2.7 Air Quality and Climate Change

This section discusses air quality in Imperial County, which was prepared by PMC. The environmental setting includes a summary of applicable regulations and a discussion of the existing regional and local air quality. This section also addresses climate change and its potential effects on air quality and other natural resources.

2.7.1 Terminology

The following is a summary of air quality terminology discussed in this section.

- **Sensitive Receptors** – Individuals such as children, the elderly, and people with preexisting health conditions who are more susceptible to hazardous conditions. Examples of sensitive receptor sites are schools, day care facilities, nursing homes, and residences.
- **Criteria Pollutants** – Air pollutants have been identified by the US Environmental Protection Agency (EPA) as being of concern nationwide. These are ozone (O_3); carbon monoxide (CO); nitrogen dioxide (NO_2); sulfur dioxide (SO_2); lead; and particulate matter (PM), which is subdivided into two classes based on particle size: PM equal to or less than 10 microns in diameter (PM_{10}) and PM equal to or less than 2.5 microns in diameter ($PM_{2.5}$).
- **Ozone (O_3)** – O_3 is the principal component of smog and is formed in the atmosphere through a series of reactions involving reactive organic gases (ROG) and nitrogen oxides (NOx) in the presence of sunlight. ROG and NOx are called precursors of ozone. Excessive exposure to O_3 irritates and causes inflammation of the mucous membranes and lung airways, causing wheezing, coughing, and pain when inhaling deeply; decreases lung capacity; and aggravates lung and heart problems. O_3 damages plants and reduces crop yield.
- **Carbon Monoxide (CO)** – CO is a colorless and odorless gas that, in the urban environment, is associated primarily with the incomplete combustion of fossil fuels in motor vehicles. Exposure to CO reduces the ability of blood to deliver oxygen to vital tissues, affecting the cardiovascular and nervous system. Excessive exposure impairs vision, causes dizziness, and can lead to unconsciousness or death.
- **Nitrogen Dioxide (NO_2)** – NO_2 is a product of combustion and is generated in vehicles and in stationary sources, such as power plants and boilers. It is also formed when ozone reacts with nitrogen oxide (NO) in the atmosphere. NO_2 is a respiratory irritant and aggravates lung and heart problems. NO_2 is a precursor to ozone and acid rain and contributes to global warming and nutrient overloading which deteriorates water quality. NO_2 is a cause of brown discoloration of the atmosphere.
- **Sulfur Dioxide (SO_2)** – SO_2 is a combustion product, with the primary source being power plants and heavy industries that use coal or oil as fuel. SO_2 is a product of diesel engine combustion. SO_2 is also a respiratory irritant that aggravates lung and heart problems. In the presence of moisture and oxygen, SO_2 converts to sulfuric acid which can damage marble, iron, and steel. SO_2 damages crops and natural vegetation, impairs visibility, and is a precursor to acid rain.
- **Lead** – Lead is a highly toxic metal that may cause a range of human health effects. Lead emissions have significantly decreased due to the near elimination of leaded gasoline use. Exposure to lead emissions can result in anemia, high blood pressure, brain and kidney damage, neurological disorders, cancer, and lowered IQ. Lead affects animals, plants, and aquatic ecosystems.

- **Inhalable Particulate Matter (PM_{10})** – PM_{10} includes both fine and coarse dust particles. Coarse particles, such as those found near roadways and dusty industries, are larger than 2.5 micrometers and smaller than 10 micrometers in diameter. Exposure to PM_{10} can result in increased respiratory symptoms, such as irritation of the airways, coughing, or difficulty breathing; aggravated asthma; development of chronic bronchitis; irregular heartbeat; nonfatal heart attacks; and premature death in people with heart or lung disease.
- **Fine Particulate Matter ($PM_{2.5}$)** – Fine particles, such as those found in smoke and haze, are $PM_{2.5}$. Sources of fine particles include all types of combustion activities (motor vehicles, power plants, wood burning, etc.) and certain industrial processes. $PM_{2.5}$ is also formed through reactions of gases such as SO_2 and NOx in the atmosphere. Excessive exposure to $PM_{2.5}$ results in the same effects as PM_{10}.
- **Toxic Air Contaminants** – Particles, liquids, and gases in the air which have harmful chemical properties that affect health.
- **Hazardous Substance** – Any biological agent and other disease-causing agent which, after release into the environment and upon exposure, ingestion, inhalation, or assimilation into any person, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions, or physiological deformations in such persons or their offspring.
- **Asbestos** – Asbestos is a known carcinogen, and inhalation of asbestos may result in the development of lung cancer or mesothelioma. Naturally occurring asbestos-bearing serpentine is a mineral commonly found in seismically active regions of California, usually in association with ultramafic rocks and along associated faults.

2.7.2 Regulatory Environment

This section presents a description of the laws, policies, and plans relevant to air quality.

2.7.2.1 State and Federal Air Quality Standards

The federal Clean Air Act (CAA) of 1971 and the CCA Amendments (1977) established the national ambient air quality standards (NAAQS), which are promulgated by the EPA. The State of California has also adopted its own California ambient air quality standards (CAAQS), which are promulgated by the California Air Resources Board (CARB). Imperial County is located within the Salton Sea Air Basin (SSAB), which is under the air quality regulatory jurisdiction of the Imperial County Air Pollution Control District (ICAPCD).

The CCA of 1971 established the NAAQS, with states retaining the option to adopt more stringent standards or to include other pollution species. These standards are the levels of air quality considered to provide a margin of safety in the protection of the public health and welfare. They are designed to protect those sensitive receptors most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise. Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed.

Both the State of California and the federal government have established health-based ambient air quality standards for six air pollutants. As shown in **Table 2.7-1**, these pollutants include O_3, CO, NO_2, SO_2, PM_{10} and subset $PM_{2.5}$, and lead. In addition, the State has set standards for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particles. These standards are designed to protect the health and welfare of the populace with a reasonable margin of safety.

Table 2.7-1. Air Quality Standards

Pollutant	Averaging Time	California Standards	National Standards
Ozone (O3)	8 Hour	0.070 ppm (137µg/m^3)	0.075 ppm
Carbon Monoxide (CO)	1 Hour	0.09 ppm (180 µg/m^3)	—
	8 Hour	9.0 ppm (10 mg/m^3)	9 ppm (10 mg/m^3)
Nitrogen Dioxide (NO_2)	1 Hour	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)
	1 Hour	0.18 ppm (339 µg/m^3)	100 ppb
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	0.030 ppm (57 µg/m^3)	53 ppb (100 µg/m^3)
	24 Hour	0.04 ppm (105 µg/m^3)	N/A
	3 Hour	—	N/A
	1 Hour	0.25 ppm (665 µg/m^3)	75 ppb
Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 µg/m^3	N/A
	24 Hour	50 µg/m^3	150 µg/m^3
Particulate Matter – Fine ($PM_{2.5}$)	Annual Arithmetic Mean	12 µg/m^3	12µg/m^3
	24 Hour	N/A	35 µg/m^3
Sulfates	24 Hour	25 µg/m^3	N/A
Lead	Calendar Quarter	N/A	1.5 µg/m^3
	30 Day Average	1.5 µg/m^3)	N/A
Hydrogen Sulfide	1 Hour	0.03 ppm (42 µg/m^3)	N/A
Vinyl Chloride (chloroethene)	24 Hour	0.01 ppm (26 µg/m^3)	N/A
Visibility-Reducing Particles	8 Hour (10:00 to 18:00 PST)	—	N/A

