5.5 AIR QUALITY

This section presents an assessment of the potential for significant adverse air quality impacts resulting from construction and implementation of Marin County's Proposed Project and its alternatives. The potential air quality impacts were assessed based on an emission inventory prepared for each of the alternatives considered in this Environmental Impact Statement (EIS). The assessment was prepared according to guidelines established under Federal Aviation Administration (FAA) Order 1050.1E, Change 1, *Environmental Impacts: Policies and Procedures,* and FAA *Air Quality Procedures for Civilian Airports & Air Force Bases*.[1]

5.5.1 REGULATORY SETTING

An airport air quality assessment requires consideration under both the Clean Air Act, including the 1990 Amendments (CAA), and the National Environmental Policy Act (NEPA). These two unique legislative acts require distinct analyses and may be separately applicable to an airport project. The CAA provides for the establishment of standards and programs to evaluate, achieve, and maintain acceptable air quality in the U.S. Under the CAA, the U.S. Environmental Protection Agency (USEPA) established a set of standards, or criteria, for six[2] pollutants determined to be potentially harmful to human health and welfare.[3] A description of the criteria pollutants and the standards for the criteria pollutants intended to protect public health, known as the National Ambient Air Quality Standards (NAAQS), are provided in Appendix F, *Air Quality*. Areas of the country where air pollution levels consistently exceed these standards may be designated nonattainment by the USEPA. A discussion of the California Environmental Quality Act (CEQA) and the California air quality standards are also provided in Appendix F.

According to FAA guidelines[4] that establish procedures to meet NEPA requirements, an air quality assessment prepared pursuant to NEPA regulations should include an analysis by evaluating the impact of the Proposed Action on the NAAQS. To conduct this impact analysis the air emissions associated with the No Action Alternative are compared to the air emissions from the Proposed Action and other alternatives evaluated in detail in the EIS. The net emissions derived from the comparison of the No Action Alternative to the Proposed Action and other alternatives evaluated in detail indicates the impact to air quality of the Proposed Action and other alternatives evaluated in detail.

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1 FAA, *Order 1050.1E Environmental Impacts: Policies and Procedures*, March 20, 2006, FAA; and *Air Quality Procedures for Civilian Airports & Air Force Bases*, April 1997, and the Addendum dated September 2004.

2 The Clean Air Act required EPA to set National Ambient Air Quality Standards for six pollutants. The EPA still considers there to be six not seven criteria pollutants. Particulate Matter is still considered one pollutant even though PM_{10} and $PM_{2.5}$ are analyzed. See EPA website. http://www.epa.gov/air/urbanair/

3 Code of Federal Regulations, Title 40, Part 50 (Title 40 CFR Part 50) *National Primary and Secondary Ambient Air Quality Standards (*NAAQS), July 2011.

4 FAA Order 1050.1E, *Environmental Impacts: Policies and Procedures*, Appendix A, Section 2 *Air Quality*, March 20, 2006.

The General Conformity regulations under the CAA establishes minimum values, referred to as the *de minimis* thresholds, for the criteria and precursor pollutants[5] that would have potential for significant air quality impacts. The Federal *de minimis* thresholds established under the CAA are provided in Appendix F.

When a Federal action would not cause annual net emissions that equal or exceed the relevant *de minimis* thresholds for the pollutants of concern, the action would not exceed the threshold for detailed consideration under the General Conformity Rule and further analysis to prepare a General Conformity Determination would not be required. Further, when an action with *de minimis* annual net emissions would not cause an exceedance of the NAAQS, a dispersion analysis to show compliance to the NAAQS would not be required.[6] Under these circumstances, no further analysis under the CAA or NEPA would be required.

The results of the emissions inventory prepared for each alternative were compared to the emissions for Alternative A (No Action) of the same year to disclose the potential increase in emissions caused by each alternative. The comparison of the emission inventories, which included an inventory of construction emissions, was used for the evaluation of General Conformity as required under the CAA. The FAA is actively planning and working with industry and the EPA to identify an unleaded replacement for leaded aviation fuel (Avgas) for piston-engine propeller aircraft by 2018 (Turbo-prop propeller aircraft and jet aircraft fuel contains no lead).[7] Lead emissions for future years would be less than calculated in this EIS if the amount of lead in Avgas is reduced or eliminated.

A regionally significant Federal action under the CAA is one where the total direct and indirect emissions (net emissions) represent greater than ten percent of the total emissions of any pollutant in the nonattainment or maintenance area, as provided in the State Implementation Plan (SIP) emissions budget. The EPA has recently removed the requirement for the regionally significant test in the most recent change to the General Conformity Regulations effective on July 6, 2010.[8] Therefore, the regionally significant test does not apply to the alternatives under consideration at DVO.

