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Background Event Sampling Report: Chevron Richmond Community Air Monitoring Program

Report Number: RCAMP_EV_13
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1 Report Document Control

PROJECT REFERENCE:	RCAMP_EV_13
REPORT TITLE:	Background Event Sampling Report: Richmond Community Air Monitoring Program
DATE SUBMITTED:	November 10, 2014
CLIENT:	Adam Lenz Sustainability Coordinator City Manager's Office E-mail: adam_lenz@richmond.ca.us Telephone: 510-620-5537
PREPARED BY:	Don Gamiles Argos Scientific Inc.
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NOTICE	

2 Introduction

The following report summarizes the monthly background data generated by the event sampling systems as part of the Richmond Community Air Monitoring Program (RCAMP). RCAMP is an independent initiative designed to provide air quality data to the general public, and to educate the community about what is in the air. The air quality monitoring equipment (including installation) was funded by Chevron in consultation with the City of Richmond. Ongoing operation, maintenance, and data reporting is managed by Argos Scientific, Inc., with direction from the City Manager's Office, and input from Chevron and community representatives.

In addition to real-time monitoring, each community location is equipped discrete air monitoring equipment, which is designed to activate on a schedule or when manually triggered. The discrete monitoring is used to collect background data. It will then be activated monthly for QA/QC purposes and also activated during an event. The data collected for this report is for background purposes.

This report details the information collected by the Volatile Organic Compound (VOC), Poly Aromatic Hydrocarbon (PAH), and the Metals sampling systems installed at the community air monitoring stations near the perimeter of Chevron's Richmond Refinery. Samples were collected from April 9, 2014 at 2:15 PM to April 10, 2014 at 2:15 PM. The remainder of the report provides a summary of the average wind direction patterns during the sample collection period, and the results of the Quality Assurance/Quality Control (QA/QC) checks. Appendix A lists the California and Federal Health limits published for substances relevant to the RCAMP.

3 Results

3.1 VOC Sample Results

This section of the report presents the results for VOC samples collected.

Table 3.1: VOC Sample Results 04/09/2014 at Atchison Village, Point Richmond, and North Richmond

Compound	Atchison Village (ppb)	Point Richmond (ppb)	North Richmond (ppb)
1,3-Butadiene	Nothing Detected	Nothing Detected	Nothing Detected
Benzene	Nothing Detected	Nothing Detected	Nothing Detected
Carbon Tetrachloride	Nothing Detected	Nothing Detected	Nothing Detected
Dichloromethane	9.4	21	Nothing Detected
Ethyl Benzene	1.3	Nothing Detected	Nothing Detected
m,p-Xylene	4.1	Nothing Detected	1.3
o-Xylene	0.67	Nothing Detected	Nothing Detected
Tetrachloroethylene	Nothing Detected	Nothing Detected	Nothing Detected
Toluene	1.2	0.87	1.1
Vinyl Chloride	Nothing Detected	Nothing Detected	Nothing Detected

3.2 PAH Sample Result

This section of the report presents the results for PAH samples collected.

Table 3.2: PAH Sample Results 04/09/2014 at Atchison Village, Point Richmond, and North Richmond

Compound	Atchison Village (µg/m³)	Point Richmond (µg/m³)	North Richmond (µg/m³)
2-Chloronaphthalene	Nothing Detected	Nothing Detected	Nothing Detected
2-Methylnaphthalene	0.1200	0.0180	0.0340
Acenaphthene	0.0240	0.0110	0.0110
Acenaphthylene	Nothing Detected	Nothing Detected	Nothing Detected
Anthracene	0.0120	0.0081	0.0041
Benzo(a)anthracene	Nothing Detected	Nothing Detected	Nothing Detected
Benzo(a)pyrene	Nothing Detected	Nothing Detected	Nothing Detected
Benzo(b)fluoranthene	Nothing Detected	Nothing Detected	Nothing Detected
Benzo(g,h,i)perylene	Nothing Detected	Nothing Detected	Nothing Detected
Benzo(k)fluoranthene	Nothing Detected	Nothing Detected	Nothing Detected
Chrysene	Nothing Detected	Nothing Detected	Nothing Detected
Dibenz(a,h)anthracene	Nothing Detected	Nothing Detected	Nothing Detected
Fluoranthene	0.0220	0.0046	0.0058
Fluorene	0.0420	0.0390	0.0230
Indeno(1,2,3-c,d)pyrene	Nothing Detected	Nothing Detected	Nothing Detected
Naphthalene	0.1600	0.0310	0.0620
Phenanthrene	0.1700	0.0670	0.0440
Pyrene	0.0120	Nothing Detected	0.0037

3.3 Metals Sample Results

This section of the report presents the results for Metals samples collected.

