



 BAY AREA AIR QUALITY  
MANAGEMENT DISTRICT

# LEADING THE WAY

2016 ANNUAL REPORT

32%

32%

geography

$139 = 2.57194$

23%

31%

47%

1mol

$C_6H_{12}O_6$

57%

$N=14$

$(N_2)/mol$

$14 \times 2g$

5%

$k = 9/48$

$1/8.16$

20%

35%

1mol

$C_6H_{12}O_6$

$N=14$

$(N_2)/mol$

$14 \times 2g$

$mol \times 180g$

$2.650$

$1.450$

$30$

$250$

$370$

$14,000$

$1,200$

$500$

$500$

$900$

$420$

$4,700$

$(0.7g)/mol$

$3.1g$

$4.7g$

$3-2-1 0 1 2 3 4 5 6$

$\bar{x} = \frac{\sum x_i}{n}$

$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n-1}}$

$E = \frac{h \lambda}{2\pi}$





# IMPROVING Public Health, Air Quality, and the Global Climate →

**IN 2016, THE AIR DISTRICT IMPROVED OUR COMMUNICATION AND COLLABORATION WITH OTHER REGIONAL AGENCIES AND BAY AREA COMMUNITIES.**

**WE MOVED** our offices to the Bay Area Metro Center in San Francisco, a more transit-friendly location that provides more collaborative meeting spaces and houses our partner regional public agencies, Metropolitan Transportation Commission, Association of Bay Area Governments, and eventually, the Bay Conservation and Development Commission. The new Center will allow for greater integration of inter-agency planning of climate protection strategies and increased space for public participation.

**THE AIR DISTRICT INCREASED OUR REACH TO THE PUBLIC THROUGH NEW SOCIAL MEDIA CHANNELS, ONLINE ENGAGEMENT, PUBLIC OPEN HOUSE EVENTS AND VIDEOS ABOUT WHO WE ARE AND IMPORTANT INITIATIVES WE HAVE DEVELOPED.**

**HOW WE DID IT**—the Air District held Open House events to introduce the draft Clean Air Plan, Regulation 11-18, Reduction of Risk from Air Toxic Emissions at Existing Facilities, and proposed changes to Regulation 6 regarding particulate matter, and more. In March, the



THE AIR DISTRICT





## Bay Area Sources of Greenhouse Gas Emissions

TRANSPORTATION

40%



INDUSTRIAL

24%



ELECTRICITY/CO-GENERATION

18%



RESIDENTIAL/COMMERCIAL FUEL USAGE

11%



RECYCLING AND WASTE

3%



HIGH GWP GASES

3%



AGRICULTURE/FARMING

1%



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# Winter Sources

of Bay Area Fine Particulate Pollution (2016)



39%

WOOD SMOKE



13%

GEOLOGICAL DUST



11%

ON-ROAD MOTOR VEHICLES



12%

FUELS COMBUSTION: STATIONARY SOURCES



10%

OTHER MOBILE SOURCES



8%

OTHER INDUSTRY/ COMMERCIAL PROCESSES



3%

COMMERCIAL COOKING



2%

ANIMAL WASTE



2%

WILDFIRES

# Summer Sources

of Bay Area Ozone-Forming Pollutants (2016)



