10 AIR QUALITY

10.1 INTRODUCTION

This chapter includes a discussion of existing air quality conditions in the Tahoe Basin, a summary of applicable air quality regulations, and an analysis of potential short-term and long-term air quality impacts that could result from implementation of the Shoreline Plan. The primary issues raised during scoping that pertain to air quality are:

- emissions generated by heavy-duty equipment used for dredging and construction of new facilities,
- the potential long-term increase in emissions associated with increased motorized boating activity,
- accounting for the seasonality of emissions-generating activity, and
- cumulative air quality conditions considering in-basin and out-of-basin projects.

The methods of analysis for short-term construction, long-term regional (operational), local mobile-source, and toxic air emissions used in this chapter are consistent with the recommendations of the California Air Resources Board (CARB) and the U.S. Environmental Protection Agency (EPA).

The threshold related to vehicle miles traveled (VMT) and traffic volumes are addressed further in Chapter 13, "Roadway Transportation and Circulation." The threshold related to nitrate deposition is addressed in Chapter 6, "Hydrology and Water Quality."

10.2 REGULATORY SETTING

10.2.1 Federal

EPA has been charged with implementing national air quality programs. EPA air quality mandates are drawn primarily from the federal Clean Air Act (CAA), which was enacted in 1970. The most recent major amendments to the CAA were made by Congress in 1990.

CRITERIA AIR POLLUTANTS

The CAA required EPA to establish national ambient air quality standards (NAAQS). As shown in Table 10-1, EPA has established NAAQS for the following criteria air pollutants: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), respirable particulate matter with an aerodynamic diameter of 10 micrometers or less (PM_{10}), fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less ($PM_{2.5}$), and lead. The primary standards protect the public health, and the secondary standards protect public welfare. The CAA also required each state to prepare an air quality control plan referred to as a state implementation plan (SIP). The federal Clean Air Act Amendments of 1990 added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA is responsible for reviewing all SIPs to determine whether they conform to the mandates of the CAA and its amendments and whether implementation would achieve air quality goals.

Table 10-1 Ambient Air Quality Standards

Pollutant	Averaging Time	TRPA Thresholds	California [a]	National [b]	
				Primary [c,d]	Secondary [c,e]
Ozone	1-hour	0.08 ppm	0.09 ppm (180 µg/m^3)	– [f]	Same as primary standard
	8-hour	–	0.070 ppm (137 µg/m^3)	0.070 ppm (137 µg/m^3)	
Carbon monoxide (CO)	1-hour	–	20 ppm (23 mg/m^3)	35 ppm (40 mg/m^3)	Same as primary standard
	8-hour	6 ppm	6 ppm [f] (7 mg/m^3)	9 ppm (10 mg/m^3)	
Nitrogen dioxide (NO_2) [f]	Annual arithmetic mean	–	0.030 ppm (57 µg/m^3)	53 ppb (100 µg/m^3)	Same as primary standard
	1-hour	–	0.18 ppm (339 µg/m^3)	100 ppb (188 µg/m^3)	–
Sulfur dioxide (SO_2)	Annual arithmetic mean	–	–	–	–
	24-hour	–	0.04 ppm (105 µg/m^3)		
	3-hour	–	–	–	0.5 ppm (1300 µg/m^3)
	1-hour	–	0.25 ppm (655 µg/m^3)	75 ppb (196 µg/m^3)	–
Respirable particulate matter (PM_{10})	Annual arithmetic mean	20 µg/m^3 in CA, 50 µg/m^3 in NV	20 µg/m^3	–	Same as primary standard
	24-hour	50 µg/m^3 in CA, 150 µg/m^3 in NV	50 µg/m^3	150 µg/m^3	
Fine particulate matter ($PM_{2.5}$)	Annual arithmetic mean	–	12 µg/m^3	12.0 µg/m^3	15 µg/m^3
	24-hour	35 µg/m^3	–	35 µg/m^3	Same as primary standard
Lead [g]	Calendar quarter	–	–	1.5 µg/m^3	Same as primary standard
	30-day average	–	1.5 µg/m^3	–	–
	Rolling 3-month average	–	–	0.15 µg/m^3	Same as primary standard

Table 10-1 Ambient Air Quality Standards

Pollutant	Averaging Time	TRPA Thresholds	California [a]	National [b]	
				Primary [c,d]	Secondary [c,e]
Hydrogen sulfide	1-hour	–	0.03 ppm (42 µg/m^3)	No national standards	
Sulfates	24-hour	–	25 µg/m^3		
Vinyl chloride [g]	24-hour	–	0.01 ppm (26 µg/m^3)		
Visibility-reducing particulate matter	8-hour	*Regional:* Extinction coefficient of 25 Mm^{-1} (157 km, 97 miles) 50 percent of the year, 34 Mm^{-1} (115 km, 71 miles) 90 percent of the year. *Subregional:* 50 Mm^{-1} (48 miles) 50 percent of the year, 125 Mm^{-1} (19 miles) 90 percent of the year.			

Notes: µg/m^3 = micrograms per cubic meter; km = kilometers; ppb = parts per billion; ppm = parts per million; TRPA = Tahoe Regional Planning Agency; Mm^{-1} = inverse mega meters; CA = California; NV = Nevada.

[a] California standards for ozone, SO_2 (1- and 24-hour), NO_2, particulate matter, and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded. California ambient air quality standards are listed in the Table of Standards in Section 70200 of Title 17 of the California Code of Regulations.

[b] National standards (other than ozone, particulate matter, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when 99 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The $PM_{2.5}$ 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. Contact the U.S. Environmental Protection Agency for further clarification and current federal policies.

[c] Concentration expressed first in units in which it was issued. Equivalent units given in parentheses are based on a reference temperature of 25 degrees Celsius (°C) and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25°C and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

[d] National primary standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

[e] National secondary standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

[f] Applicable in the Lake Tahoe Air Basin.

[g] The California Air Resources Board has identified lead and vinyl chloride as toxic air contaminants with no threshold of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants.

Sources: CARB 2016a, TRPA 2016:3-2 to 3-4

EMISSION STANDARDS FOR RECREATIONAL WATERCRAFT

EPA has separate emission requirements for watercraft with spark-ignition engines and compression-ignition engines. Most, if not all, recreational watercraft used on Lake Tahoe have spark-ignition engines powered by gasoline rather than compression-ignition engines powered by diesel fuel. Table 10-2 summarizes the exhaust emission standards promulgated by EPA for marine spark-ignition engines.

Table 10-2 EPA Exhaust Emission Standards for Marine Spark-Ignition Engines

Engine Type [a]	Model Year	HC + NO_X (g/kW-hr)		CO (g/kW-hr)	
		P ≤ 4.3 kW [b]	P > 4.3 kW [b]	P ≤ 4.3 kW [b]	P > 4.3 kW [b]
Personal watercraft and outboard marine engines	1998	278	(0.917 x (151 + 557/($P^{0.9}$)) + 2.44	—	—
	1999	253	(0.833 x (151 + 557/($P^{0.9}$)) + 2.89	—	—
	2000	228	(0.750 x (151 + 557/($P^{0.9}$)) + 3.33	—	—
	2001	204	(0.667 x (151 + 557/($P^{0.9}$)) + 3.78	—	—
	2002	179	(0.583 x (151 + 557/($P^{0.9}$)) + 4.22	—	—
	2003	155	(0.500 x (151 + 557/($P^{0.9}$)) + 4.67	—	—
	2004	130	(0.417 x (151 + 557/($P^{0.9}$)) + 5.11	—	—
	2005	105	(0.333 x (151 + 557/($P^{0.9}$)) + 5.56	—	—
	2006–2009	81	(0.250 x (151 + 557/($P^{0.9}$)) + 6.00	—	—
	2010 and newer	30.0	2.1 + 0.09 x (151 + 557/$P^{0.9}$)	500 - 5.0 x P	300
Conventional sterndrive/inboard engines	2010 and newer	5.0		75.0	

Notes: HC + NO_X = hydrocarbons plus oxides of nitrogen; CO = carbon monoxide; kW = kilowatts; g/kW-hr = grams per kilowatt-hour.

[a] Separate federal emission standards are established for marine vessels with high-performance engines.

[b] P stands for the maximum engine power in kilowatts.

Sources: 40 CFR 91.104, Outboard and personal watercraft exhaust emission standards (1998–2009); and 40 CFR 1045.103, Outboard and personal watercraft exhaust emission standards (2010+)

To better understand the degree to which these emission standards became more stringent for later model year engines, Table 10-3 shows how the EPA standards apply to engines with power ratings of 50 horsepower (hp), 100 hp, and 200 hp (equivalent to 37 kilowatts [kW], 75 kW, and 149 kW, respectively) and operating at 40 percent load. Table 10-3 also shows the outcome of watercraft subject to CARB's emission standards, which are discussed in more detail below.

