

APPENDIX 5.1G

# Cumulative Impacts Analysis for the LEC

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# Cumulative Impacts Analysis for the LEC

Cumulative air quality impacts from the LEC and other reasonably foreseeable projects will be both regional and localized in nature. Regional air quality impacts are possible for pollutants such as ozone, which is formed through a photochemical process that can take hours to occur. Carbon monoxide, NO<sub>x</sub>, and SO<sub>x</sub> impacts are generally localized in the area in which they are emitted. PM<sub>10</sub> can create a local air quality problem in the vicinity of its emission source, but can also be a regional issue when it is formed in the atmosphere from VOC, SO<sub>x</sub>, and NO<sub>x</sub>.

The cumulative impacts analysis considers the potential for both regional and localized impacts due to emissions from proposed operation of LEC. Regional impacts are evaluated by comparing maximum daily and annual emissions from LEC with emissions of ozone and PM<sub>10</sub> precursors in both San Joaquin County and the entire San Joaquin Valley. Localized impacts are evaluated by looking at other local sources of pollutants that are not included in the background air quality data to determine whether these sources in combination with LEC would be expected to cause significant cumulative air quality impacts.

## Regional Impacts

Regional impacts are evaluated by assessing LEC's contribution to regional emissions. Although the relative importance of VOC and NO<sub>x</sub> emissions in ozone formation differs from region to region and from day to day, state law requires reductions in emissions of both precursors to reduce overall ozone levels. The change in the sum of emissions of these pollutants, equally weighted, provides a rough estimate of the impact of LEC on regional ozone levels.<sup>12</sup> Similarly, a comparison of the emissions of PM<sub>10</sub> precursor emissions from LEC with regional PM<sub>10</sub> precursor emissions provides an estimate of the impact of LEC on regional PM<sub>10</sub> levels.

Under SJVAPCD regulations, LEC will be required to provide offsets for increases in NO<sub>x</sub>, VOC, SO<sub>2</sub>, and PM<sub>10</sub> emissions from the project above certain regulatory thresholds. Regulatory offset requirements are calculated based on quarterly emissions, but the regional inventories are expressed in tons per day of emissions. Comparisons are shown on both a daily and annual basis.

Tables 5.1G-1 and 5.1G-2 summarize these comparisons. LEC emissions are compared with regional emissions in 2012, as that is the year the project is expected to begin operation. San Joaquin County and SJVAPCD emissions projections for 2012 were estimated by averaging the projected emissions inventories for 2010 and 2015 obtained from the Air Resources Board's web-based emission inventory projection software, available at [www.arb.ca.gov/app/emsinv/emssumcat2007.php](http://www.arb.ca.gov/app/emsinv/emssumcat2007.php).

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<sup>12</sup> LEC is proposing to use direct, and not interpollutant, offsets for ozone precursors, so all NO<sub>x</sub> emissions from the project will be offset using NO<sub>x</sub> ERCs while all VOC emissions will be offset using VOC ERCs.

## Localized Impacts

To evaluate potential cumulative impacts of LEC in combination with other projects in the area, projects within a radius of 10 km (6 miles) of the project were used for the cumulative impacts analysis.

Within this search area, three categories of projects with combustion sources were used as criteria for identification:

- Existing projects that have been in operation since at least 2007;
- Projects for which air pollution permits to construct have been issued and that began operation after July 1, 2007; and
- Projects for which air pollution permits to construct have not been issued, but that are reasonably foreseeable.

Existing projects that have been in operation since at least 2007 are reflected in the ambient air quality data that has been used to represent background concentrations; consequently, no further analysis of the emissions from this category of facilities was performed. The cumulative impacts analysis adds the modeled impacts of selected facilities to the maximum measured background air quality levels, thus ensuring that these existing projects are taken into account.

Projects for which air pollution permits to construct have been issued but that were not operational in 2007 were identified through a request of permit records from the San Joaquin Valley APCD. Projects that had a permit to construct issued after July 1, 2007, would be included in the cumulative air quality impacts analysis. However, as indicated in the District's response to our request for information about potential projects (copy attached), there are no projects that meet these criteria. Therefore, the cumulative impacts analysis includes only the existing NCPA Lodi STIG turbine and emergency Diesel fire pump engine, along with the LEC. Table 5.1G-3 provides the emission rates and stack parameters used in the cumulative impacts analysis. The modeling results are summarized in Table 5.1G-4. The modeling indicates that the maximum modeled impacts from the old and new plants overlap very little, if at all.

