =$  (pc/mi/ln)  
 LOS = (Exhibit 13-2)

### Speed Determination

$M_S =$  3.701 (Exhibit 13-11)  
 $S_R =$  -47.1 mph (Exhibit 13-11)  
 $S_0 =$  N/A mph (Exhibit 13-11)  
 $S =$  -47.1 mph (Exhibit 13-13)

### Speed Determination

$D_S =$  (Exhibit 13-12)  
 $S_R =$  mph (Exhibit 13-12)  
 $S_0 =$  mph (Exhibit 13-12)  
 $S =$  mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2016

Project Description Existing Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2514	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	75	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2514	0.95	Level	23	3	0.809	0.95	3443
Ramp	75	0.85	Level	15	3	0.865	0.95	107
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 3443 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>	V <sub>F</sub>	3443	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	3336	Exhibit 13-8 4800 No
	V <sub>R</sub>	107	Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	

	Actual	Max Desirable	Violation?
V <sub>12</sub>	3443	Exhibit 13-8 4400:All	No

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 32.5 (pc/mi/ln)
LOS = (Exhibit 13-2)	LOS = D (Exhibit 13-2)

### Speed Determination Speed Determination

M <sub>S</sub> = (Exhibit 13-11)	D <sub>S</sub> = 0.438 (Exhibit 13-12)
S <sub>R</sub> = mph (Exhibit 13-11)	S <sub>R</sub> = 60.6 mph (Exhibit 13-12)
S <sub>0</sub> = mph (Exhibit 13-11)	S <sub>0</sub> = N/A mph (Exhibit 13-12)
S = mph (Exhibit 13-13)	S = 60.6 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Existing Plus Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2514	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	175	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2514	0.95	Level	23	3	0.809	0.95	3443
Ramp	175	0.85	Level	15	3	0.865	0.95	251
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 3443 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	3443	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	3192	Exhibit 13-8 4800 No
		V <sub>R</sub>	251 Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	
	V <sub>12</sub>	3443	Exhibit 13-8 4400:All No

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 32.5 (pc/mi/ln)
LOS = (Exhibit 13-2)	LOS = D (Exhibit 13-2)

### Speed Determination Speed Determination

M <sub>S</sub> = (Exhibit 13-11)	D <sub>S</sub> = 0.451 (Exhibit 13-12)
S <sub>R</sub> = mph (Exhibit 13-11)	S <sub>R</sub> = 60.1 mph (Exhibit 13-12)
S <sub>0</sub> = mph (Exhibit 13-11)	S <sub>0</sub> = N/A mph (Exhibit 13-12)
S = mph (Exhibit 13-13)	S = 60.1 mph (Exhibit 13-13)



## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 No-Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	5940	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	102	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	5940	0.95	Level	23	3	0.809	0.95	8135
Ramp	102	0.85	Level	15	3	0.865	0.95	146
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 8135 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity		LOS F?
		Exhibit 13-8		
V <sub>FO</sub>				
		V <sub>F</sub>	8135	Exhibit 13-8 4800 Yes
		V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	7989	Exhibit 13-8 4800 Yes
		V <sub>R</sub>	146	Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area

Actual	Max Desirable	Violation?
V <sub>R12</sub>	Exhibit 13-8	

### Flow Entering Diverge Influence Area

Actual	Max Desirable	Violation?
V <sub>12</sub>	Exhibit 13-8 4400:All	Yes

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 72.9 (pc/mi/ln) LOS = F (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = (Exhibit 13-11)	D <sub>S</sub> = 0.441 (Exhibit 13-12)
S <sub>R</sub> = mph (Exhibit 13-11)	S <sub>R</sub> = 60.4 mph (Exhibit 13-12)
S <sub>0</sub> = mph (Exhibit 13-11)	S <sub>0</sub> = N/A mph (Exhibit 13-12)
S = mph (Exhibit 13-13)	S = 60.4 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 NB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 With-Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	5940	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	202	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	5940	0.95	Level	23	3	0.809	0.95	8135
Ramp	202	0.85	Level	15	3	0.865	0.95	289
UpStream								
DownStream								

Merge Areas	Diverge Areas
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Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 8135 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	8135	Exhibit 13-8 4800 Yes
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	7846	Exhibit 13-8 4800 Yes
	V <sub>R</sub>	289	Exhibit 13-10 2000 No

