

Appendix E:

Field Quality Control Samples

Appendix E Tables:

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Phase 1 North Central District & Yakima Valley Receptor, Ambient and Quality Control Sites

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Phase 1 North Central District & Yakima Valley Perimeter Sites

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Phase 1 Receptor

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Phase 2 Perimeter

Appendix G Field Quality Control Samples Key Terms

- NCD= North Central District
- YV= Yakima valley
- trip spikes= spiked at a known concentration by the lab, taken out to the field, and no air drawn through the tube
- trip blanks= blank tubes taken out to the field
- id= identification
- ng= nanogram
- ng/tube= nanograms per sampling tube
- ng/m³= nanograms over cubic meters
- CPF= chlorpyrifos
- CPF total= sum of chlorpyrifos and chlorpyrifos-oxon expressed as the molar equivalent of CPF
- CPF eq= chlorpyrifos molar equivalent
- eve= evening
- aft= afternoon
- morn= morning
- AZ= azinphosmethyl
- AZ total= sum of azinphosmethyl and azinphosmethyl-oxon expressed as the molar equivalent of AZ
- AZ eq= azinphosmethyl molar equivalent
- PH= phosmet
- MA= malathion
- recov= recovery
- st. dev= standard deviation
- CV= coefficient of variation
- n/a= non applicable

Receptor and ambient samples

Air samples were collected with SKC universal sample pumps (model # 224-PCXR4) at a flowrate of 2.0 liters per minutes with a OVS XAD-2 tube (SKC catalog # 226-58A).

Perimeter samples

Air samples were collected with Hi-Lite 30 sample pumps (model # 228-031) at a flowrate of 6.0 liters per minutes with a OVS XAD-2 tube (SKC catalog # 226-58A).

All rotameters were calibrated to Bios Defender 520 (SKC catalog #717-520H) which was calibrated against a primary standard (bubble flow meter).

Samples were analyzed by a LC-MS at DEOHS- Environmental Health Lab.

Table 91. Field Quality Control Samples (ng/tube)
Phase 1 North Central District Yakima Valley Receptor, Ambient, and Quality Control Sites

Type/id number	region	spike load CPF ng	spike date	analysis date	duration spike-analysis (day)	Mass Recovered (ng)				% CPF Recov.
						CPF	CPF-Oxon	CPF-Oxon as CPF Eq	Total CPF	
Trip Spikes										
2501	NCD	12.5	3/20/2008	10/20/2008	214	13	<1	13	13	107
2505	NCD	12.5	3/20/2008	10/20/2008	214	13	<1	13	13	104
2509	NCD	12.5	3/20/2008	10/20/2008	214	14	<1	14	14	112
2513	NCD	12.5	4/18/2008	10/20/2008	185	10	<1	10	10	79
2517	NCD	12.5	4/18/2008	10/20/2008	185	11	<1	11	11	87
2521	NCD	12.5	4/18/2008	10/20/2008	185	11	<1	11	11	88
2522	NCD	12.5	3/20/2008	10/20/2008	214	11	<1	11	11	89
2526	NCD	12.5	3/20/2008	10/20/2008	214	13	<1	13	13	103
2001	YV	12.5	2/29/2008	10/20/2008	234	11	<1	11	11	90
2005	YV	12.5	2/29/2008	10/20/2008	234	11	<1	11	11	89
2010	YV	12.5	2/29/2008	10/20/2008	234	12	<1	12	12	92
2019	YV	12.5	2/29/2008	10/20/2008	234	11	<1	11	11	88
2023	YV	12.5	2/29/2008	10/20/2008	234	12	<1	12	12	92
2027	YV	12.5	2/29/2008	10/20/2008	234	11	<1	11	11	87
2028 ^a	YV	12.5	2/29/2008	10/20/2008	234	24	5	5	29	234
2033	YV	12.5	3/20/2008	10/20/2008	214	13	<1	13	13	100
2037	YV	12.5	3/20/2008	10/20/2008	214	13	<1	13	13	104
								mean	12.820	102.564
								st. dev	4.377	35.016
								cv	0.341	0.341
							without #2028	mean	11.794	94.353
								st. dev	1.155	9.240
								cv	0.098	0.098
Trip Blanks										
1511	NCD			10/20/2008		<1	<1	<1	<1	
1516	NCD			10/20/2008		<1	<1	<1	<1	
1520	NCD			10/20/2008		<1	<1	<1	<1	
1525	NCD			10/20/2008		<1	<1	<1	<1	
1529	NCD			10/20/2008		<1	<1	<1	<1	
1534	NCD			10/20/2008		<1	<1	<1	<1	
1538	NCD			10/20/2008		<1	<1	<1	<1	
1542	NCD			10/20/2008		<1	<1	<1	<1	
1009	YV			10/20/2008		<1	<1	<1	<1	
1013	YV			10/20/2008		<1	<1	<1	<1	
1017	YV			10/20/2008		<1	<1	<1	<1	
1021	YV			10/20/2008		<1	<1	<1	<1	
1022	YV			10/20/2008		<1	<1	<1	<1	
1024	YV			10/20/2008		<1	<1	<1	<1	
1025	YV			10/20/2008		<1	<1	<1	<1	
1029	YV			10/20/2008		<1	<1	<1	<1	
Footnotes										
a. Lab reported double spiking could not occur. No other explanation at this time. #2028.										