**Table 5.1G-1**  
**NCPA Lodi Energy Center**  
**Regional Cumulative Impacts Analysis: Ozone Precursors**

	2012 San Joaquin County Inventory Emissions, tons/day		2012 SJVAPCD Inventory Emissions, tons/day		2012 San Joaquin County Inventory Emissions, tons/yr		2012 SJVAPCD Inventory Emissions, tons/yr	
	NOx	VOC	NOx	VOC	NOx	VOC	NOx	VOC
<b>Source Category</b>								
Stationary Sources	17.7	7.8	105.4	81.7	6,450.1	2,839.5	38,480.3	29,813.2
Area-Wide Sources	1.7	16.1	17.5	156.1	622.7	5,858.6	6,393.5	56,974.3
Mobile Sources	64.0	20.5	367.0	112.9	23,367.5	7,473.6	133,952.4	41,198.1
Total by Pollutant	83.4	44.3	489.9	350.6	30,440.3	16,171.7	178,826.3	127,985.6
Total Ozone Precursors	127.7		840.6		46,612.0		306,811.9	
<b>LEC Emissions</b>								
LEC Emissions by Pollutant	0.437	0.092	0.437	0.092	71.5	17.5	71.5	17.5
Total LEC Ozone Precursors	0.53		0.53		89.0		89.0	
LEC Ozone Precursors as Percent of Regional Total	0.41%		0.06%		0.19%		0.03%	
<b>Reductions from ERCs</b>								
LEC Net Increase	0.294	0.072	0.294	0.072	107.2	26.3	107.2	26.3
LEC Net Increase	0.143	0.020	0.143	0.020	-35.7	-8.8	-35.7	-8.8
Remaining LEC Ozone Precursors	0.16		0.16		-44.5		-44.5	
Remaining LEC Ozone Precursors as Percent of Regional Total	0.13%		0.02%		0.00%		0.00%	

**Table 5.1G-2  
NCPA Lodi Energy Center  
Regional Cumulative Impacts Analysis:  
PM10 Precursors**

	2012 San Joaquin County Inventory Emissions, tons/day				2012 SJVAPCD Inventory Emissions, tons/day			
	NOx	VOC	SO2	PM10	NOx	VOC	SO2	PM10
<b>Source Category</b>								
Stationary Sources	17.7	7.8	4.9	2.9	105.4	81.7	23.0	24.7
Area-Wide Sources	1.7	16.1	0.1	26.8	17.5	156.1	1.1	248.2
Mobile Sources	64.0	20.5	0.7	3.5	367.0	112.9	2.0	20.5
Total by Pollutant	83.4	44.3	5.6	33.2	489.9	350.6	26.1	293.4
Total PM10 Precursors		166.6				1160.0		
<b>LEC Emissions</b>								
LEC Emissions by Pollutant	0.437	0.092	0.069	0.128	0.437	0.092	0.069	0.128
Total LEC PM10 Precursors		0.73				0.73		
LEC PM10 Precursors as Percent of Regional Total		0.44%				0.06%		
<b>Reductions from ERCs</b>								
LEC Net Increase	0.294	0.072	0.148	0.043	0.294	0.072	0.148	0.043
Remaining LEC PM10 Precursors	0.143	0.020	-0.079	0.085	0.143	0.020	-0.079	0.085
Remaining LEC PM10 Precursors as Percent of Regional Total		0.17				0.17		
		0.10%				0.01%		

**Table 5.1G-2 (cont'd)**  
**NCPA Lodi Energy Center**  
**Regional Cumulative Impacts Analysis:**  
**PM10 Precursors**

