Appendix F

Public Education and Technology Advancement

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F. ADDITIONAL AIR QUALITY STRATEGIES

Despite major reductions in emissions and corresponding improvements in air quality, the San Joaquin Valley (Valley) continues to face difficult challenges in meeting the National Ambient Air Quality Standards (NAAQS, or standards). Achieving attainment of the Environmental Protection Agency's (EPA) increasingly stringent standards will require the development and implementation of transformative zero/near-zero emissions technology over the coming decades.

F.1 TECHNOLOGY ADVANCEMENT PROGRAM

On March 18, 2010, the San Joaquin Valley Air Pollution Control District (District) Governing Board approved the Technology Advancement Program (TAP), a strategic and comprehensive program to identify, solicit, and support technology advancement opportunities. The program represents a significant step forward in the District's efforts to attain ever-tightening federal air quality standards and fulfill the District's public health mission. The primary goal of TAP is to advance technology and accelerate the deployment of innovative clean air technologies that can bring about emission reductions as rapidly as practicable. To address the Valley's needs with respect to both ozone and PM2.5, which are largely driven by NOx emissions, the TAP has placed a particular focus on NOx emissions reduction technologies. The program is implemented through a coordinated and collaborative process that engages technology developers and potential end-users through:

- Grant funding for technology advancement projects in the San Joaquin Valley through competitive processes
- Integration of technology advancement goals into existing grant programs
- Comprehensive outreach to identify potential technology and demonstration partners
- Ongoing review and feedback on new technologies
- Building partnerships with other agencies
- Building local capacity for research and development in the San Joaquin Valley

F.1.1 TECHNOLOGY FOCUS AREAS

The District has structured the TAP to encourage participation within three focus areas. These focus areas represent the current needs of the Valley; they also reflect the types of proposals previously received by the District within this and other programs. Throughout implementation of this PM2.5 Plan and future air quality plans, the District will continue to evaluate and, if necessary, update these technology focus areas to address the Valley's air quality challenges.

I. **Renewable Energy**. Renewable energy projects focus on overcoming the barriers that prevent the use or adoption of zero-emission renewable energy sources or reduce emissions from renewable energy systems to make them cleaner than comparable non-renewable alternatives.

II. **Waste Solutions**. Waste solutions projects focus on zero and near-zero emission technologies that minimize or eliminate emissions from waste management systems and processes, including waste-to-fuel systems, such as dairy digesters and other bio-fuel applications.

III. **Mobile Sources**. Mobile source projects focus on zero and near-zero emission technologies with emphasis on goods and people movement, off-road equipment, and agricultural equipment.

F.1.2 District Action to Promote the Use of Natural Gas Technology for Goods Movement

Heavy-duty trucks are the largest source of NOx emissions in the Valley, and attaining the health-based ozone and particulate standards will require significant additional reductions in truck emissions through the development and implementation of advanced truck technology. Additionally, reducing emissions from heavy-duty trucks will provide significant health benefits for communities in the Valley and throughout the state, particularly those communities located near major freight corridors.

Much of the state's investment in recent technology development and demonstration efforts has focused on electrification. Although there have been significant advances in battery and fuel cell electric vehicle technologies, pursuing the advancement and deployment of clean natural gas heavy-duty vehicles and other more readily available and suitable near-zero emission technologies will help the Valley address our significant air quality challenges in a faster manner than solely relying on electrification technology due to current range limitations. Near-zero natural gas truck technology is already available commercially for limited applications and has the potential to reduce emissions. With additional advances in technology in the near term, near-zero emissions natural gas truck technology could be expanded to more applications, serving as a vital component of the strategy to bring transformational change to the goods movement sector.

To advance the adoption of near-zero natural gas truck technology, the District adopted its *Action Plan for Promoting the Use of Natural Gas Technology for Goods Movement in the San Joaquin Valley* (Action Plan).[1] The Action Plan is a multifaceted plan for promoting the deployment of near-zero emissions natural gas vehicles and infrastructure in the San Joaquin Valley. The elements of the Action Plan are:

1. Support policy changes and legislation that help create a market for development, promotion, and deployment of near-zero emissions natural gas technology.

