Ambient Air Monitoring Reference Guide for the Richmond-North Richmond-San Pablo Area

This table provides information about different ambient air monitoring programs and projects. Air monitoring efforts are performed by different organizations, and datasets include different pollutants and have different purposes and uses. *Ambient* data refers to data collected in-community where people live and work, representing the outdoor air we normally breathe.

	Air Monitoring Program or Project	Data Description	Monitoring Locations	Pollutants or parameters measured	Links to data and information
Air District	**Air District-operated long-term sites**	Regulatory ambient data; required for Air District, CARB, and U.S. EPA programs; some data available in real-time	San Pablo (Rumrill Blvd.)	O_3, CO, NO, NO_2, SO_2, PM_{10}, $PM_{2.5}$, gas air toxics	Real-time data (except PM_{10} and air toxics) Historical data on EPA's AirData page Air District Monitoring Network Information
			Richmond (7th Street)	SO_2, H_2S, gas air toxics	
			Point Richmond	H_2S	
	Air District-operated mobile monitoring	Short-term monitoring project focused on gas air toxics; project selected by the AB 617 Monitoring Plan Steering Committee	Targeted areas in Richmond-North-Richmond-San Pablo	Selected gas air toxics such as BTEX and 1,3-butadiene	StoryMap with project information and findings
Chevron	**Chevron-operated Community Monitoring Stations**	Non-regulatory ambient data, required by the City of Richmond and not subject to Air District regulations; data available in real-time	Atchison Village North Richmond Point Richmond	Black Carbon, $PM_{2.5}$, H_2S, BTEX and other gas air toxics, meteorology	Chevron real-time monitoring data page
Sensor Networks	**PSE Healthy Energy & APEN**	CARB AB 617 grantee; network of Aeroqual sensors; additional short-term monitoring for black carbon and volatile organic compounds	50 sensors installed across the area	$PM_{2.5}$, NO_2, O_3, temperature, relative humidity, and dew point	Project information page
	Groundwork Richmond & Ramboll	CARB AB 617 grantee; network of Clarity sensors with real-time data; additional short-term monitoring for black carbon and PM metals	52 sensors installed across the area	$PM_{2.5}$, NO_2	Air Rangers Project Information Clarity Open Map (real-time data)
	BEACO$_2$N	School-based sensor network with real-time data, operated by UC Berkeley	15+ schools across the area	CO_2, CO, NO, NO_x, O_3, PM	Data, map, and information page
	PurpleAir	Public-operated sensors with real-time data	20+ locations across the area	$PM_{2.5}$, PM_{10}	Real-time data page
Additional Projects and Datasets	**Aclima**	Mobile monitoring conducted August-October 2019 – quarterly average concentrations	Throughout the Richmond-North Richmond-San Pablo area	$PM_{2.5}$, NO_2, O_3, CO, CO_2	Aclima Insights Website
		Annual baseline monitoring (data for Contra Costa County collected November 2019-October 2020)	Throughout the Bay Area	$PM_{2.5}$, NO_2, O_3, CO, CO_2	Aclima Air.Health Website
	Assessment of Coal Air Pollution Project	Short-term project focused on particulate matter from coal and petroleum coke operations; CARB AB 617 grantee	Around Levin Terminal and adjacent railways	Particulate matter	Project background and status provided in Update on Air Monitoring Projects, Fall 2021
	AirNow Fire and Smoke Map	Real-time, interactive map for displaying data from government agency monitors and Purple Air sensors, designed for use during wildfire events	Data available from across the U.S.	$PM_{2.5}$	AirNow Fire and Smoke Map Website

Pollutant Abbreviations

O_3: Ozone
CO: Carbon monoxide
CO_2: Carbon dioxide
NO: Nitric oxide
NO_2: Nitrogen dioxide
SO_2: Sulfur dioxide
H_2S: Hydrogen sulfide
BTEX: Benzene, Toluene, Ethylbenzene, Xylene
$PM_{2.5}$: Particulate matter with diameter 2.5 microns or smaller
PM_{10}: Particulate matter with diameter 10 microns or smaller

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Emissions Monitoring Reference Guide for the Richmond-North Richmond-San Pablo Area

This table provides information about different programs and systems for emissions monitoring. Monitoring data for pollution emissions, such as from source tests, refinery flare monitoring, and refinery continuous emission, fenceline and ground-level monitoring, are collected at or near specific pollution sources to provide information on emissions from those sources. The Air District conducts source tests at numerous facilities across the Bay Area. Chevron operates several monitoring systems for compliance with U.S. EPA and Air District requirements, and those systems and resulting data are subject to different levels of review and oversight by the Air District. Data described below can be requested using the Air District's Public Records Request system.