32%

ON-ROAD MOTOR VEHICLES



34%

OTHER MOBILE SOURCES



11%

CONSUMER PRODUCTS



9%

ARCHITECTURAL COATINGS



8%

FUELS COMBUSTION: STATIONARY SOURCES



3%

FUELS DISTRIBUTION



2%

OTHER INDUSTRY/ COMMERCIAL PROCESSES



1%

PETROLEUM REFINING FACILITIES



# WORKING TOGETHER FOR CLEAN AIR AND CLIMATE PROTECTION

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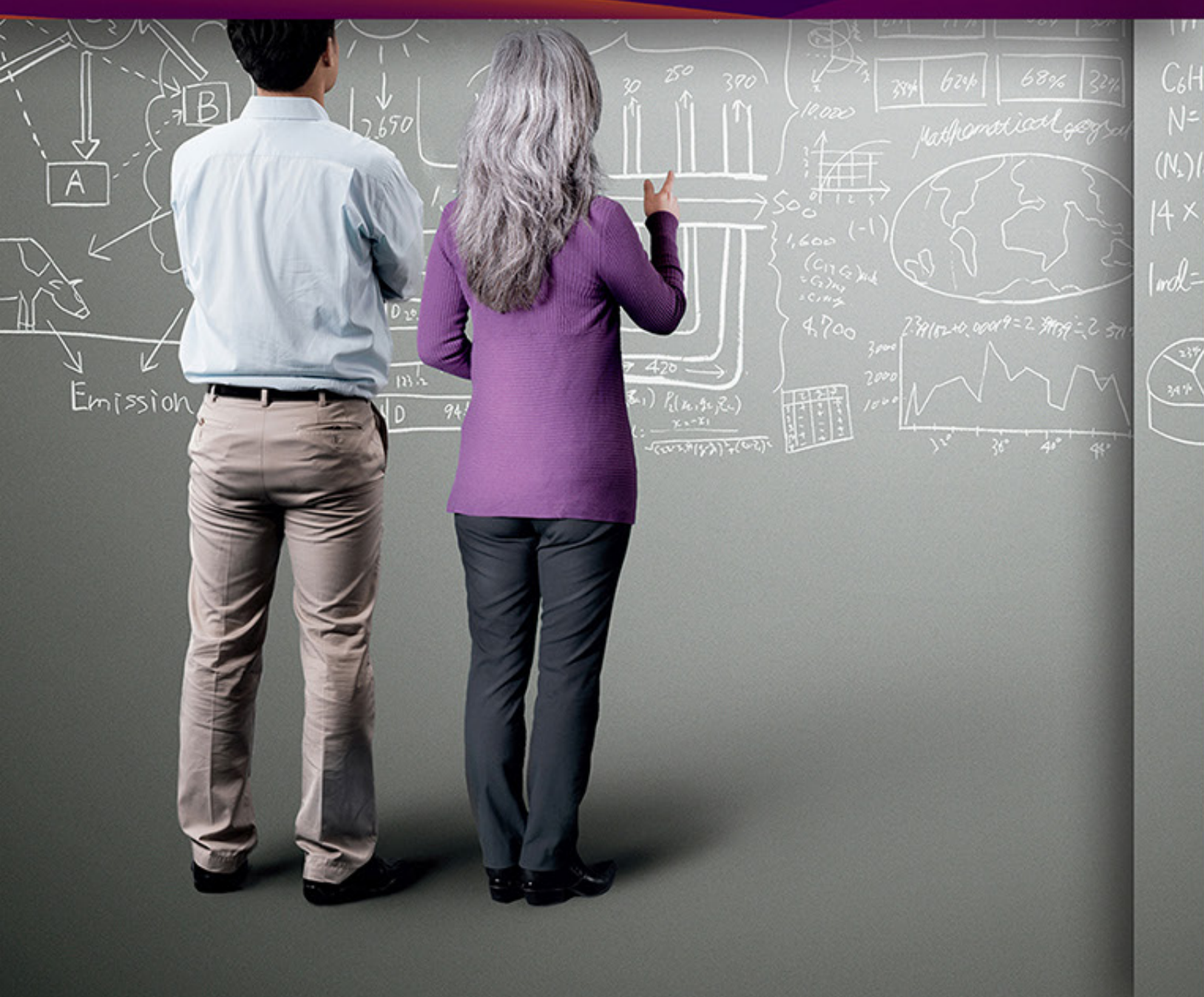
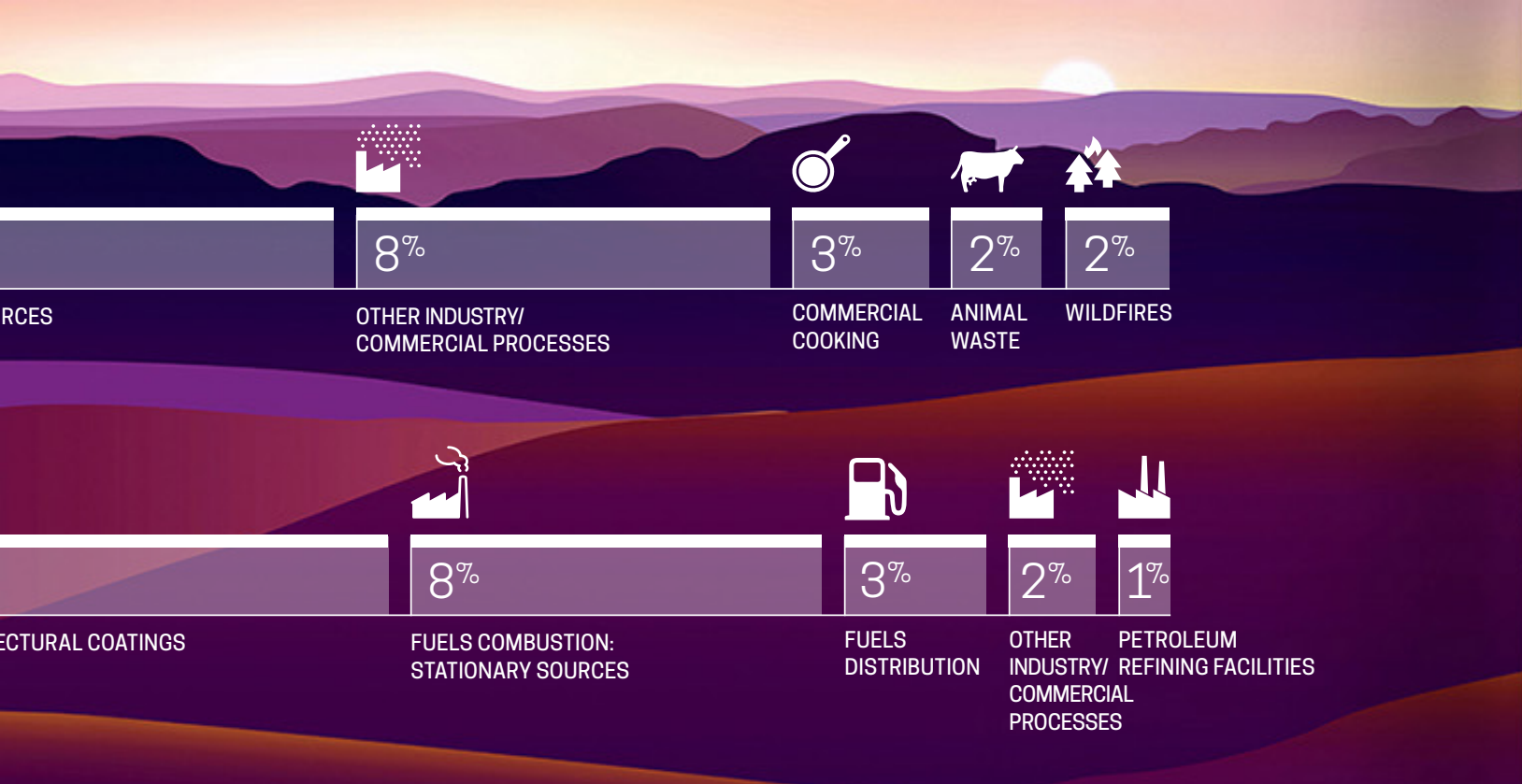
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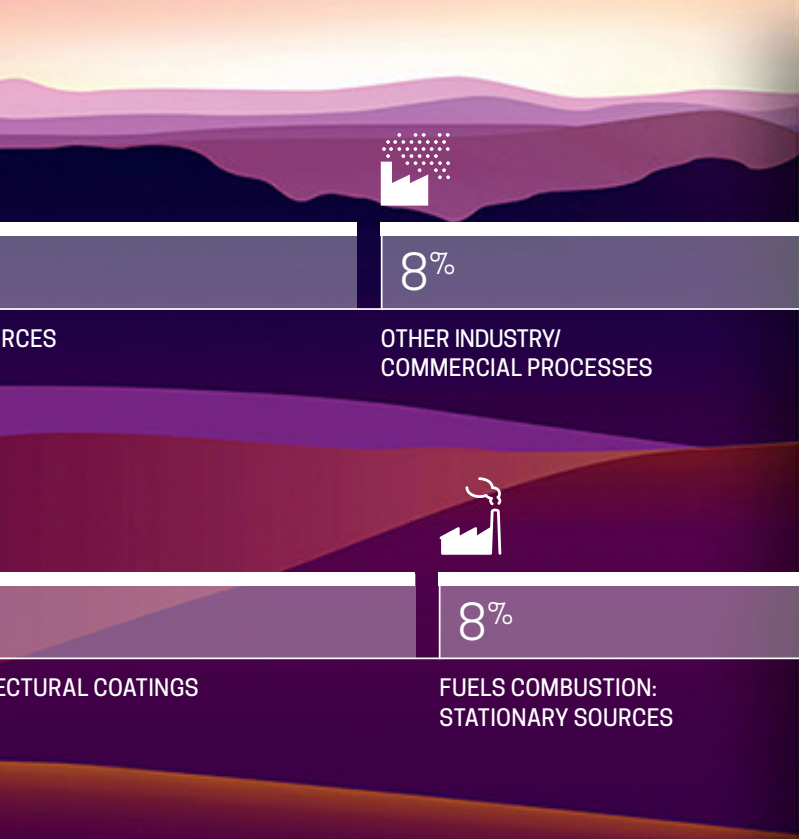
