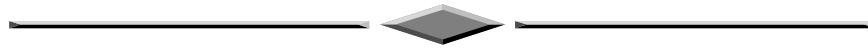


APPENDIX C

AIR QUALITY TECHNICAL APPENDIX



**APPENDIX C
AIR QUALITY TECHNICAL APPENDIX**

TABLE OF CONTENTS

<u>SECTION</u>	<u>TITLE</u>	<u>PAGE</u>
C.1	INTRODUCTION.....	C-1
C.2	BACKGROUND/DATA SOURCES.....	C-1
C.2.1	Baseline - NAS Point Mugu	C-1
C.2.2	Baseline - Point Mugu Sea Range	C-1
C.2.3	Minimum Components/Preferred Alternatives.....	C-2
C.3	PROCEDURES USED FOR EMISSION ESTIMATES - NEPA AND EO 12114 ANALYSES	C-2
C.3.1	Stationary Source Emissions	C-2
C.3.1.1	No Action Alternative/Baseline	C-2
C.3.1.2	Minimum Components/Preferred Alternatives	C-4
C.3.2	Motor Vehicle Emissions	C-4
C.3.2.1	No Action Alternative/Baseline	C-4
C.3.2.2	Minimum Components/Preferred Alternatives	C-4
C.3.3	Aircraft Operations	C-4
C.3.3.1	No Action Alternative/Baseline	C-4
C.3.3.2	Minimum Components/Preferred Alternatives	C-6
C.3.4	Marine Vessel Emissions.....	C-7
C.3.5	Missile/Target Emissions	C-8
C.4	EMISSIONS TRANSPORT ANALYSIS	C-9
C.5	CLEAN AIR ACT CONFORMITY APPLICABILITY	C-9
C.5.1	Point Mugu Sea Range	C-9
C.5.1.1	Aircraft Emissions.....	C-13
C.5.1.2	Marine Vessels.....	C-13
C.5.2	Actions Occurring in Ventura County.....	C-15
C.6	EMISSION CALCULATIONS	C-15
	Record of Non-Applicability.....	C-60

LIST OF FIGURES

<u>NUMBER</u>	<u>TITLE</u>	<u>PAGE</u>
C-1	U.S. Territorial Waters Limit/State Waters Limit.....	C-3
C-2	Emission Transport Estimate for NEPA Air Quality Analysis Using Mean Annual Surface Winds	C-10
C-3	Air Districts in the Region of Influence	C-11



LIST OF TABLES

<u>NUMBER</u>	<u>TITLE</u>	<u>PAGE</u>
C.5-1	<i>De minimis</i> Levels for Determination of Applicability of General Conformity Rule.....	C-12
C.5-2	Aircraft Sorties and Operations Associated with the Proposed Action	C-14
C.5-3	Emission Sources Associated with the Proposed Action	C-15
C.6-1	Summary of Emissions at NAS Point Mugu	C-16
C.6-2	Aircraft Operation Emissions at NAS Point Mugu	C-17
C.6-3	Point Mugu Sea Range Aircraft Emissions - No Action	C-18
C.6-4	Point Mugu Sea Range Aircraft Emissions - Proposed Action	C-26
C.6-5	Point Mugu Sea Range Marine Vessel Emissions - No Action	C-36
C.6-6	Point Mugu Sea Range Marine Vessel Emissions -Proposed Action	C-40
C.6-7	Point Mugu Sea Range Missile/Target Activities - No Action	C-44
C.6-8	Point Mugu Sea Range Missile/Target Activities - Proposed Action	C-48
C.6-9	Point Mugu Sea Range Aircraft Emissions -Conformity Applicability	C-52
C.6-10	Point Mugu Sea Range Marine Vessel Emissions - Conformity Applicability	C-58

APPENDIX C AIR QUALITY TECHNICAL APPENDIX

C.1 INTRODUCTION

This appendix provides additional information on the methodology developed in support of the emissions analyses presented in Chapter 4 of the EIS/OEIS. In addition, this appendix contains a discussion of Clean Air Act general conformity requirements promulgated by the U.S. Environmental Protection Agency (USEPA) and a discussion of conformity applicability for the proposed action, including a draft Record of Non-Applicability (RONA) and supporting material.

