California Environmental Protection Agency
Department of Pesticide Regulation

ENVIRONMENTAL JUSTICE PILOT PROJECT
PESTICIDE AIR MONITORING IN PARLIER
ADDENDUM

ARB Monitoring Results

September 2007

This is a second addendum to the December 2006 DPR progress report on its Parlier monitoring project. An earlier addendum, in March 2007, summarized results of DPR air monitoring for calendar year 2006. Complete data for the monitoring done by the Air Resources Board (ARB) and the San Joaquin Air Pollution Control District (SJVAPCD) were not available at that time. This addendum summarizes all preliminary results for 2006 air monitoring done by DPR, ARB and SJVAPCD. The results are preliminary and subject to change after full analysis of quality control data.

A full discussion and evaluation of the results will be presented in the final report, expected later this year or early in 2008. Analysis of this data may result in modifications. (For more background, see the December 2006 progress report, www.cdpr.ca.gov/docs/envjust/pilot_proj/interim/narrative.pdf).

For this project, ARB analyzed approximately 74 samples for volatile organic compounds (VOC) and 65 samples for metals and elements. ARB collected its last VOC and metals/elements samples on January 6, 2007 and PM2.5 samples on January 14, 2007. The SJVAPCD collected continuous samples for the criteria pollutants, nitrogen dioxide and ozone. There were few differences between data reported in mid-2006 and data for the remainder of the calendar year. Key differences were:

- Detections of pesticides monitored by ARB (Table 1) were generally higher than they were earlier in the year. Twenty-one of twenty-three VOCs monitored by ARB were detected in Parlier (Table 3). Acetone had the highest concentration of 46,464 ng/m^3, which compares with levels measured in Fresno.

- Acrolein was the only pesticide monitored by ARB that exceeded the acute screening level (highest concentration detected was 4,485 ng/m^3, screening level 190 ng/m^3). There was no reported use of acrolein in the Parlier area during 2006. Major sources of acrolein include engine exhaust and tobacco smoke.

- Carbon disulfide and formaldehyde also have some pesticidal uses, but detected concentrations in Parlier are likely due to non-pesticidal sources. Carbon disulfide is a natural product and is used in industrial processes. Formaldehyde is found in pressed wood (e.g., plywood and particleboard), tobacco smoke and other combustion processes, textiles (e.g., clothing and drapes), and adhesives/glues.

- Figure 1 shows concentrations of the criteria air pollutants ozone and nitrogen dioxide at the SJVAPCD Kearney Agricultural Center monitoring station. The highest 1-hour concentration for ozone was 257,070 ng/m^3 (131 ppb) and nitrogen dioxide was 116,773 ng/m^3 (62 ppb). Ozone exceeded the 8-hour average concentration air quality standard of 137,000 ng/m^3 (70 ppb) multiple times from May through October, 2006. Nitrogen dioxide did not exceed the 1-hour average concentration standard of 470,000 ng/m^3 (250 ppb).

- The PM2.5 state and federal standard was exceeded in February 2006, December 2006, and January 2007.

Table 1. Highest concentrations detected for each pesticide. **Pesticides in Bold were monitored by DPR.** *Pesticides in italics were monitored by ARB.*