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5 Precursor pollutants are pollutants that are involved in the chemical reactions that form the resultant pollutant. Ozone precursor pollutants are NO_x, VOC, and SO_2, whereas $PM_{2.5}$ precursor pollutants include NO_x, VOC, SO_x, and ammonia (NH_3).

6 FAA, *Air Quality Procedures for Civilian Airports and Air Force Bases*, April 1997; and Addendum, September 2004. Quoted from Section 2.1.5, *National Ambient Air Quality Standards* (*NAAQS) Assessment*, "If the action is in a nonattainment or maintenance area and exempt or presumed to conform under conformity requirements, it is assumed that a NAAQS assessment is not required for an airport or air base action since it is unlikely the action's pollutant concentrations would exceed the NAAQS."

7 FAA Memorandum From Ralph Thomson, Manager, Airport Planning and Environmental Division, APP-400, Subject: Interim Guidance on Mitigating Public Risks Associated with Lead Emissions from Avgas, June 19, 2013.

8 USEPA, 6560-50-P [EPA-HQ-OAR-2006-0669; FRL-9131-7] RIN 2060-AH93 Revisions to the General Conformity regulations. 40 CFR Parts 51 and 93 pgs 52 and 53.

All input data, assumptions, and methodologies used to develop this air quality assessment are provided in Appendix F. The Air Quality Technical Report provides an overview of the requirements under NEPA and the CAA, and documents FAA's coordination with Federal, state, and local air quality agencies. The existing air quality conditions at DVO are described in Chapter Four, *Affected Environment*.

5.5.2 FUTURE CONDITIONS: 2018

Alternative A:
No Action

Airfield Configuration: Alternative A is the No Action alternative for 2018. Airport physical conditions such as the airfield configuration are assumed to be unchanged and therefore consistent with Existing Conditions (2008).

Aircraft Activity Levels and Fleet Mix Characteristics: With or without the development of a runway alternative, air traffic is projected to increase each year and by 2018 the number of annual aircraft operations is expected to be 100,500, which is higher than Existing Conditions (2008) by 15,000 operations.

Mobile Sources: Future mobile sources were projected assuming the increase in the number of vehicles at the Airport would be directly related to projected increases in aircraft annual operations.

Stationary Sources: Energy consumption for stationary sources for the 2018 Alternative A analysis year was projected using the growth in aircraft operations.

Emissions Inventory: The emission inventory for this alternative provided in **Table 5.5-1** shows the greatest overall emission contribution comes from aircraft operations. Emissions of Lead (Pb), Course particulate matter (PM_{10}) and Fine particulate matter ($PM_{2.5}$) are also produced primarily by aircraft engines.

Table 5.5-1
ALTERNATIVE A (2018) EMISSIONS INVENTORY
Gnoss Field Airport

EMISSION SOURCES	ANNUAL EMISSIONS (tons per year)						
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Pb**
Aircraft	173.36	12.57	1.22	0.49	11.21	11.21	0.13
GSE	0.52	0.08	0.19	0.01	0.01	0.01	NA
GAV in Parking Facilities	0.25	0.03	0.02	0.00	0.00	0.00	NA
GAV on Roadways	0.21	0.01	0.02	0.00	0.00	0.00	NA
Stationary Sources	0.52	17.13	1.22	0.00	0.05	0.05	NA
TOTAL	**174.87**	**29.82**	**2.67**	**0.50**	**11.27**	**11.27**	**0.13**

CO: Carbon Monoxide
VOC: Volatile Organic Compounds
NOx: Nitrogen Oxides
SOx: Sulfur Oxides
PM10: Course particulate matter
PM2.5: Fine particulate matter
Pb: Lead
GSE: Ground Support Equipment, which includes the Airport's two fuel trucks and mowing tractor
GAV: Ground Access Vehicles
Total emissions may not sum exactly due to rounding.
Source: EDMS ver. 5.1 L&B Analysis, 2009

Alternative B:
Extend Runway to the Northwest by 1,100 Feet (Sponsor's Proposed Project)

Airfield Configuration: 2018 Alternative B includes a 1,100 foot extension of Runway 13/31 to the northwest.