[1] San Joaquin Valley Air Pollution Control District. (2015, May 6). *Item Number 5: Review and Approve Action Plan for Promoting the Use of Natural Gas Technology for Goods Movement in the San Joaquin Valley.* http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2015/May/StudySession/final/05.pdf

2. Increase outreach efforts to communicate benefits and encourage transition to natural gas technology by Valley fleet operators.

3. Provide additional incentives for natural gas vehicles and infrastructure.

4. Promote technology advancement for near-zero emissions natural gas technologies through the District's Technology Advancement Program.

5. Continue to evaluate and support, as appropriate, the development and deployment of hydrogen fuel cell technology in the heavy-duty truck sector.

F.1.3 DEMONSTRATION PROJECTS

To date, the District has completed four Technology Advancement Program competitive funding Request for Proposals (RFPs), receiving over 137 proposals for clean technology demonstration projects. In total, the District has approved 35 of the proposed projects, for a total funding of over $12.6 million. Many successful demonstration projects have been completed, including the following:

- **Electric Powered Yard Truck:** Transportation Power, Inc. demonstrated a zero emission electric yard tractor, which was placed into operation at IKEA to primarily move shipping containers and trailers around the facility at its main California Distribution Center in Lebec, CA. A Kalmar Ottawa diesel tractor was converted to battery-electric propulsion. The tractor accumulated a total of more than 12,500 miles of operation during the one-year demonstration phase of this project, producing a wealth of valuable data. This technology met or exceeded diesel yard tractor throughput, while producing zero emissions at a higher rate of energy efficiency than the diesel counterparts. Operational costs for the electric tractor were considerably lower, with an energy cost of 31 cents per mile, compared with $1.12 per mile for an equivalent diesel yard tractor, for an operational cost savings of $5,000 to $6,000 per year. This technology was proven successful and has the potential for widespread implementation.

- **Greenwaste Compost Site Emissions Reductions from Solar-Powered Aeration and Biofilter Layer:** The Association of Compost Producers and their partners conducted a research project that involved building and emissions testing a prototype commercial-scale Aerated Static Pile (ASP) compost system. Three piles were built abutting each other to create an extended design collectively known as an eASP. Each eASP zone was placed on a foundation of aeration pipes and coarse-ground woody material, and was capped with a 1-foot-thick layer of finished, unscreened compost acting as a biofilter. The eASP was built using electric conveyors in place of diesel equipment, and was aerated using power provided by an on-site photovoltaic array. The prototype eASP and conventional windrows of the same age and feedstock were maintained for one month, during which time emissions of VOCs, ammonia and greenhouse gases were sampled using flux chambers. Emissions from the eASP during the active composting phase were significantly reduced for total non-methane, VOCs, ammonia, and NOx compared to

the control windrows. The project also reduced the amount of fuel, water, and land necessary for active-phase composting.

- **Ultra-low NOx Biogas Engine and Emissions Control System:** California Bioenergy developed and tested at the Bidart Stockdale Dairy in Kern County a novel internal combustion engine/generator utilizing exhaust gas recirculation (EGR) and non-selective catalytic reduction (NSCR) controls. The objective was to demonstrate that such a system could achieve ultra-low NOx emissions of 0.07 pounds of NOx per megawatt-hour of useful energy output when fueled by biogas from a heated covered lagoon dairy manure digester. During the demonstration, the engine initially achieved the targeted emissions level but eventually overheated and failed due to malfunction of the temperature controls and cooling system. This project was largely successful in demonstrating that the control technology was effective in achieving the targeted emissions level; the operational difficulties the engine experienced were not related to the control technology. The encouraging results of this demonstration show this technology may be worth pursuing for further development.

- **Restaurant Charbroiler Technology Partnership:** District Rule 4692 achieves significant emissions reductions from chain-driven charbroilers. A variety of technologies for capturing emissions from underfired charbroilers have been developed or improved in recent years. Underfired charbroiler technologies still need further evaluation and demonstration at Valley restaurants before these technologies can be considered for amendments to Rule 4692. Technological feasibility issues and logistical issues such as the need to modify hoods and exhaust systems and reinforce roof supports in addition to the purchase, installation, maintenance, and labor costs must all be evaluated.