Emissions analyses used for the National Environmental Policy Act (NEPA) and Executive Order 12114, Environmental Effects Abroad of Major Federal Actions (EO 12114) impact assessments are more comprehensive than those used for general conformity determination purposes. The description of analysis procedures used for the NEPA and EO 12114 analysis is provided in Section C.3 of this appendix. The description of analysis procedures used for the conformity analysis is provided in Section C.5.

C.2 BACKGROUND/DATA SOURCES

C.2.1 Baseline - NAS Point Mugu

Baseline emissions for all sources at NAS Point Mugu were obtained from the *Final Environmental Impact Statement for the Realignment of E-2 Squadrons from Marine Corps Air Station (MCAS) Miramar* (Southwest Division 1998 - hereafter referred to as the "E-2 FEIS"). This analysis provides the most current and complete set of emissions data available for NAS Point Mugu.

C.2.2 Baseline - Point Mugu Sea Range

To estimate emissions associated with current activities, the baseline operations level of testing and training activity was used to establish an air quality baseline for the Sea Range. For the air quality analysis, Sea Range emissions were calculated separately for aircraft operations, marine vessel activity, and missile and target activity (the specific procedures for calculating emissions are provided in Section C.3). These emissions estimates were then combined to provide an air quality baseline for the Sea Range. Since emissions associated with NAS Point Mugu airfield operations were included in the NAS Point Mugu air quality baseline (see C.2.1 above), emissions below 3,000 feet (914 m) and within 3 NM (5.6 km) from the mainland shore were not included in the Sea Range baseline emissions calculations.

Baseline emission sources for NAS Point Mugu include those emissions generated by the recent addition of 16 E-2 aircraft to Point Mugu. While E-2 aircraft occasionally support Sea Range operations (typically during a FLEETEX), and their emissions were included within the Sea Range baseline emissions estimates, the relocation of the 4 E-2 squadrons to Point Mugu does not result in an increase of Sea Range emissions due to additional E-2 operations. The E-2 squadrons do not use the Point Mugu Sea Range for training, but typically train in two main areas: 1) airspace associated with the San Clemente Island range, and 2) airspace (R2508) in the Owens Valley. Transit routes to these areas do not typically pass through Sea Range airspace, but in the case that they did, the E-2 aircraft fly above 3,000 feet (914 m), and their emissions would not affect regional air quality.



C.2.3 Minimum Components/Preferred Alternatives

Both the Minimum Components Alternative and the Preferred Alternative include proposed operations that would result in increased activities at NAS Point Mugu and on the Sea Range. These activities would result in potential increases in air emissions. The proposed action is to accommodate new types of testing and training, accommodate an increase in current training operations, and modernize Sea Range facilities. Except for minor increases in construction emissions associated with facility modernization, emission sources associated with the proposed activities are limited to aircraft operations, marine vessel operations, and missile and target operations. There would not be an increase in the number of personnel at NAS Point Mugu. Therefore, there would not be an increase in emissions associated with personal or government motor vehicle operations. Due to the minimal numbers of operations proposed (i.e., a maximum of 150 aircraft sorties per year, of which only 99 would originate from NAS Point Mugu), there would not be a need for additional maintenance facilities or support equipment at NAS Point Mugu; the small number of operations could be accommodated within the existing range of annual operations.

For the air quality analysis, Sea Range emissions were calculated separately for aircraft operations, marine vessel activity, and missile and target activity (the specific procedures for calculating emissions are provided in Section C.3). These emission estimates were then combined to provide an estimate of the emissions increase associated with the Minimum Components and Preferred Alternatives, and used to assess the potential for significant impacts on air quality. For purposes of distinguishing between potential NEPA impacts and potential EO 12114 impacts, estimates were made to identify operations occurring within or outside of U.S. Territory. For purposes of this EIS/OEIS, operations in those areas landward of San Nicolas Island were included within the U.S. Territory emissions estimates (i.e., inclusive of Range Areas 3B/W2, 3D, and 3A; Figure C-1). Airfield operations at NAS Point Mugu associated with the proposed activities were included in the NEPA analysis and also used in the assessment of conformity applicability (refer to Section C.5).