Table 10-3 Emission Rates Pursuant to EPA and CARB Exhaust Emission Standards for Spark-Ignition Personal Watercraft and Outdoor Marine Engines of 50, 100, and 200 Horsepower

Model Year	HC + NO_X (lb/hr)					
	50-hp Engine		100-hp Engine		200-hp Engine	
1998	5.2	—[1]	10.0	—[1]	19.3	—[1]
1999	4.8	—[1]	9.1	—[1]	17.6	—[1]
2000	4.3	—[1]	8.3	—[1]	15.9	—[1]
2001	3.9	1.6	7.4	3.1	14.3	6.0
2002	3.4	1.6	6.5	3.1	12.6	6.0
2003	3.0	1.6	5.7	3.1	10.9	6.0
2004	2.5	1.3	4.8	2.5	9.3	4.8
2005	2.1	1.3	3.9	2.5	7.6	4.8

Table 10-3 Emission Rates Pursuant to EPA and CARB Exhaust Emission Standards for Spark-Ignition Personal Watercraft and Outdoor Marine Engines of 50, 100, and 200 Horsepower

Model Year	HC + NO_X (lb/hr)					
	50-hp Engine		100-hp Engine		200-hp Engine	
2006	1.6	1.3	3.1	2.5	6.0	4.8
2007	1.6	1.3	3.1	2.5	6.0	4.8
2008	1.6	0.6	3.1	1.1	6.0	2.1
2009	1.6	0.6	3.1	1.1	6.0	2.1
2010 and newer	0.6	0.6	1.1	1.1	2.1	2.1
Factor of increased level of stringency from 1998 model year to 2010 model year	9.1	9.1	9.1	9.1	9.0	9.0

Notes: HC = total hydrocarbons; NO_X = oxides of nitrogen; lb/hr = pounds per hour.

[1] Model years 1998-2000 registered in California were subject only to EPA emission standards because CARB did not establish more stringent emission standards for those model years.

Source: Calculated by Ascent Environmental using the equations for federal emission standards listed in Tables 10-2 and 10-3 and a load factor of 40 percent. See Appendix C for detailed calculations.

As shown in Table 10-3, emission standards for engines model year 2010 and newer are approximately nine times more stringent (or 89 percent less polluting) than 1998 model year engines. This means that the fleet of recreational watercraft will become cleaner as older engines are replaced by newer engines.

EPA also established standards for evaporative loss emissions from marine spark-ignition watercraft. These include an evaporative loss emissions standard for fuel lines of 15 grams per square meter per day (g/m^2/day) starting with model year 2009, an evaporative loss emission standard for fuel tank permeation of 1.5 g/m^2/day staring with model year 2011, and a diurnal evaporative loss emission standard for fuel tanks of 0.40 gram per gallon per day (40 CFR 1045.112). Thus, it is anticipated that the level of evaporative loss emission from recreational watercraft will decrease as engines newer than model year 2009 replace older engines.

HAZARDOUS AIR POLLUTANTS AND TOXIC AIR CONTAMINANTS

Toxic air contaminants (TACs), or in federal parlance, hazardous air pollutants (HAPs), are a defined set of airborne pollutants that may pose a present or potential hazard to human health. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity may pose a threat to public health even at low concentrations.

A wide range of sources, from industrial plants to motor vehicles, emit TACs. 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 affects, such as eye watering, respiratory irritation (a cough), runny nose, throat pain, and headaches.

For evaluation purposes, TACs are separated into carcinogens and noncarcinogens based on the nature of the physiological effects associated with exposure to the pollutant. Carcinogens are assumed to have no safe threshold below which health impacts would not occur. This contrasts with criteria air pollutants, for which acceptable levels of exposure can be determined and for which the ambient standards have been established (Table 10-1). Cancer risk from TACs is expressed as excess cancer cases per 1 million exposed individuals, typically over a lifetime of exposure.

EPA regulates HAPs through its National Emission Standards for Hazardous Air Pollutants. The standards for a source category require the maximum degree of emission reduction that the EPA determines to be achievable, which is known as the Maximum Achievable Control Technology standards. These standards are authorized by Section 112 of the CAA, and the regulations are published in 40 CFR Parts 61 and 63.

10.2.2 Tahoe Regional Planning Agency

THRESHOLDS

TRPA has adopted environmental threshold carrying capacities (environmental thresholds) related to air quality and other resources for the Tahoe Region. Every 4 years, TRPA evaluates the environmental thresholds to determine whether each threshold standard is being achieved and/or maintained, makes specific recommendations to address problem areas, and directs general planning efforts for the next 4-year period.

TRPA threshold standards address CO, ozone, regional and subregional visibility, respirable (PM_{10}) and fine ($PM_{2.5}$) particulate matter, and nitrate deposition. Numerical standards have been established for each of these parameters, and management standards have been developed that are intended to assist in attaining the threshold standards. Environmental thresholds for air quality are listed below.

Carbon Monoxide

- **Numerical Standard:** Maintain CO concentrations at or below 9 parts per million (ppm) averaged over 8 hours.

- **Management Standard:** Reduce average daily traffic volume between 4:00 p.m. and midnight in the U.S. 50 corridor by 7 percent from the 1981 base year during the months of November through February.

Ozone

- **Numerical Standards:**
  - Maintain ozone concentration below 0.08 ppm averaged over 1 hour.
  - Maintain NO_X emissions at or below the 1981 level.

Regional Visibility and Subregional Visibility

- **Numerical Standards:**
  - Achieve an extinction coefficient of 25 inverse mega meters (Mm^{-1}) at least 50 percent of the time as calculated from aerosol species concentrations measured at the Bliss State Park monitoring site (visual range of 97 miles). Calculations will be made during 3-year running periods using the existing monitoring data as the performance standards to be met or exceeded 156 kilometers (97 miles) at least 50 percent of the year as measured by aerosol concentrations measured at the Bliss State Park monitoring site.

  - Achieve an extinction coefficient of 34 Mm^{-1} at least 90 percent of the time as calculated from aerosol species concentrations measured at the Bliss State Park monitoring site (visual range of 71 miles).

  - Achieve an extinction coefficient of 34 Mm^{-1} at least 50 percent of the time as calculated from aerosol species concentrations measured at the South Lake Tahoe monitoring site (visual range of 48 miles).

  - Achieve an extinction coefficient of 125 Mm^{-1} at least 90 percent of the time as calculated from aerosol species concentrations measured at the South Lake Tahoe monitoring site (visual range of 19 miles).

Subregional Visibility

- Numerical Standards:
  - Achieve 78 kilometers (48 miles) at least 50 percent of the year as measured by particulate concentrations measured at the South Lake Tahoe monitoring site.
  - Achieve 31 kilometers (19 miles) at least 90 percent of the year as measured by particulate concentrations measured at the South Lake Tahoe monitoring site.
- Management Standards:
  - Reduce suspended soil particles by 30 percent of the 1981 base values through technology, management practices, and educational programs.
  - Reduce wood smoke emissions by 15 percent of the 1981 base values through technology, management practices, and educational programs.
  - Reduce vehicle miles of travel by 10 percent of the 1981 base values.

Respirable and Fine Particulate Matter

- Numerical Standards:
  - Maintain PM_{10} at or below 50 micrograms per cubic meter ($\mu g/m^3$) measured over a 24-hour period in the portion of the Tahoe Region within California, and maintain PM_{10} at or below 150 $\mu g/m^3$ measured over a 24-hour period in the portion of the region within Nevada.
  - Maintain PM_{10} at or below annual arithmetic average of 20 $\mu g/m^3$ in the portion of the Tahoe Region within California, and maintain PM_{10} at or below annual arithmetic average of 50 $\mu g/m^3$ in the portion of the region within Nevada.
  - Maintain $PM_{2.5}$ at or below 35 $\mu g/m^3$ measured over a 24-hour period using gravimetric or beta attenuation methods or any equivalent procedure that can be shown to provide equivalent results at or near the level of air quality standard.
  - Maintain $PM_{2.5}$ at or below annual arithmetic average of 12 $\mu g/m^3$ in the portion of the Tahoe Region within California, and maintain $PM_{2.5}$ at or below annual arithmetic average of 15 $\mu g/m^3$ in the portion of the region within Nevada.

Nitrate Deposition

- **Vehicle Miles Traveled:** Reduce VMT in the [Tahoe region] by 10% of the 1981 base year values.
- **Management Standards:** Reduce the transport of nitrates into the [Tahoe region], and reduce NO_X produced in the [Tahoe region] consistent with the water quality thresholds.

Attainment status and trends of each air quality indicator are summarized in Chapter 3 of the 2015 Threshold Evaluation Report (TRPA 2016).

In addition, the TRPA compact between California and Nevada states that the Regional Plan shall provide for attaining and maintaining federal, state, or local air quality standards, whichever are strictest, in the respective portions of the Tahoe Region for which the standards are applicable.

LAKE TAHOE REGIONAL PLAN

Goals and Policies

The goals and policies are designed to achieve and maintain adopted environmental thresholds and are implemented through the TRPA Code of Ordinances (TRPA Code), the Environmental Improvement Program, and the Transportation Improvement Plan (with the Tahoe Metropolitan Planning Organization). The Land

Use Element of the goals and policies document consists of seven subelements, including the air quality subelement. The air quality subelement includes the following two goals:

GOAL AQ-1: Attain and maintain air quality in the region at levels that are healthy for humans and the ecosystem, achieve and maintain environmental thresholds and do not interfere with residents' and visitors' visual experience.