  During the summer of 2015, the District's Governing Board approved $750,000 to fund the Restaurant Charbroiler Technology Partnership (RCTP) program which provides funding for restaurants to install particulate control systems for underfired charbroilers as demonstration projects to assess their feasibility and effectiveness. This information will assist in evaluating potential amendments to Rule 4692. The first demonstration unit funded under the RCTP program successfully completed in September 2017. Several additional projects are expected to be funded in the near future.

- **Zero-Emission Transport Refrigeration Unit:** Together with eNow Inc., Great Dane-Johnson Refrigerated Truck Bodies, Emerson, and Challenge Dairy Products, Inc., the Valley Air District and EPA Region 9 officials successfully demonstrated California's first zero-emissions transport refrigeration unit (TRU). TRUs are refrigeration units mounted on trucks and are traditionally powered by high-pollution small diesel engines to provide the needed cooling to transport chilled products.

  This demonstration of the Challenge Dairy "Rayfrigeration" delivery truck was the first trial for this type of zero-emissions transport refrigeration unit in the nation. The

total cost of this project was over $1.2 million, with the Valley Air District providing $400,000 through TAP, funded in part through EPA Region 9.

To date, the technology has been successfully developed and tested, and is currently being demonstrated in use by Challenge Dairy on their local delivery routes. This demonstration phase has been underway since April 18, 2017, when the truck was successfully delivered from Johnson Refrigerated Truck Bodies in Rice Lake, WI to Challenge in Fresno, CA. Project partners estimate operation and maintenance cost reductions of over 90% as compared with conventional TRUs.

- **Dairy Feed Mixing Electrification:** A demonstration project with Philip Verwey Farms, a dairy in Hanford, involved converting several elements of its feeding operation from diesel power to electricity. The project was successful in demonstrating that diesel emissions could be significantly reduced at dairies and other animal feeding operations throughout the District in a cost-effective manner and subsequently throughout the Valley. As a result, the District worked closely with the agricultural industry and technology providers, to develop the Dairy Feed Mixing Electrification Program and allocated $4 million to expand the installation of electric feed mixing equipment and further reduce diesel emissions from mobile equipment at Valley dairies and other confined animal feeding operations.

In 2018, the District expects to open its fifth competitive solicitation for proposals. In addition to directly funding demonstration projects, the District actively seeks opportunities to collaborate with technology innovators in seeking additional funding.

F.2 Public Education and Participation

The District's mission to protect public health by improving air quality in the San Joaquin Valley relies on the public's awareness and understanding of the District's air-quality improvement programs. The Valley cannot meet these public health goals on the back of businesses alone. Valley businesses are subject to some of the most stringent air quality regulations in the nation. As Valley businesses continue to be subject to additional rounds of prohibitory regulations, the role of the public becomes increasingly important in reaching attainment of federal standards.

Emissions from public behavior such as driving, residential wood burning and lawn-care maintenance continue to be a key factor in the Valley's emissions inventory. Consequently, public acceptance of concepts such as alternative commute options, as well as specific clean-air strategies, like Check Before You Burn, the Air Alert program and Healthy Air Living (HAL), requires widespread lifestyle changes. To that end, the District Governing Board has placed a high priority on conducting an active and effective public education and outreach program.

The District's comprehensive public education and outreach program is composed of numerous elements that are designed to allow the District to leverage opportunities to advance the District's multiple strategic objectives, such as:

- Encourage and enlist the general public to do their part to reduce air pollution
- Empower and inform the public to protect themselves during episodes of poor air quality by providing them timely air quality information as well as scientific and comprehensible information on the health effects of air pollution
- Provide accurate and objective information about Valley efforts to reduce air pollution, measurable results and achievements, and challenges that remain.