Source: CARB 2013a
Notes: mg/m^3=milligrams per cubic meter; ppm=parts per million; ppb=parts per billion; µg/m^3=micrograms per cubic meter

Specific geographic areas are classified as attainment, nonattainment, or unclassified areas for each pollutant, based on the comparison of measured data with federal and state standards. The unclassified designation is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. The Imperial County portion of the SSAB is currently designated as a nonattainment area for the 8-hour O_3 NAAQS and CAAQS. The entire County is designated as a nonattainment area for the PM_{10} NAAQS and CAAQS. The central portion of Imperial County is designated as a nonattainment area for the $PM_{2.5}$ NAAQS. The Imperial County portion of the SSAB is in attainment or unclassified with the NAAQS and CAAQS for the other applicable criteria pollutants. **Table 2.7-2** shows the federal and state attainment status for the Imperial County portion of the SSAB.

Table 2.7-2. Federal and State Ambient Air Quality Attainment Status for Imperial County

Pollutant	Federal	State
8-Hour Ozone (O_3)	Nonattainment	Nonattainment
Coarse Particulate Matter (PM_{10})	Nonattainment	Nonattainment
Fine Particulate Matter ($PM_{2.5}$)	Nonattainment (central portion) Unclassified (remainder)	Attainment
Carbon Monoxide (CO)	Unclassified/Attainment	Attainment
Nitrogen Dioxide (NO_2)	Unclassified/Attainment	Attainment
Sulfur Dioxide (SO_2)	Attainment	Attainment
Lead	Unclassified/Attainment	Attainment
Sulfates	—	Attainment
Hydrogen Sulfide	—	Unclassified
Visibility Reducing Particles	—	Unclassified

Source: CARB 2013b

The EPA, under the provisions of the CAA, requires each state with regions that have not attained the NAAQS to prepare a State Implementation Plan (SIP), detailing how these standards are to be met in each local area. The SIP is a legal agreement between each state and the federal government to commit resources to improving air quality. It serves as the template for conducting regional and project-level air quality analysis. The SIP is not a single document but a compilation of new and previously submitted attainment plans, emissions inventory, emissions reduction programs, district rules, state regulations, and federal controls. CARB is the lead agency for developing the SIP in California. Local air districts, such as the ICAPCD, prepare air quality attainment plans or air quality management plans and submit them to CARB for review, approval, and incorporation into the applicable SIP. The air districts develop the strategies stated in the SIPs for achieving air quality standards on a regional basis.

General conformity requirements were adopted by the US Congress as part of the CAA Amendments of 1990. The purpose of the general conformity program is to ensure that actions taken by the federal government do not undermine state or local efforts to achieve and maintain NAAQS. The General Conformity Rule applies to "…any activity that a department…of the Federal government supports in any way, provides financial assistance for, licenses, permits, or approves…" (40 Code of Federal Regulations [CFR] Section 51.852). The General Conformity Rule (40 CFR Sections 51.850–51.860 and 93.150–93.160) requires any federal agency responsible for an action in a federal nonattainment or attainment/maintenance area to demonstrate conformity to the applicable SIP. To do so, the federal agency must determine that the action is either exempt from General Conformity Rule requirements or subject to a formal conformity determination. All reasonably foreseeable emissions predicted to result from the action—both direct and indirect—must be considered, and the location and quantity of emissions must be identified. Only federal nonattainment and maintenance pollutant emissions are considered under a general conformity analysis.

2.7.2.2 Imperial County Air Pollution Control District

As previously described, the air quality in the County is under the jurisdiction of the ICAPCD. The ICAPCD is the local air quality agency and shares responsibility with CARB for ensuring that state and federal ambient air quality standards are achieved and maintained in Imperial County. ICAPCD responsibilities include monitoring ambient air quality, planning activities such as modeling and maintenance of the emission inventory, and preparing clean air plans. The ICAPCD develops air quality plans that address state and federal requirements. The clean air plans include strategies and tactics to be used to attain and maintain acceptable air quality in Imperial County. The ICAPCD clean air plans include the following:

Final 2009 8-Hour Ozone Modified Air Quality Management Plan

The ICAPCD adopted the Final 2009 8-hour Ozone Modified Air Quality Management Plan on July 13, 2010 (ICAPCD 2010). The plan includes control measures which are an integral part of how the ICAPCD currently controls the ROG and NOx emissions within the O_3 nonattainment areas. The overall strategy includes programs and control measures which represent the implementation of Reasonable Available Control Technology (40 CFR 51.912) and the assurance that stationary sources maintain a net decrease in emissions.

Final PM_{10} 2009 State Implementation Plan

The final PM_{10} SIP was adopted by the ICAPCD on August 11, 2009 (ICAPCD 2009). The PM_{10} nonattainment status required the ICAPCD to begin the development of best available control measures (BACM) for fugitive dust. This process began prior to the development of the SIP. In November 2005, the ICAPCD adopted revised fugitive dust control measures (Regulation VIII) which are the primary control strategy for the PM_{10} SIP. On April 23, 2013, the EPA fully approved Regulation VIII fugitive dust rules into the Imperial County portion of the California SIP as BACM.

2013 State Implementation Plan for the 2006 24-Hour $PM_{2.5}$ Moderate Nonattainment Area

The $PM_{2.5}$ SIP was adopted by the ICAPCD on December 18, 2014 (ICAPCD 2014). The $PM_{2.5}$ nonattainment status required the ICAPCD to attain the $PM_{2.5}$ standard before the end of 2015. One of Imperial County's unique features is also its greatest challenge when trying to improve air quality. Imperial County is one of California's international gateways; specifically, Calexico shares a border with the densely populated city of Mexicali, Mexico. As is demonstrated in the $PM_{2.5}$ SIP, the primary reason for elevated $PM_{2.5}$ levels in Imperial County is transport from Mexico. Essentially, the 2013 $PM_{2.5}$ SIP demonstrates attainment of the 2006 $PM_{2.5}$ NAAQS "but for" transport of international emissions from Mexicali, Mexico. In accordance with the CAA, the 2013 $PM_{2.5}$ SIP satisfies the attainment demonstration requirement satisfying the provisions of the CAA.

The ICAPCD is also responsible for monitoring air pollution and adopting rules and regulations. The ICAPCD has the authority to adopt and enforce regulations dealing with controls for specific types of sources, emissions of hazardous air pollutants, and New Source Review. The rules and regulations include procedures and requirements to control the emission of pollutants and prevent significant adverse impacts. The ICAPCD Rules and Regulations are part of the SIP and are, in some instances, separately enforceable by the EPA. Examples of ICAPCD Rules and Regulations include the following:

- Rule 310 – Operational Development Fee. The purpose of this rule is to provide the ICAPCD with a sound method for mitigating the emissions produced from the operation of new development projects throughout the County and incorporated cities. All project proponents have the option to

either provide off-site mitigation or pay the operational development fee, or do a combination of both. This rule assists the ICAPCD in attaining the state and federal ambient air quality standards for PM_{10} and O_3.