Aircraft Activity Levels and Fleet Mix Characteristics: With or without the implementation of this alternative the number of annual aircraft operations for 2018 would be the same as discussed for 2018 Alternative A. However, aircraft air emissions would increase slightly as compared to the 2018 Alternative A because the extension of the runway would cause an increase in aircraft taxiing time to get to the ends of the longer runway. The distance from the central aircraft parking area to the runway ends under Alternative B would also be slightly longer as compared to Alternative D. Therefore Alternative B would have slightly increased air emissions associated with this increased aircraft taxi time as compared to Alternative D.

In addition to the increase in taxi time, in this alternative the critical aircraft would be able to take off with 100 percent of its Maximum Take Off Weight (MTOW) as compared to a reduced MTOW with the critical aircraft in the 2018 Alternative A. The ability to take off with 100 percent of MTOW as compared to a reduced MTOW would result in a slight increase in annual aircraft emissions. This is because when an aircraft is heavier it takes slightly longer to takeoff and climb-out as compared to a lighter aircraft thus burning slightly more fuel and producing slightly greater air

emissions. However, this increase is partially offsite because under Alternative B, the critical aircraft and a small number of other aircraft would no longer be required to make stops at alternate airports to refuel to reach their final destination. Eliminating an extra aircraft takeoff and landing while en route to a final destination would slightly reduce air emissions associated with this alternative. However, given the variability of this activity in terms of which aircraft and airports, and to present the greatest potential air emissions, the potential reduction in air emissions at DVO or other area airports associated with implementation of this alternative was not quantified in this analysis.

Mobile Sources: Alternative B would not increase the number of ground access vehicles using DVO beyond the 2018 Alternative A condition, because there would be no new buildings, hangars, or additional annual aircraft operations.

Stationary Sources: No new buildings or hangars are proposed for 2018 Alternative B, therefore emissions from stationary sources would be the same as 2018 Alternative A.

Emissions Inventory: The emission inventory for 2018 Alternative B provided in **Table 5.5-2**, shows the greatest overall emission contribution comes from aircraft operations. Emissions of Pb, PM_{10} and $PM_{2.5}$ are also produced primarily by aircraft engines. See Table 5.5-8 at the end of this section for a comparison of the increase in emissions of each alternative against Alternative A for each year.

Table 5.5-2
ALTERNATIVE B (2018) EMISSIONS INVENTORY
Gnoss Field Airport

EMISSION SOURCES	ANNUAL EMISSIONS (tons per year)						
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Pb**
Aircraft	179.54	14.40	1.32	0.53	11.24	11.24	0.13
GSE	0.52	0.08	0.19	0.01	0.01	0.01	NA
GAV in Parking Facilities	0.25	0.03	0.02	0.00	0.00	0.00	NA
GAV on Roadways	0.21	0.01	0.02	0.00	0.00	0.00	NA
Stationary Sources	0.52	17.14	1.22	0.00	0.05	0.05	NA
TOTAL	**181.05**	**31.66**	**2.77**	**0.54**	**11.30**	**11.30**	**0.13**

CO: Carbon Monoxide
VOC: Volatile Organic Compounds
NOx: Nitrogen Oxides
SOx: Sulfur Oxides
PM10: Course particulate matter
PM2.5: Fine particulate matter
Pb: Lead
GSE: Ground Support Equipment, which includes the Airport's two fuel trucks and mowing tractor
GAV: Ground Access Vehicles
Total emissions may not sum exactly due to rounding.
NA = Not applicable/Not available

Source: EDMS ver. 5.1, L&B Analysis, 2009.

Alternative D:
Extend Runway to the Southeast by 240 Feet and to the Northwest by 860 Feet

Airfield Configuration: 2018 Alternative D includes an extension of Runway 13/31 to the southeast by 240 feet and to the northwest by 860 feet.

Aircraft Activity Levels and Fleet Mix Characteristics: With or without the implementation of this alternative the number of annual aircraft operations for 2018 would be the same as discussed for 2018 Alternative A. However, aircraft air emissions would increase slightly as compared to the 2018 Alternative A because the extension of the runway would cause an increase in aircraft taxiing time to get to the ends of the longer runway. However, the distance from the central aircraft parking area to the runway ends under Alternative D would be slightly shorter as compared to Alternative B. Therefore Alternative D would have slightly lower air emissions associated with this increased aircraft taxi time as compared to Alternative B.