**Table 92. Field Quality Control Samples (ng/tube)
 Phase 1 North Central District and Yakima Valley
 Perimeter Sites**

Type/id number	region	spike load ng	spike date	analysis date	duration spike-analysis (day)	Mass recovered (ng)			CPF Total	% CPF Recov.
						CPF	CPF-Oxon	CPF-Oxon as CPF Eq		
Trip Spikes-Low										
5505	NCD	50	3/20/2008	10/20/2008	214	39	<1	<1	39	78
5507	NCD	50	3/20/2008	10/20/2008	214	30	<1	<1	30	61
5513	NCD	50	3/20/2008	10/20/2008	214	33	<1	<1	33	66
4505	YV	50	3/20/2008	10/20/2008	214	34	<1	<1	34	68
4507	YV	50	3/20/2008	10/20/2008	214	34	<1	<1	34	67
4513	YV	50	3/20/2008	10/20/2008	214	41	<1	<1	41	81
							mean		35	70
							st. dev.		3.82	7.64
							CV		0.109	0.109
Trip Spikes-Hi										
5506	NCD	250	3/20/2008	10/20/2008	214	190	1	1	191	76
5508	NCD	250	3/20/2008	10/20/2008	214	181	<1	<1	181	73
5514	NCD	250	3/20/2008	10/20/2008	214	173	<1	<1	173	69
4506	YV	250	3/20/2008	10/20/2008	214	163	<1	<1	163	65
4508	YV	250	3/20/2008	10/20/2008	214	152	1	1	153	61
4514	YV	250	3/20/2008	10/20/2008	214	198	<1	<1	198	79
							mean		177	71
							st. dev.		17.0	6.79
							CV		0.096	0.096
Trip Blanks										
5002	NCD			10/20/2008		<1	<1	<1	<1	
5004	NCD			10/20/2008		<1	<1	<1	<1	
5005	NCD			10/20/2008		<1	<1	<1	<1	
5007	NCD			10/20/2008		<1	<1	<1	<1	
5010	NCD			10/20/2008		<1	<1	<1	<1	
5014	NCD			10/20/2008		<1	<1	<1	<1	
4002	YV			10/20/2008		<1	<1	<1	<1	
4004	YV			10/20/2008		<1	<1	<1	<1	
4005	YV			10/20/2008		<1	<1	<1	<1	
4010	YV			10/20/2008		<1	<1	<1	<1	
4007	YV			10/20/2008		<1	<1	<1	<1	
4015	YV			10/20/2008		<1	<1	<1	<1	

**Table 93. Field Quality Control Samples (ng/tube)
 Phase 2 Yakima Valley Receptor, Ambient, and Quality Control Sites**