GOAL AQ-2: Maintain an effective air quality mitigation program for the region.

Code of Ordinances

Applicable provisions of Chapter 33, "Grading and Construction," and Chapter 65, "Air Quality and Transportation," of the TRPA Code are described below.

Chapter 33.3.1—Grading and Construction

Chapter 33 includes requirements about grading and construction activity, which include limiting grading and earth disturbance activity to the portion of the calendar year between May 1 and October 15 unless approval is granted by TRPA and TRPA-approved dust control measures are implemented.

Chapter 65.1—Air Quality Control

The provisions of Chapter 65.1 apply to direct sources of air pollution in the Tahoe Region, including certain on-road motor vehicles registered in the region, combustion heaters installed in the region, open burning and stationary sources of air pollution, and idling combustion engines. The following provisions are potentially applicable to the proposed project and alternatives:

- Section 65.1.3, "Vehicle Inspection and Maintenance Program," states that to avoid duplication of effort in implementation of an inspection/maintenance program for certain vehicles registered in the CO nonattainment area, TRPA shall work with the affected state agencies to plan for applying state inspection/maintenance programs to the Tahoe Region.

- Section 65.1.8, "Idling Restrictions," states that no person shall cause a combustion engine in a parked auto, truck, bus, or boat to idle for more than 30 consecutive minutes in the designated plan areas (with limited exemptions). It also states that no person shall cause a diesel engine in a vehicle exceeding 10,000 pounds gross vehicle weight or a diesel engine in off-road self-propelled equipment exceeding 25 horsepower to idle more than 15 minutes within the portions of the region in Nevada, or to idle longer than 5 minutes within the portions of the region in California.

Chapter 60.1—Water Quality Control

Chapter 60 includes the following requirements related to the attainment and maintenance of water quality standards:

- Section 60.1.3.E, "Prohibition of Certain Watercraft, "prohibits the launching, mooring, or operation of all two-stroke engine–powered watercraft within the Tahoe Region is prohibited, except as follows:

    1. Any two-stroke engine–powered watercraft whose fuel is directly injected into the cylinder shall be exempt from the prohibition.

    2. Any two-stroke engine–powered watercraft whose fuel is directly injected into the crankcase prior to entering the cylinder and the fuel injection engine and that was purchased before January 27, 1999, shall be prohibited commencing October 1, 2001.

    3. Any watercraft powered by a two-stroke engine whose engine is certified as meeting the EPA 2006 standard or the CARB 2001 standard shall be exempt from the prohibition.

    4. Sailboats utilizing two-stroke engines as auxiliary power shall be prohibited commencing October 1, 2001.

5. Any watercraft powered by a two-stroke engine rated at 10 horsepower or less shall be prohibited commencing October 1, 1999.

6. Any watercraft powered by an engine that has been certified as meeting EPA's 2001–2005 emission standard shall be prohibited commencing October 1, 2001.

TRPA Standard Conditions of Approval for Shorezone Projects

TRPA is committed to continue to monitor and adaptively manage construction emissions through existing permit compliance programs. Pregrade inspections occur for every permitted project prior to any ground-disturbing activities. These inspections verify that all required permit conditions, such as the location of staging areas and the use of approved power sources, are in place prior to intensive construction activities. In addition, compliance inspections occur throughout the period of construction activity to verify compliance with all permit requirements. These compliance inspections are a core function of TRPA and local jurisdiction building departments. If an inspection determines that a project is not in compliance with permit conditions, then enforcement actions are taken, which can include stopping activity at the construction site and monetary fines.

In addition to existing permit limits, TRPA's Standard Conditions of Approval for Shorezone Projects (TRPA Permit Attachment S) include the following air quality–related measures:

- All existing disturbed areas and areas disturbed as a result of construction activity authorized by the permit, or otherwise occurring on the subject project during the time period when the permit is valid, shall be revegetated using only those species contained on TRPA's list of acceptable species. All required vegetation shall be completed by completion of the project.

- All material obtained from excavation work shall be contained within the foundations, retaining walls, or by a similar means approved by TRPA, or the excavated material shall be disposed of at a site approved by TRPA.

- Soil and construction materials shall not be tracked off-site. Grading operations shall cease in the event a danger of violating this condition exists. The site shall be cleaned and the road right-of-way shall be swept clean when necessary.

- The length of open trenches (excluding foundations) shall not exceed 50 feet at the end of each working day, unless approved by TRPA.

- Loose soil mounds or surfaces shall be protected from wind and water erosions by being appropriately covered or contained when active construction is not occurring.

- Replanting of all exposed surfaces, as shown on the revegetation and slope stabilization plans, shall be completed within 1 year following the commencement of construction, unless the approved construction schedule establishes otherwise.

- At all times during construction, environmental protection and erosion control devices shall be maintained in a functioning state. Such devices include, but are not limited to, sediment barriers, dust control devices, and vegetative protection.

Air Quality Monitoring

The overall effectiveness of efforts to attain and maintain air quality standards will continue to be monitored through a comprehensive multiagency air quality program. The existing air quality monitoring program is being expanded to ensure adequate data continues to be available to assess the status and trends of a variety of constituents. If ongoing monitoring determines that efforts to achieve adopted air quality standards have not been successful, then TRPA will develop and implement additional compliance measures as required by Chapter 16 of the TRPA Code. Additional compliance measures could include additional required construction best practices, an expanded rebate program to replace nonconforming

woodstoves or other emission-producing appliances, or restrictions on other emission sources such as off-highway vehicles or boats.

10.2.3 California

CARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). California law authorizes CARB to set ambient (outdoor) air pollution standards (California Health and Safety Code Section 39606) in consideration of public health, safety, and welfare (i.e., the California Ambient Air Quality Standards [CAAQS] shown in Table 10-1).

CRITERIA AIR POLLUTANTS

CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. In most cases, the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest date practical. The CCAA specifies that local air districts should focus attention on reducing the emissions from transportation and areawide emission sources and provides air districts with the authority to regulate indirect sources. (Placer County Air Pollution Control District has jurisdiction in Placer County, California, and El Dorado County Air Quality Management District has jurisdiction in El Dorado County, California.)

Among CARB's other responsibilities are overseeing local air district compliance with federal and state laws; approving local air quality plans; submitting SIPs to EPA; monitoring air quality; determining and updating area designations and maps; and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

TOXIC AIR CONTAMINANTS

TACs in California are regulated primarily through the Tanner Air Toxics Act (Assembly Bill [AB] 1807, Chapter 1047, Statutes of 1983) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588, Chapter 1252, Statutes of 1987). AB 1807 sets forth a formal procedure for CARB to designate substances as TACs. Research, public participation, and scientific peer review are required before CARB can designate a substance as a TAC. To date, CARB has identified more than 21 TACs, including diesel particulate matter (diesel PM), and adopted EPA's list of HAPs as TACs.

EMISSION STANDARDS FOR RECREATIONAL WATERCRAFT

The exhaust emission standards established by CARB for marine spark-ignition engines are summarized in Table 10-4.

Table 10-3 shows how CARB's standards apply to engines with power ratings of 50 hp, 100 hp, and 200 hp (equivalent to 37 kW, 75 kW, and 149 kW, respectively) and operating at 40 percent load. Table 10-3 also shows the outcome of watercraft subject to EPA's emission standards, which are discussed in more detail above.

CARB's emission standards become more stringent sooner than EPA's emission standards. For instance, the emission standards CARB requires for 2001 model year engines (shown in Table 10-4) is the same as the federal requirement for 2006 model year engines (shown in Table 10-4).

Table 10-4 CARB Exhaust Emission Standards Marine Spark-Ignition Engines

Engine Type [a]	Model Year	HC + NO_x [a] (g/KW-hr)		CO (g/KW-hr)	
		P ≤ 4.3 kW [b]	P > 4.3 kW [b]	P ≤ 40 kW [b]	P > 40 kW [b]
Personal watercraft and outboard marine engines	2001–2003	81.00	(0.25 x (151 + 557/($P^{0.9}$)) + 6.0	–	–
	2004–2007	64.80	(0.20 x (151 + 557/($P^{0.9}$)) + 4.8	–	–
	2008 and newer	30.00	(0.09 x (151 + 557/($P^{0.9}$)) + 2.1	–	–
	2009 and newer	–	–	500 - 5.0 x P	300
Conventional sterndrive/inboard engines	Model Year	P ≤ 373 kW		P ≤ 373 kW	
	2003–2006	16.0		–	
	2007	14.0		–	
	2008	5.0		–	
	2009 and newer	5.0		75.0	

Notes: HC + NO_x = hydrocarbons plus oxides of nitrogen; CO = carbon monoxide; kW = kilowatts; g/kW-hr = grams per kilowatt-hour.

[a] Separate emission standards are established for marine vessels with high-performance engines.

[b] P stands for the maximum engine power in kilowatts.