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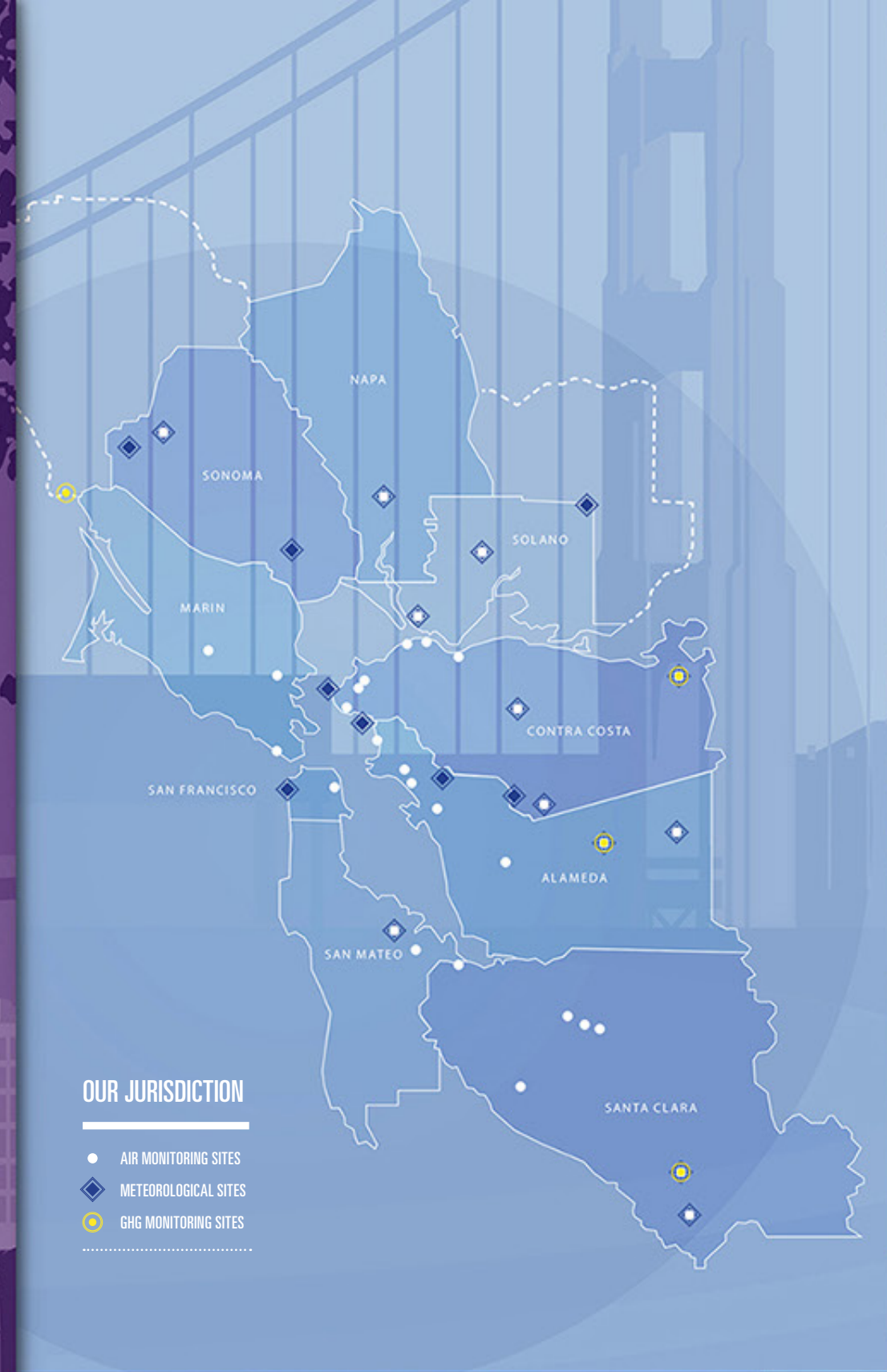
Air District launched a new online civic engagement tool, Open Air Forum, that offers the public a new way to review and provide feedback on specific Air District topics, documents and rules. And the Air District expanded our presence on social media launching Facebook, Twitter, Instagram and YouTube sites with regular postings on Air District programs, initiatives, weather and air quality conditions.