In addition to the increase in taxi time, in this alternative the critical aircraft would be able to take off with 100 percent of its Maximum Take Off Weight (MTOW) as compared to a reduced MTOW with the critical aircraft in the 2018 Alternative A. The ability to take off with 100 percent of MTOW as compared to a reduced MTOW would result in a slight increase in annual aircraft emissions. This is because when an aircraft is heavier it takes slightly longer to takeoff and climb-out as compared to a lighter aircraft thus burning slightly more fuel and producing slightly greater air emissions. However, this increase is partially offsite because under Alternative D, the critical aircraft and a small number of other aircraft would no longer be required to make stops at alternate airports to refuel to reach their final destination. Eliminating an extra aircraft takeoff and landing while en route to a final destination would slightly reduce air emissions associated with this alternative. However, given the variability of this activity in terms of which aircraft and airports, and to present the greatest potential air emissions, the potential reduction in air emissions at DVO or other area airports associated with implementation of this alternative was not quantified in this analysis.

Mobile Sources: Alternative D would not increase the number of ground access vehicles using DVO beyond the 2018 Alternative A condition or Alternative B, because there would be no new buildings, hangars, or additional annual aircraft operations.

Stationary Sources: No new buildings or hangars are proposed for 2018 Alternative D, therefore emissions from stationary sources would be the same as 2018 Alternative A.

Emissions Inventory: The emission inventory for 2018 Alternative D provided in **Table 5.5-3** shows the greatest overall emission contribution comes from aircraft operations. Emissions of Pb, PM_{10} and $PM_{2.5}$ are also produced primarily by aircraft engines. See Table 5.5-8 at the end of this section for a comparison of the increase in emissions of each alternative against Alternative A for each year.

Table 5.5-3
ALTERNATIVE D (2018) EMISSIONS INVENTORY
Gnoss Field Airport

EMISSION SOURCES	ANNUAL EMISSIONS (tons per year)						
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Pb**
Aircraft	179.28	14.32	1.31	0.53	11.24	11.24	0.13
GSE	0.52	0.08	0.19	0.01	0.01	0.01	NA
GAV in Parking Facilities	0.25	0.03	0.02	0.00	0.00	0.00	NA
GAV on Roadways	0.21	0.01	0.02	0.00	0.00	0.00	NA
Stationary Sources	0.52	17.14	1.22	0.00	0.05	0.05	NA
TOTAL	**180.79**	**31.58**	**2.77**	**0.54**	**11.30**	**11.30**	**0.13**

CO: Carbon Monoxide
VOC: Volatile Organic Compounds
NOx: Nitrogen Oxides
SOx: Sulfur Oxides
PM10: Course particulate matter
PM2.5: Fine particulate matter
Pb: Lead
GSE: Ground Support Equipment, which includes the Airport's two fuel trucks and mowing tractor
GAV: Ground Access Vehicles
Total emissions may not sum exactly due to rounding.
NA = Not applicable/Not available
Source: EDMS ver. 5.1, L&B Analysis, 2009.

5.5.3 CONSTRUCTION

Although a final construction schedule has not been determined, construction is assumed to be complete before 2018. During the years prior to 2018, a two year construction program is proposed. A total inventory of construction emissions was prepared to reflect the use of construction equipment and vehicles. The type and number of construction vehicles and equipment required is based on other similar airport construction projects that have been previously reviewed and approved in NEPA documentation. Modeling assumptions and details of construction tasks are provided in Appendix F.

The inventory of construction emissions is summarized in **Table 5.5-4**. While Alternative B proposes to extend the northwest segment of the runway (runway end 13), Alternative D extends both runway ends. However, both Alternative B and Alternative D would have the same overall extension of 1,100 feet

and would be expected to involve similar construction equipment, methods, quantities, and materials. Therefore construction emissions of Alternative B would be the same as for Alternative D on an annual basis.

Table 5.5-4
CONSTRUCTION EMISSIONS INVENTORY
Gnoss Field Airport

CONSTRUCTION YEARS	ANNUAL CONSTRUCTION EMISSIONS (tons per year)					
	CO	VOC	NO_x	SO_x	PM_{10}	$PM_{2.5}$
Year 1	2.64	NA	4.69	0.00	0.22	0.20
Year 2	0.83	NA	1.23	0.00	0.07	0.07

CO: Carbon Monoxide
VOC: Volatile Organic Compounds
NOx: Nitrogen Oxides
SOx: Sulfur Oxides
PM10: Course particulate matter
PM2.5: Fine particulate matter
NA = Not applicable/Not available
Note: PM10 and PM2.5 values are for construction exhaust emissions only.
Source: URBEMIS ver. 9.2.4, L&B Analysis, 2009.

Airport construction activities would result in a short-term increase in emissions of criteria air pollutants. Air pollution during the construction period would be a consequence of direct emissions from construction equipment. The evaluation of construction emissions showed the annual net emissions would be below the *de minimis* thresholds established under the CAA conformity rules. Construction would not cause a significant adverse air quality impact. In addition, these emissions would be temporary and would be mitigated to the extent possible by Marin County through the construction contractor as they comply with the guidelines in AC 150/5370-10E, *Standards for Specifying Construction of Airports*. Additional mitigation measures to reduce the amount of fugitive dust from construction are provided in Appendix F.