Flow Entering Merge Influence Area	Flow Entering Diverge Influence Area
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Actual	Max Desirable	Violation?	Actual	Max Desirable	Violation?
V <sub>R12</sub>	Exhibit 13-8		V <sub>12</sub>	8135	Exhibit 13-8 4400:All Yes

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 72.9 (pc/mi/ln) LOS = F (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = (Exhibit 13-11) S <sub>R</sub> = mph (Exhibit 13-11) S <sub>0</sub> = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D <sub>S</sub> = 0.454 (Exhibit 13-12) S <sub>R</sub> = 60.0 mph (Exhibit 13-12) S <sub>0</sub> = N/A mph (Exhibit 13-12) S = 60.0 mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2016

Project Description Existing Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2032	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	83	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2032	0.95	Level	23	3	0.809	0.95	2783
Ramp	83	0.85	Level	15	3	0.865	0.95	119
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 2783 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	2783	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2664	Exhibit 13-8 4800 No
		V <sub>R</sub>	119 Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	
	V <sub>12</sub>	2783	Exhibit 13-8 4400:All No

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 26.8 (pc/mi/ln) LOS = C (Exhibit 13-2)
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### Speed Determination Speed Determination

M <sub>S</sub> = (Exhibit 13-11) S <sub>R</sub> = mph (Exhibit 13-11) S <sub>0</sub> = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D <sub>S</sub> = 0.439 (Exhibit 13-12) S <sub>R</sub> = 60.5 mph (Exhibit 13-12) S <sub>0</sub> = N/A mph (Exhibit 13-12) S = 60.5 mph (Exhibit 13-13)
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## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Existing Plus Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2032	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	183	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2032	0.95	Level	23	3	0.809	0.95	2783
Ramp	183	0.85	Level	15	3	0.865	0.95	262
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 2783 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	2783	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2521	Exhibit 13-8 4800 No
		V <sub>R</sub>	262 Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?
V <sub>R12</sub>		Exhibit 13-8	
	V <sub>12</sub>	2783	Exhibit 13-8 4400:All No

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 26.8 (pc/mi/ln)
LOS = (Exhibit 13-2)	LOS = C (Exhibit 13-2)

### Speed Determination Speed Determination

M <sub>S</sub> = (Exhibit 13-11)	D <sub>S</sub> = 0.452 (Exhibit 13-12)
S <sub>R</sub> = mph (Exhibit 13-11)	S <sub>R</sub> = 60.1 mph (Exhibit 13-12)
S <sub>0</sub> = mph (Exhibit 13-11)	S <sub>0</sub> = N/A mph (Exhibit 13-12)
S = mph (Exhibit 13-13)	S = 60.1 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	Opening Year

Project Description Near-Term Plus Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	2032	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	209	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	2032	0.95	Level	23	3	0.809	0.95	2783
Ramp	209	0.85	Level	15	3	0.865	0.95	299
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 2783 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	2783	Exhibit 13-8 4800 No
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	2484	Exhibit 13-8 4800 No
		V <sub>R</sub>	299 Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area

Actual	Max Desirable	Violation?
V <sub>R12</sub>	Exhibit 13-8	

### Flow Entering Diverge Influence Area

Actual	Max Desirable	Violation?
V <sub>12</sub>	Exhibit 13-8 4400:All	No

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 26.8 (pc/mi/ln) LOS = C (Exhibit 13-2)
---	--

### Speed Determination

M <sub>S</sub> = (Exhibit 13-11) S <sub>R</sub> = mph (Exhibit 13-11) S <sub>0</sub> = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D <sub>S</sub> = 0.455 (Exhibit 13-12) S <sub>R</sub> = 60.0 mph (Exhibit 13-12) S <sub>0</sub> = N/A mph (Exhibit 13-12) S = 60.0 mph (Exhibit 13-13)
---	---

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	11/16/2016	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 No-Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	5000	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	119	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	5000	0.95	Level	23	3	0.809	0.95	6848
Ramp	119	0.85	Level	15	3	0.865	0.95	170
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 6848 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?		Actual	Capacity	LOS F?	
V <sub>FO</sub>		Exhibit 13-8		V <sub>F</sub>	6848	Exhibit 13-8	4800	Yes
				V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	6678	Exhibit 13-8	4800	Yes
				V <sub>R</sub>	170	Exhibit 13-10	2000	No