- Rule 401 – Opacity of Emissions. This rule applies to any discharge of air pollutants, and prohibits emissions in excess of specified opacity limits.
- Rule 403 – General Limitations on the Discharge of Air Contaminants. Rule 403 sets forth limitations on emissions of pollutants, including particulate matter, from individual sources.
- Rule 407 – Nuisances. Rule 407 prohibits a person from discharging from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.
- Rule 424 – Architectural Coatings. Rule 424 regulates the sale of architectural coatings and limits the volatile organic compounds (VOC) content in paints.
- Rule 426 – Cutback Asphalt and Emulsified Paving Materials. Rule 426 reduces air emissions by applying requirements and limits to the manufacture, mixing, storage, use, and application of cutback asphalt and emulsified asphalt paving materials.
- Regulation VIII – Fugitive Dust Rules. Regulation VIII sets forth rules regarding the control of fugitive dust, including fugitive dust from construction activities. The regulation requires implementation of fugitive dust control measures to reduce emissions from earth-moving, unpaved roads, handling of bulk materials, and control of track-out/carryout dust from active construction sites. BACMs to reduce fugitive dust during construction and earth-moving activities include but are not limited to:

    1. Phasing of work in order to minimize disturbed surface area;
    2. Application of water or chemical stabilizers to disturbed soils;
    3. Construction and maintenance of wind barriers; and
    4. Use of a track-out control device or wash down system at access points to paved roads. Compliance with Regulation VIII is mandatory on all construction sites, regardless of size. However, compliance with Regulation VIII does not constitute mitigation under the reductions attributed to environmental impacts.

2.7.2.3 Imperial County General Plan

The *Conservation and Open Space Element* of the existing General Plan contains a goal and objectives that contribute to reducing criteria air pollutant emissions:

- Protection of Air Quality

    Goal 9. The County shall actively seek to improve and maintain the quality of air in the region.

    Objective 9.1. Ensure that all facilities shall comply with current federal and State requirements for attainment of air quality objectives.

    Objective 9.2. Cooperate with all federal and State agencies in the effort to attain air quality objectives.

The *Land Use Element* of the existing General Plan also contains a goal and associated objectives that contribute to reducing criteria air pollutant emissions:

- Protection of Environmental Resources

  Goal 9. Identify and preserve significant natural, cultural, and community character resources and the County's air and water quality.

  Objective 9.6. Incorporate the strategies of the Imperial County Air Quality Attainment Plan (AQAP) in land use planning decisions and as amended.

  Objective 9.7. Implement a review procedure for land use planning and discretionary project review which includes the Imperial County Air Pollution Control District.

2.7.3 Existing Conditions

Air quality is defined by the concentration of pollutants related to human health. Concentrations of air pollutants are determined by the rate and location of pollutant emissions released by pollution sources and the atmosphere's ability to transport and dilute such emissions. Imperial County contains relatively few major emission sources, but may experience significant vehicular traffic, particularly near Calexico, given proximity to an international port entry into the United States. Emission sources consist of Electric generating facilities, geothermal power generation, food processing, plaster manufacturing, and other light industrial facilities. Imperial Valley agriculture produces a variety of crops including hay, vegetables, and dairy products. Beyond the urban and rural areas of Imperial County are large expanses of open desert and the Salton Sea with little human activity. Natural factors that affect transport and dilution include terrain, wind, and sunlight. Therefore, ambient air quality conditions within the local air basin are influenced by such natural factors as topography, meteorology, and climate, in addition to the amount of air pollutant emissions released by existing air pollutant sources.

2.7.3.1 Environmental Setting, Climate, and Meteorology

Imperial County is located in the southeastern corner of California and is surrounded by mountain ranges to the east, and west with vast open land containing desert sand. As previously described, the SSAB encompasses the entirety of Imperial County. The SSAB also consists of the southeast portion of Riverside County. The SSAB is generally an arid desert region, with a significant portion located below sea level. A semi-permanent high-pressure cell blocks mid-latitude storms and causes sunny skies most of the time. The high-pressure zone tends to be weaker in the winter and it is during this time that the SSAB usually receives most of its rainfall which historically averages just under three inches per year according to the Western Regional Climate Center (WRCC 1948-2005).

Regional air quality within the SSAB is affected by topography and atmospheric inversions. The area is generally very flat and bordered to the west by the Peninsular Mountain range and to the east by the Chocolate, Orocopia, and Cargo Muchacho mountains. The Imperial County portion of the SSAB experiences mild and dry winters with daily maximum temperatures in the 65 to 75ºF (18–24ºC) range and extremely hot summers with daily maximum temperatures of 104 to 115ºF (40–46ºC). Summer weather patterns are dominated by intense heat inducing low-pressure areas over the interior desert. The flat terrain of the Imperial Valley, coupled with the strong temperature differentials created by

intense solar heating, produces moderate winds and deep thermal convection (ICAPCD 2009). These climatic conditions are strongly influenced by the large-scale sinking and warming of air in the semi-permanent subtropical high-pressure center of the Pacific Ocean. The Peninsular Mountain range to the west blocks any coastal influence, such as cool and damp marine air.

The sun shines, on the average, more in the Imperial County that anywhere else in the United States (ICAPCD 2009). Humidity is low throughout the year, ranging from 28 percent in summer to 52 percent in winter (ICAPCD 2009). The large daily oscillation of temperature produces a corresponding large variation in the relative humidity. Nocturnal humidity rises to 50–60 percent, but drops to about 10 percent during the day (ICAPCD 2009). Although Imperial County occasionally experiences high winds of greater than 30 miles per hour (most frequently in April and May), wind speeds in the area are generally less than 10 miles per hour (ICAPCD 2009). Wind statistics reveal that prevailing winds blow from the northwest-northeast; a secondary trend of the wind direction from the southeast is also evident (ICAPCD 2009). The mountains to the east act as physical barriers to the dispersion of airborne contaminants.

The SSAB also experiences surface inversions almost every day of the year. These inversions are caused by the presence of the region's typical subtropical high-pressure cell, which causes the air mass aloft to sink. Air masses are large bodies of air with similar temperature and moisture content. An air mass aloft refers to the higher-altitude air mass which inductively suggests that there is a separate (and thus different in temperature and moisture content) air mass at ground level. As this air mass sinks, the temperature thereof rises through compressional heating, thus exceeding the temperature of the air below. This stable atmospheric condition, known as a subsidence inversion, becomes a nearly impenetrable barrier to the vertical mixing of pollutants. These inversions often last for long periods of time, which allows for air stagnation and the buildup of pollutants. During the winter, the area experiences radiation inversions in which the air near the ground surface cools by radiation, whereas the air higher in the atmosphere remains warmer. A shallow inversion layer is created between the two layers and precludes the vertical dispersion of air, thus trapping pollutants. The highest ozone levels are often associated with subsidence inversions.