F.2.1 PUBLIC EDUCATION AND OUTREACH ACTIVITIES

Engaging the public in efforts to reduce emissions is a key element of the District's attainment strategy. Education increases public support and understanding of new and controversial regulations. The District's education and information program has expanded and evolved over the years. The following is a partial list of the District's Public Education and Outreach Activities:

- Executing successful outreach campaigns for District grant programs
    - Promoting and conducting close to 15 years of Clean Green Yard Machines (CGYM) lawn mower-exchange programs
    - Promoting the Burn Cleaner Woodstove Change-out program
    - Developing and implementing the Tune In, Tune Up vehicle emissions check program
    - Developing Proposition 1B "Calling All Truckers" radio, print and billboard campaign
        - Working with Operation Clean Air (OCA), Coalition for Clean Air, and members of the goods movement industry
        - Supporting the Drive Clean! vehicle program
- Developing seasonal, strong "Make One Change" bilingual messages in English and Spanish across the three distinct media markets of the Valley (Sacramento, Fresno, Bakersfield)
- Launching and updating the Air Alert program
- Developing strong media relationship with reporters throughout the Valley and conducting hundreds of English and Spanish media interviews annually
- Regular meetings with Valley newspaper editorial boards and placement of op-eds in local papers
- Launching the amended Check Before You Burn residential wood-burning curtailment program
- Coordinating targeted outreach to foothill and mountain communities to solicit their participation and understanding in reducing particulate matter
- Producing the District's yearly *Annual Report to the Community*
- Developing the Real-time Air Advisory Network (RAAN) and the accompanying smart phone app
- Enhanced RAAN to provide residents with air quality information for their neighborhood by entering their address the first-of-its-kind system for

communicating real-time neighborhood-level air quality, taking into account the meteorological conditions as well as observed air quality concentrations from the District's air monitoring network

- Developing and deploying a display device to provide a visual indicator for school staff, students and parents to follow real-time changes to the RAAN levels throughout the day
- Launching the Healthy Air Living Schools program, including developing branded program materials
    - Enrolling more than 1,000 schools in the program to follow RAAN
    - Engaging hundreds of Valley schools in the "Turn the Key Be Idle Free" no-idling campaign
    - Guiding schools in the use of the Real-Time Outdoor Activity Risk (ROAR) guidelines, which provide health recommendations for outdoor exercise based on the duration of student's exposure, the intensity of their exercise and the air quality conditions
- Developing the Web-based Archived Air Quality (WAAQ) system to give the public access to historical air quality information
- Creating a new Healthy Air Heroes educational activity kit geared for children in grades K-6, which includes an activity book, pencil, crayons, stickers and a toy
- Improving the District's widely used 1-800-SMOG Info line that provides callers daily air quality forecasts and burn status information by county
- Launching HAL and creating understanding with the public through a variety of different outreach strategies and materials, including:
    - HAL logo development
    - Quick screen displays for events and District lobbies
    - HAL website
- Assisting with public workshops
- Creating and administering the annual HAL Kids Calendar featuring youth artwork
- Developing materials and crafting outreach targeted to the District's environmental justice areas
- Advertising through Cinemedia and movie lobby posters program during peak movie-going seasons (summer, holidays)
- Creating "Don't Burn Trash" messaging and placing the messaging in strategic areas in response to public needs and observations of the District's Compliance Department
- Releasing regular Valley Air District Air Quality Reports: Free media-branded daily air quality reports for Spanish- and English-language radio & TV
- Developing a campaign targeting real estate brokers to ensure they are in compliance with the wood stove change-out program upon each home sale, including direct mail, internet ads, Eblasts, flyers and radio sponsorship on real estate shows
- Leveraging partnerships with bike coalition groups, asthma coalitions and local Metropolitan Planning Organizations to promote "Earth Day," "Bike to Work" and "Rideshare" weeks