Pesticide	Quantitation Limit (ng/m^3)	Highest 1-Day Concentration (ng/m^3)	Acute Screening Level (ng/m^3)
1,3-dichloropropene	444	23,080*	160,000
Acrolein[a]	670	4,485*	190
Arsenic[a]	1.0	5*	30
Carbon disulfide[a]	310	3,050[c]	1,550,000
Chlorpyrifos	46.3	150	1,200
Chlorpyrifos oxygen analog	11.6	28	1,200
Copper[b]	1.0	550*	100,000
Diazinon	11.6	172	130
Diazinon oxygen analog	11.6	71	130
Formaldehyde[a]	120	9,250	19,000
Methyl bromide	116	2,468*	820,000
Malathion	11.6	21	40,000
Malathion oxygen analog	11.6	16	40,000
MITC	23.2	5,010	66,000
Phosmet	23.2	42	77,000
Sulfur[b]	2.0	1,800*	N/A
Xylene[b]	850	5,780*	900,000
Chlorothalonil	92.6	Trace	34,000
Dichlorvos	46.3	Trace	160,000
Permethrin	46.3	Trace	168,000
Propargite	46.3	Trace	14,000
Simazine	11.6	Trace	110,000
Trifluralin	23.2	Trace	1,200,000
Azinphos-methyl	23.2	Not detected	101,000
Cypermethrin	46.3	Not detected	40,000
Dicofol	46.3	Not detected	11,000
Dimethoate	11.6	Not detected	34,000
Dimethoate oxygen analog	11.6	Not detected	34,000
Diuron	23.2	Not detected	170,000
Endosulfan	46.3	Not detected	4,000
Endosulfan sulfate	46.3	Not detected	4,000
EPTC	11.6	Not detected	230,000
Metolachlor	11.6	Not detected	85,000
Molinate	11.6	Not detected	200,000
Norflurazon	11.6	Not detected	170,000
Oryzalin	11.6	Not detected	420,000
Oxyfluorfen	46.3	Not detected	510,000
Propanil	11.6	Not detected	51,000
SSS-tributylphos… (DEF)	11.6	Not detected	8,800
Thiobencarb	11.6	Not detected	425,000

*Concentration is higher than reported in last progress report or addendum.
[a] Detections of these compounds are likely due to non-pesticidal sources only.
[b] Detections of these compounds are likely due to both pesticidal and non-pesticidal sources.
[c] Last sample collected was June 28, 2006.
N/A = not available

Table 2. Percent of samples with detectable pesticide concentrations and reported use (within five miles of Parlier). **Pesticides in Bold were monitored by DPR.** *Pesticides in italics were monitored by ARB.*

Pesticide	Numbers of Samples Collected	Percent of Samples with Detection[a]	Reported Use 2006 (pounds a.i.)	Number of Reported Applications 2006
Carbon disulfide[b]	33	100	0	0
Copper[c]	64	100	109,750	2,159
Formaldehyde[b]	65	100	0	0
Sulfur[c]	64	100	801,340	6,197
Acrolein[b]	71	85	0	0
MITC	468	84	36,480	16
Methyl bromide	71	66	12,481*	68*
Chlorpyrifos	468	64	31,420	1217
Arsenic[b]	64	64	0	0
Xylene[c]	71	49	10	2
1,3-dichloropropene	71	34	302,075	122
Diazinon	468	32	3,450	222
Trifluralin	468	24	79	16
Chlorpyrifos oxygen analog	468	22	---	---
Diazinon oxygen analog	468	19	---	---
Phosmet	468	19	31,862	1235
Chlorothalonil	468	17	5,230	153
Propargite	468	15	7,080	330
Simazine	468	7	13,120	1063
Malathion oxygen analog	468	5	---	---
Dichlorvos	468	1	0	0
Permethrin	468	1	222	43
Azinphos-methyl	468	0	83	7
Dicofol	468	0	151	6
Dimethoate	468	0	374	15
Dimethoate oxygen analog	468	0	---	---
Diuron	468	0	2,310	125
Endosulfan	468	0	7	1
Malathion	468	0	665	14
Norflurazon	468	0	1,249	204
Oryzalin	468	0	12,970	708
Oxyfluorfen	468	0	8,616	2,369
Cypermethrin	468	0	0	0
Endosulfan sulfate	468	0	---	---
EPTC	468	0	0	0
Metolachlor	468	0	0	0
Molinate	468	0	0	0
Propanil	468	0	0	0
SSS-tributylphos… (DEF)	468	0	0	0
Thiobencarb	468	0	0	0

[a] Includes quantified detections and trace detections.
[b] Detections of these compounds are likely due to non-pesticidal sources only.
[c] Detections of these compounds are likely due pesticidal and non-pesticidal sources.
*Includes some chamber fumigations. Some additional chamber use may be added if reported

Table 3. Highest volatile organic compound (VOC) concentrations measured by ARB. VOCs that were likely detected due to pesticide use in the Parlier area are shown in bold. VOCs that have some pesticidal use, but not in the Parlier area are shown in italics. Concentrations detected at ARB's monitoring station in Fresno are shown for comparison.