5.5.4 FUTURE CONDITIONS: 2023

For air quality impacts, a second timeframe was analyzed that represents five years beyond the opening of the project. The following provides an overview of the potential air quality impacts from operation of the Airport in 2023 under each alternative condition.

Alternative A:
No Action

Airfield Configuration: Alternative A is the No Action alternative for 2023. Airport physical conditions are assumed to be consistent with Existing Conditions (2008).

Aircraft Activity Levels and Fleet Mix Characteristics: With or without the development of a runway alternative, air traffic is projected to increase each year and by 2023 the number of annual aircraft operations is expected to be 112,200, which is higher than 2018 conditions by 11,700 operations.

Mobile Sources: Future mobile sources were projected assuming the increase in the number of vehicles at the Airport would be directly related to projected increases in aircraft annual operations.

Stationary Sources: Energy consumption for stationary sources for the 2023 Alternative A analysis year was projected using the growth in aircraft operations.

Emissions Inventory: The emission inventory for this alternative provided in **Table 5.5-5** shows the greatest overall emission contribution comes from aircraft operations.

Table 5.5-5
ALTERNATIVE A (2023) EMISSIONS INVENTORY
Gnoss Field Airport

EMISSION SOURCES	ANNUAL EMISSIONS (tons per year)						
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Pb**
Aircraft	193.57	14.04	1.36	0.54	12.52	12.52	0.14
GSE	0.56	0.07	0.11	0.01	0.01	0.01	NA
GAV in Parking Facilities	0.27	0.02	0.01	0.00	0.00	0.00	NA
GAV on Roadways	0.23	0.01	0.01	0.00	0.00	0.00	NA
Stationary Sources	0.52	17.18	1.22	0.00	0.05	0.05	NA
TOTAL	**195.14**	**31.33**	**2.72**	**0.56**	**12.58**	**12.58**	**0.14**

Total emissions may not sum exactly due to rounding.
Source: EDMS ver. 5.1 L&B Analysis, 2010

Alternative B:
Extend Runway to the Northwest by 1,100 Feet (Sponsor's Proposed Project)

Airfield Configuration: 2023 Alternative B would include no additional development, so the airfield layout would be the same as 2018 Alternative B.

Aircraft Activity Levels and Fleet Mix Characteristics: With or without the implementation of this alternative the number of annual aircraft operations for 2023 would be the same as discussed for 2023 Alternative A. However, emissions due to aircraft would change as compared to the 2023 Alternative A because the extension of the runway would cause a change in taxi time. This alternative would result in an increase in average aircraft taxi time as compared to the 2023 Alternative A. Longer taxi times increase annual aircraft emissions. It is expected that Alternative B would have an increased taxi time and therefore increased annual

emissions over Alternative D because the extension of Alternative B increases the distance from the central aircraft parking area to the runway ends as compared to Alternative D.

In addition to the increase in taxi time, the critical aircraft in this alternative would be able to take off with 100 percent of its MTOW as compared to a reduced MTOW with the aircraft in the 2023 Alternative A. The ability to take off with 100 percent of MTOW as compared to a reduced MTOW would result in a slight increase in annual aircraft emissions. This is because when an aircraft is heavier it takes slightly longer to takeoff and climbout as compared to a lighter aircraft thus burning slightly more fuel and producing slightly greater air emissions. It is anticipated that under Alternative B, the critical aircraft and a small number of other aircraft would no longer be required to make stops at alternate airports to refuel to reach their final destination and thus reduce emissions. However, given the variability of this activity in terms of which aircraft and airports, and to present an estimate of the greatest potential emissions, the potential reduction in air emissions at DVO or other area airports was not quantified in this analysis.

Mobile Sources: Alternative B would not increase the number of ground access vehicles using DVO beyond the 2023 Alternative A condition, because there would be no new buildings, hangars, or additional annual aircraft operations.

Stationary Sources: No new buildings or hangars are proposed for 2023 Alternative B, therefore emissions from stationary sources would be the same as 2023 Alternative A.

Emissions Inventory: The emission inventory for 2023 Alternative B provided in **Table 5.5-6**, shows the greatest overall emission contribution comes from aircraft operations. See Table 5.5-8 at the end of this section for a comparison of the increase in emissions of each alternative against Alternative A for each year.