**IN LATE 2016, THE AIR DISTRICT PUBLISHED THE DRAFT CLEAN AIR PLAN, SPARE THE AIR, COOL THE CLIMATE, A CALL TO ACTION THAT WILL LEAD THE REGION TOWARD A POST-CARBON ECONOMY BY 2050.**

This bold Plan includes a long-range carbon-free vision for the Bay Area. The Plan serves as a call to action—for the Air District, Bay Area businesses and residents—to lead the region toward a post-carbon economy and a clean air future. *Spare the Air, Cool the Climate* can be reviewed at: [www.baaqmd.gov/cleanairplan](http://www.baaqmd.gov/cleanairplan).

New rules that further reduce emissions from refineries were adopted by the Air District's Board of Directors.

- Regulation 9, Rule 14 reduces sulfur dioxide emissions from coke calcining—the largest Bay Area source. Regulation 12, Rule 15—a first-of-its-kind requirement—improves emissions tracking at refineries and enables the Air District to track those emissions when operational changes are made, while also allowing the agency to provide more information to the public.
- The Air District also published draft Regulation 11, Rule 18 designed to incorporate the latest public health guidelines and reduce health risk to residents from toxic air contaminants emitted by facilities in the Bay Area. The new rule would reduce toxic emissions from a wide range of facilities.



**OUR JURISDICTION**

- AIR MONITORING SITES
- ◆ METEOROLOGICAL SITES
- GHG MONITORING SITES

BAY AREA PERMITTED FACILITIES	
Refineries	5
Major Facilities Excluding Refineries	82
Gasoline Dispensing Facilities	2,347
All Other Facilities	8,147
<b>TOTAL</b>	<b>10,581</b>
Permitted Devices and Operations	24,042
NEW PERMIT APPLICATIONS	
Major Source Review (Title V)	77
New Source Review (NSR)	1,063
<b>TOTAL</b>	<b>1,140</b>

WE  
FOR



# LEADING THE WAY WAS OUR FOCUS IN 2016, A TRANSFORMATIONAL YEAR FOR THE BAY AREA AIR DISTRICT.

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## NEW BEGINNING

After nearly 50 years on Ellis Street, the Air District joined forces with our regional partner agencies, the Metropolitan Transportation Commission and the Association of Bay Area Governments, moving together to the Bay Area Metro Center in San Francisco. The location provides easier access by transit, opportunities for greater collaboration with both the public and partner agencies, and is a gold LEED-certified building.

## ADVANCED REGULATIONS

Rule 2-5 was amended to incorporate the latest public health guidelines and toxic air contaminant trigger levels in relation to toxic emissions from new sources. A second rule, Rule 9-13 established limits of toxic air contaminants, nitrogen oxides and particulate matter from Portland Cement facilities. These two rules will continue to curb air emissions from sources that impact localized regions in the Bay Area.

## CHANGES IN THE AIR

The Air District provided funding to over 1,000 Bay Area residents to upgrade from a wood burning fireplace to cleaner heating options, contributed to the expansion of electric vehicle infrastructure, and published the *Planning Healthy Places Guidebook*—a roadmap to reduce traffic emissions. We expanded our monitoring network adding a new near-roadway air monitoring site, and a greenhouse gas monitoring network.

The Bay Area will continue to lead the nation in innovative, effective climate initiatives even in the absence of science-based policies at the national level. We recently released our vision to improve air quality and reduce climate impacts, our Clean Air Plan, *Spare the Air, Cool the Climate*. Through this ambitious plan, we will tackle climate change head on—Bay Area residents expect nothing less.

Jack P. Broadbent  
Executive Officer  
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NEXT  
305

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## WOOD SMOKE REDUCTION GRANTS

The Air District provided funding to help Bay Area homeowners and landlords replace their wood-burning heating device with a qualifying electric heat pump or natural gas or propane fueled device, or to decommission their fireplace. Additional funds were provided to low-income residents, those in high wood smoke areas, and households whose wood-burning device is their sole source of heat.