- Developing "New Media" strategy for the District, which leverages the power of social media sites such as Facebook, Twitter, Instagram and YouTube
- Utilizing video more aggressively to communicate key website information in a more exciting way and to provide District-focused footage to media outlets
- Producing outreach pieces on a wide variety of District programs, including grants, asbestos, compliance, permitting, etc.
- Redeveloping the District's valleyair.org homepage to make it easier to navigate, including:
    - Major overhaul of the grants section to better serve potential applicants
    - Creation of a widget or digital tool to allow schools to place RAAN monitoring information directly on their homepage
- Conducting a series of successful symposiums, conferences, town hall meetings and community meetings
    - Central Valley Summit on Alternatives to Open Burning of Agricultural Waste, November 2017
    - The 2015 Transboundary Ozone Conference
    - The 2012 PM and Lawn Care Symposium
    - Multiple general air quality conferences
- Conducting hundreds of presentations throughout the Valley on air quality topics, and responding to tens of thousands of public calls and emails

F.2.2 PUBLIC EDUCATION AND OUTREACH PROGRAMS

Air pollution levels can vary greatly during the day. While the District issues a daily air quality forecast for each county in the air basin, localized air quality often deviates from these generalized, county-wide, daily forecasts. Numerous pollutants and meteorological parameters are measured throughout the Valley on a daily basis using an extensive air monitoring network managed by the District and the California Air Resources Board (CARB). The network measures pollutant concentrations necessary to show progress toward compliance with the NAAQS. The network also provides real-time air quality measurements used for daily air quality forecasts, residential wood-burning declarations, Air Alerts and RAAN.

F.2.2.1 Air Alerts

The District alerts the public during unique air quality episodes, such as wildfires and windblown dust events. Health caution notices are prepared and public notification is provided through the District's website, social media and press releases to media and County health offices. Additionally, the District has collaborated with the National Weather Service (NWS) to issue Air Quality Alerts when major parts of the Valley are experiencing impacts from these unique episodes. During these alerts, the District utilizes the NWS public notification system to encourage anyone being exposed to poor air quality or wildfire smoke to move inside to an air-conditioned environment and limit their outdoor exertion. The District also advises individuals that if they can smell smoke or see ash that is an indication that they should be treating air quality conditions as "Unhealthy" (RAAN Level 4 or higher) and remain indoors to protect their health.

F.2.2.2 Real–Time Air Advisory Network

The District launched RAAN in 2010. This program is the first communication network in the nation to provide automated notification of poor or changing local air quality to the public throughout the air basin. While the District initially developed the program for schools as a tool to determine appropriate levels of outdoor activity for their students, the District expanded the program in 2011, and it is now available to all Valley residents.

The District combines local air quality information with specific, concentration-based health recommendations that allow RAAN subscribers to make informed decisions about when and for whom outdoor activities should be limited. The knowledge that exercise magnifies the health risks of PM2.5 exposure motivated the District to develop the RAAN program. Anyone can subscribe to RAAN at www.myraan.com; all that is required is the subscriber's email address. Once subscribed, the District will send email notifications with a link to the real-time data of the closest monitoring station within the District's extensive monitoring network. The District sends automated notifications on an hourly basis when air quality deteriorates or improves.

The District has provided Valley residents with a free smartphone app capable of delivering real-time air quality information, as well as other related information, since 2012. The District has since reengineered the app in-house and has released a brand new version in the spring of 2018, which serves both iPhone and Android devices. The app provides easy access to RAAN data, notification of whether residential wood burning is allowed during the Check Before You Burn season, and the ability for a user to file an air quality complaint directly to the District, with photos if desired. A new feature of the app will be the users' ability to receive air quality information for their current location utilizing GPS, as well as other location addresses that can all be stored for quick reference. The District is expecting that the usage of the new app will be widespread and will help Valley residents receive timely air quality information that can be used to coordinate outdoor activities during periods of the best air quality.

To provide residents with the air quality information for their address, the District developed a first-of-its-kind system for communicating neighborhood-level air quality by dividing the Valley into 4 km x 4 km grid cells (resulting in 3,600 neighborhoods) and taking into account the real-time meteorological conditions in each of the grid cells as well as observed air quality concentrations from the District's air monitoring network. This enhanced neighborhood RAAN was released in spring of 2018.