### Flow Entering Merge Influence Area Flow Entering Diverge Influence Area

	Actual	Max Desirable	Violation?		Actual	Max Desirable	Violation?	
V <sub>R12</sub>		Exhibit 13-8		V <sub>12</sub>	6848	Exhibit 13-8	4400:All	Yes

### Level of Service Determination (if not F) Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 61.8 (pc/mi/ln)
LOS = (Exhibit 13-2)	LOS = F (Exhibit 13-2)

### Speed Determination Speed Determination

M <sub>S</sub> = (Exhibit 13-11)	D <sub>S</sub> = 0.443 (Exhibit 13-12)
S <sub>R</sub> = mph (Exhibit 13-11)	S <sub>R</sub> = 60.4 mph (Exhibit 13-12)
S <sub>0</sub> = mph (Exhibit 13-11)	S <sub>0</sub> = N/A mph (Exhibit 13-12)
S = mph (Exhibit 13-13)	S = 60.4 mph (Exhibit 13-13)

## RAMPS AND RAMP JUNCTIONS WORKSHEET

General Information		Site Information	
Analyst	JR	Freeway/Dir of Travel	I-5 SB Off ramp
Agency or Company	Peters Engineering Group	Junction	Nees Avenue
Date Performed	8-23-17	Jurisdiction	Caltrans
Analysis Time Period	Sunday Peak Hour	Analysis Year	2037

Project Description 2037 With-Project Conditions

Inputs			
Upstream Adj Ramp	Freeway Number of Lanes, N	2	Downstream Adj Ramp
<input type="checkbox"/> Yes <input type="checkbox"/> On	Ramp Number of Lanes, N	1	<input type="checkbox"/> Yes <input type="checkbox"/> On
<input type="checkbox"/> No <input type="checkbox"/> Off	Acceleration Lane Length, L <sub>A</sub>		<input type="checkbox"/> No <input type="checkbox"/> Off
L <sub>up</sub> = ft	Deceleration Lane Length L <sub>D</sub>	150	L <sub>down</sub> = ft
V <sub>u</sub> = veh/h	Freeway Volume, V <sub>F</sub>	5000	V <sub>D</sub> = veh/h
	Ramp Volume, V <sub>R</sub>	219	
	Freeway Free-Flow Speed, S <sub>FF</sub>	75.0	
	Ramp Free-Flow Speed, S <sub>FR</sub>	35.0	

### Conversion to pc/h Under Base Conditions

(pc/h)	V (Veh/hr)	PHF	Terrain	%Truck	%Rv	f <sub>HV</sub>	f <sub>p</sub>	v = V/PHF x f <sub>HV</sub> x f <sub>p</sub>
Freeway	5000	0.95	Level	23	3	0.809	0.95	6848
Ramp	219	0.85	Level	15	3	0.865	0.95	314
UpStream								
DownStream								

Merge Areas Diverge Areas

Estimation of v <sub>12</sub>	Estimation of v <sub>12</sub>
$V_{12} = V_F (P_{FM})$ (Equation 13-6 or 13-7)	$V_{12} = V_R + (V_F - V_R)P_{FD}$ (Equation 13-12 or 13-13)
L <sub>EQ</sub> =	L <sub>EQ</sub> =
P <sub>FM</sub> = using Equation (Exhibit 13-6)	P <sub>FD</sub> = 1.000 using Equation (Exhibit 13-7)
V <sub>12</sub> = pc/h	V <sub>12</sub> = 6848 pc/h
V <sub>3</sub> or V <sub>av34</sub> pc/h (Equation 13-14 or 13-17)	V <sub>3</sub> or V <sub>av34</sub> 0 pc/h (Equation 13-14 or 13-17)
Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 2,700 pc/h? <input type="checkbox"/> Yes <input type="checkbox"/> No
Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No	Is V <sub>3</sub> or V <sub>av34</sub> > 1.5 * V <sub>12</sub> /2 <input type="checkbox"/> Yes <input type="checkbox"/> No
If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)	If Yes, V <sub>12a</sub> = pc/h (Equation 13-16, 13-18, or 13-19)

### Capacity Checks

	Actual	Capacity	LOS F?
V <sub>FO</sub>		Exhibit 13-8	
	V <sub>F</sub>	6848	Exhibit 13-8 4800 Yes
	V <sub>FO</sub> = V <sub>F</sub> - V <sub>R</sub>	6534	Exhibit 13-8 4800 Yes
	V <sub>R</sub>	314	Exhibit 13-10 2000 No