Table 5.5-6
ALTERNATIVE B (2023) EMISSIONS INVENTORY
Gnoss Field Airport

EMISSION SOURCES	ANNUAL EMISSIONS (tons per year)						
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Pb**
Aircraft	200.46	16.08	1.47	0.59	12.55	12.55	0.15
GSE	0.56	0.07	0.11	0.01	0.01	0.01	NA
GAV in Parking Facilities	0.27	0.02	0.01	0.00	0.00	0.00	NA
GAV on Roadways	0.23	0.01	0.01	0.00	0.00	0.00	NA
Stationary Sources	0.52	17.18	1.22	0.00	0.05	0.05	NA
TOTAL	**202.03**	**33.37**	**2.83**	**0.61**	**12.61**	**12.61**	**0.15**

Total emissions may not sum exactly due to rounding.
NA = Not applicable/Not available

Source: EDMS ver. 5.1, L&B Analysis, 2010.

Alternative D:
Extend Runway to the Southeast by 240 Feet and to the Northwest by 860 Feet

Airfield Configuration: 2023 Alternative D would include no additional development, so the airfield layout would be the same as 2018 Alternative D.

Aircraft Activity Levels and Fleet Mix Characteristics: With or without the implementation of this alternative the number of annual aircraft operations for 2023 would be the same as discussed for 2023 Alternative A. However, emissions due to aircraft would change as compared to the 2023 Alternative A because the extension of the runway would cause a change in taxi time. This alternative would result in an increase in average aircraft taxi time as compared to the 2023 Alternative A. Longer taxi times increase annual aircraft emissions. It is expected that Alternative D would have a decreased taxi time compared to Alternative B. Alternative B increases the distance from the central aircraft parking area to the runway ends as compared to Alternative D. Therefore Alternative D would have decreased annual emissions compared to Alternative B.

In addition to the increase in taxi time, the critical aircraft in this alternative would be able to take off with 100 percent of its MTOW as compared to a reduced MTOW with the aircraft in the 2023 Alternative A. The ability to take off with 100 percent of MTOW as compared to a reduced MTOW would result in a slight increase in annual aircraft emissions. This is because when an aircraft is heavier it takes slightly longer to takeoff and climbout as compared to a lighter aircraft thus burning slightly more fuel and producing slightly greater air emissions. It is anticipated that under Alternative D, the critical aircraft and a small number of other aircraft would no longer be required to make stops at alternate airports to refuel to reach their final destination and thus reduce emissions. However, given the variability of this activity in terms of which aircraft and airports, and to present a worst case scenario for estimated emissions, the potential reduction in air emissions at DVO or other area airports was not quantified in this analysis.

Mobile Sources: Alternative D would not increase the number of ground access vehicles using DVO beyond the 2023 Alternative A condition or Alternative B, because there would be no new buildings, hangars, or additional annual aircraft operations.

Stationary Sources: No new buildings or hangars are proposed for 2023 Alternative D, therefore emissions from stationary sources would be the same as 2023 Alternative A.

Emissions Inventory: The emission inventory for 2023 Alternative D provided in **Table 5.5-7**, shows the greatest overall emission contribution comes from aircraft operations. See Table 5.5-8 at the end of this section for a comparison of the increase in emissions of each alternative against the No Action condition for each year.

Table 5.5-7
ALTERNATIVE D (2023) EMISSIONS INVENTORY
Gnoss Field Airport

EMISSION SOURCES	ANNUAL EMISSIONS (tons per year)						
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Pb**
Aircraft	200.17	16.00	1.47	0.59	12.55	12.55	0.15
GSE	0.56	0.07	0.11	0.01	0.01	0.01	NA
GAV in Parking Facilities	0.27	0.02	0.01	0.00	0.00	0.00	NA
GAV on Roadways	0.23	0.01	0.01	0.00	0.00	0.00	NA
Stationary Sources	0.52	17.18	1.22	0.00	0.05	0.05	NA
TOTAL	**201.75**	**33.29**	**2.83**	**0.60**	**12.61**	**12.61**	**0.15**

Total emissions may not sum exactly due to rounding.
NA = Not applicable/Not available
Source: EDMS ver. 5.1, L&B Analysis, 2010.