Existing air quality and historical trends and projections in the County are documented by measurements made by the ICAPCD. Air quality monitoring sites in the County are located at Calexico, El Centro, Niland, Westmorland, and Brawley. As previously stated, O_3, PM_{10}, and $PM_{2.5}$ are the pollutants most intensely affecting the County. Therefore, **Table 2.7-3** shows historical occurrences of O_3, PM_{10}, and $PM_{2.5}$ pollutant levels exceeding state and federal ambient air quality standards for the three-year period of 2012, 2013, and 2014 at all the listed monitoring stations. Due to various meteorological factors, including wind, air pollutant measurements within the County are sometimes influenced from surrounding areas, including air pollution generated in other counties.

Table 2.7-3. Ambient Air Quality Monitoring Data

Pollutant Standards	2012	2013	2014
		Calexico – Ethel Street Monitoring Station	
Ozone (O_3)			
Number of days above state 1-hour standard	11	3	5
Number of days above state 8-hour standard	26	19	13
Number of days above federal 8-hour standard	12	8	5

Table 2.7-3. Ambient Air Quality Monitoring Data

Coarse Particulate Matter (PM_{10})			
Number of days above state standard	210	*	*
Number of days above federal standard	9	0	0
Fine Particulate Matter ($PM_{2.5}$)			
Number of days above federal standard	*	3	10
El Centro – 9th Street Monitoring Station			
Ozone (O_3)			
Number of days above state 1-hour standard	9	7	2
Number of days above state 8-hour standard	23	23	13
Number of days above federal 8-hour standard	14	11	5
Coarse Particulate Matter (PM_{10})			
Number of days above state standard	36	*	90
Number of days above federal standard	0	0	0
Fine Particulate Matter ($PM_{2.5}$)			
Number of days above federal standard	0	0	0
Niland – English Road Monitoring Station			
Ozone (O_3)			
Number of days above state 1-hour standard	0	1	0
Number of days above state 8-hour standard	4	5	2
Number of days above federal 8-hour standard	1	3	0
Coarse Particulate Matter (PM_{10})			
Number of days above state standard	100	145	124
Number of days above federal standard	13	0	6
Fine Particulate Matter ($PM_{2.5}$)			
Number of days above federal standard	*	*	*
Westmorland – West 1st Street Monitoring Station			
Ozone (O_3)			
Number of days above state 1-hour standard	0	*	*
Number of days above state 8-hour standard	3	*	*
Number of days above federal 8-hour standard	0	*	*
Coarse Particulate Matter (PM_{10})			
Number of days above state standard	*	87	*

Table 2.7-3. Ambient Air Quality Monitoring Data

Number of days above federal standard	0	13	25
Fine Particulate Matter ($PM_{2.5}$)			
Number of days above federal standard	*	*	*
Brawley – 220 Main Street Monitoring Station			
Ozone (O_3)			
Number of days above state 1-hour standard	*	*	*
Number of days above state 8-hour standard	*	*	*
Number of days above federal 8-hour standard	*	*	*
Coarse Particulate Matter (PM_{10})			
Number of days above state standard	109	123	184
Number of days above federal standard	0	19	*
Fine Particulate Matter ($PM_{2.5}$)			
Number of days above federal standard	0	0	0

Source: CARB 2015

* = No data is currently available from CARB to determine the value.

2.7.3.2 Toxic Air Contaminants

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. TACs are considered either carcinogenic or noncarcinogenic based on the nature of the health effects associated with exposure to the pollutant. For regulatory purposes, carcinogenic TACs are assumed to have no safe threshold below which health impacts would not occur, and cancer risk is expressed as excess cancer cases per one million exposed individuals. Noncarcinogenic TACs differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis.

There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes, such as petroleum refining and chrome-plating operations; commercial operations, such as gasoline stations and dry cleaners; and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as from accidental releases of hazardous materials during upset conditions. The health effects associated with TACs are quite diverse and generally are assessed locally, rather than regionally. TACs can cause long-term health effects such as cancer, birth defects, neurological damage, asthma, bronchitis, or genetic damage, or short-term acute effects such as eye watering, respiratory irritation (a cough), running nose, throat pain, and headaches.

To date, CARB has designated nearly 200 compounds as TACs. Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to a relatively few compounds.

Most recently, CARB identified diesel particulate matter (diesel PM) as a TAC. Diesel PM differs from other TACs in that it is not a single substance but rather a complex mixture of hundreds of substances. Diesel exhaust is a complex mixture of particles and gases produced when an engine burns diesel fuel. Diesel PM is a concern because it causes lung cancer; many compounds found in diesel exhaust are carcinogenic. Diesel PM includes the particle-phase constituents in diesel exhaust. The chemical composition and particle sizes of diesel PM vary between different engine types (heavy duty, light duty), engine operating conditions (idle, accelerate, decelerate), fuel formulations (high/low sulfur fuel), and the year of the engine (EPA 2002). Some short-term (acute) effects of diesel exhaust include eye, nose, throat, and lung irritation, and diesel exhaust can cause coughs, headaches, light-headedness, and nausea. Diesel PM poses the greatest health risk among the TACs. Almost all diesel exhaust particle mass is 10 microns or less in diameter. Because of their extremely small size, these particles can be inhaled and eventually trapped in the bronchial and alveolar regions of the lung.

2.7.4 Constraints and Opportunities

This section discusses the potential constraints and opportunities associated with the regulatory requirements and existing conditions of the County's air quality.

2.7.4.1 Constraints Due to Regulatory Requirements

ICAPCD

Projects developed in Imperial County must meet the requirements of the ICAPCD. Specific rules and regulations adopted by the ICAPCD limit the emissions that can be generated by various activities and identify specific pollution reduction measures that must be implemented in association with various activities. These rules regulate not only emissions of the six criteria air pollutants but also toxic emissions and acutely hazardous non-radioactive materials emissions. Emissions sources subject to these rules are regulated through the ICAPCD's permitting process and standards of operation.

For instance, through this permitting process, the ICAPCD monitors generation of stationary emissions. Any sources of stationary emissions constructed in Imperial County are subject to ICAPCD rules and regulations and would need to meet ICAPCD permitting requirements (stationary sources are defined as any building, structure, facility, or installation which emits or may emit any air pollutant). For example, Rule 207, New and Modified Stationary Source Review, establishes preconstruction review requirements for new and modified stationary sources to ensure that the operation of such sources do not interfere with the attainment or maintenance of national and state ambient air quality standards.