## ELECTRIC VEHICLE INFRASTRUCTURE

\$4.26 million in funds were awarded for 624 new plug-in electric vehicle charging stations (ports) for cities in the nine counties of the Bay Area.

## PLANNING HEALTHY PLACES GUIDEBOOK

*Planning Healthy Places* is a guidebook for local land use planners, elected officials, developers, community groups, public health advocates and those interested in integrating land use, air quality and public health. Initiatives that support these efforts are vital to help reduce traffic and greenhouse gas emissions. Livable, walkable neighborhoods help minimize residential exposure to air pollution and promote clean, healthy air for all Bay Area residents. The document identifies feasible and effective “best practices” for minimizing air pollution exposure and emissions in communities. The guidebook also provides an online mapping tool identifying locations that have the potential to experience elevated levels of air pollution. *Planning Healthy Places* can be viewed at <http://www.baaqmd.gov/planninghealthyplaces>

## CLIMATE FORWARD BAY AREA: A LEADERSHIP FORUM

The Air District hosted the two-day Climate Forward Forum in October 2016, which brought together technology, government, non-profit organizations and industry leaders to share ideas and approaches to reducing local greenhouse gases while maintaining economic viability. Topics included transportation alternatives, waste reduction, water use and featured a keynote address by Van Jones, *New York Times* best-selling author and CNN commentator. Videos of the three plenary round-table discussions and Van Jones’ keynote address can be viewed at [www.climateleadershipforum.org](http://www.climateleadershipforum.org)

## GREENHOUSE GAS MEASUREMENT PROGRAM

Adding to the region’s robust monitoring network, the Air District launched a system of fixed-site GHG monitors across the Bay Area and a mobile research van to provide more site-specific air quality and greenhouse gas measurements. The goal is to provide the scientific basis that supports rulemaking and GHG reduction policies in the Bay Area.

## RECORD-BREAKING SUMMER SPARE THE AIR SEASON

The 2016 summer smog season marked a record-breaking number of Spare the Air Alerts called during a single season. The Air District called 27 alerts during the 2016 Spare the Air smog season, beating the previous record of 25 alerts set in 1996. A series of heat waves and smoke from wildfires, along with ever-increasing traffic, contributed to unhealthy air quality and led to the record number of alerts.

## EXPANDED AIR MONITORING NETWORK

In 2016, a new near-roadway air monitoring station was opened at Aquatic Park in Berkeley, along I-80. Additionally, the Air District collaborated on several special studies, including:

- *speciation of ultra-fine particulates (UC Davis)*
- *sensor networks (UC Berkeley)*
- *greenhouse gas measurements (Harvard)*
- *ground-level ozone monitoring (California Baseline Ozone Transport Study)*

### COMING IN 2017:

- *a fourth near-roadway station along the I-580 corridor in Pleasanton*
- *a special monitoring station for toxics and black carbon in Pittsburg at the Los Medanos Community Health Care District facility*
- *community monitoring stations in support of the Air District’s new refinery rules*

# 2016 PROJECTS



*Jack P. Broadbent*

## Regulation 2, Rule 5: New Source Review for Toxic Air Contaminants—amendments adopted

### PERMITTING ACTIVITY

#### BAY AREA PERMITTED FACILITIES

Refineries	5
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<b>TOTAL</b>	<b>10,581</b>
Permitted Devices and Operations	24,042

#### NEW PERMIT APPLICATIONS

Major Source Review (Title V)	77
New Source Review (NSR)	1,063
<b>TOTAL</b>	<b>1,140</b>



# Grant and Incentive programs

## CARL MOYER PROGRAM/MOBILE SOURCE INCENTIVE FUND (MSIF)—2016

Total Funds Awarded	\$11M
Number of Engines Covered by Grant Projects	121

### Estimated Lifetime Emissions Reduction for the Projects Funded (tons)

Reactive Organic Gases (ROG)	19
Oxides of Nitrogen (NO <sub>x</sub> )	258
Particulate Matter (PM <sub>10</sub> )	8
<b>TOTAL</b>	<b>285</b>

## GOODS MOVEMENT PROGRAM—2016

Total Funds Awarded	\$27.6M
Number of Engines Covered by Grant Projects	232

### Estimated Lifetime Emissions Reduction for the Projects Funded (tons)

NO <sub>x</sub>	992
PM <sub>10</sub>	18
<b>TOTAL</b>	<b>1,010</b>

## TFCA REGIONAL FUND GRANTS—2016

Total Funds Awarded	\$16.49M
Number of Engines Covered by Grant Projects	98

### Estimated Lifetime Emissions Reduction for the Projects Funded (tons)

ROG	51.59
NO <sub>x</sub>	85.32
PM <sub>10</sub>	37.44
<b>TOTAL</b>	<b>174.35</b>
Carbon Dioxide (CO <sub>2</sub> )	87,735.43

## LOWER EMISSION SCHOOL BUS PROGRAM—2016

Bus Replacements, Retrofits, and CNG Tank Replacements (MSIF funds)	
<b>TOTAL FUNDS AWARDED</b>	<b>\$564,000</b>

Number of Buses Awarded Grants	21
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## TFCA COUNTY PROGRAM MANAGER FUND GRANTS—FISCAL YEAR ENDING 2016

Total Funds Awarded	\$9.29M
Number of Projects/Programs Awarded Grants	50

### Estimated Lifetime Emissions Reduction for the Projects Funded (tons)

ROG	60.32
NO <sub>x</sub>	52.77
PM <sub>10</sub>	41.11
<b>TOTAL</b>	<b>154.20</b>
CO <sub>2</sub>	90,214

## VEHICLE BUY BACK PROGRAM—2016

<b>TOTAL FUNDS AWARDED</b>	<b>\$5.5M</b>
Number of Vehicles Scrapped in 2016	5,161

# Legislation Summary

## THE AIR DISTRICT CO-SPONSORED TWO BILLS THAT WERE PASSED INTO LAW THIS YEAR THAT WILL CONTRIBUTE TO THE REDUCTION OF VEHICLE EMISSIONS.