F.2.2.3 Real-Time Electronic Air Quality Display

When the District retired its colored Air Quality Flag Program in 2014, it intensified its focus on connecting schools to the RAAN as a more health-protective outreach tool. While the flag program was based on the air quality forecast for the day, RAAN links the public to actual hourly readings from a network of local air monitors. The District developed a prototype display device to provide a visual indicator for school staff, students and parents to follow real-time changes to the RAAN levels throughout the day. These devices, or Real-time Electronic Air-quality Displays (READs), were designed to replace the air quality colored flags and the District plans to deploy 20 of them in a pilot project in schools throughout the Valley's eight counties. The 24-inch

and 32-inch LED monitors connect to the internet and link to RAAN to provide the air quality level for the neighborhood in which it is located. The monitor fetches data every 30-60 seconds ensuring that the display is updated promptly when the hourly data becomes available. The first monitors were installed in schools in early 2018. An assessment of the pilot program will be performed at the end of the school year.[2]

F.2.2.4 Real-time Outdoor Activity Risk (ROAR)

To support the expanded RAAN program, the District developed the Real-time Outdoor Activity Risk (ROAR) scale. The levels of this scale provide specific recommendations and limitations for increasing levels of activity, from recess through competitive athletic events. This scale is based on the Air Quality Index system that is used for the daily air quality forecasts, but provides more detailed activity recommendations based on the latest health science. The ROAR system, when used in conjunction with RAAN notices and daily air quality forecasts, is part of a comprehensive set of tools available to schools and the public for effective health protection.

F.2.2.5 Web–Based Archived Air Quality (WAAQ) System

Providing accurate and up-to-date air quality information to Valley residents is a top priority for the District. This is especially important since there are times when the Valley's unique geography, topography, and meteorology overwhelm all clean air measures and lead to high pollution concentrations that may be unhealthy for Valley residents. High pollution concentrations also occur when exceptional events such as wildfires are experienced. Under these circumstances, the best course of action is to provide notifications to Valley residents so that sensitive individuals, in particular, can take precautions to minimize exposure.

Following up on the success of the RAAN program, the District developed a system that provides air quality conditions on a neighborhood-by-neighborhood (4km x 4km) scale as opposed to being limited to only the readings from monitors. The District unveiled a state-of-the-art web tool for exploring historical air quality information at the neighborhood level. WAAQS allows anyone to compare air quality information over the past two decades in any Valley neighborhood. The District has now implemented WAAQS and it is available to the public on the District web at: http://www.valleyair.org/waaqs/

F.2.2.6 Check Before You Burn

The Check Before You Burn outreach program is critical to the implementation of District Rule 4901 (Wood Burning Fireplaces and Wood Burning Heaters). Rule 4901, along with the Check Before You Burn program, is credited with reducing levels of PM2.5 emissions during the winter season to historically low levels. The rule and outreach program was amended in 2008 and again in 2014 to reflect more stringent federal health-based standards, and together they have achieved the highest level of public recognition and compliance of any District program, with 80% of Valley residents professing awareness based on a 2014 public survey.[3] In 2017, the District developed

[2] SJVAPCD 2017-18 Report to the Community. Available at http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2017/March/final/06.pdf

[3] San Joaquin Valley Air Pollution Control District: Memorandum to SJVUAPCD Governing Board, District's Public Opinion Survey Relating to Residential Wood Burning and Other Habits of Valley Residents. Fresno, CA: Public

a new, more complete survey to assess wood burning behaviors and public perception of the District's programs. The results of the new survey helped the District gain more specific information for a comprehensive assessment of the District's current efforts and potential future strategies to further reduce pollution from residential wood burning (Appendix C).[4]

Annual Check Before You Burn outreach campaigns feature District Governing Board members in television, outdoor and printmedia speaking to the public about how to get involved in clean air activities. The District continues to benefit from well established relationships with Valley meteorologists and daily burn status announcements in the weather segments of the evening news. The District also uses extensive social media posts (Facebook,Twitter and Instagram) to reach even more segments of the Valley's population. In addition, the District's toll-free information line and website receives thousands of hits during the wood-burning season, specifically to access daily wood burning status information.