ICAPCD Rule 216, Construction or Reconstruction of Major Stationary Sources that Emit Hazardous Air Pollutants, requires all owners and operators of stationary sources that emit toxic emissions to install best available control technology for toxics (T-BACT) to any constructed or reconstructed major source. All T-BACT determinations are controlled to a level that the ICAPCD has determined to be, at a minimum, no less stringent than new source maximum achievable control technology as required by the federal CAA. In addition, ICAPCD Rule 1101, New Source Performance Standards, mandates surveillance of certain industries whose operations have been judged to be a significant hindrance to the attainment of NAAQS. These "problem" industries are identified and ranked in their order of priority as major sources of pollutants by the EPA in Title 40 of the Code of Federal Regulations [40 CFR 60.16]. In general terms, the listing highlights the types of facilities and operations that are most likely to cause air pollution problems. Included in Rule 1101 are various subparts that define methods by which facilities or operations can work toward compliance with mandated emissions standards. These subparts are identified as "emissions guidelines" or "standards of performance."

The ICAPCD also requires analysis of potential air quality impacts associated with the construction and operation of more typical forms of land use development, such as residential and/or commercial uses. Any development project with the potential to have a significant impact on regional and local air quality is required to develop a comprehensive air quality analysis report containing effective and comprehensive mitigation for construction and operational air emissions. The ICAPCD has established significance criteria that may be relied upon in order to make determinations concerning air quality impacts. The ICAPCD-established thresholds of significance for air quality for construction and operational activities of land use development projects are shown in **Table 2.7-4**.

Table 2.7-4. ICAPCD Significance Thresholds

Air Pollutant	Construction Activities	Operations
Reactive Organic Gases (ROG)	75 lbs/day	55 lbs/day
Nitrogen Oxides (NOx)	100 lbs/day	55 lbs/day
Coarse Particulates (PM_{10})	150 lbs/day	150 lbs/day
Fine Particulates ($PM_{2.5}$)	None	None
Carbon Monoxide (CO)	550 lbs/day	550 lbs/day
Sulfur Oxides (SO_x)	None	150 lbs/day

Source: ICAPCD 2007

In terms of potential construction impacts, mitigation of such activities is required when the emissions thresholds are equaled or exceeded by fugitive dust and/or combustion emissions. The ICAPCD identifies feasible mitigation measures for those projects which have been deemed to have a significant environmental impact, and provides a menu of mitigation measures for the construction and operational phases of a project. ICAPCD construction mitigation measures are designed to reduce emissions from heavy-duty construction equipment and may include emulsified fuels, catalyst and filtration technologies, engine replacement, new alternative fueled trucks, and implementation of construction air quality analysis reports (ICAPCD 2007).

The ICAPCD also seeks to aggressively reduce fugitive dust emissions by requiring that all construction sites, regardless of size or projected emissions, must comply with the requirements contained within Regulation VIII, described previously. The primary intent of Regulation VIII is to reduce the amount of PM_{10} entrained into the atmosphere as a result of anthropogenic (man-made) fugitive dust sources. Development projects with construction-generated emissions estimates that cannot be adequately mitigated with on-site mitigation measures alone are required by the ICAPCD to prepare a health risk assessment (HRA) concerning the exposure of diesel PM to vicinity sensitive receptors. An HRA is intended to address health risks from airborne contaminants. According to the ICAPCD, the HRA requires a diesel exhaust screening level performed in consultation with ICAPCD engineering staff.

In terms of potential operational air quality impacts, the ICAPCD identifies required mitigation in order to reduce a project's emissions when thresholds are equaled or exceeded. Most of the long-term operational mitigation strategies suggested by the ICAPCD focus on methods to reduce vehicle trips and travel distance, including site design standards which encourage pedestrian- and bicycle-friendly transit-oriented development. In addition, the recommendations include design strategies for residential and commercial buildings that address energy conservation and other concepts to reduce total project emissions. Development projects with operational emissions estimates that cannot be adequately mitigated with on-site mitigation measures alone are required by the ICAPCD to implement off-site mitigation measures, pay an operational development fee, or do a combination of both. The funds generated from operational development fees are redistributed by the ICAPCD for various mitigation projects.

Office of Environmental Health Hazard Assessment

The California Office of Environmental Health Hazard Assessment (OEHHA) is a state agency that reviews advances in science concerning health effects and exposure assessment. Periodically, the OEHHA updates its HRA Guidelines which are used to estimate health risk. The OEHHA recently adopted updates to its HRA Guidance Manual which more intensely characterize early childhood exposures and refine exposure assessment for all ages.

For many situations, use of the OEHHA Guidance Manual will result in higher estimated health risks than would have been calculated with the previous risk methodology. In some cases, the new estimated air toxic inhalation risk would be only slightly higher than the estimate using the previous methodology; in other cases, the new estimated inhalation risk could be up to three to five times higher. As a result, the updated OEHHA Guidance Manual will likely expand the notification and permitting requirements for many industrial uses (new and existing) that require air toxics permits and may require additional analysis and mitigation for development projects that trigger CEQA.

For industrial uses that require air toxics permits, the updated Guidance Manual is expected to substantially increase the number of new and existing sources that trigger notification or modeling obligations under the Assembly Bill (AB) 2588 "Hot Spots" program. It is likely that the updated Guidance Manual will make it harder (i.e., costlier) for many sources—including small sources such as gas stations—to obtain necessary permits in a timely manner. A possible result includes a substantial number of small sources, like gas stations, no longer able to obtain permits as they would not be able to meet the more stringent emissions limits and acquisition of the necessary source control equipment upgrades are too costly.

Future development projects subject to CEQA could be significantly affected under the updated Guidance Manual because HRAs using the new methodology are expected to estimate impacts that are two to five times greater (or more in some cases) than HRAs prepared using the prior methodology—even assuming no change in exposure. This effect could result in a finding of significant impact for a higher number of projects. Staff for the South Coast Air Quality Management District has also indicated that the updated Guidance Manual could mean that relatively small, temporary construction projects result in significant health risks. This could require a greater number of projects to complete a full environmental impact report (EIR) and potentially include additional control measures.

2.7.4.2 Constraints Due to Existing Conditions

The combination of the flat terrain of the County and the strong diurnal temperature differentials created by solar heating produces moderate winds and deep thermal convection. The high temperatures combined with low humidity produce hot, dry summers that contribute to the buildup of O_3. As previously stated, the County also experiences surface inversions almost every day of the year, which are nearly impenetrable barriers to the vertical mixing of pollutants. These inversions often last for long periods of time, which allows for air stagnation and the buildup of pollutants. The highest O_3 levels are often associated with subsidence inversions.

The Salton Sea is a saline body of water in a natural sink that is being replenished predominantly by farm drainage and seepage, with occasional inputs from stormwater runoff. The Salton Sea fluctuates in size and capacity but is currently about 35 miles long and 15 miles wide, occupies 376 square miles, and contains about 7.5 million acre-feet of water. Water levels at the Salton Sea have dropped from a high stand surface elevation of 227 feet below sea level to the present elevation at 235 feet below sea level due to reduced water inflow.

As inflows to the Salton Sea continue to decrease, the shallow perimeter areas of the lakebed are exposed to the dry, desert winds, creating occasionally severe dust storms. Fugitive dust is emitted by means of saltation (bouncing) of sand particles from upwind sources, in which the sand particles bounce along the exposed playa and dislodge other particles which begin saltation themselves, dislodging still more sand particles. The longer the unbroken dust emissive areas, the greater the particulate emissions and severity of dust storms.