Volatile Organic Compound	**Quantitation Limit (ng/m^3)**	**Parlier: Highest 1-Day Concentration (ng/m^3)**	**Fresno: Highest 1-Day Concentration (ng/m^3)**	**Acute Screening Level (ng/m^3)[a]**
1,3-Butadiene	87	498	649	TBD[1]
1,3-Dichloropropene	444	23,082	5,859	160,000
Acetaldehyde	180	10,396*	7,048*	TBD
Acetone	700	46,464*	34,848*	TBD
Acetonitrile	490	7,880	6,240	TBD
Acrolein	670	4,485*	4,933*	190
Acrylonitrile	640	2,547*	1,868*	TBD
Benzene	160	3,124*	4,374	13,000,000
Carbon disulfide	310	3,050*	2,071	1,550,000
Carbon tetrachloride[1]	120	860	--	19,000,000
Chloroform	96	143	239	1,500,000
Dichlorobenzene	1,760	Not detected	Not detected	TBD
Ethyl benzene	850	1,190*	1,996*	TBD
Formaldehyde	120	9,250	10,571*	19,000
Methyl bromide	116	2,468*	418*	820,000
Methyl chloroform	50	107	107	TBD
Methyl ethyl ketone	290	1,730*	1,442*	130,000,000
Methylene chloride	340	1,393	1,155*	140,000,000
Perchloroethylene	66	332*	332*	200,000,000
Styrene	420	Not detected	1,083*	210,000,000
Toluene	740	6,622*	11,794*	370,000,000
Trichloroethylene	105	105*	Not detected	TBD
Xylene[b]	850	5,776*	9,853*	900,000

*Concentration is higher than reported in last progress report.

[a] Reference exposure levels determined by OEHHA are the acute screening levels used for VOCs.

[b] Non-pesticidal sources may contribute to the detection of xylene.

[1] To Be Determined.

Table 4. Highest metal concentrations detected by ARB. Metals that were likely detected due to pesticide use in the Parlier area are shown in bold. Metals that have some pesticidal use, but not in the Parlier area are shown in italics.

	Quantitation Limit (ng/m^3)	Highest Concentration in Parlier (ng/m^3)	Acute Screening Level (ng/m^3)
Aluminum	3*	6,600**	TBD[1]
Antimony	5*	27**	TBD
Arsenic	*1**	*5***	*190*
Barium	4*	390**	TBD
Bromine	1	28**	TBD
Calcium	2*	3,800**	TBD
Chlorine	1*	1,000**	210,000
Chromium	1*	22**	TBD
Cobalt	1*	13**	TBD
Copper	1	550**	100,000
Iron	1	8,300**	TBD
Lead	1*	15**	TBD
Manganese	1	170**	TBD
Mercury	1*	2**	1,800
Molybdenum	2	52	TBD
Nickel	1	2	6,000
Phosphorus	1*	1,200**	TBD
Potassium	2*	5,000**	TBD
Rubidium	1	23**	TBD
Selenium	1*	5**	TBD
Silicon	2	19,000**	TBD
Strontium	1	94**	TBD
Sulfur	1*	1800	TBD
Tin	4*	9**	TBD
Titanium	1*	790**	TBD
Vanadium	1*	10**	TBD
Yttrium	1*	3**	TBD
Zinc	1	200**	TBD

*The quantitation limit has changed over the study duration. All have decreased.