Source: 13 CCR 2442, Emission Standards

CARB also established emission standards for conventional sterndrive/inboard engines starting with model year 2003, whereas EPA standards start with model year 2010. In 2015, CARB also established more stringent standards for evaporative emissions from spark-ignition watercraft of model years 2018–2020 and later (CFR, Title 13, Section 2442).

ADVANCED CLEAN CARS PROGRAM

In January 2012, CARB approved the Advanced Clean Cars program which combines the control of greenhouse gas (GHG) emissions and criteria air pollutants, as well as requirements for greater numbers of zero-emission vehicles, into a single package of regulatory standards for vehicle model years 2017–2025. The new regulations strengthen the GHG standard for 2017 models and beyond. This will be achieved through existing technologies, the use of stronger and lighter materials, and more efficient drivetrains and engines. The program's zero-emission vehicle regulation requires battery, fuel cell, and/or plug-in hybrid electric vehicles to account for up to 15 percent of California's new vehicle sales by 2025. The program also includes a clean fuels outlet regulation designed to support the commercialization of zero-emission hydrogen fuel cell vehicles planned by vehicle manufacturers by 2015 by requiring increased numbers of hydrogen fueling stations throughout the state. The number of stations will grow as vehicle manufacturers sell more fuel cell vehicles. By 2025, when the rules will be fully implemented, the statewide fleet of new cars and light trucks will emit 34 percent fewer GHGs and 75 percent fewer smog-forming emissions than the statewide fleet in 2016 (CARB 2016b).

10.2.4 Nevada

Nevada has not established emission standards for recreational watercraft or on-road vehicles that are more stringent than the emission standards established by EPA.

10.3 AFFECTED ENVIRONMENT

Ambient concentrations of air pollutants are determined by the amount of pollutants emitted in an area, and the atmosphere's ability to transport and dilute those emissions. Natural factors influence transportation and dilution including terrain, wind, atmospheric stability, and sunlight. The Lake Tahoe Air Basin (LTAB) is a geographic unit demarcated by similar regional meteorological and geographic conditions. The LTAB comprises portions of El Dorado and Placer Counties on the California side and Washoe County, Douglas County, and the Carson City Rural District on the Nevada side, which together also compose the study area for air quality impacts from the Shoreline Plan. The air quality standards listed above generally apply to the basin as a unit.

10.3.1 Climate, Meteorology, and Topography

Lake Tahoe and the surrounding region lie in a depression between the crests of the Sierra Nevada and Carson Range at a surface elevation of 6,260 feet above sea level. The mountains surrounding Lake Tahoe are approximately 8,000–9,000 feet high, with some reaching beyond 10,000 feet. This geographic boundary delineates the LTAB. According to documents from the Tahoe Integrated Information Management System, the "bowl" shape of the LTAB has significant air quality implications. There are two meteorological regimes that affect air quality in the LTAB.

First, thermal inversions occur when a warm layer of air traps a cold layer of air at the surface of the land and lake. Locally generated air pollutants are often trapped in the "bowl" by frequent inversions that limit the amount of air mixing, which allows pollutants to accumulate. Inversions most frequently occur during the winter in the LTAB but are common throughout the year. Often, wintertime inversions result in a layer of wood smoke, mostly from residential heating, which can be seen over Lake Tahoe.

The second meteorological regime affecting air quality in the LTAB is the atmospheric transportation of pollutants from the Sacramento Valley and San Francisco Bay Area. Lake Tahoe's location directly to the east of the crest of the Sierra Nevada allows prevailing easterly winds, combined with local mountain upslope winds, to bring air from populated regions west of the Sierra to the LTAB. The strength of this pattern depends on the amount of heat, usually highest in summer beginning in April and ending in late October.

10.3.2 Existing Air Quality

CRITERIA AIR POLLUTANTS

Concentrations of criteria air pollutants are used to indicate ambient air quality. CARB, the Placer County Air Pollution Control District (PCAPCD), and the El Dorado County Air Quality Management District (EDCAQMD) operate a regional monitoring network that measures the ambient concentrations of the six criteria air pollutants within the LTAB. These monitoring stations measure maximum daily concentrations and the number of days during which CAAQS or NAAQS for a given pollutant were exceeded. The measurements are available on CARB's website.

Both EPA and CARB use ambient air quality monitoring data to designate the attainment status of an area relative to the NAAQS and CAAQS for each criteria air pollutant. The purpose of these designations is to identify those areas with air quality problems and thereby initiate planning efforts for improvement.

EPA has designated the LTAB in attainment of the NAAQS for all the criteria air pollutants (EPA 2018a, 2018b). However, EPA designated the California portion of the LTAB as a maintenance area with respect to the NAAQS for CO. The applicable federal air quality maintenance plan for the LTAB is California's SIP for

Carbon Monoxide (CO Maintenance Plan), originally adopted in 1996 and revised in 2004 (CARB 2004). Part of the maintenance strategy involves allocation of transportation emissions budgets to the maintenance areas, which are tracked by the Tahoe Metropolitan Planning Organization.

The Tahoe Basin is designated as nonattainment with respect to TRPA's 8-hour average ozone threshold standard and TRPA's 24-hour average PM_{10} threshold standard (TRPA 2016:3-8 and 3-9).

CARB has designated the LTAB as nonattainment with respect to the CAAQS for ozone and PM_{10} and as attainment or "unclassified" with respect to the CAAQS for all other criteria air pollutants (CARB 2017a). "Unclassified" is used in an area that cannot be classified based on available information as meeting or not meeting the standards.

Existing Emissions from Recreational Boating Activity

Table 10-5 shows the mass of emissions of criteria air pollutants and precursors generated by recreational boating activity in the LTAB in 2017 and 2035. These values are part of the statewide emissions inventory and projections developed for California by CARB and include only emissions generated by recreational boats registered in California and active in the LTAB.

Table 10-5 Emissions Inventory and Projections for Recreational Boats in the Lake Tahoe Air Basin

Calendar Year	Peak Summer Day (lb./day)[1]				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
2017	322	1,376	5,536	90	68
2035	240	542	4,872	38	28

Notes: lb/day = pounds per day; NO_X = oxides of nitrogen; ROG = reactive organic gases; CO = carbon monoxide; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less.

[1] These values are part of the statewide emissions inventory and projections developed for California by CARB and include only emissions generated by boats registered in California and active in the Lake Tahoe Air Basin.

Source: CARB 2017b

Staff at CARB have indicated that the level of boat ownership on the California side of the LTAB is expected to increase from 2017 to 2035 and that the increase is based on projected population growth in California and trends in recreational boat sales; nonetheless, the level of boat-generated emissions is expected to decrease as newer, cleaner boats replace older boats over time (Chou, pers. comm., 2018).

The State of Nevada has not developed an emissions inventory for recreational watercraft registered in Nevada and operated in the LTAB. However, it is anticipated that emissions from Nevada-registered watercraft in the LTAB will also decrease from existing conditions to 2035 because recreational watercraft sold in Nevada are subject to increasingly stringent federal emission standards (summarized in Table 10-2). Also, the rate at which activity by Nevada-registered watercraft in the LTAB would increase is assumed to be similar to that of California-registered watercraft. Moreover, there is an approximate 5-year lag in the timing of when federal emission standards become more stringent compared to CARB's emission standards. This means even more emissions reduction will be realized as the fleet of Nevada-registered watercraft turns over between existing conditions and the planning horizon year of the Shoreline Plan. Therefore, the downward trend for boat emissions shown in Table 10-5 is representative of a downward projection in emissions for all boats operating in the LTAB.

TOXIC AIR CONTAMINANTS

Existing sources of TACs in the LTAB include diesel-fueled vehicles traveling on major roadways such as U.S. 50 and SR 89. Other sources of TACs include seasonal operation of diesel-powered snow management equipment, such as plows and snow makers, during the winter season.

Most, if not all, recreational watercraft used on Lake Tahoe are powered by gasoline. Notable TACs contained in the exhaust of gasoline-powered engines include acetaldehyde, acrolein, benzene, 1,3-butadiene, ethylbenzene, formaldehyde, hexane, methanol, methyl ethyl ketone, naphthalene, propylene, styrene, toluene, and xylene (BAAQMD 2012:87). TAC emissions from recreational watercraft on Lake Tahoe are not a major concern because, due to the nature of boating activity, they are mostly a function of fuel consumption and boating activity occurs throughout the lake rather than in a few concentrated locations.

Naturally occurring asbestos is also recognized by CARB as a TAC. Asbestos is the common name for a group of naturally occurring fibrous silicate minerals that can separate into thin but strong and durable fibers. According to two reports by the California Department of Conservation Division of Mines and Geology—*Relative Likelihood for the Presence of Naturally Occurring Asbestos in Placer County, California* and *A General Location Guide to Ultramafic Rocks in California—Areas More Likely to Contain Naturally Occurring Asbestos* (Van Gosen and Clinkenbeard 2011; Higgins and Clinkenbeard 2006:54; Churchill and Hill 2000), the Tahoe Basin is not likely to contain naturally occurring asbestos.