Table 3.3: Metals Sampling Results 04/09/2014 at Atchison Village, Point Richmond, and North Richmond

Elements	Atchison Village (µg/m³)	Point Richmond (µg/m³)	North Richmond (µg/m³)
Aluminum	0.1445	0.0767	0.0505
Antimony	Nothing Detected	Nothing Detected	Nothing Detected
Arsenic	Nothing Detected	0.0013	Nothing Detected
Barium	0.0104	Nothing Detected	Nothing Detected
Cadmium	Nothing Detected	Nothing Detected	Nothing Detected
Calcium	0.3069	0.1258	0.0851
Chromium	0.0032	0.0037	0.004
Cobalt	Nothing Detected	Nothing Detected	Nothing Detected
Copper	0.2593	0.0295	0.0512
Gallium	Nothing Detected	Nothing Detected	Nothing Detected
Germanium	Nothing Detected	Nothing Detected	Nothing Detected
Indium	Nothing Detected	Nothing Detected	Nothing Detected
Iron	0.4237	0.1186	0.137
Lanthanum	Nothing Detected	Nothing Detected	Nothing Detected
Lead	0.0078	Nothing Detected	Nothing Detected
Magnesium	0.2693	Nothing Detected	Nothing Detected
Manganese	0.0095	Nothing Detected	0.0034
Mercury	Nothing Detected	Nothing Detected	Nothing Detected
Molybdenum	Nothing Detected	Nothing Detected	Nothing Detected
Nickel	0.003	Nothing Detected	0.0035
Palladium	Nothing Detected	Nothing Detected	Nothing Detected
Potassium	0.2517	0.0583	0.0545
Rubidium	Nothing Detected	Nothing Detected	Nothing Detected
Silicon	0.4336	0.2094	0.1702
Silver	Nothing Detected	Nothing Detected	Nothing Detected
Sodium	2.685	Nothing Detected	0.6656
Strontium	0.0046	Nothing Detected	Nothing Detected
Tin	Nothing Detected	Nothing Detected	0.0101
Titanium	0.0202	0.014	0.0075
Vanadium	Nothing Detected	Nothing Detected	Nothing Detected
Yttrium	Nothing Detected	Nothing Detected	Nothing Detected
Zinc	0.0278	0.0401	0.0117
Zirconium	0.0026	Nothing Detected	Nothing Detected