F.2.2.7 Healthy Air Living (HAL)

Most of the District's outreach activities and programs are covered by the HAL umbrella. As a year-round message, the HAL goal of "make one change" promotes and encourages Valley residents and businesses to implement voluntary measures to reduce emissions and improve air quality. Many of the emission-reduction recommendations address PM2.5 emissions, either directly emitted or as byproducts of other pollutants (e.g. reducing the number of miles traveled in a car reduces NOx and, therefore, particulates).

Components of the HAL message include: *Healthy Air Heroes* kids activity kits aimed at elementary school students and their parents; the *Healthy Air Living Kids Calendar* for kindergarteners through high school students; and *Healthy Air Living Schools program* which provides tools for educators to protect their students' health from the harmful effects of air pollution. In addition to these specific programs and others, the HAL logo and message are incorporated into the District's communications, collateral, incentive materials, and outreach efforts.

F.2.2.8 Healthy Air Living Partners

Through the HAL Partners program, adopted in 2009, the District provides participating businesses and entities with tools and educational materials to promote voluntary actions by employers and their employees to reduce emissions or shift emission-producing activities to non-peak periods.

F.2.3 PUBLIC PARTICIPATION

Non-regulatory strategies help accelerate attainment and have been an important part of the District's air quality attainment plans. The following strategies are supported by

Governing Board Meeting, March 20, 2014. Available at http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2014/march/final/09.pdf

[4] San Joaquin Valley Air Pollution Control District: Memorandum to SJVUAPCD Governing Board, District's Residential Wood Burning Survey Results. Fresno, CA: Public Governing Board, January 18, 2018. Available at http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2018/January/final/10.pdf

the District as alternative methods for the public to implement to reduce emissions in the Valley.

F.2.3.1 Green Purchasing and Contracting

Valley businesses and government agencies can get involved in air quality improvements by considering the environmental impacts when making purchasing and contracting decisions. Green purchasing and contracting is the selection of goods, services, and vehicles that have a reduced impact on human health and the environment when compared with other products that serve the same purpose. These efforts can reduce waste, energy consumption and the overall impact of day to day operations. When making purchasing decisions, preference should be given to environmentally responsible products, materials and supplies; fuel-efficient, low-emission and hybrid vehicles; energy-efficient and water-efficient appliances; and service providers who employ greener methods.

The District has created the *Green Purchasing and Contracting: A guide to reducing environmental impacts through the procurement process* guideline and made it available on the District webpage.[5] The District has also set an example for other agencies by adopting and implementing its own Green Procurement & Sustainable Practices Policy in January 2012. The District will continue to support Valley organizations in adopting policies and practices to make green purchasing and contracting a routine part of their operations.

F.2.3.2 Energy Efficiency and Conservation

California has been on the forefront of developing renewable energy sources and has implemented regulations to ensure cleaner non-renewable energy. The District's involvement in energy efficiency and renewable energy is guided by its Regional Energy Efficiency Strategy (REES), adopted in January 2010.[6] This policy identifies the District's commitment to fostering energy efficiency and clean energy alternatives as opportunities for emissions reductions. The District continues to work with stakeholders and state agencies to expand net metering and feed-in tariffs for use of solar and other renewable energy sources, promote energy efficiency programs for energy end users that will result in lower emissions and a more stable electrical distribution system, and develop measures that incentivize and encourage low-emission technologies for use of waste gas as an alternative to waste-gas venting or flaring.