5.5.5 DETERMINATIONS

5.5.5.1 NEPA Analysis for Air Quality

For a Federal NEPA determination, an air quality analysis is needed to determine the proposed action's potential impact on air quality. The inventories were then compared to Alternative A emissions of the same year to discern the net emissions (the difference between the total emissions from each of the development alternatives and Alternative A). **Table 5.5-8**, summarizes the net difference in emissions and compares that to the CAA conformity threshold for each pollutant. If an alternative's net emissions exceed the conformity threshold then a significant impact would occur. Conversely, if an alternative's net emissions do not exceed the conformity threshold then a significant impact would not occur. Section 176(c) of the CAA, as amended in 1990, requires that Federal actions conform to the appropriate Federal or State air quality plans (FIP's or SIP's) in order to attain the CAA's air quality goals. Marin County is located within the Bay Area Air Quality Management (BAAQMD) District of California. The BAAQMD is responsible for assuring the NAAQS are attained. Therefore, BAAQMD thresholds have been included in the analysis.

Alternative B and Alternative D were compared to Alternative A of the same year. Annual net emissions of CO for Alternative B and D for 2018, are well below the threshold of 100 tons per year. Annual net emissions of CO for Alternative B and D for 2023, are also well below the threshold of 100 tons per year. Annual net emissions of $PM_{2.5}$ for Alternative B and D for 2018, as compared to Alternative A are well below the Federal threshold of 100 tons per year and the California threshold of 10 tons per year. Annual net emissions of VOC and NO_X for Alternative B and D are also well below the de minimis thresholds established under the CAA.

Table 5.5-8
ANNUAL NET EMISSIONS OF CRITERIA AND PRECURSOR AIR POLLUTANTS AND CONFORMITY THRESHOLD (BUILD ALTERNATIVES COMPARED TO NO ACTION OF THE SAME YEAR)
Gnoss Field Airport

ALTERNATIVES	IMPACT OF CRITERIA AND PRECURSOR POLLUTANT EMISSIONS (in tons per year)						
	CO	**VOC**	**NO_x**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**	**Pb**
CLEAN AIR ACT Conformity Threshold	**100**	**100**	**100**	**100**	**NA**	**100**	**NA**
BAAQMD Threshold	**NA**	**NA**	**10**	**NA**	**15**	**10**	**NA**
Construction Year 1							
Alternative B	2.64	NA	4.69	0.00	0.22	0.20	NA
Alternative D	2.64	NA	4.69	0.00	0.22	0.20	NA
Construction Year 2							
Alternative B	0.83	NA	1.23	0.00	0.07	0.07	NA
Alternative D	0.83	NA	1.23	0.00	0.07	0.07	NA
2018							
Alternative B	6.18	1.83	0.10	0.04	0.03	0.03	0.00
Alternative D	5.92	1.76	0.10	0.04	0.03	0.03	0.00
2023							
Alternative B	6.89	2.05	0.11	0.05	0.03	0.03	0.01
Alternative D	6.61	1.96	0.11	0.04	0.03	0.03	0.01

CO: Carbon Monoxide
VOC: Volatile Organic Compounds
NOx: Nitrogen Oxides
SOx: Sulfur Oxides
PM10: Course particulate matter
PM2.5: Fine particulate matter
Pb: Lead
NA = Not applicable/Not available
Total emissions may not sum exactly due to rounding.
Source: EDMS ver. 5.1, L&B, 2009.

The evaluation showed that the net emissions for each project alternative in 2018 and 2023 and from construction activities would be below the CAA thresholds, would not exceed any NEPA significance criteria, and the impact of Alternative B or Alternative D on air quality is not significant.

5.5.5.2 State Implementation Plan (SIP) Compliance

According to the CAA, each state must provide the USEPA with a SIP. The SIP must include a strategy for air quality improvement in local areas for each criteria pollutant that exceeds the NAAQS. The SIP must also include a plan to maintain acceptable air quality in areas that do not exceed the NAAQS.

The California SIP is made up of a series of plans for each of the major air basins in the state. The Final Bay Area 2010 Clean Air Plan[9] was adopted on September 15, 2010.

The air quality evaluation showed that annual net emissions caused by operation and construction of the alternatives, would not equal or exceed the relevant *de minimis* thresholds for the pollutants of concern. Therefore the alternatives would be assumed to comply with the Final Bay Area 2010 Clean Air Plan/SIP because the alternatives would not cause or contribute to new violations of any NAAQS; increase the frequency or severity of existing violations of any NAAQS; or, delay the timely attainment of any NAAQS or any required interim emission reductions or milestones. A more detailed discussion of the Final Bay Area 2010 Clean Air Plan is provided in Appendix F.

5.5.5.3 General Conformity Evaluation

The evaluation of General Conformity showed that annual net emissions caused by operation and construction of Alternative B or Alternative D, would not equal or exceed the relevant *de minimis* thresholds for the pollutants of concern. Therefore implementation of either Alternative B or Alternative would not have a significant impact on air quality. A CAA General Conformity Determination is not necessary for Alternative B or Alternative D.