While water levels at the Salton Sea have already dropped 8 feet from its high stand surface elevation, some future water level projections have reported an expectation that the lake will fall an additional 3 to 20 feet in coming years because of rapid evaporation and increased water conservation. The Imperial Irrigation District (IID) (2014b) estimates that approximately 17,068 acres of playa will be exposed by the year 2020, 50,797 acres by 2030, and 60,025 acres will be potentially exposed by the year 2040. Complicating the situation is the fact that Salton Sea mud contains substantial amounts of arsenic and selenium and heavy metals such as chromium, zinc, and lead. These chemicals could be attached to the fine particles of sediment and, as the lake evaporates, could be exposed to people.

Air quality in Imperial County is also affected by air pollutants transported from the higher urbanized South Coast Air Basin to the northwest, the San Diego County Air Basin to the west, Mexico to the south, and Arizona to the east. Similarly, wind blowing in a northeast direction transports pollutants from Mexicali into Calexico. High concentrations of air pollutants pose health hazards for the general population, but particularly for the young, the elderly, and the sick. Typical health problems attributed to smog include respiratory ailments, eye and throat irritations, headaches, coughing, and chest discomfort. Certain land uses are considered to be more sensitive to the effects of air pollution. Schools, hospitals, residences, and other facilities where people congregate, especially children, the elderly, and infirm, are considered particularly sensitive to air pollutants.

As mentioned previously, Imperial County is currently designated as a nonattainment area for the 8-hour O_3 NAAQS and CAAQS. The entire County is designated as a nonattainment area for the PM_{10} CAAQS while only the western portion of the County is designated nonattainment for the PM_{10} NAAQS. The central portion of Imperial County is designated as a nonattainment area for the $PM_{2.5}$ NAAQS. As shown in **Table 2.7-3**, pollutant levels often exceed state and federal ambient air quality standards throughout the County. For instance, the state standard for PM_{10} was exceeded at the Niland monitoring station on 100 days in 2012, 145 days in 2013, and 124 days in 2014. The majority of PM emissions in the County are generated by unpaved roads, farming operations, fugitive windblown dust, and burning of agricultural waste.

Despite stringent PM-reducing efforts by the County, the region has a significant problem with asthma. Asthma is a chronic disease that inflames airways and causes recurrent wheezing, coughing, difficulty breathing, and chest tightness. Attacks can be mild to deadly. According to the California Department of Public Health (2009), 20.2 percent of children in Imperial County are diagnosed with asthma, while the national average is 13.7 percent. Imperial County consistently has the highest asthma hospitalization rate among all California counties and the highest rate of asthma-related emergency room visits for children ages 5–17 (DPH 2009).

2.7.4.3 Constraints Due to Climate Change

According to reports issued by the California Climate Change Center (CCCC), temperatures in California will rise significantly during this century as a result of the greenhouse gas (GHG) emissions humans

release into the atmosphere (CCCC 2012). California can draw on substantial scientific research conducted by experts at various universities and research institutions. With more than a decade of concerted research, scientists have established that the early signs of climate change are already evident in the state—as shown, for example, in increased average temperatures, changes in temperature extremes, reduced snowpack in the Sierra Nevada, sea level rise, and ecological shifts. Many of these changes are accelerating locally, across the country, and around the globe. As a result of emissions already released into the atmosphere, California will face intensifying climate change in coming decades (CNRA 2009).

Generally, research indicates that California should expect overall hotter and drier conditions, with a continued reduction in winter snow (with concurrent increases in winter rains), as well as increased average temperatures and accelerating sea-level rise. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing (CNRA 2009). According to the California Energy Commission's Renewable Energy Action Team (REAT), mean annual minimum temperatures are projected to substantially increase in Imperial County, as temperature change projections indicate mean annual, monthly median, and minimum and maximum temperature increases over 2°C. Projections also show a change in the distribution of precipitation and vegetation shift due to climate change, based on the capacity of species to migrate and keep up with geographic change (REAT 2014).

The State of California has completed three climate change assessments and is in the process of preparing a fourth. California produces periodic scientific assessments on the potential impacts of climate change in the state and reports potential adaptation responses. Climate science and knowledge about climate impacts continue to evolve and be refined, through both improvements in impact modeling and direct observations of the changing climate over time. In order to support California leadership on climate policies and actions, it is critical that California continue to invest in regionally relevant climate science that is complementary to local, federal, and international climate science efforts.

The first California climate change assessment (First Assessment), completed in 2006, began the work of trying to "downscale" global climate models in order to provide information about expected climate impacts at a regionally relevant scale. The second California climate change assessment (Second Assessment), completed in 2009, provided initial estimates of some of the economic impacts of expected and unfolding climate risks in the state, such as costs to coastal economies from sea level rise. Expected climate impacts will have very significant economic impacts that may be reduced with appropriate measures to reduce climate risks.

The Second Assessment provided support for the State's 2009 California Climate Change Adaptation Strategy, the State's first multisectoral effort to plan for climate risks. The third California climate change assessment (Third Assessment), completed in 2012, was shaped by requests for additional information regarding state vulnerabilities to climate change, including (1) the need to better understand institutional barriers to efforts to prepare for climate risks, (2) risks in specific sectors (water, energy, agriculture), and (3) risks at the local scale. The Third Assessment supported the development of the Safeguarding California Plan for reducing climate risk (an update to the 2009 California Climate Change Adaptation Strategy). The significant advances in climate science in the Third Assessment allowed state agencies to expand and refine recommendations for reducing climate risk in California.

A fourth California climate change assessment (Fourth Assessment) will provide additional information to support decisions that will safeguard the people, economy, and resources of California. Among other informational gaps about climate vulnerabilities, California lacks information regarding expected climate

impacts from extreme weather events. Climate change not only creates new average conditions but is also expected to create more extreme events such as more frequent and more severe wildfires, and more intense and more frequent drought. A recent study by the US Geological Survey shows that a single extreme winter storm in California could cost on the order of $725 billion—with total direct property losses of nearly $400 billion, of which $20 billion to $30 billion would be recoverable through insurance, and business interruption costs of $325 billion (CCCC 2012). California also needs to better understand the scope, timing, cost, and feasibility of various management options to address climate risks (CCCC 2012). Accurately understanding climate risks and management options will allow the State to prioritize actions and investments to safeguard the people, economy, and natural resources of California.

Impacts on Water Supply

The state's water supply is already under stress and is anticipated to shrink under even the most conservative climate change scenario. The state's urgent water management challenges posed by climate change include increasing demand from a growing population as temperatures rise. Warmer average global temperatures cause more rainfall than snowfall, making the winter snowfall season shorter and accelerating the rate at which the snowpack melts in the spring. The Sierra snowpack is estimated to experience a 25–40 percent reduction from its average by 2050 (CNRA 2009). Climate change effects on water supplies and stream flows are also expected to increase competition among urban and agricultural water users and environmental needs (CCCC 2012).