3.4 Wind Roses

Figure 3.1: Atchison Village

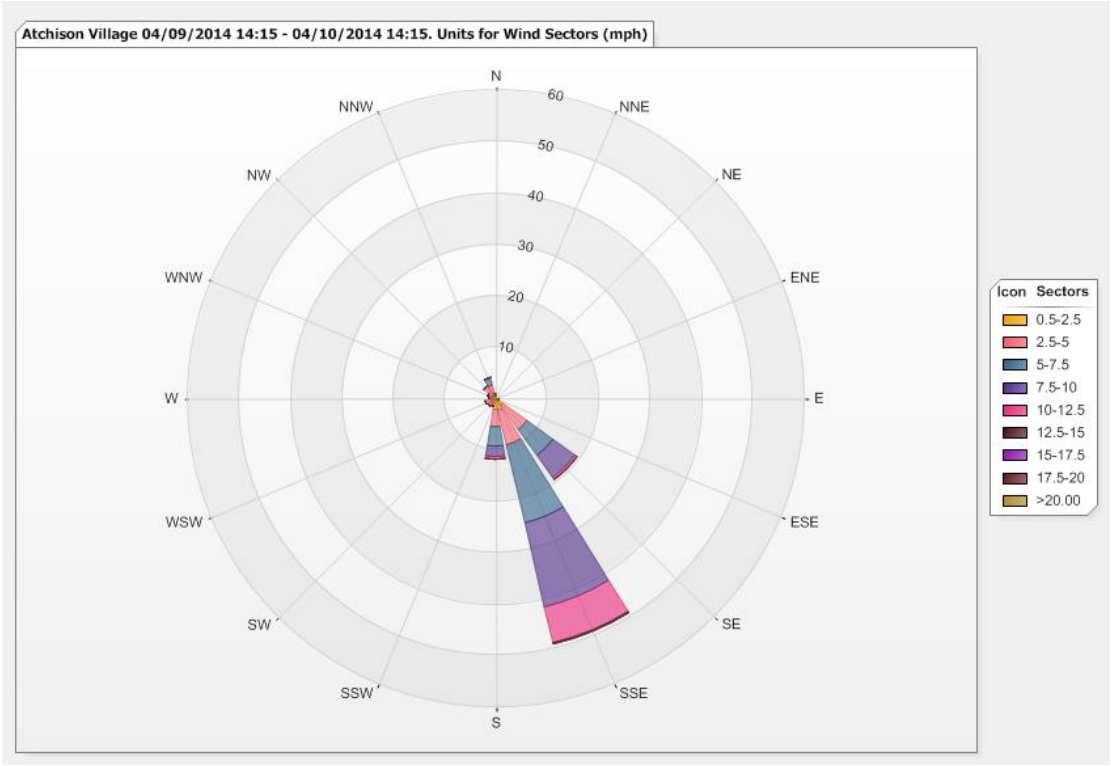


Figure 3.2: Point Richmond

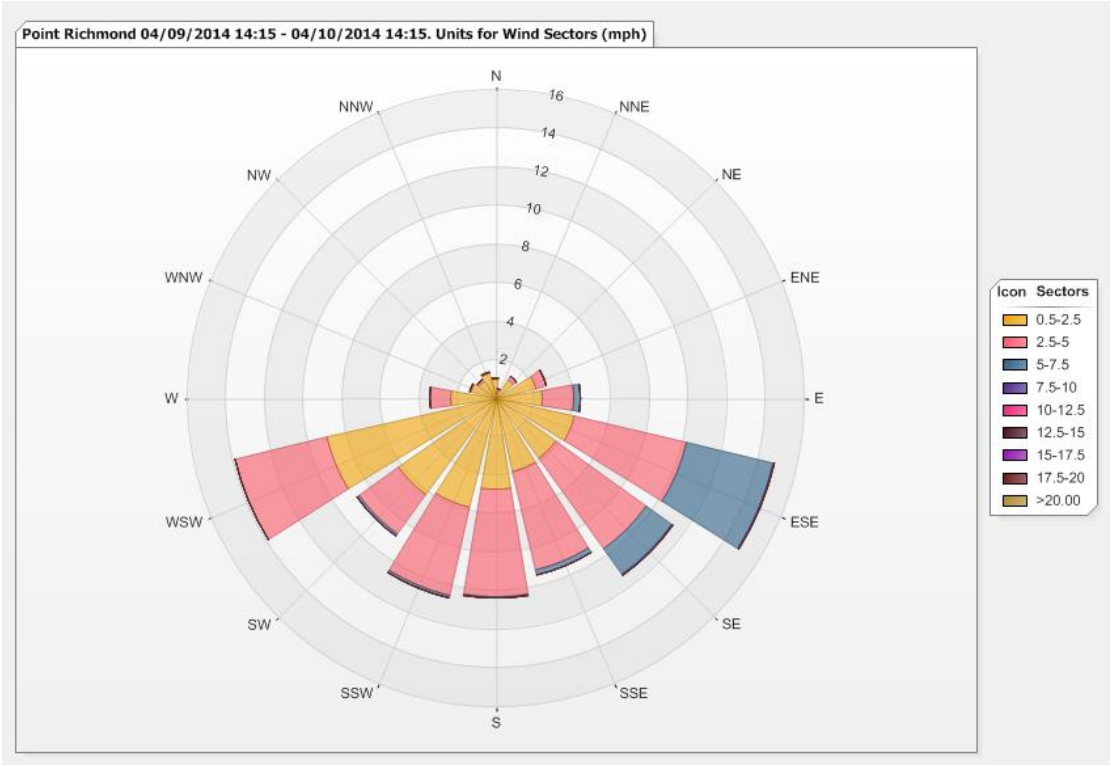
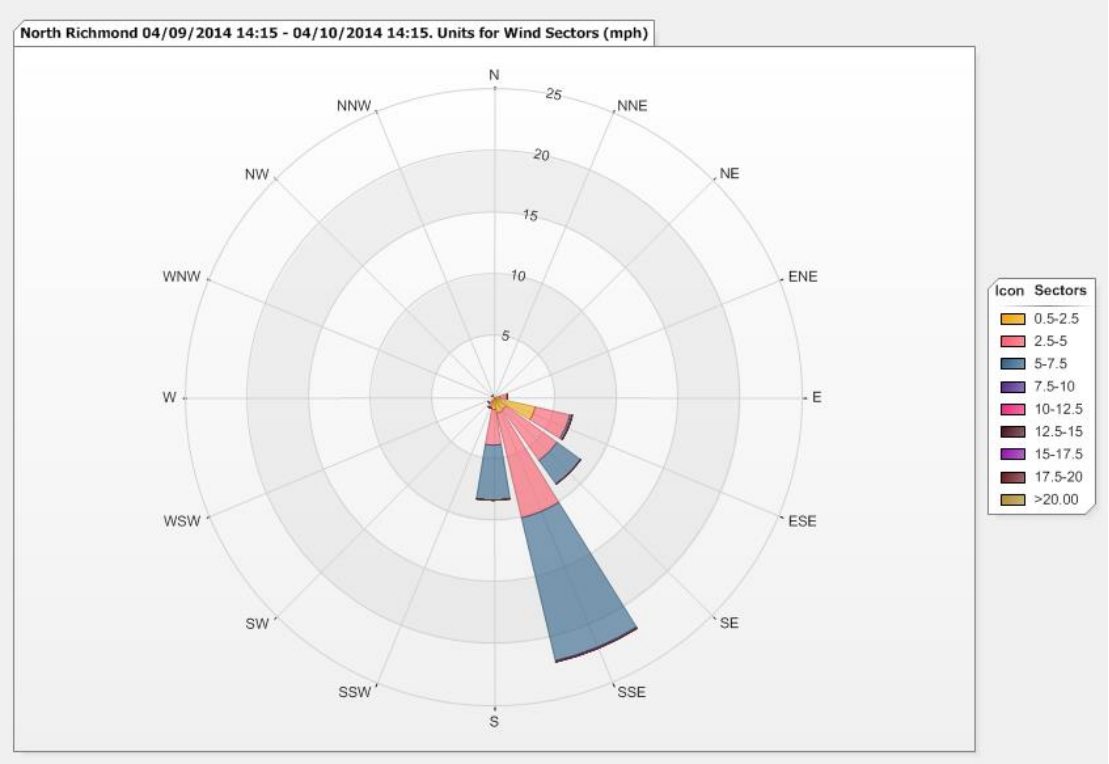