type/id number	spike load (ng)	spike date	analysis date	duration spike - analysis (day)	Mass Recovered (ng)				PH	PH % Recov.	MA	MA % Recov.
					AZ	AZ % Recov.	AZ-oxon	AZ-oxon % Recov.				
Trip spikes												
7501	50	5/19/2008	12/2/2008	197	45	91	41	82	43	86	49	97
7503	50	5/19/2008	12/2/2008	197	45	89	38	77	40	79	45	90
7505	50	5/19/2008	12/2/2008	197	46	92	37	75	40	79	46	92
7509	50	5/19/2008	12/2/2008	197	46	91	42	84	43	86	49	97
7511	50	5/19/2008	12/2/2008	197	44	87	31	62	34	69	41	82
7514	50	5/19/2008	12/2/2008	197	44	89	41	82	43	86	48	95
7517	50	5/19/2008	12/2/2008	197	46	91	39	78	42	84	48	95
7519 ^a	50	5/19/2008	12/2/2008	197	46	92	44	87	46	92	50	100
7521	50	5/19/2008	12/2/2008	197	45	89	38	76	37	75	47	93
7523	50	5/19/2008	12/2/2008	197	45	90	41	81	43	85	47	94
7524	50	5/19/2008	12/2/2008	197	45	91	39	78	40	79	47	93
				mean	45	90	39	78	41	82	47	94
				st. dev.	0.71	1.42	3.27	6.54	3.22	6.44	2.38	4.76
				CV	0.02	0.02	0.08	0.08	0.08	0.08	0.05	0.05
Trip blanks												
7001			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
7003			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
7005			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
7009			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
7011			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
7013			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
7016			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
7018			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
7021			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
7023			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
7024			12/2/2008	197	<0.5		<0.5		<0.5		<0.4	
Footnotes												
^a Back sections contained the following % of total recovered AZ (5%) , AZ-oxon (6.4), PH(5.4), and MA(4.5).												

**Table 94. Field Quality Control Samples (ng/tube)
 Phase 2 Yakima Valley Perimeter Site**

Type/Id number	spike load AZ, PH, MA (ng)	spike load AZ-Oxon (ng)	spike date	analysis date	duration spike - analysis (day)	Mass Recovered							
						AZ (ng)	AZ % Spike Recov.	AZ-oxon (ng)	AZ-oxon % Spike Recov.	PH (ng)	PH % Spike Recov.	MA (ng)	MA % Spike Recov.
Spikes													
9701	50	20	6/16/2008	12/2/2008	169	47	93	16	78	38	76	43	86
9705	50	20	6/16/2008	12/2/2008	169	46	92	16	79	43	86	46	92
9709	50	20	6/16/2008	12/2/2008	169	48	96	16	82	46	92	47	94
9713 ^{a,b}	50	20	6/16/2008	12/2/2008	169	45	90	16	82	46	91	46	92
					mean	46	93	16	80	43	86	46	91
					st. dev.	1.04	2.07	0.30	1.73	3.64	7.27	1.67	3.34
					CV	0.02	0.02	0.02	0.02	0.08	0.08	0.04	0.04
Blanks													
9501				12/2/2008		<0.5		<0.5		1		1	
9505				12/2/2008		<0.5		<0.5		<0.5		<0.4	
9509				12/2/2008		<0.5		<0.5		<0.5		0.4	
9513				12/2/2008		<0.5		<0.5		<0.5		0.4	
Footnotes													
^a Az-oxon Backsection:secondary qualifier ion ratio is outside of the acceptable range; identification should be considered tentative. Mass = 0.5ng													
^b Back sections contained ~ 2% of total recovered of AZ(1.6%) , AZ-oxon (3.1), PH(1.5), and MA(1.1).													

**Table 95. Quality Control Analysis (co-located Samples)
 Phase 1 Receptor**

	Total CPF^a		
Date	Primary (ng/m3)	QC (ng/m3)	difference (%)
North Central District			
3-Apr-08	3.3	8.1	84.2
6-Apr-08	0.6	1.0	50.0
8-Apr-08	1.1	3.4	102.2
10-Apr-08	3.8	3.9	2.6
12-Apr-08	162.1	7.6	182.1
14-Apr-08	0.7	0.9	25.0
16-Apr-08	6.5	7.5	14.3
18-Apr-08	4.7	3.8	21.2
20-Apr-08	7.5	8.0	6.5
22-Apr-08	10.2	11.8	14.5
24-Apr-08	4.8	5.2	8.0
26-Apr-08	3.0	2.0	40.0
28-Apr-08	1.5	1.5	0.0
30-Apr-08	0.4	0.4	0.0
2-May-08	0.9	0.8	11.8
Yakima Valley			
8-Mar-08	1.6	1.5	6.5
10-Mar-08	1.8	1.7	5.7
12-Mar-08	15.3	16.1	5.1
14-Mar-08	6.3	5.7	10.0
16-Mar-08	3.9	3.8	2.6
18-Mar-08	18.7	20.0	6.7
20-Mar-08	4.4	4.3	2.3
22-Mar-08	31.8	35.0	9.6
24-Mar-08	27.6	33.7	19.9
26-Mar-08	3.0	3.3	12.6
28-Mar-08	6.0	5.3	12.4
30-Mar-08	84.3	56.8	39.0
1-Apr-08	81.9	78.0	4.9
3-Apr-08	242.3	216.7	11.2
6-Apr-08	8.2	8.0	2.5
Footnotes			
^a Total CPF = CPF + the CPF-oxon as the molar equivalent of CPF			