The California Department of Water Resources (DWR), in collaboration with the State Water Resources Control Board, other state agencies, and numerous stakeholders, has initiated a number of projects to begin climate change adaptation planning for the water sector, including the development of an adaptation strategy entitled Managing an Uncertain Future: Climate Change Adaptation Strategies for California's Water (DWR 2008). This report details how climate change is already affecting the state's water supplies and sets forth ten adaptation strategies to help avoid or reduce climate change impacts to water resources, such as water conservation strategies, the enhancement of wetland ecosystems, and the expansion of water storage and conjunctive management of surface and groundwater resources. Other strategies include fixing the Sacramento-San Joaquin Delta water supply system, water quality, and ecosystem conditions, the practice of integrated flood management, and the provision for sustainable funding for statewide and integrated regional water management (DWR 2008). The ultimate goal of the water conservation measures highlighted in the report is to achieve a statewide 20 percent reduction in per capita water use in 2020 (DWR 2008).

Climate change can exacerbate ongoing conflicts over water by increasing demand and decreasing supply (CCCC 2012). According to the State's Third Climate Change Assessment, the most important step toward preparing for climate change is to implement and enforce an accurate monitoring system that records who is diverting water, in what quantities, and when. This would significantly improve decision-making compared to the current water management in which groundwater is essentially unmanaged (CCCC 2012).

Scientific evidence suggests that the drought experience in California beginning in 2011 has been intensified by climate change. In response to the on-going drought experienced in California beginning in 2011, the Governor issued Executive Order B-29-15, which imposes restrictions to achieve a statewide 25 percent reduction in potable urban water usage through February 28, 2016. The water restrictions issued under Executive Order B-29-15 require water suppliers to the state's municipalities to reduce water consumption in comparison to the amount used in 2013. Water suppliers have been directed to develop rate structures and other pricing mechanisms, including but not limited to surcharges, fees, and

penalties, to maximize water conservation consistent with statewide water restrictions. This water reduction goal applies to residential, commercial, industrial, and institutional land uses.

Other components of the Executive Order include implementation of an appliance rebate program to provide monetary incentives for the replacement of inefficient household devices and the provision of funding to allow lawn replacement programs in underserved communities. Also, under Executive Order B-29-15 new construction is prohibited from installing irrigation with potable water that is not delivered by drip or microspray systems.

Loss of Natural Resources

The current distribution, abundance, and vitality of species and habitats are strongly dependent on climatic (and microclimatic) conditions. According to the State's Third Assessment (CCCC 2012), changes in temperature and precipitation patterns associated with climate change would shift California's current climate zones, and thus habitats associated with these zones. Global climate change would alter the composition, structure, and arrangement of the vegetation cover of the state (forest and wildland). Species distribution would move geographically as the climate changes, with forest stands, woodlands, and grassland species predicted to move northward and higher in elevation.

The negative ecological impacts of shifting habitats could be more severe than anticipated if species are unable to overcome physical barriers (such as human settlements) to migrate to areas with suitable climatic conditions (CCCC 2012). One hundred years of historical observations of species behavior suggests that climate is changing conditions so rapidly that some vegetation cannot keep pace (CCCC 2012). In fact, some climates that currently still exist (such as alpine climates) could disappear entirely in the future, while other regional climates (such as desert climates) could expand significantly, resulting in some species losing their habitats and others expanding theirs (CCCC 2012). Furthermore, the entire vegetative community may be affected if nonnative invasive species occupy sites and replace native plants, which is a situation exacerbated by climate change. Outbreaks of nonnative insects and diseases compromise forest health and the capability of the forest stands to reproduce and to store carbon on a landscape basis.

Beginning in 2009, the California Department of Fish and Wildlife and California State Parks made climate change a priority in addressing the complex and large-scale challenges needed for conserving biodiversity and habitat (CNRA 2009). Both of these departments are an important part of the climate change solution and are working collaboratively with stakeholders to create strategies for addressing climate change impacts while responding to public needs. One example strategy is the development of a system of sustainable habitat reserves. The intent of this strategy is to identify and improve a statewide landscape reserve system to protect the maximum number of representative plant and animal species in California.

The State recently released a report entitled *California Climate Adaptation Strategy for Biodiversity and Habitat* that identifies the concept of adaptive management as a key element of implementing effective conservation programs, especially in light of some of the uncertainties associated with climate change (CCCC 2015). Natural communities, ecosystems, species population dynamics, and the effects of stressors on the environment are inherently complex. Wildlife and resource managers often are called upon to implement conservation strategies or actions based on limited scientific information and despite considerable uncertainties. Adaptive management combines data from monitoring species and natural systems with new information from management and targeted studies to continually assess the effectiveness of, and adjust and improve, conservation actions (CCCC 2015).

Adverse Impacts on Agricultural Resources

Agriculture in California generates more than $30 billion per year, the highest crop value in the nation, provides more than 1 million jobs, and serves as an important source of the nation's food supply (CCCC 2012). The sector is already under stress from competing and growing urban and environmental water demands and continuing development on agricultural land (CCCC 2012). Climate change is expected to exacerbate stresses on the agricultural sector. Changes in temperature and water availability—annual and seasonal shifts as well as extremes—affect both crop yield and quality, making the sector highly sensitive to climate change. Indirect impacts will also take a toll, including possible further decreases of pollinators and increases of pests and disease (CCCC 2012).

According to the Third Assessment (2012), recent scientific studies have established that many impacts on perennials (such as peaches, strawberries, and almonds) vary by crop, while nearly all annual crops (such as wheat and sunflowers) are expected to decline under climate change. Many farms, especially in the fruit and nut business, require long-term investments, making fast adaptation difficult, and could thus experience serious losses if decisions continue to be made with no regard to expected climate changes. Agriculture will continue to be an important economic sector but some losses will be incurred and the ultimate impacts will be a function of how effectively farmers adopt adaptation measures (CCCC 2012).

The California Department of Food and Agriculture and the California Department of Conservation are developing strategies to address impacts to state agricultural resources resulting from climate change. Some of these strategies include the support of research and development for more drought-tolerant cultivars, crop rotations, and crop mixtures; increased vigilance and development of a long-term funding strategy at the state's port-of-entry inspection stations to prevent entry of new diseases, pests, and weeds; and the encouragement of crop diversification among farming operations (CNRA 2009).

Other strategies include irrigation technologies that provide a reliable water supply and also reduce emissions of nitrous oxide (a greenhouse gas). Other examples include soil carbon storage, renewable energy, and crop diversification in local farming systems. Overall, adopting adaptation strategies that work for specific locations and crops will increase farmers' capacity to manage changes while addressing the needs of natural resources and social issues such as farm labor and urbanization pressure (CCCC 2012).

Adverse Impact to Public Health

Climate change is expected to lead to an increase in ambient (i.e., outdoor) average air temperature, with greater increases expected in summer. Larger temperature increases are anticipated in inland communities, such as those located in Imperial County, as compared to the California coast. The potential health impacts from sustained and significantly higher than average temperatures include heat stroke, heat exhaustion, and the exacerbation of existing medical conditions such as cardiovascular and respiratory diseases, diabetes, nervous system disorders, emphysema, and epilepsy.