C.3 PROCEDURES USED FOR EMISSION ESTIMATES - NEPA AND EO 12114 ANALYSES

Emissions were categorized on the basis of the following types of emission sources:

- Stationary Sources
- Motor Vehicle Operations
- Aircraft Operations
- Marine Vessel Operations
- Missile/Target Operations

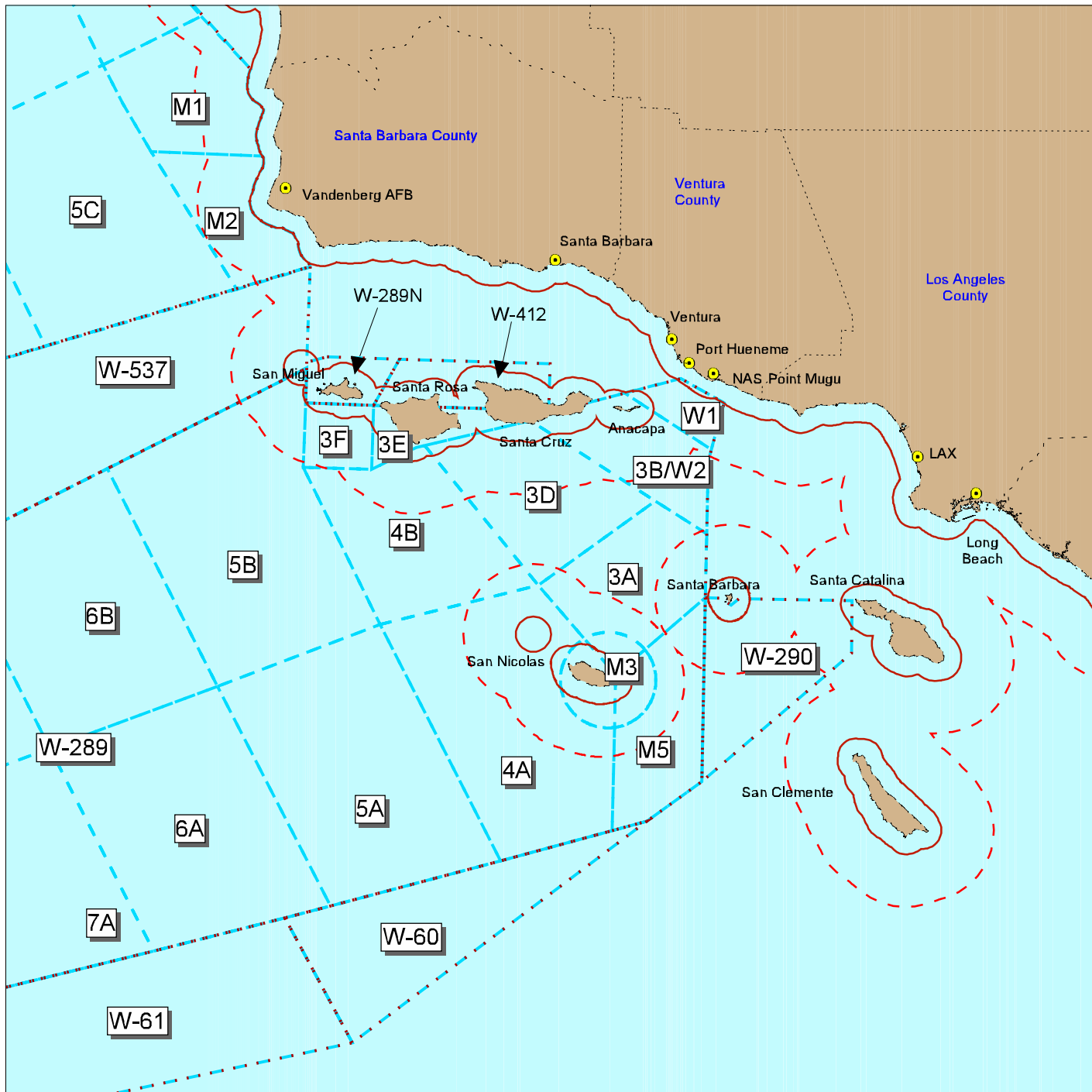
Each subsection below describes the procedures used to estimate emissions for each source category. Procedures are described separately for the No Action Alternative (baseline/current activities) and the Minimum Components/Preferred Alternatives as appropriate.