10.3.3 Sensitive Receptors

Sensitive receptors are people, or facilities that generally house people (e.g., schools, hospitals, residences), that may experience adverse effects from unhealthful concentrations of air pollutants. Sensitive land uses are land uses that accommodate sensitive receptors, and exposure to pollutants could result in health-related risks to individuals. Existing sensitive land uses that accommodate sensitive receptors throughout the Tahoe Region include residences, schools, hospitals, daycare centers, parks, and playgrounds.

10.4 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

10.4.1 Methods and Assumptions

Operational emissions of criteria air pollutants and precursors (reactive organic gases [ROG], NO_X, PM_{10}, and $PM_{2.5}$) associated with implementation of the Shoreline Plan alternatives were calculated using CARB's existing and projected emissions inventory, the projected increase in boating activity on Lake Tahoe (as presented in Chapter 2, "Description of Proposed Project and Alternatives"), and the associated increase in on-road motor vehicle travel (as presented in Chapter 13, "Roadway Transportation and Circulation"). See Appendix C for all emission calculations, including output from the EMFAC2014 model used to estimate on-road mobile-source emissions. The analysis of operational emissions focuses on whether implementation of any of the Shoreline Plan alternatives would result in a substantial increase in emissions of criteria air pollutants and precursors in the LTAB. It is assumed that all the increases in boating activity associated with implementation of any of the Shoreline Plan alternatives would be in addition to the growth in boat ownership and boating activity incorporated into CARB's emissions projections for 2035, as shown in Table 10-4.

Although CARB's emissions inventory for recreational boating activity in the LTAB accounts for emissions only from boats registered in California, this analysis considers the projected decline in boat emissions, as shown in Table 10-5, to also be representative of the trend for emissions generated by Nevada-registered boats in the LTAB. This assumption is based on the fact that boats sold in California have been subject to CARB's increasingly stringent emission standards (see Table 10-4) and boats sold in Nevada have been

subject to federal emission standards that have also become increasingly stringent by model year. In other words, CARB's projected trend for boat emissions generated by California-registered boats in the LTAB serves as a proxy for Nevada-registered boats in the LTAB.

It is not meaningful to speculate on the specific type, number, location, timing, or construction details of future projects that would be implemented over the planning horizon of the Shoreline Plan, so short-term construction-generated emissions of criteria air pollutants and ozone precursors (NO_X and ROG) (which would be assessed at the project level during environmental review of specific development proposals) are assessed qualitatively.

Construction- and operation-related emissions of TACs were evaluated qualitatively based on the magnitude and duration of TAC-emitting activity and the proximity to nearby sensitive receptors. Odor impacts were also assessed qualitatively.

10.4.2 Significance Criteria

Significance criteria relevant to air quality are summarized below. The applicable TRPA threshold standards, the air quality criteria from the TRPA Initial Environmental Checklist, and other relevant information were considered in the development of the significance criteria. An impact would be considered significant if it would:

- cause a substantial increase in pollutant emissions or a deterioration of ambient air quality;
- violate any air quality standard, including the NAAQS, CAAQS, and TRPA's numeric thresholds (as listed in Table 10-1) or contribute substantially to an existing or projected exceedance of these standards;
- result in a cumulatively considerable net increase of any criteria pollutant for which the LTAB is nonattainment with respect to the applicable NAAQS, CAAQS, or TRPA numeric threshold standard;
- conflict with applicable local, state, or regional air quality plans;
- expose sensitive receptors to substantial pollutant concentrations (including TACs/HAPs); or
- create substantial, objectionable odors.

10.4.3 Environmental Effects of the Project Alternatives

Impact 10-1: Long-term operational emissions of regional criteria air pollutants and precursors

Based on estimates of increased boating activity and emissions modeling and analysis, implementation of the Shoreline Plan under Alternatives 1, 3, and 4 would not result in the long-term increase in emissions of ozone precursors, CO, PM_{10}, and $PM_{2.5}$ in the LTAB and therefore would not result in the deterioration of ambient air quality or the exceedance of an applicable air quality standards. Long-term operational emissions also would not contribute to the nonattainment designation with respect to the CAAQS and TRPA numeric threshold standards for ozone and PM_{10} or inhibit implementation of the CO Maintenance Plan. This impact would be **less than significant** for Alternatives 1, 3, and 4.

Based on estimates of increased boating activity and emissions modeling and analysis, Shoreline Plan Alternative 2 would result in a long-term increase in emissions of NO_X and CO. The long-term increase in NO_X, which is an ozone precursor, would contribute to the nonattainment status of the LTAB with respect to the CAAQS for ozone and/or an exceedance of TRPA's 1-hour ozone threshold standard of 0.08 ppm. The long-term increase in CO would conflict with implementation of the CO maintenance plan and/or contribute to

exceedances of TRPA's 8-hour threshold standard of 6 ppm. This would be a **significant** impact for Alternative 2. Mitigation Measure 10-2 would require TRPA to limit the number of new moorings and boat ramps to the same numbers authorized under Alternative 1. This would reduce boat emissions such that they would not cause or contribute to an exceedance of the TRPA's numeric threshold standard for ozone or the CAAQS for ozone or CO and thereby would reduce this impact to a **less-than-significant** level.

The increase in long-term operational emissions associated with each Shoreline Plan alternative would primarily be a function of the increase in recreational boating activity that would occur, and, to a lesser degree, any new roadway vehicle trips associated with boating activity. None of the Shoreline Plan alternatives would result in new area sources or stationary sources of emissions such as those typically associated with the development of new residential or commercial buildings (e.g., natural gas-fired boilers, operation of landscape maintenance equipment).

Table 10-6 shows the projected increase in peak-day boating activity and roadway vehicle travel under each Shoreline Plan alternative.

Table 10-6 Boating Activity Levels and Roadway Travel by Alternative

	Peak-Day Boating Activity[1]		Increase in Peak-Day Roadway Vehicle Travel[2]
	Boat-hr/day	% Change	(VMT/day)
Baseline conditions	12,512	–	–
Baseline + Alternative 1	14,096	13%	11,368
Baseline + Alternative 2	17,939	43%	49,007
Baseline + Alternative 3	12,982	4%	7,613
Baseline + Alternative 4	12,521	No change	No change

Notes: boat-hr/day = boating-hours per day; VMT/day = vehicle miles travelled per day.

[1] Boating Activity levels are provided in Table 2-3 with percent change calculations added.

[2] The increases in VMT by roadway vehicles are provided in Table 13-5, in Chapter 13, "Roadway Transportation and Circulation."

Source: Values from Chapter 2, "Description of Proposed Project and Alternatives," Table 2-3; % change based on calculations

It is conservatively assumed that none of the increases in boating activity projected for the Shoreline Plan alternatives is accounted for in CARB's projected 2035 emissions inventory (as presented in Table 10-5). That is, all additional boating activity resulting from the Shoreline Plan alternatives is assumed to be in addition to the boating growth anticipated in CARB's emission inventory.

The net change in emissions associated with the change in boating activity levels and any associated increase in roadway vehicle trips were estimated for buildout (2040) and compared with existing conditions (2017) for each alternative below.

Alternative 1: Proposed Shoreline Plan

As shown in Table 10-6, the level of peak-day boating activity would increase from approximately 12,500 boat-hours per day (boat-hr/day) under existing conditions to approximately 14,100 boat-hr/day in 2040 under Alternative 1, or an increase of approximately 13 percent. In addition, there would be an associated increase of approximately 11,400 vehicle miles travelled per day (VMT/day) by roadway motor vehicles.

These changes are reflected in the operational emissions estimates for Alternative 1 and shown in Table 10-7.

Table 10-7 Net Change in Operational Emissions in the Lake Tahoe Air Basin under Alternative 1

Emissions Source	Peak-Day Emissions (lb/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Existing boating activity (2017) [1]	322	1,376	5,536	90	68
Boating activity in 2040 [2]	270	610	5,485	43	32
Increased roadway vehicle travel [3]	1.0	0.7	10.2	1.2	0.5
Net change [4]	-51	-765	-41	-46	-36

Notes: lb/day = pounds per day; NO_X = oxides of nitrogen; ROG = reactive organic gases; CO = carbon monoxide; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less.

[1] Emissions generated by existing levels of boating activity in the Lake Tahoe Air Basin are provided by CARB's emissions inventory (CARB 2017b). These values are based on emission factors for boats registered in California.

[2] The estimates of emission levels generated by boating activity in 2040 are based on CARB's projected inventory for 2035, which is the latest calendar year for which CARB projects future emission levels. These estimates account for the expected growth in boating activity by boats registered in California as well as increases resulting from this alternative (as shown in Table 10-6).

[3] Emissions associated with the increase in roadway vehicle travel were estimated using the projected level of vehicle miles travelled, as shown in Table 10-6, and emission factors from EMFAC2014v1.0.7 (CARB 2015).

[4] The net change in emissions levels accounts only for the change in emissions per boat for boats registered in California. However, the relative net change in emissions generated by Nevada-registered boats is assumed to be comparable.