**Table E6. Quality Control Analysis (co-located Samples)
 Phase 1 Perimeter**

Date	Sample period	Total CPF ^a		
		Primary (ng/m ³)	QC (ng/m ³)	Difference (%)
North Central District				
6-Apr-08	Pre-spray	8.1	9.3	13.5
7-Apr-08	Spray, a.m.	869.6	888.6	2.2
7-Apr-08	Spray, p.m.	312.5	293.3	6.3
7-Apr-08	Spray, night	128.3	115.1	10.8
8-Apr-08	Post-spray 1, a.m.	264.4	238.3	10.4
8-Apr-08	Post-spray 1, p.m.	128.9	124.5	3.4
9-Apr-08	Post spray 2	159.4	61.4	88.8
Yakima Valley				
31-Mar-08	Pre-spray	20.1	22.9	13.0
2-Apr-08	Spray, a.m.	902.3	822.9	9.2
2-Apr-08	Spray, p.m.	102.5	133.0	25.9
2-Apr-08	Spray, night	259.2	227.1	13.2
3-Apr-08	Post-spray 1, a.m.	332.5	354.2	6.3
3-Apr-08	Post-spray 1, p.m.	397.3	381.0	4.2
4-Apr-08	Post spray 2	296.2	295.6	0.2
Footnotes				
^a Total CPF = CPF + the CPF-oxon as the molar equivalent of CPF				

**Table 97. Quality Control Analysis (co-located Samples)
 Phase 2 Receptor**

start date	ID		Total AZ ^a		
	primary	qc	primary (ng/m ³)	qc (ng/m ³)	difference (%)
Yakima Valley					
21-May-08	8007	8009	0.2	0.2	0.0
24-May-08	8017	8020	9.9	7.7	25.0
27-May-08	8027	8029	7.6	8.8	14.6
30-May-08	8037	8039	14.9	17.5	16.0
2-Jun-08	8047	8049	2.1	2.1	0.0
5-Jun-08	8057	8059	0.7	0.3	80.0
8-Jun-08	8067	8069	10.8	9	18.2
11-Jun-08	8077	na	15.7	na	na
13-Jun-08	8087	8089	9.5	11.4	18.2
17-Jun-08	8097	8099	21.9	19.1	13.7
20-Jun-08	8107	8109	16.5	19.5	16.7
23-Jun-08	8117	8119	12.4	11.5	7.5
26-Jun-08	8127	8130	8.2	6.1	29.4
2-Jul-08	8137	8140	13.3	10	28.3
5-Jul-08	8147	8149	3	2.4	22.2
8-Jul-08	8157	8159	4.7	6.1	25.9
11-Jul-08	8167	8169	5.6	4.1	30.9
14-Jul-08	8177	8179	6	2.6	79.1
17-Jul-08	8187	8189	6.6	6.1	7.9
20-Jul-08	8197	8199	3.6	3.7	2.7
23-Jul-08	8207	8209	6.4	4.7	30.6
26-Jul-08	8217	8219	2.9	2.7	7.1
29-Jul-08	8227	8229	2.6	2.6	0.0
Footnote					
^a Total AZ = AZ + the AZ-oxon as the molar equivalent of AZ					

**Table E8. Quality Control Analysis (co-located Samples)
 Phase 1 Perimeter**

Date	sample period	ID		Total AZ ^a		
		primary	qc	Primary (ng/m ³)	QC (ng/m ³)	difference (%)
Yakima Valley						
19-Jun-08	Pre-spray	9003	9009	12.6	20.1	45.9
20-Jun-08	Spray, p.m.	9030	9060	7553.6	na	
21-Jun-08	Spray, night	9031	9061	40.3	42.4	5.1
21-Jun-08	Post-spray 1, a.m.	9077	9097	89.9	74.9	18.2
21-Jun-08	Post-spray 1, p.m.	9078	9098	35.8	30.9	14.7
22-Jun-08	Post spray 2	9107	9117	25.8	23.1	11.0
footnote						
^a Total AZ = AZ + the AZ-oxon as the molar equivalent of AZ						