Further, because the emissions caused by Alternative B and the other alternatives are *de minimis*, in accordance with FAA Order 1050.1E, Change 1, *Environmental Impacts: Policies and Procedures,* and FAA *Air Quality Procedures for Civilian Airports & Air Force Bases* the project is determined not to cause an exceedance of the NAAQS[10], and there is no requirement to conduct dispersion analysis to compare project-related emissions to the NAAQS. Consequently, Alternative B and Alternative D comply with CAA Section 176(c) (1). No further analysis or reporting is required under the provisions of the CAA or NEPA.

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[9] Bay Area Air Quality Management District. Final Bay Area Clean Air Plan. September 15, 2010.

[10] FAA, *Air Quality Procedures for Civilian Airports and Air Force Bases*, April 1997; and Addendum, September 2004 quoted from Section 2.1.5, NAAQS Assessment, "If the action is in a nonattainment or maintenance area and exempt or presumed to conform under conformity requirements, it is assumed that a NAAQS assessment is not required for an airport or air base action since it is unlikely the action's pollutant concentrations would exceed the NAAQS."

5.5.5.4 Assessment of Climate Change

Although there are no Federal standards for aviation-related GHG emissions, it is well-established that GHG emissions can affect climate.[11] The Council on Environmental Quality (CEQ) has indicated that climate should be considered in NEPA analyses. As noted by CEQ, however, "it is not currently useful for the NEPA analysis to attempt to link specific climatological changes, or the environmental impacts thereof, to the particular project or emissions, as such direct linkage is difficult to isolate and to understand".[12] The following provides an estimate of GHG emissions for the various alternatives. These estimates are provided for information only as no Federal NEPA standard for the significance of GHG emissions from individual projects on the environment has been established. Emissions from Alternative B are approximately 3 metric tons higher than from Alternative D in both year 2018 and year 2023.

Alternative A (No Action)

Under Alternative A, there would be no increase in project specific GHG emissions.

Alternative B (Sponsor's Proposed Project)

For 2018 conditions, the Sponsor's Proposed Project would increase GHG emissions by 242.13 metric tons over the No Action alternative of the same year, an increase of approximately nine percent. This increase would comprise less than 3.55×10^{-8} percent of U.S. based GHG emissions and less than 4.94×10^{-9} percent of global GHG emissions.[13] For 2023 conditions, the Sponsor's Proposed Project would increase GHG emissions by 269.33 metric tons over the No Action alternative of the same year, an increase of approximately nine percent. This increase would comprise less than 3.95×10^{-8} percent of U.S. based GHG emissions and less than 5.50×10^{-9} percent of global GHG emissions.

Alternative D

For 2018 conditions, Alternative D would increase GHG emissions by 239.18 metric tons over the No Action alternative of the same year, an increase of approximately nine percent. This increase would comprise less than 3.51×10^{-8} percent of U.S. based GHG emissions and less than 4.88×10^{-9} percent of global GHG emissions. For 2023 conditions, Alternative D would increase GHG emissions by 266.08 metric tons over the No Action alternative of the same year, an increase of approximately nine percent. This increase would comprise less than 3.90×10^{-8} percent of U.S. based GHG emissions and less than 5.43×10^{-9} percent of global GHG emissions.

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11 See *Massachusetts* v. *E.P.A.,* 549 U.S. 497, 508-10, 521-23 (2007).

12 CEQ, *Draft NEPA Guidance on Consideration* of *the Effects* of *Climate Change and Greenhouse Gas Emissions,* (2010). http://ceq.hss.doe.gov/nepa/regs/Consideration_ of Effects_ of GHG_Draft_NEP A_Guidance_FINAL _02182010.pdf

13 U.S. based GHG emission estimated at 6,821.8 million metric tons CO_2 equivalent in Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990-2010, (April 2012). The IPCC estimates global GHGs in 2004 at 49 Gigatonnes.

Summary

Based on the findings presented, no further consideration of GHGs is necessary.[14] There is no substantive difference in GHG emissions between alternatives B and D. See Appendix F for additional details regarding the GHG evaluation.

[14] FAA Order 1050.1E, Change 1, Guidance Memo#3. To: FAA Lines of Business and Managers with NEPA Responsibilities. From: Julie Marks, FAA AEE-400, Prepared by Thomas Cuddy, FAA AEE-400. Subject: Considering Greenhouse Gases and Climate Under the National Environmental Policy Act (NEPA): Interim Guidance. January 12, 2012.