- SB 1128 (Glazer) removed the sunset on the region's commuter benefits program.
- SB 773 (Allen) directs University of California to study the issue of unregistered vehicles, and vehicles in California with out-of-state plates.

Additionally, the Air District supported AB 1685 (Gomez), which increases penalties for vehicle manufacturers who fail to comply with California air quality requirements.

SB 32 (Pavley), supported by the Air District, was double joined to AB 197 (Garcia) and signed into law. SB 32 extends California's climate emissions limits beyond 2020, by codifying a 40 percent reduction below 1990 levels by 2030. AB 197 creates a Joint Legislative Committee on Climate Policies, adds two legislators to the ARB as non-voting members, makes ARB Board member terms six years, and puts a variety of new requirements on ARB, including prioritizing rules that directly reduce emissions at large stationary sources.

The Air District strongly supported AB 2292 (Gordon), which mandated improvements to CalEnviroScreen, which fails to identify many severely disadvantaged communities. That bill failed to pass the Appropriations Committee in its first house. The District had an "oppose unless amended" position on a related bill AB 1550 (Gomez), which increases reliance on CalEnviroScreen, by saying that all 25 percent of the cap-and-trade funds required to be spent to benefit disadvantaged communities must now be spent *within* these communities. AB 1550 was signed into law without amendment as part of a climate package.

The District also had a "support if amended" position on SB 1383 (Lara), due to our concern regarding CalEnviroScreen. The bill was amended to address our concerns and codifies emissions reduction targets for short-lived climate pollutants, specifically methane, hydrofluorocarbons and black carbon.

Several other bills supported by the Air District did not become law. Three measures would have increased funding for emissions cleanup technology at ports. Another, SB 1441 (Leno) would have ended the practice of allowing utilities to bill customers for natural gas leaks.

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# 2016 by the Numbers

## REVENUE

Permit-Related Revenue	57%
County Property Tax	33%
Federal Grants	6%
State and Other Grants	4%

## EXPENDITURES

Personnel	65%
Services and Supplies	23%
Capital Outlay	12%

## BAY AREA AIR QUALITY

2016 Exceedances of Air Quality Standards

<b>OZONE</b>	
Days over National 8-Hour Standard	15
Days over California 1-Hour Standard	5
Days over California 8-Hour Standard	15
<b>PARTICULATE MATTER</b>	
Days over National 24-Hour PM10 Standard	0
Days over California 24-Hour PM10 Standard	0
Days over National 24-Hour PM2.5 Standard	0

## RULEMAKING ACTIVITY

2016 Rules Adopted or Amended

<b>APRIL 20, 2016</b>	
Regulation 12, Rule 15: Petroleum Refining Emission Tracking adopted	
Regulation 9, Rule 14: Petroleum Coke Calcining adopted	
<b>MAY 18, 2016</b>	
Manual of Procedures—amendments adopted	
<b>JUNE 15, 2016</b>	
Regulation 3: Fees—amendments adopted	
<b>OCTOBER 19, 2016</b>	
Regulation 9, Rule 13: Portland Cement Manufacturing—amendments adopted	
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AIR POLLUTION COMPLAINTS  
800.334.ODOR (6367)

AIR QUALITY INFO  
800.HELP.AIR (435.7247)  
Daily Air Quality Forecasts,  
Spare the Air Alerts,  
Agricultural Burn Days

COMPLIANCE ASSISTANCE  
415.749.4999

ENGINEERING SERVICES  
415.749.4990

GENERAL BUSINESS  
415.749.5000

PUBLIC INFORMATION  
415.749.4900

REPORT SMOKING VEHICLES  
800.EXHAUST (394.2878)  
www.SmokingVehicleHelp.org

WINTER SPARE THE AIR ALERTS  
877.4NO.BURN (466.2876)

## WEBSITES

www.baaqmd.gov  
www.sparetheair.org  
www.twitter.com/@sparetheair  
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## SOCIAL MEDIA





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AIR QUALITY INFO  
800.HELP.AIR (435.7247)  
Daily Air Quality Forecasts,  
Spare the Air Alerts,  
Agricultural Burn Days

COMPLIANCE ASSISTANCE  
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ENGINEERING SERVICES  
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### WEBSITES

www.baaqmd.gov  
www.sparetheair.org  
www.twitter.com/@sparetheair  
www.facebook.com/sparetheair  
www.twitter.com/@airdistrict  
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### SOCIAL MEDIA





# Legislative Summary

## THE AIR DISTRICT CO-SPONSORS LEGISLATION THAT WILL CONTRIBUTE TO THE STATE'S CLIMATE AND AIR QUALITY GOALS

\$9.29M  
50

- SB 1128 (Glazer) removed the surcharge on out-of-state plates.
- SB 773 (Allen) directs University of California to phase out out-of-state plates.