***Concentration is higher than reported in last progress report.

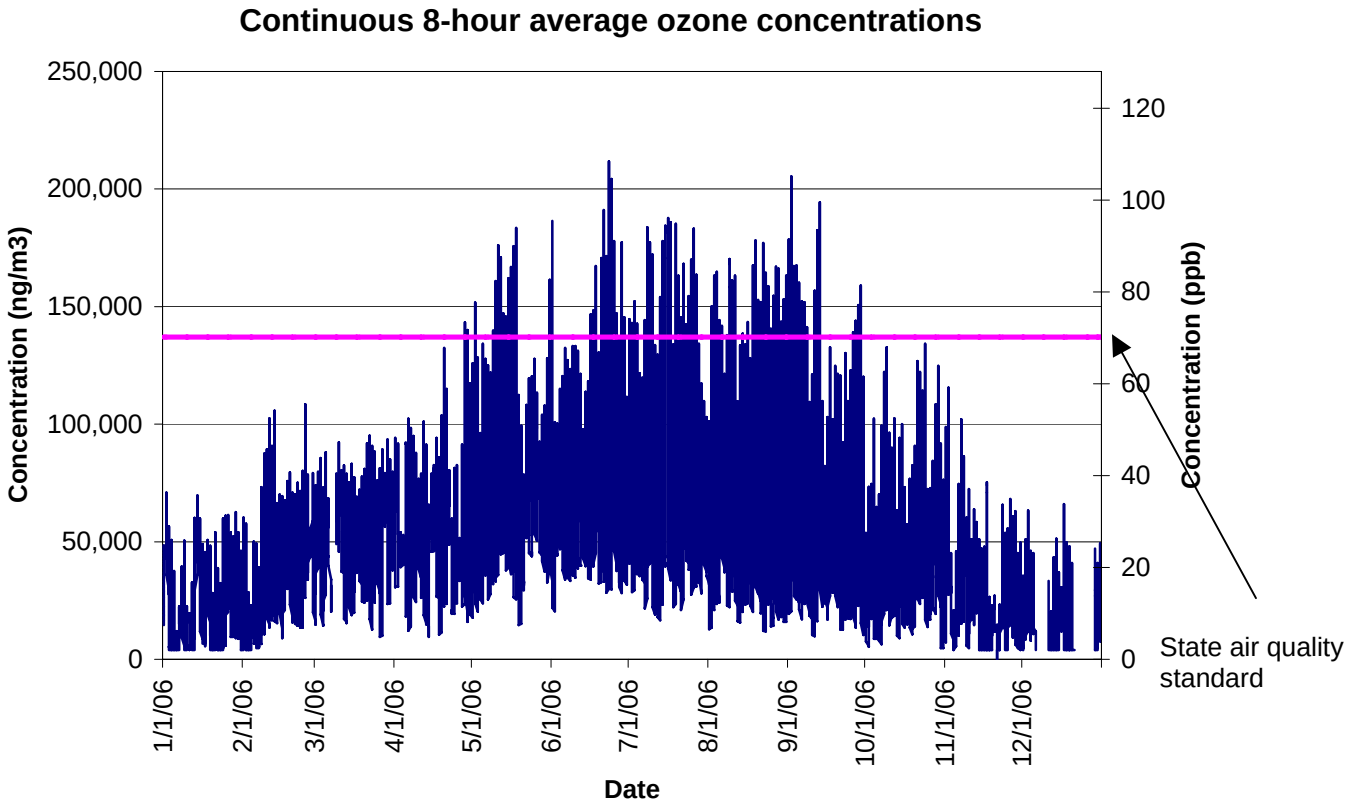
[1] To Be Determined.

Table 5. Average quarterly hexavalent chromium concentrations measured at ARB monitoring station in Parlier. Concentrations detected at ARB's monitoring station in Fresno are shown for comparison. Concentrations are for a composite sample averaged over 3-month period.