	2012 San Joaquin County Inventory Emissions, tons/yr				2012 SJVAPCD Inventory Emissions, tons/yr			
	NOx	VOC	SO2	PM10	NOx	VOC	SO2	PM10
<b>Source Category</b>								
Stationary Sources	6,450.1	2,839.5	1,772.8	1,057.8	38,480.3	29,813.2	8,386.1	9,012.6
Area-Wide Sources	622.7	5,858.6	37.0	9,778.2	6,393.5	56,974.3	411.4	90,598.7
Mobile Sources	23,367.5	7,473.6	252.0	1,284.4	133,952.4	41,198.1	720.5	7,471.0
Total by Pollutant	30,440.3	16,171.7	2,061.9	12,120.4	178,826.3	127,985.6	9,517.9	107,082.2
Total PM10 Precursors		60,794.2				423,412.0		
<b>LEC Emissions</b>								
LEC Emissions by Pollutant	71.5	17.5	24.3	44.0	71.5	17.5	24.3	44.0
Total LEC PM10 Precursors		157.3				157.3		
LEC PM10 Precursors as Percent of Regional Total		0.26%				0.04%		
<b>Reductions from ERCs</b>								
LEC Net Increase	107.25	26.25	54.05	15.60	107.25	26.25	54.05	15.60
LEC Net Increase	-35.75	-8.75	-29.71	28.41	-35.75	-8.75	-29.71	28.41
Remaining LEC PM10 Precursors		-45.80				-45.80		
Remaining LEC PM10 Precursors as Percent of Regional Total		0.00%				0.00%		

**Table 5.1G-3  
NCPA Lodi Energy Center  
Emission Rates and Stack Parameters for Cumulative Impacts Modeling**

	Stack Diam, m	Release Height m	Temp, deg K	Exhaust Flow, m3/s	Exhaust Velocity, m/s	Emission Rates, g/s			
						NOx	SO2	CO	PM10
<b>Averaging Period: One hour</b>									
LEC Gas Turbine 1	5.779	45.720	350.93	492.950	18.793	1.9215	0.7560	1.7549	n/a
Aux Boiler	0.914	12.192	463.71	9.848	14.997	0.0688	2.332E-02	2.991E-01	n/a
Existing Lodi CT #2	2.788	28.042	682.59	316.972	51.934	0.6552	1.633E-01	1.6905	n/a
Existing Lodi Fire Pump Engine	0.127	4.572	714.26	1.018	80.386	0.2038	1.575E-03	1.010E-01	n/a
<b>Averaging Period: Three hours</b>									
Gas Turbine 1	5.779	45.720	350.93	492.950	18.793	n/a	0.7560	n/a	n/a
Aux Boiler	0.914	12.192	463.71	9.848	14.997	n/a	2.332E-02	n/a	n/a
Existing Lodi CT #2	2.788	28.042	682.59	316.972	51.934	n/a	1.633E-01	n/a	n/a
Existing Lodi Fire Pump Engine	0.127	4.572	714.26	1.018	80.386	n/a	1.575E-03	n/a	n/a
<b>Averaging Period: Eight hours</b>									
Gas Turbine 1	5.779	45.720	350.93	492.950	18.793	n/a	n/a	85.4887	n/a
Aux Boiler	0.914	12.192	463.71	9.848	14.997	n/a	n/a	2.991E-01	n/a
Existing Lodi CT #2	2.788	28.042	682.59	316.972	51.934	n/a	n/a	1.6905	n/a
Existing Lodi Fire Pump Engine	0.127	4.572	714.26	1.018	80.386	n/a	n/a	1.010E-01	n/a
<b>Averaging Period: 24 hours</b>									
Gas Turbine 1	5.779	45.720	343.15	310.758	11.847	n/a	0.4377	n/a	1.1340
Aux Boiler	0.914	12.192	463.71	9.848	14.997	n/a	1.166E-02	n/a	0.0296
Cooling Tower (per cell, 7 cells)	4.267	13.960	303.54	87.445	6.114	n/a	n/a	n/a	8.097E-03
Existing Lodi CT #2	2.788	28.042	682.59	316.972	51.934	n/a	1.633E-01	n/a	0.2520
Existing Lodi Fire Pump Engine	0.127	4.572	714.26	1.018	80.386	n/a	1.575E-03	n/a	0.0333
<b>Averaging Period: Annual</b>									
Gas Turbine 1	5.779	45.720	360.93	458.119	17.466	2.0520	0.6991	n/a	1.2059
Aux Boiler	0.914	12.192	463.71	9.848	14.997	3.674E-03	1.246E-03	n/a	3.164E-03
Cooling Tower (per cell, 7 cells)	4.267	13.960	303.54	87.445	6.114	n/a	n/a	n/a	8.097E-03
Existing Lodi CT #2	2.788	28.042	682.59	316.972	51.934	6.552E-01	1.633E-01	n/a	2.520E-01
Existing Lodi Fire Pump Engine	0.127	4.572	714.26	1.018	80.386	2.327E-03	1.798E-05	n/a	1.899E-04