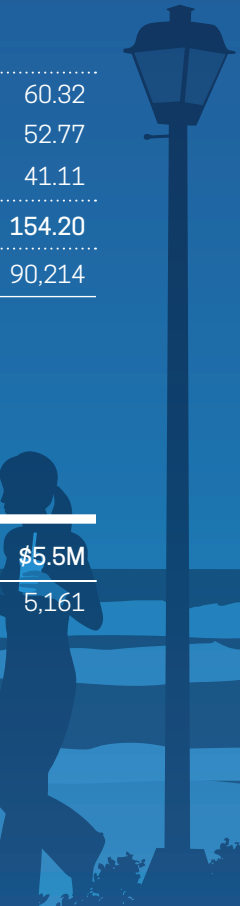
Additionally, the Air District supports legislation that will help those who fail to comply with California's climate and air quality goals.

SB 32 (Pavley), supported by the Air District, extends California's climate emissions cap-and-trade program by 2030. AB 197 creates a Joint Air Quality Improvement Council as non-voting members, makes the Air District a non-voting member of ARB, including prioritizing rules.

The Air District strongly supports legislation that will help those who fail to identify many severely damaged areas in its first house. The District has supported legislation which increases reliance on California's climate goals to be spent to benefit disadvantaged communities. Legislation signed into law without amendments.

The District also had a "supporter" role in the passage of CalEnviroScreen. The bill was signed into law for short-lived climate pollutants.

Several other bills supported by the Air District received funding for emissions cleanup to allow utilities to bill customers.



Jack P. Broadbent  
Executive Officer  
Air Pollution Control Officer

### HEALTH RISK ASSESSMENTS

Diesel Engines	153
Gasoline Dispensing	20
Other Commercial/Industrial	55
<b>TOTAL</b>	<b>228</b>

### COMPLIANCE AND ENFORCEMENT ACTIVITY

#### 2016 COMPLIANCE INSPECTIONS

Source Inspections	6,874
Air Pollution Complaints (Excluding Smoking Vehicles)	7,414
Gasoline-Dispensing Facility Inspections	1,259
Asbestos Inspections	3,085
Reportable Compliance Activities	404
Diesel Compliance and Grant Inspections	3,202
<b>TOTAL</b>	<b>22,238</b>

#### 2016 CIVIL PENALTIES AND VIOLATIONS

Civil Penalties	\$6,112,931
Violations Resolved with Penalties	441

### AIR POLLUTION COMPLAINT CATEGORIES

Odor	43.3%	4,570
Wood Smoke	20.9%	2,205
Smoking Vehicle	29.7%	3,136
Dust	3.0%	316
Asbestos	1.2%	124
Miscellaneous Categories (including Smoke, Outdoor Burning and Gas Stations)	1.9%	199
<b>TOTAL COMPLAINTS</b>		<b>10,550</b>

### SOURCE TEST ACTIVITY

2016 Number of Source Tests

Refinery Source Tests	141
Compliance Rate	99.3%
Title V Facility Source Tests (Excluding Refineries)	48
Compliance Rate	91.7%
General Compliance Tests	273
Compliance Rate	95.6%
Gasoline Dispensing Facilities	153
Compliance Rate	56.2%
Other Miscellaneous Source Tests	14,119
Compliance Rate	99.9%
<b>TOTAL SOURCE TESTS</b>	<b>14,734</b>
<b>TOTAL VIOLATIONS</b>	<b>105</b>
<b>COMPLIANCE RATE</b>	<b>99.3%</b>

### LABORATORY

2016 Samples Analyzed in the Lab

PM <sub>10</sub> *	2,981
Toxics	702
Source-oriented analyses	165
Interagency projects	13
<b>TOTAL</b>	<b>2,981</b>

\*Accounts for PM<sub>10</sub> and PM<sub>2.5</sub> samples; does not include weighing performed by CARB during the facility move and during subsequent construction

### Executive Management

Jack P. Broadbent  
Executive Officer  
Air Pollution Control Officer

Brian C. Bunker  
District Counsel

Jean Roggenkamp  
Deputy Executive Officer

Damian Breen  
Jeff McKay  
Deputy Air Pollution Control Officers

Maricela Martinez  
Manager, Executive Operations

### Division Directors and Officers

John Chiladakis  
Information Services

Lisa F. Fasano  
Communications

Henry Hilken  
Planning and Climate Protection

Wayne Kino  
Compliance and Enforcement

Rex Sanders  
Administrative Resources

Eric Stevenson  
Measurements, Meteorology and Rules

Jaime A. Williams  
Engineering and Information Technology

### Current Board Members

ALAMEDA COUNTY  
Pauline Russo Cutter  
Rebecca Kaplan  
Scott Haggerty  
Nate Miley

CONTRA COSTA COUNTY  
John Gioia  
David E. Hudson, Vice-Chair  
Karen Mitchoff  
Mark Ross

MARIN COUNTY  
Katie Rice, Secretary

NAPA COUNTY  
Brad Wagenknecht

SAN FRANCISCO COUNTY  
Edwin M. Lee  
Hillary Ronen  
Jeff Sheehy

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David Canepa  
Carole Groom  
Doug Kim

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Liz Kniss, Chair  
Rod G. Sinks  
Margaret Abe-Koga