Numerous studies have indicated that there are generally more deaths during periods of sustained higher temperatures. The elderly, infants, and socially isolated people with pre-existing illnesses who lack access to air conditioning or cooling spaces are among the most at risk during heat waves. Public health could also be affected by climate change impacts on air quality, food production, the amount and quality of water supplies, energy pricing and availability, and the spread of infectious diseases (CCCC 2012). These impacts could have potentially long-term repercussions, and the severity of their impacts depends largely on how communities and families can adapt (CCCC 2012).

The Public Health Climate Change Adaptation Work Group, in concert with the Department of Public Health, has identified several priorities for public health adaptation for climate change (CNRA 2009), as many climate adaptation opportunities exist for protecting the public welfare, many of which have already proven effective. Strategic placement of cooling centers, for instance, has been clearly shown to save lives during heat waves. Another of these priorities involves the increase of ground cover and shading by expanding urban forests, community gardens, parks, native vegetation cover, and open spaces in order to reduce urban heat islands, which are prone to develop when high ratios of paving material exist compared with natural ground cover. Another priority involves the improvement of disease reporting, management, and surveillance by replacing the current paper-based system with a secure electronic system. The Centers for Disease Control and Prevention is exploring ways to develop rapid surveillance by coordinating with larger entities such as the Regional Health Information Organizations and Health Information Exchanges (CNRA 2009).

2.7.4.4 Opportunities

As stated, Imperial County contains relatively few major emissions sources, but does experience significant vehicular traffic, particularly near Calexico, given proximity to two international ports of entry into the United States. Other emissions sources consist of food processing, plaster manufacturing, light industrial facilities, vehicular travel on unpaved roads, farming operations, and fugitive windblown dust. Air quality in Imperial County is also affected by air pollutants transported from the higher urbanized South Coast Air Basin to the northwest, the San Diego County Air Basin to the west, Mexico to the south, and Arizona to the east. Similarly, wind blowing in a northeast direction transports pollutants from Mexicali into Calexico.

The ICAPCD is working cooperatively with counterparts from Mexico to implement emissions reductions strategies and projects for air quality improvements at the border. In August 2012, the US and Mexico signed the U.S.-Mexico Environmental Program Border 2020. Border 2020 is a cooperative effort between the EPA, Mexico's SEMARNAT (federal environmental agency and EPA counterpart), the four U.S. border states (Texas, New Mexico, Arizona, and California) and the six Mexican border states (Tamaulipas, Nuevo León, Coahuila, Chihuahua, Sonora, and Baja California), plus 26 U.S. border tribes. The initiative is to improve the environment by focusing on cleaning the air, providing safe drinking water, reducing the risk of exposure to hazardous waste, and ensuring emergency preparedness along the U.S.-Mexico border. The two countries strive to achieve these goals through local input from states, local governments, and citizens.

Within the Mexicali and Imperial Valley area, the Air Quality Task Force (AQTF) has been organized to address those issues unique to the border region known as the Mexicali/Imperial air shed. The AQTF membership includes representatives from federal, state, and local governments from both sides of the border, as well as representatives from academia, environmental organizations, and the general public. This group was created to promote regional efforts to improve the air quality monitoring network, emissions inventories, and air pollution transport modeling development, as well as the creation of programs and strategies to improve air quality. Air quality improvement programs are a valuable resource for the local environmental managers to determine connections between air quality, land use, communications infrastructure, and economic development issues.

Reducing emissions of PM and NOx from idling vehicles at ports of entry is one of the most important air quality challenges facing the Imperial County and Mexicali region. Even with standards taking effect over the next decade for idling vehicles, millions of vehicles will continue to emit large amounts of NOx, PM, and TACs, which contribute to serious public health problems. Therefore, it is important to understand

the impacts and to evaluate the amount of air emissions generated by idling vehicles at the Calexico East and Calexico West Ports of Entry. On behalf of the AQTF, in 2014, the ICAPCD was selected as a grantee to study border idling. The ICAPCD set out to study two essential elements. The first element is to determine the vehicle idling impacts at both ports of entry. The second element, crucial to any air quality improvements, is the identification of emissions reduction strategies that U.S.-Mexican planning agencies could implement at both ports of entry in order to reduce impacts upon the general population. Estimating emissions from idling vehicles and identifying potential control strategies can be helpful in securing organizational support for federal, state, and local governments on both sides of the border.

Overall, this air quality improvement program will (1) estimate PM and NOx emissions from northbound idling vehicles waiting at the two ports of entry and (2) identify emissions reduction strategies (with accompanying PM and NOx reductions) that U.S.-Mexican planning agencies could implement at the two ports of entry. Several tasks need to be accomplished for this program. Each task will take between two and three months, except for production of the final report where additional review time has been incorporated to allow the EPA and other stakeholders adequate opportunity to review and provide comments on the draft final report. It is expected that the final report will be available by late 2015. The final report will contain comparisons of actual accomplishments to the objectives established for the period when the work was done, quantified outputs and outcomes, and the accomplished objectives and any other pertinent information to the analysis.

As previously stated, existing air quality and historical trends and projections in the County are documented by measurements made by the ICAPCD at five air quality monitoring sites located at Calexico, El Centro, Niland, Westmorland, and Brawley. The ICAPCD has recently approved and commenced with upgrades to all its monitoring stations which includes the addition of a hydrogen sulfide (H_2S) monitor, five new continuous PM_{10} samplers that will measure continuously 24 hours per day.

As also stated, as water levels at the Salton Sea have dropped, the shallow perimeter areas of the lakebed are increasingly exposed to the dry, desert winds (IID 2014b). The County has already been working to remedy this problem in a partnered role with the IID as part of the Salton Sea Restoration and Renewable Energy Initiative Program (IID 2014b). The Salton Sea Restoration and Renewable Energy Initiative Program is the planning process for habitat and air quality mitigation around the Salton Sea. Phase I, Early Start, includes restoration projects that are currently in development and a process for implementing instant habitat in the State's Species Conservation Habitat footprint.

Phase II, Development of Habitat and Renewable Energy Complex, will consist of the implementation of planning work completed in Phase I and integrating it on the ground with renewable-energy development, from funding through state or federal grants, private sectors, or others. Phase III, Restoration Plan, will integrate Phase I and Phase II into the Salton Sea Restoration Plan. More specifically, the County and IID have coordinated the instigation of the Red Hill Bay Wetlands Restoration Project, included in Phase I of the Restoration Plan, which contains the goal of covering the playa areas of Red Hill Bay with saline water in some areas and vegetation in other areas, thereby decreasing particulate matter (dust) from becoming airborne during wind events. "Cells" would be constructed in a mosaic to maximize the reduction of dust emissions; the final design would resemble a patchwork, with small expanses of open playa interrupted by habitat cells that provide ecological and recreational benefits while minimizing dust emissions. The effects of this effort will act as a "lessons learned" approach to successfully implementing future restoration actions.