Date	Hexavalent Chromium (ng/m^3)	
	Parlier	Fresno
1/1/06 – 3/30/06	0.06	0.08
4/1/2006 – 6/30/06	<MDL	0.06
7/1/06 – 9/30/06	<MDL	<MDL
10/1/06 – 12/31/06	0.07	0.06

*Minimum detection limit (MDL) = 0.06

Figure 1. Concentrations of criteria air pollutants at the Parlier monitoring station, 2006



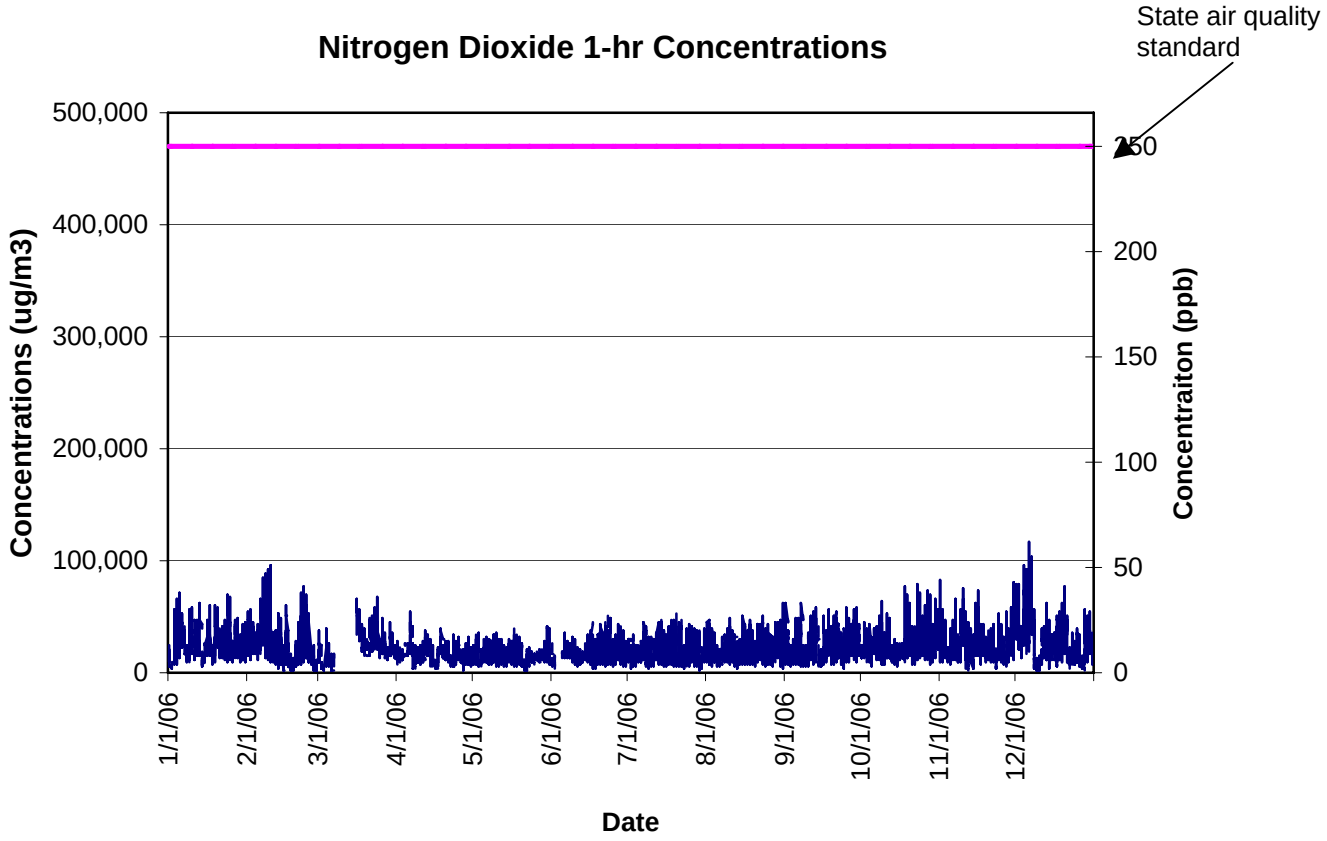
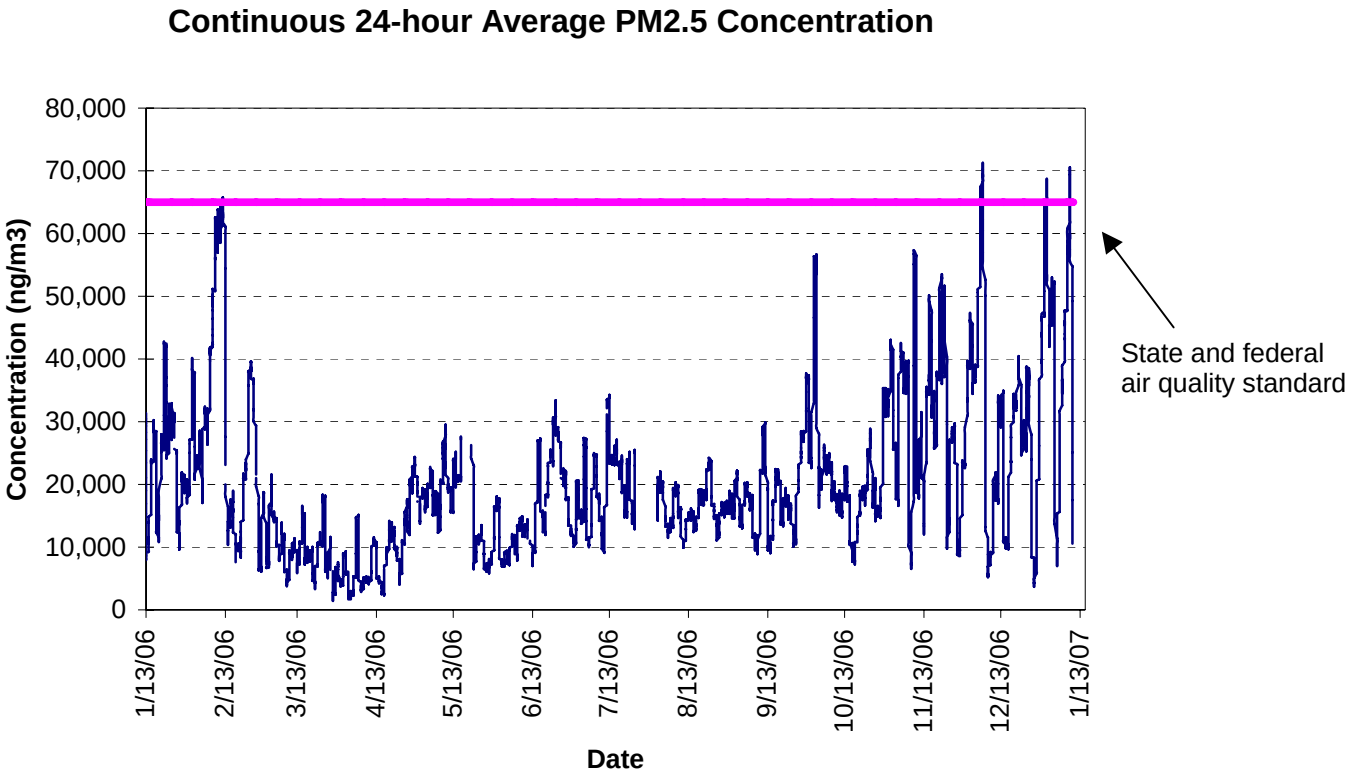



Figure 13. Concentrations of fine particulate matter (PM2.5) at the Parlier monitoring station, 2006.