Figure 3.3: North Richmond



3.5 QA/QC Checks

Table 3.4: Atchison Village QA/QC

Instrument	Sample Date	Sample Time	Chain of Custody	Passed QA/QC
VOC	04/09/2014	24 hrs	Yes	Yes
PAH	04/09/2014	24 hrs	Yes	Yes
Metals	04/09/2014	24 hrs	Yes	Yes

Table 3.5: Point Richmond QA/QC

Instrument	Sample Date	Sample Time	Chain of Custody	Passed QA/QC
VOC	04/09/2014	24 hrs	Yes	Yes
PAH	04/09/2014	24 hrs	Yes	Yes
Metals	04/09/2014	24 hrs	Yes	Yes

Table 3.6: North Richmond QA/QC

Instrument	Sample Date	Sample Time	Chain of Custody	Passed QA/QC
VOC	04/09/2014	24 hrs	Yes	Yes
PAH	04/09/2014	24 hrs	Yes	Yes
Metals	04/09/2014	24 hrs	Yes	Yes

Appendix A: California and Federal Health Limits

Gas/Compound	Acute Health Limit	Chronic Health Limit	Source
Arsenic		0.015 µg/m³	CA
Benzene	8 ppb	1 ppb	CA
1-3 Butadiene	298 ppb	1 ppb	CA
Cadmium		0.02 µg/m³	CA
Calcium	-	5 µg/m³	Federal
Carbon Tetrachloride	302 ppb	6 ppb	CA
Copper	100 µg/m³	-	CA
Dichlormethane	4,035 ppb	115 ppb	CA
Ethylbenzene		461 ppb	CA
Lead	1.5 µg/m³	0.15 µg/m³	CA/Federal
Manganese	0.17 µg/m³	0.09 µg/m³	CA
Naphthalene	-	9 µg/m³	CA
Nickel	0.2 µg/m³	0.014 µg/m³	CA
Pyrene	-	9 µg/m³	Federal
Selenium	-	20 µg/m³	CA
Silica	-	3 µg/m³	CA
Toluene	9,814 ppb	80 ppb	CA
Vinyl Chloride	70,588 ppb		CA
m,p-Xylene	5,069ppb	161 ppb	CA

Sources for Health Limits

California health standards were obtained from the California Office of Environmental Health Hazard Assessment. This organization is responsible for conducting health risk assessments of chemical contaminants found in air. This includes studying the health impacts on sensitive subpopulations such as children and the elderly.

Federal health standards were obtained from the Environmental Protection Agency (EPA). The EPA publishes regulations and sets air quality standards for the nation.

General Health Limits for Metals :

Copper, Lead, and Manganese all have published health limits. However, in general, the EPA sets health limits for metals and other elements based on an estimate that they should not exceed 10% of the particulates in an ambient air

sample. Since the EPA's annual limit for Particulate Matter (PM) smaller than 10 microns should not exceed 50 $\mu g/m^3$, the annual exposure to these elements should not exceed 5 $\mu g/m^3$.