### Flow Entering Merge Influence Area

Actual	Max Desirable	Violation?
V <sub>R12</sub>	Exhibit 13-8	

### Flow Entering Diverge Influence Area

Actual	Max Desirable	Violation?
V <sub>12</sub>	Exhibit 13-8 4400:All	Yes

### Level of Service Determination (if not F)

$D_R = 5.475 + 0.00734 v_R + 0.0078 V_{12} - 0.00627 L_A$ D <sub>R</sub> = (pc/mi/ln) LOS = (Exhibit 13-2)	$D_R = 4.252 + 0.0086 V_{12} - 0.009 L_D$ D <sub>R</sub> = 61.8 (pc/mi/ln) LOS = F (Exhibit 13-2)
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### Speed Determination

M <sub>S</sub> = (Exhibit 13-11) S <sub>R</sub> = mph (Exhibit 13-11) S <sub>0</sub> = mph (Exhibit 13-11) S = mph (Exhibit 13-13)	D <sub>S</sub> = 0.456 (Exhibit 13-12) S <sub>R</sub> = 59.9 mph (Exhibit 13-12) S <sub>0</sub> = N/A mph (Exhibit 13-12) S = 59.9 mph (Exhibit 13-13)
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**August 31, 2017 Letter from the State  
Department of Transportation  
(CALTRANS)**

**2 Pages**

**DEPARTMENT OF TRANSPORTATION****DISTRICT 6**

1352 WEST OLIVE AVENUE  
P.O. BOX 12616  
FRESNO, CA 93778-2616  
PHONE (559) 444-2493  
FAX (559) 445-5875  
TTY 711  
www.dot.ca.gov



*Making Conservation a  
California way of life.*

August 31, 2017

06-FRE-5-65.782  
CUP No. 3528  
Travel Center

Mr. Derek Chambers  
Planner  
County of Fresno  
Planning Department  
2220 Tulare Street, 6th Floor  
Fresno, CA 93721

Dear Mr. Chambers:

The purpose of this comment letter is to formalize our response made at the August 24, 2017 Planning Commission hearing on CUP No. 3528 and its associated traffic impact study (TIS).

We provided comments on January 13, 2017 to the project proponent's TIS dated November 16, 2016 prepared by Peters Engineering Group (PEG). In our January 13<sup>th</sup> comment letter we had two outstanding concerns: the trip generation and the growth rate. On August 23, 2017, we received an email correspondence from PEG in response to our January 13, 2017 comment letter. In addition, on August 25, 2017 we received a memorandum from PEG titled: *Response to Comments on Traffic Impact Study, Proposed E-Z Trip Travel Center* dated August 23, 2017 formalizing PEG's email correspondence. Caltrans has the following comments:

In regards to the trip generation, PEG had reviewed trip generation data from three Love's Travel Stop facilities that was used in a TIS from another travel center located in Madera County. PEG found that the trip generation information used in the Love's TIS are similar to that with the PEG TIS. The value used in the Love's P.M. peak hour trip generation rate of 39.00 trips per 1,000 square feet which calculated to be 490 trips (before pass by reduction) compared to 480 trips used in PEG's TIS. Therefore, it is our conclusion that the trip generation rates and methods used in PEG's TIS are reasonable.

In regards to the growth rate, PEG used a growth rate of 1% per year for trips on Nees Avenue and a growth rate in excess of 4% per year for the freeway mainline. The 4% annual growth rate was verified in reviewing the merge and diverge data sheets presented in in Appendix F of the PEG TIS. These volumes were obtained from Caltrans *Transportation Concept Report* dated February 2013 for Interstate 5. We concur with PEG that the additional growth on Nees Avenue within the interchange and west of the interchange will be generated mainly by the proposed

Mr. Derek Chambers  
August 31, 2017  
Page 2

project and any other proposed projects. Therefore, we concur with PEG that the future traffic volume projections presented in the TIS are appropriate.

If you have any further questions, please contact me at (559) 444-2493.

Sincerely,



DAVID PADILLA  
Associate Transportation Planner  
Planning North Branch

c: Michael Navarro, Chief, Planning North Branch, Caltrans