F.2.3.3 Roadmap for Incorporating Energy Efficiency/Renewable Energy Policies and Programs into State and Tribal Implementation Plans

On July 3, 2012, EPA released the first version of *The Roadmap for Incorporating Energy Efficiency/ Renewable Energy Policies and Programs into State and Tribal Implementation Plans* which is part of EPA's effort to encourage state, tribal, and local

[5] SJVAPCD. *Green Purchasing and Contracting: A guide to reducing environmental impacts through the procurement process.* Available at http://www.valleyair.org/Programs/FastTrack/2011/GreenPurchasingReport4-6-11%20_2_.pdf.
[6] San Joaquin Valley Air Pollution Control District. (2010). *Approval of the District's Regional Energy Efficiency Strategy*. Memorandum to the SJVAPCD Governing Board. Public Hearing, January 21, 2010. http://www.valleyair.org/Board_meetings/GB/agenda_minutes/Agenda/2010/January/Agenda_Item_7_Jan_21_2010.pdf

agencies to consider incorporating energy efficiency and renewable energy policies and programs in their state and Tribal Implementation Plans (SIPs/TIPs). The initiative, available at http://www.epa.gov/airquality/eere/, includes a manual, training, tools, and technical assistance.

F.2.3.4 Eco-Driving

Finding ways, through education and outreach, to reduce emissions from mobile sources in the Valley is critical to attainment of federal air quality standards. One such program in development is Eco-Driving. Eco-Driving refers to everyday techniques that drivers can do to maximize the fuel economy of their vehicles. These include: observing good operating maintenance, such as proper tire pressure, wheel alignment, and oil viscosity; improving aerodynamics; traveling at efficient speeds; choosing the appropriate gear for manual transmissions; driving defensively to avoid unnecessary braking; accelerating at a constant pace; and other simple, yet often forgotten, driving techniques. As with other informational activities conducted by the District, an Eco-Driving program could be encompassed under the Healthy Air Living umbrella.

F.2.3.5 Alternative Energy Production

The District encourages cleaner ways of generating electricity and mechanical power, and moving vehicles, in addition to overall reductions in energy use. These alternative energy choices include renewable energy, waste-to-energy systems, and alternative fuels and vehicle technologies. The District also encourages the use of alternative energy sources that are clearly cleaner than industry standards in terms of criteria pollutants. The District's *Alternative Energy: On the Fast Track to Clean Air,*[7] is a guideline for considering clean energy options in the Valley that discusses, and provides additional resources for, the District's current recommendations regarding the most advantageous and viable alternative energy systems. Alternative energy choices include solar energy, wind turbines, biomass, dairy digesters, and electric irrigation pumps, just to name a few.

F.2.3.6 Replacement of High-Polluting Devices

The residents of the Valley can reduce emissions through the replacement of high-polluting devices with cleaner technologies. Two examples include the replacement of open hearth fireplaces and higher polluting wood burning devices with natural gas or EPA-certified wood burning devices, and the replacement of gas powered lawnmowers with electric lawnmowers. The District supports these transitions by providing incentive funding to replace high-polluting units with cleaner alternatives. The District also supports the efforts of Valley residents to replace and/or repair motor vehicles through additional incentive programs. Examples of District incentive programs aimed at residents of the Valley include:

- Burn Cleaner
- Clean Green Yard Machine
- Tune-in & Tune-Up
- Vanpool Voucher

[7] SJVAPCD. *Alternative Energy: On the Fast Track to Clean Air. A Guide for Considering Clean Energy Options in the San Joaquin Valley.* Available at http://www.valleyair.org/Programs/FastTrack/2011/Alternative%20Energy.pdf

- Drive Clean in the San Joaquin

Additional details of these programs can be found on the District website at: http://valleyair.org/grants/

F.2.3.7 Employer-Based Trip Reduction

The goal of District Rule 9410 (Employer-Based Trip Reduction) (eTRIP Rule) is to reduce single-occupancy-vehicle work commutes. The eTRIP Rule requires the Valley's larger employers, representing a wide range of locales and sectors, to select and implement workplace measures that make it easier for their employees to choose ridesharing and alternative transportation. Because of the diversity of employers covered by the eTRIP Rule, the rule was built with a flexible, menu-based approach. Using the eTRIP Plan, employers choose from a list of measures, each contributing to a workplace that encourages employees to reduce their dependence on single-occupancy vehicles. Each eTRIP measure has a point value, and employer eTRIP Plans must reach specified point targets for each strategy. The District has continually provided employer assistance through training, guidance materials, promotional information, and online reporting options.

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