Source: Data and calculations compiled by Ascent Environmental in 2018. See Appendix C for detailed modeling results and calculations.

Based on the emissions estimates presented in Table 10-7, emissions of ozone precursors, CO, PM_{10}, and $PM_{2.5}$ in the LTAB would decrease from existing conditions to 2040 under Alternative 1. This is because the emission rates for recreational watercraft on Lake Tahoe would decrease substantially over the planning horizon of the Shoreline Plan (as described in Section 10.2, "Regulatory Setting"). Any increase in boating activity and associated roadway vehicle travel resulting from Alternative 1 would be more than offset by fleet turnover and the increasingly stringent California and federal emissions standards for recreational watercraft. Because of the long-term reduction in emissions of ozone precursors, CO, PM_{10} and $PM_{2.5}$ that would result from stricter standards and cleaner engines over time, implementation of Alternative 1 would not result in the deterioration of ambient air quality or the exceedance of an applicable air quality standard. It would also not contribute to nonattainment designation with respect to the CAAQS and numeric TRPA threshold standards for ozone and PM_{10} or inhibit implementation of the CO Maintenance Plan. This impact would be **less than significant**.

Alternative 2: Maintain Existing TRPA Shorezone Regulations (No Project)

As shown in Table 10-6, the level of peak-day boating activity would increase from approximately 12,500 boat-hr/day under existing conditions to approximately 18,000 boat-hr/day in 2040 under Alternative 3, or an increase of approximately 43 percent. There would also be an associated increase of approximately 49,000 VMT/day by roadway motor vehicles.

These changes are reflected in the operational emissions estimates for Alternative 2 and are shown in Table 10-8.

Based on the emissions estimates presented in Table 10-8, emissions of NO_X and CO in the LTAB would increase from existing conditions to 2040 under Alternative 2, while emissions of ROG, PM_{10}, and $PM_{2.5}$ would decrease. The long-term increase in NO_X, which is an ozone precursor, could contribute to the nonattainment status of the LTAB with respect to the CAAQS for ozone and/or an exceedance of TRPA's 1-hour ozone threshold standard of 0.08 ppm. In addition, the long-term increase in CO would conflict with implementation of the CO maintenance plan and/or contribute to exceedances of TRPA's 8-hour threshold standard of 6 ppm. This would be a **significant** impact.

Table 10-8 Net Change in Operational Emissions in the Lake Tahoe Air Basin under Alternative 2

Emissions Source	Peak-Day Emissions (lb/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Existing boating activity (2017)[1]	322	1,376	5,536	90	68
Boating activity in 2040[2]	344	777	6,980	54	40
Increased roadway vehicle travel[3]	4.3	2.9	44.0	5.0	2.0
Net change[4]	26	-597	1,488	-31	-26

Notes: lb/day = pounds per day; NO_X = oxides of nitrogen; ROG = reactive organic gases; CO = carbon monoxide; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less.

[1] Emissions generated by existing levels of boating activity in the Lake Tahoe Air Basin are provided by CARB's emissions inventory (CARB 2017b). These values account only for boating activity by boats registered in California.

[2] The estimates of emission levels generated by boating activity in 2040 are based on CARB's projected inventory for 2035, which is the latest calendar year for which CARB projects future emission levels. These estimates account for the expected growth in boating activity by boats registered in California as well as increases resulting from this alternative (as shown in Table 10-6).

[3] Emissions associated with the increase in roadway vehicle travel were estimated using the projected level of vehicle miles travelled, as shown in Table 10-6, and emission factors from EMFAC2014v1.0.7 (CARB 2015).

[4] The net change in emissions levels accounts only for the change in emissions per boat for boats registered in California. However, the relative net change in emissions generated by Nevada-registered boats is assumed to be comparable.

Source: Data and calculations compiled by Ascent Environmental in 2018. See Appendix C for detailed modeling results and calculations.

Alternative 3: Limit New Development

As shown in Table 10-6, the level of peak-day boating activity would increase from approximately 12,500 boat-hr/day under existing conditions to approximately 13,000 boat-hr/day in 2040 under Alternative 3. This represents an increase of approximately 4 percent. In addition, there would be an increase of approximately 7,600 VMT/day by roadway motor vehicles.

These changes are reflected in the operational emissions estimates for Alternative 3 and shown in Table 10-9.

Table 10-9 Net Change in Operational Emissions in the Lake Tahoe Air Basin under Alternative 3

Emissions Source	Peak-Day Emissions (lb/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Existing boating activity (2017)[1]	322	1,376	5,536	90	68
Boating activity in 2040[2]	249	562	5,051	39	29
Increased roadway vehicle travel[3]	0.7	0.5	6.8	0.8	0.3
Net change[4]	-72	-814	-478	-50	-39

Notes: lb/day = pounds per day; NO_X = oxides of nitrogen; ROG = reactive organic gases; CO = carbon monoxide; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less.

[1] Emissions generated by existing levels of boating activity in the Lake Tahoe Air Basin are provided by CARB's emissions inventory (CARB 2017b). These values account only for boating activity by boats registered in California.

[2] The estimates of emission levels generated by boating activity in 2040 are based on CARB's projected inventory for 2035, which is the latest calendar year for which CARB projects future emission levels. These estimates account for the expected growth in boating activity by boats registered in California as well as increases resulting from this alternative (as shown in Table 10-6).

[3] Emissions associated with the increase in roadway vehicle travel were estimated using the projected level of vehicle miles travelled, as shown in Table 10-6, and emission factors from EMFAC2014v1.0.7 (CARB 2015).

[4] The net change in emissions levels accounts only for the change in emissions per boat for boats registered in California. However, the relative net change in emissions generated by Nevada-registered boats is assumed to be comparable.

Source: Data and calculations compiled by Ascent Environmental in 2018. See Appendix C for detailed modeling results and calculations.

Based on the emissions estimates presented in Table 10-9, emissions of ozone precursors, CO, PM_{10}, and $PM_{2.5}$ in the LTAB would decrease from existing conditions to 2040 under Alternative 3. This is because the emission rates of recreational watercraft on Lake Tahoe would decrease substantially over the planning

horizon of the Shoreline Plan (as described in Section 10.2, "Regulatory Setting"). Any additional increase in boating activity and associated roadway vehicle travel would be more than offset by fleet turnover and the increasingly more stringent California and federal emissions standards for recreational watercraft. Because of the long-term reduction in emissions of ozone precursors, CO, PM_{10}, and $PM_{2.5}$ that would result from stricter standards and cleaner engines over time, implementation of Alternative 1 would not result in the deterioration of ambient air quality or the exceedance of an applicable air quality standard. It would also not contribute to nonattainment designation with respect to the CAAQS and numeric TRPA threshold standards for ozone and PM_{10} or inhibit implementation of the CO Maintenance Plan. This impact would be **less than significant**.

Alternative 4: Expand Public Access and Reduce Existing Development

As shown in Table 10-6, there would be no substantial increase in the level of peak-day boating activity or roadway motor vehicle activity between existing conditions and 2040 buildout conditions under Alternative 4.

Operational emissions estimates for Alternative 4 are shown in Table 10-10.

Table 10-10 Net Change in Operational Emissions in the Lake Tahoe Air Basin under Alternative 4

Emissions Source	Peak-Day Emissions (lb/day)				
	NO_X	ROG	CO	PM_{10}	$PM_{2.5}$
Existing boating activity (2017) [1]	322	1,376	5,536	90	68
Boating activity in 2040 [2]	240	542	4,872	38	28
Increased roadway vehicle travel [3]	0	0	0	0	0
Net change [4]	-82	-834	-664	-52	-40

Notes: lb/day = pounds per day; NO_X = oxides of nitrogen; ROG = reactive organic gases; CO = carbon monoxide; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less.

[1] Emissions generated by existing levels of boating activity in the Lake Tahoe Air Basin are provided by CARB's emissions inventory (CARB 2017b). These values account only for boating activity by boats registered in California.

[2] The estimates of emission levels generated by boating activity in 2040 are based on CARB's projected inventory for 2035, which is the latest calendar year for which CARB projects future emission levels. These estimates account for the expected growth in boating activity by boats registered in California as well as increases resulting from this alternative (as shown in Table 10-6).

[3] Emissions associated with the increase in roadway vehicle travel were estimated using the projected level of vehicle miles travelled, as shown in Table 10-6, and emission factors from EMFAC2014v1.0.7 (CARB 2015).

[4] The net change in emissions levels accounts only for the change in emissions per boat for boats registered in California. However, the relative net change in emissions generated by Nevada-registered boats is assumed to be comparable.

Source: Data and calculations compiled by Ascent Environmental in 2018. See Appendix C for detailed modeling results and calculations.