SOLANO COUNTY  
Jim Spering  
Pete Sanchez

SONOMA COUNTY  
Teresa Barrett  
Shirlee Zane

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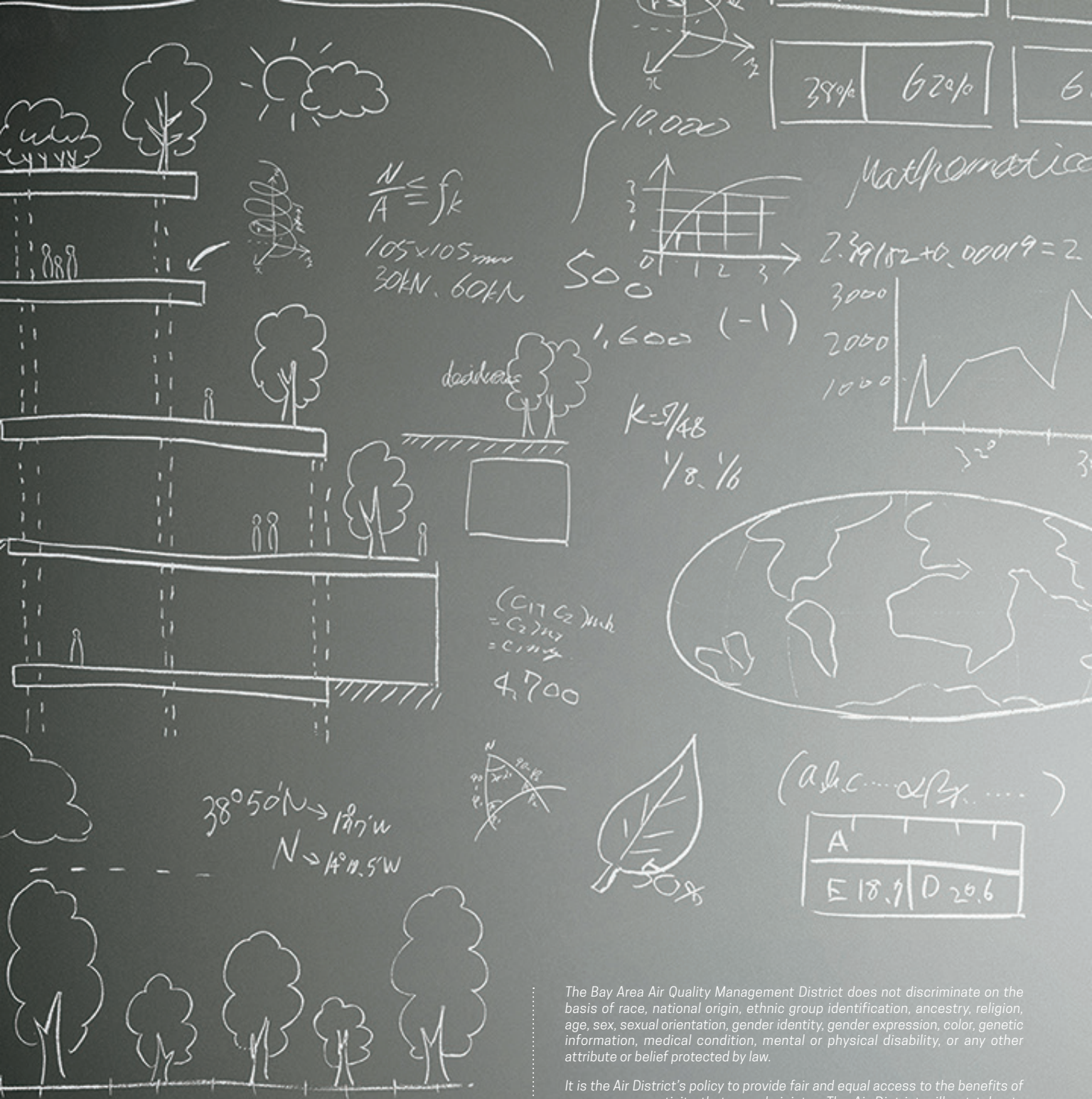
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### SOCIAL MEDIA







**BAY AREA AIR QUALITY  
MANAGEMENT DISTRICT**

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It is the Air District's policy to provide fair and equal access to the benefits of a program or activity that we administer. The Air District will not tolerate discrimination against any person(s) seeking to participate in, or receive the benefits of, any program or activity offered or conducted by us. Members of the public who believe they or others were unlawfully denied full and equal access to an Air District program or activity may file a discrimination complaint with us under this policy. This non-discrimination policy also applies to other people or entities affiliated with the Air District, including contractors or grantees that we utilize to provide benefits and services to members of the public.

Auxiliary aids and services including, for example, qualified interpreters and/or listening devices to individuals who are deaf or hard of hearing, and to other individuals as necessary to ensure effective communication or an equal opportunity to participate fully in the benefits, activities, programs and services will be provided by the Air District in a timely manner and in such a way as to protect the privacy and independence of the individual. Please contact the Non-Discrimination Coordinator identified below at least three days in advance of a meeting so that arrangements can be made accordingly.

If you believe discrimination has occurred with respect to one of our programs or activities, you may contact the Non-Discrimination Coordinator identified below or visit our website at [www.baaqmd.gov/accessibility](http://www.baaqmd.gov/accessibility) to learn how and where to file a complaint of discrimination.

Questions regarding this policy should be directed to the Air District Non-Discrimination Coordinator, Rex Sanders, at 415.749.4951 or by email at [rsanders@baaqmd.gov](mailto:rsanders@baaqmd.gov).