	Monitoring Program or System	Description	Monitoring Locations	Pollutants or parameters measured	Links to data and information
Air District	**Air District source testing**	The Air District performs emissions tests on certain sources to support permitting requirements, emissions inventory development and validation, modeling analyses, enforcement investigations, and compliance with regulations; Identified instances of non-compliance are referred to Air District Compliance & Enforcement (C&E) for further evaluation of violation.	At specific sources and facilities throughout the Bay Area	Facility and source-specific	Air District Source Test website
Chevron	**Chevron-operated refinery fenceline monitoring**	Monitoring for compliance with Air District Rule 12-15 and 40 CFR 63, Subpart CC using a combination of fixed-site and open-path monitors. Fenceline Monitoring Plans and Quality Assurance Project Plans (QAPPs) are subject to Air District approval. Quarterly reports are submitted to Air District for review.	Open path segments along the Chevron refinery fenceline, and ground level, community and passive benzene point monitoring sites	H_2S, SO_2, BTEX, Butane, Ethane, Methane, Propane, Pentane	Real-time data on Chevron's air monitoring website Bay Area refinery fenceline monitoring plans and QAPPs
	Chevron-operated refinery Ground-Level Monitoring	Monitoring for sulfur dioxide and hydrogen sulfide for compliance with Air District Rule 9-1 and Rule 9-2. Monitoring systems are subject to QA field auditing by Air District staff, monitoring data are reviewed by the Air District, and identified instances of non-compliance are referred to Air District C&E for further evaluation of violation.	Three fixed-site locations within Chevron fenceline	SO_2 and H_2S Meteorology	Real-time data on Chevron's air monitoring website Historical data available by public records request
	Source tests at Chevron	Source tests conducted by Chevron consultants with Air District regulatory oversight; test plans are required, and source tests are observed by Air District staff when deemed necessary. Resulting reports are reviewed in detail and subject to approval by the Air District, and source tests that do not follow approved methodologies or meet quality and regulatory standards are rejected, initiating a retest. Identified instances of non-compliance are referred to Air District C&E for further evaluation of violation. Repair and retest are required when a violation occurs.	Various sources at Chevron	Source-specific	Air District Source Test website Source test data available by public records request
	Compliance Monitoring	Continuous Emissions Monitoring Systems (CEMS), parametric monitoring, leak detection and repair for regulatory compliance. Air District oversight of installation, operation, calibration, and/or certification. Monthly and excess emission CEMS reports are submitted to Air District for review. Identified instances of non-compliance are referred to Air District C&E for further evaluation of violation.	Various sources at Chevron, including refinery fuel gas (RFG) systems	Source-specific; most sources with CEMS monitor CO, NOx, SO_2	Air District Source Test website
	Chevron-operated refinery flare monitoring	Monitoring for amounts and composition of gas sent to flare sources for compliance with Air District Rule 12-11. CEMS installed for compositional analysis and flow rate of flare gas. Air District oversight of CEMS installation, operation, calibration, and certification. Data available monthly; flaring incidents must be reported to Air District and may result in further enforcement action.	Various sources at Chevron	Source-specific	Data available monthly on Air District's Flare Data Website
Water Pollution Control Plant	**City of Richmond-operated monitoring**	Monitoring for hydrogen sulfide for informational purposes. Data are not citable under Air District Rule 9-2.	Two fixed-site locations next to the Water Pollution Control Plant	H_2S	Real-time data on City of Richmond website

Abbreviations:

CO: Carbon monoxide
NO_x: Nitrogen oxides
SO_2: Sulfur dioxide
H_2S: Hydrogen sulfide
BTEX: Benzene, Toluene, Ethylbenzene, Xylene
CEMS: Continuous emissions monitoring system
QAPP: Quality Assurance Project Plans
CFR: Code of Federal Regulations
C&E: Air District Compliance and Enforcement

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