Based on the emissions estimates presented in Table 10-10, emissions of ozone precursors, CO, PM_{10}, and $PM_{2.5}$ in the LTAB would decrease from existing conditions to 2040 under Alternative 4. This is because there would be no increase in boating activity and, as described in Section 10.2, "Regulatory Setting," the emission rates of recreational watercraft on Lake Tahoe would decrease substantially over the planning horizon of the Shoreline Plan because of increasingly stringent California and federal emission standards. Because of the long-term reduction in emissions of ozone precursors, CO, PM_{10}, and $PM_{2.5}$ that would result from stricter standards and cleaner engines over time, and static level of boat and roadway vehicle activity, Alternative 4 would not result in the deterioration of ambient air quality or the exceedance of an applicable air quality standard. It would also not contribute to a nonattainment designation with respect to the CAAQS and numeric TRPA threshold standards for ozone and PM_{10} or inhibit implementation of the CO Maintenance Plan. This impact would be **less than significant**.

Mitigation Measures

Mitigation Measure 10-1: Limit the number of moorings and boat ramps

This mitigation measure would be required for Alternative 2.

TRPA will revise the Code of Ordinances to limit the total number of new moorings (i.e., buoys, slips, and lifts) and boat ramps to the number authorized under Alternative 1. This would allow a total of 2,116 new moorings and two new boat ramps.

Significance after Mitigation

Implementation of Mitigation Measure 10-1 would restrict the number of new moorings and boat ramps to the same number authorized for Alternative 1. Because motorized watercraft activity and emissions are directly correlated to the number of moorings and boat ramps, this mitigation measure would reduce motorized watercraft activity under Alternative 2 to the same level as Alternative 1. As described above, the amount of motorized watercraft activity that would result from Alternative 1 would result in levels of boat emissions that would not cause or contribute to an exceedance of the TRPA's numeric threshold standard for ozone or the CAAQS for ozone or CO. This impact would be reduced to a **less-than-significant** level for Alternative 2.

Impact 10-2: Short-term construction emissions of ROG, NO_X, PM_{10}, and $PM_{2.5}$

Implementation of the Shoreline Plan under Alternatives 1, 2, 3, and 4 would result in the construction of new piers, boat ramps, marinas, and/or boat houses. Given the number of new facilities that could be developed and the limited construction season in the Tahoe Region (i.e., May 1 to October 15), it is possible that a substantial amount of construction activity could occur at one time. Thus, equipment exhaust and fugitive dust emissions could violate or contribute substantially to an existing or projected air quality violation, especially considering the nonattainment status of the LTAB with respect to the CAAQS and TRPA numeric threshold standards for ozone and PM_{10}. Therefore, this impact would be **potentially significant** for Alternatives 1, 2, 3, and 4.

It is anticipated that the best practices incorporated into the TRPA Standard Conditions of Approval for Shorezone Projects, as required by Mitigation Measure 10-2, would be effective in substantially reducing construction-generated emissions to **less-than-significant** levels for Alternatives 1, 2, 3, and 4.

Construction emissions are described as "short term" or temporary in duration and have the potential to represent a significant air quality impact if they violate or contribute to the violation of an applicable air quality standard. ROG and NO_X emissions are primarily associated with gas and diesel equipment exhaust. ROG is also emitted during the application of architectural coatings and during paving. Fugitive dust emissions (PM_{10} and $PM_{2.5}$) are primarily associated with site preparation and vary as a function of such parameters as soil silt content, soil moisture, wind speed, acreage of disturbance area, and VMT and travel speed by construction vehicles on- and off-site.

Construction activities performed under all alternatives would be required to comply with TRPA's Standard Conditions of Approval for Shorezone Projects (TRPA Permit Appendix S), which are summarized in Section 10.2, "Regulatory Setting." These conditions include some dust control measures, including covering mounds of loose soil, revegetating disturbed areas, and avoiding track out.

Although project-specific details are not known for individual construction projects that would occur under the Shoreline Plan, the types of construction activities that would be associated with the development of a new boat ramp or pier, or dredging activity generate equipment exhaust and fugitive dust emissions that could violate or contribute substantially to an existing or projected air quality violation and/or expose sensitive receptors to substantial pollutant concentrations, especially considering the nonattainment status of the LTAB with respect to the CAAQS and numeric TRPA threshold standards for ozone and PM_{10}.

Because several local jurisdictions have their own regulations pertaining to construction emissions, project construction activities in those locations would be required to comply with those rules under all proposed alternatives. For projects in Placer, El Dorado, and Washoe Counties, construction equipment exhaust emissions may not exceed PCAPCD Rule 202, EDCAQMD Rule 202, or Washoe County Health District Regulation 040.005 limitations regarding visible emissions, respectively. Operators of vehicles and equipment that exceed opacity limits must be immediately notified, and the equipment must be repaired within 72 hours. Construction of projects located in California are also required to comply with all other applicable PCAPCD or EDCAQMD rules, as appropriate, including PCAPCD Rule 228 and EDCAQMD Rule 223, regarding fugitive dust; PCAPCD Rule 218 and EDCAQMD Rule 215, regarding the application of architectural coatings; and PCAPCD Rule 217 and EDCAQMD Rule 224, regarding cutback and emulsified asphalt paving materials. Projects located in Washoe County would be required to comply with Regulations 040.030, Dust Control; 040.090, Cutback Asphalts; and 040.200, Diesel Engine Idling.

The level of construction-generated emissions that could occur under each alternative is discussed separately below.

Alternative 1: Proposed Shoreline Plan

Alternative 1 would allow new dredging under certain conditions and would result in the construction of up to an additional 10 new public piers, 128 private multiple-use or single-use piers, and two new boat ramps.

Given the limited construction season in the Tahoe Region (i.e., May 1 to October 15) and the number of new facilities that could be developed under Alternative 1, it is possible that a substantial amount of construction activity could occur at one time. Thus, equipment exhaust and fugitive dust emissions could violate or contribute substantially to an existing or projected air quality violation, especially considering the nonattainment status of the LTAB with respect to the CAAQS and TRPA numeric threshold standards for ozone and PM_{10}. Therefore, this impact would be **potentially significant**.

Alternative 2: Maintain Existing TRPA Shorezone Regulations (No Project)

Alternative 2 would authorize additional public and private piers, buoys, public and private marina slips, public boat ramps, new and expanded marinas, and private boat lifts. As described in Section 2.8.2, the number of new moorings would be limited by the number of eligible parcels that could place moorings consistent with location standards including the prohibition on structures within prime fish habitat. A maximum of two buoys and one boat lift would be allowed for each littoral parcel. Based on an assessment of the most recent prime fish habitat map and pier eligibility criteria, it is estimated that up to 4,871 new buoys, 1,897 new slips, and 168 new boat lifts could be developed under the No Project Alternative, for a total of 6,396 new moorings.

For the same reasons described for Alternative 1, construction activity under Alternative 2 could contribute substantially to an existing or projected air quality violation, especially considering the nonattainment status of the LTAB with respect to the CAAQS and TRPA numeric threshold standards for ozone and PM_{10}. Therefore, this impact would be **potentially significant**.

Alternative 3: Limit New Development

Alternative 3 would authorize five new public piers, 86 private multiple-use piers, and one new boat ramp.

For the same reasons described for Alternative 1, construction activity under Alternative 3 could contribute substantially to an existing or projected air quality violation, especially considering the nonattainment status of the LTAB with respect to the CAAQS and TRPA numeric threshold standards for ozone and PM_{10}. Therefore, this impact would be **potentially significant**.

Alternative 4: Expand Public Access and Reduce Existing Development

Alternative 4 would authorize an additional 15 public piers and the potential removal and relocation of existing piers and boat ramps with a 2:1 reduction in the total number of structures.

For the same reasons described for Alternative 1, construction activity under Alternative 4 could contribute substantially to an existing or projected air quality violation, especially considering the nonattainment status of the LTAB with respect to the CAAQS and TRPA numeric threshold standards for ozone and PM_{10}. Therefore, this impact would be **potentially significant**.

Mitigation Measures

Mitigation Measure 10-2: Add best construction practices for emissions to the standard conditions of approval for shoreline projects

This mitigation measure would be required for Alternatives 1, 2, 3, and 4.

TRPA will revise the Standard Conditions of Approval for Shorezone Projects (TRPA Permit Attachment S) to require that minimum construction emission reduction best practices be implemented for all projects within the shorezone. The Standard Conditions of Approval for Shorezone Projects will be amended to add the following best construction practices:

- Fugitive dust shall not exceed 40 percent opacity and not go beyond the property boundary at any time during project construction.
- No open burning of removed vegetation shall occur during infrastructure improvements.
- Idling time for all diesel-powered equipment shall not exceed 5 minutes.
- Water shall be applied as needed to prevent dust impacts from extending off-site. Operational water truck(s) shall be on-site, as required, to control fugitive dust. Construction vehicles leaving the site shall be cleaned to prevent dust, silt, mud, and dirt from being released or tracked off-site.
- Existing power sources or clean-fuel generators rather than temporary diesel power generators shall be used wherever feasible.