TABLE 5.1G-4  
Modeled Maximum Cumulative Project Impacts

Pollutant	Averaging Time	Maximum Localized Impacts ( $\mu\text{g}/\text{m}^3$ )			Background ( $\mu\text{g}/\text{m}^3$ )	Total Impact ( $\mu\text{g}/\text{m}^3$ )	State Standard ( $\mu\text{g}/\text{m}^3$ )	Federal Standard ( $\mu\text{g}/\text{m}^3$ )
		LEC Alone	Existing Facility	Total				
NO <sub>2</sub> <sup>a</sup>	1-hour	27.5	152.7	152.8	163.6	316.4	338	–
	Annual	0.3	0.1	0.3	34.0	34.3	–	100
SO <sub>2</sub>	1-hour	10.4	9.1	10.4	46.8	57.2	650	–
	3-hour	7.6	7.4	7.6	28.6	36.2	–	1300
	24-hour	2.9	3.3	3.3	10.8	14.1	109	365
	Annual	0.1	0.02	0.1	2.7	2.8	–	80
CO	1-hour	324	176	324	5,500	5,824	23,000	40,000
	8-hour	111	100	112	3,178	3,290	10,000	10,000
PM <sub>10</sub>	24-hour	3.7	20.7	21.7	85	106.7	50	150
	Annual	0.9	0.02	0.9	33.4	34.3	20	--
PM <sub>2.5</sub>	24-Hour	3.7	20.7	21.7	48	69.7	–	35
	Annual	0.9	0.02	0.9	13.1	14.0	12	15

Notes:

a. Ozone limiting method applied for 1-hour average, using concurrent O<sub>3</sub> data.



# San Joaquin Valley

## AIR POLLUTION CONTROL DISTRICT

Nancy Matthews  
Sierra Research  
1801 J Street  
Sacramento, CA 95811

### RE: Request for Public Information

Dear Ms. Matthews:

The District has received your request for information regarding Authority to Construct projects that occurred within 6 miles of 12751 Thornton Road in Lodi, CA.

The list of possible projects of interest included several farm conservation management plan projects for farms, several non-new source review (In-house Permit to Operate) projects and several VOC only sources. After eliminating these projects, the list was reduced to three projects. The following is a brief description of those projects:

**1. 2131 W. Turner Road, Lodi**

The Authority to Construct did not authorize any emission increases so no modeling was done.

**2. 401 W. Armstrong Road, Lodi**

The District is in receipt of an incomplete application for a digester gas fired engine at a dairy. No emission or modeling data is available yet.

**3. 8407 Kelley Drive, Stockton**

An Authority to Construct was issued for an internal combustion engine after July 1, 2007, and the District has received an application to install another engine instead. The second application is incomplete so no emission or modeling information is available yet. Emission and modeling information is available for the unit that was originally authorized.

**Seyed Sadredin**

Executive Director/Air Pollution Control Officer

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**Northern Region**

4800 Enterprise Way  
Modesto, CA 95356-8718  
Tel: (209) 557-6400 FAX: (209) 557-6475

**Central Region (Main Office)**

1990 E. Gettysburg Avenue  
Fresno, CA 93726-0244  
Tel: (559) 230-6000 FAX: (559) 230-6061  
[www.valleyair.org](http://www.valleyair.org)

**Southern Region**

2700 M Street, Suite 275  
Bakersfield, CA 93301-2373  
Tel: (661) 326-6900 FAX: (661) 326-6985

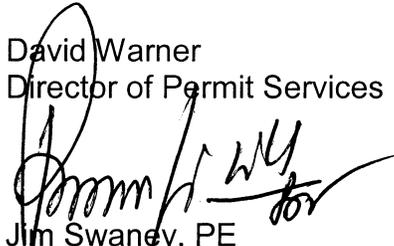
Nancy Matthews  
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Enclosed is an invoice for the time spent gathering the requested information.  
After the District receives payment, the requested information will be  
electronically transmitted to you.

Should you have any questions please telephone Mark Schonhoff at (209) 557-  
6448.

Sincerely,

David Warner  
Director of Permit Services



Jim Swaney, PE  
Permit Services Manager

MJS

enclosure