Significance after Mitigation

Mitigation Measure 10-2 includes basic best practices for dust control during construction. Implementation of Mitigation Measure 10-2 would reduce fugitive PM_{10} and $PM_{2.5}$ dust emissions for each project and minimize dispersion beyond a given property boundary. Implementation of Mitigation Measure 10-2, as prescribed, would also reduce diesel equipment exhaust emissions of NO_X and PM_{10} by restricting idling times for diesel equipment. It is anticipated that these best practices would be effective in substantially reducing construction-generated emissions. Importantly, projects located in the jurisdictions of PCAPCD or EDCAQMD must demonstrate, as a condition of approval, that emissions would be mitigated to levels below the respective district-applicable threshold standards for construction emissions. This would ensure that impacts from project-specific construction activities would be mitigated to a **less-than-significant** level.

Impact 10-3: Exposure of sensitive receptors to toxic air contaminants

Implementation of the Shoreline Plan under Alternatives 1, 2, 3, and 4 would not result in the siting of new stationary sources of TACs, new sensitive receptors, or an increase in TAC emissions generated by recreational watercraft. Construction of new facilities would involve the use of off-road heavy-duty diesel-powered equipment that emits diesel PM. However, because of the short duration of construction activity at any single location and the highly dispersive properties of diesel PM, construction-related TAC emissions would not expose sensitive receptors to substantial concentrations of TACs. This impact would be **less than significant** for Alternatives 1, 2, 3, and 4.

None of the Shoreline Plan alternatives would result in the siting of new sensitive receptors, such as residences or schools, or new stationary sources of TACs.

As described in Section 10.3.2, "Existing Air Quality," notable TACs emitted by recreational watercraft on Lake Tahoe may include acetaldehyde, acrolein, benzene, 1,3-butadiene, ethylbenzene, formaldehyde, hexane, methanol, methyl ethyl ketone, naphthalene, propylene, styrene, toluene, and xylene—and the quantity in which these TACs are emitted is a function of the level of total organic gases (TOG) (BAAQMD 2012:87). TOG is a portion of total hydrocarbon emissions. Tables 10-7, 10-8, 10-9, and 10-10 show that emissions of hydrocarbons are expected to decrease from existing conditions to 2040 under Alternatives 1, 2, 3, and 4, respectively, because of the turnover in the boat fleet. Therefore, it is expected that emissions of TACs generated by recreational watercraft would also decrease. For this reason, and because emission-generating recreational boating activity would occur lakewide and not be concentrated in a few locations or near sensitive receptors for any extended period, there would be no adverse effect from boat-generated TAC emissions.

For construction activities, diesel PM is the primary TAC of concern. Construction of new facilities, such as piers, boat ramps, or a new or expanded marina, could involve the generation of diesel PM emissions in the exhaust of off-road heavy-duty diesel equipment used in dredging, site preparation (e.g., clearing and grading), and paving. On-road diesel-powered haul trucks or barges traveling to and from a construction site to deliver materials and equipment are less of a concern because they would not stay on the site for long durations. Consequently, it is important to consider that the use of off-road heavy-duty diesel equipment would be limited to the periods of construction, for which most diesel-powered off-road equipment use would occur during the limited construction season (approximately May 1 to October 15) and only during the season or seasons when the proposed facility is being constructed.

The primary factor used to determine health risk associated with exposure to TAC emissions is the dose to which receptors are exposed. Dose is a function of the concentration of one or more substances in the environment and the duration of exposure to that substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for any exposed receptor. Thus, the risks estimated for an exposed individual are higher if a fixed exposure occurs over a longer period. According to the Office of Environmental Health Hazard Assessment, health risk assessments, which determine the acceptable level of exposure of sensitive receptors to TAC emissions, should be based on a 30-year exposure period for residential receptors; however, such assessments should be limited to the period/duration of activities associated with the proposed project (OEHHA 2015:8-1 and 8-6).

Another important factor is the proximity of nearby sensitive receptors and their occupancy characteristics. Studies show that diesel PM is highly dispersive (as an example, diesel PM concentrations decrease by 70 percent at 500 feet from the source) (Zhu et al. 2002). Thus, receptors must be close to sources to result in the possibility of exposure to concentrations of concern.

Also, research of diesel PM generated by freeway traffic (i.e., on-road vehicles) indicates that vegetation, particularly fine-needle tree species, can remove particulate from the air (Fuller et al. 2009; Breathe California 2008), further reducing potential exposure to diesel PM. This suggests that some protection may be provided by fine needle conifer trees located between diesel PM-emitting construction activity and sensitive receptors.

In addition, emissions of diesel PM generated by construction activity would be limited by TRPA conditions of approval, for any facilities that would be constructed in an upland area (e.g., parking lot for a boat ramp or marina), and Mitigation Measure 10-2, which would require best construction practices that include limit emissions from construction equipment.

The potential for sensitive receptors to be exposed to elevated levels of health risk from construction-generated emissions of diesel PM is discussed for each alternative separately below.

Alternative 1: Proposed Shoreline Plan

Alternative 1 would authorize new dredging in certain instances, and construction of new slips and an additional 10 public piers, 128 private multiple-use piers, and two new boat ramps over the buildout period.

It is not anticipated that construction any of these facility types would take more than one or two construction seasons (i.e., May 1 to October 15). Moreover, because the shorezone of Lake Tahoe is geographically spread out, multiple construction sites would not be near each other generating emissions that affect the same individual receptors. Therefore, due to the short duration of construction activity at any single location and the highly dispersive properties of diesel PM, construction-related TAC emissions would not expose sensitive receptors to substantial concentrations of TACs. Additionally, construction projects must comply with provisions of the TRPA Code limiting idling, which reduces the amount of TAC emissions. This impact would be **less than significant**.

Alternative 2: Maintain Existing TRPA Shorezone Regulations (No Project)

Alternative 2 would authorize additional public and private piers, buoys, public and private marina slips, public boat ramps, new and expanded marinas, and private boat lifts. As described in Section 2.8.2, the number of new moorings would be limited by the number of eligible parcels that could place moorings consistent with location standards including the prohibition on structures within prime fish habitat. It is anticipated that the construction of a new or expanded marina could take place over two construction seasons (i.e., May 1 to October 15). Like Alternative 1, due to the short duration of construction activity at any single location and the highly dispersive properties of diesel PM, construction-related TAC emissions would not expose sensitive receptors to substantial concentrations of TACs. Additionally, construction projects must comply with provisions of the TRPA Code limiting idling, which reduces the amount of TAC emissions. This impact would be **less than significant**.

Alternative 3: Limit New Development

Alternative 3 would authorize new dredging in certain instances, and construction of an additional 5 public piers, 86 private multiple-use piers, and one new boat ramp. Like Alternative 1, due to the short duration of construction activity at any single location and the highly dispersive properties of diesel PM, construction-related TAC emissions would not expose sensitive receptors to substantial concentrations of TACs. Additionally, construction projects must comply with provisions of the TRPA Code limiting idling, which reduces the amount of TAC emissions. This impact would be **less than significant**.

Alternative 4: Expand Public Access and Reduce Existing Development

Alternative 4 would authorize an additional 15 public piers and the potential removal, relocation, and rebuild of some existing piers and boat ramps. Like Alternative 1, due to the short duration of construction activity at any single location and the highly dispersive properties of diesel PM, construction-related TAC emissions would not expose sensitive receptors to substantial concentrations of TACs. Additionally, construction projects must comply with provisions of the TRPA Code limiting idling, which reduces the amount of TAC emissions. This impact would be **less than significant**.

Mitigation Measures

No mitigation is required.

Impact 10-4: Exposure to excessive odorous emissions

Implementation of the Shoreline Plan under Alternatives 1, 2, 3, and 4 would not result in the siting of new major sources of odors or new sensitive receptors. Neither construction nor operation of facilities that may be developed because of the Shoreline Plan would create objectionable odors affecting a substantial number of people. This impact would be **less than significant**.

The occurrence and severity of odor impacts depend on numerous factors, including the nature, frequency, and intensity of the source; wind speed and direction; and the presence of sensitive receptors. Although offensive odors rarely cause physical harm, they can be unpleasant, leading to considerable distress and often generating citizen complaints to local governments and regulatory agencies.

Alternative 1: Proposed Shoreline Plan

Alternative 1 would not result in any new major sources commonly known to produce odors (e.g., landfills, wastewater treatment facilities) and it would not result in the development of new sensitive receptors. Correspondingly, PCAPCD, EDCAQMD, and TRPA have no records of odor complaints regarding emissions generated by recreational watercraft (Springsteen, pers. comm., 2018, Lenkin 2018). Diesel exhaust from the use of heavy-duty off-road equipment during the construction of new facilities would be intermittent and temporary and would dissipate rapidly from the source with an increase in distance. Thus, implementation of Alternative 1 would create objectionable odors affecting a substantial number of people. As a result, this impact would be **less than significant**.

Alternative 2: Maintain Existing TRPA Shorezone Regulations (No Project)

For the same reasons described above for Alternative 1, odor impacts associated with Alternative 2 would be **less than significant.**

Alternative 3: Limit New Development

For the same reasons described above for Alternative 1, odor impacts associated with Alternative 3 would be **less than significant.**

Alternative 4: Expand Public Access and Reduce Existing Development

For the same reasons described above for Alternative 1, odor impacts associated with Alternative 4 would be **less than significant.**

Mitigation Measures

No mitigation is required.

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