C.3.1 Stationary Source Emissions





C.3.1.1 No Action Alternative/Baseline

Emissions for all stationary sources were calculated by summing the 1996 estimates plus the E-2 stationary source contributions, as reflected in the E-2 FEIS (Table C.6-1 – included in Section C.6, Emission Calculations).

U.S. Territorial Waters Limit State Waters Limit



Legend

-  Warning Area Boundaries
-  Sea Range
-  U.S. Territorial Waters Limit
-  State Waters Limit (3 NM)



Projection: Universal Transverse Mercator
North American Datum 1927
Zone 11

30 0 30 Nautical Miles



Figure
C-1

C.3.1.2 Minimum Components/Preferred Alternatives

None of the activities proposed as part of the Minimum Components or Preferred Alternatives would result in an increase in stationary source emissions.

C.3.2 Motor Vehicle Emissions

C.3.2.1 No Action Alternative/Baseline

A - Personal Vehicles

Annual emissions from personal vehicles at NAS Point Mugu were calculated by summing the 1996 estimates plus the E-2 personal vehicle source contributions, as reflected in the E-2 FEIS (see Table C.6-1 – included in Section C.6, Emission Calculations).

B - Government Vehicles

Annual emissions from government owned vehicles at NAS Point Mugu were calculated by summing the 1996 estimates plus the E-2 government owned vehicle source contributions, as reflected in the E-2 FEIS (see Table C.6-1).

C.3.2.2 Minimum Components/Preferred Alternatives

None of the activities proposed as part of the Minimum Components or Preferred Alternatives would result in an increase in motor vehicle emissions.

C.3.3 Aircraft Operations

Aircraft include fixed-wing and rotary-wing aircraft. The methodology described below was used to estimate emissions from aircraft for the No Action Alternative and the Minimum Components/Preferred Alternatives. The methodology is based on the most recent data sources, as well as consultation with the Navy's Aircraft Environmental Support Office (AESO).

C.3.3.1 No Action Alternative/Baseline

For the No Action Alternative (current operations), separate estimates were made for aircraft emissions at the NAS Point Mugu airfield (included in the E-2 FEIS) and emissions for aircraft operating on the Sea Range in support of NAWCWPNS Point Mugu activities.

A - NAS Point Mugu

Annual emissions from aircraft operations at NAS Point Mugu were calculated by summing the 1996 estimates plus the E-2 aircraft operations, as reflected in the E-2 FEIS. These estimates include aircraft emissions below 3,000 feet (914 m) and within 3 NM (5.6 km) from shore (Table C.6-2 – included in Section C.6, Emission Calculations).

B - Point Mugu Sea Range

Since airfield time (i.e., taxi, take-off, landing, climb out) for those aircraft flights which originated from NAS Point Mugu were included in the NAS Point Mugu emission estimates, these emissions

were not included in the estimates of baseline emissions from aircraft operations on the Sea Range. Therefore, except for the F-4 which also lands and takes off from the airfield at San Nicolas Island, aircraft are assumed to operate in the cruise mode while conducting exercises on the Sea Range. Emissions above 3,000 feet (914 m) were considered to be above the atmospheric inversion layer and would not have an impact on the local air quality. Therefore, to estimate baseline Sea Range emissions, aircraft operating beyond 3 NM (5.6 km) from the mainland coast and between 0 and 3,000 feet (0 and 914 m) within the Sea Range were included in the estimates. The average time each aircraft type operates between 0 and 3,000 feet (0 and 914 m) was calculated based on aircraft operating profiles and estimated time of operation as provided by NAWCWPNS Point Mugu. The following describes each step used to prepare the emission estimates (Table C.6-3 – included in Section C.6, Emission Calculations).

Step 1: Determine the number and type of aircraft operation. The number and type of operation for aircraft operating in the Sea Range for FY95 were obtained from data collected in support of this EIS/OEIS to characterize baseline conditions for the Sea Range (refer to Section 3.0 and Appendix B of this EIS/OEIS). For purposes of characterizing annual emissions within and outside of U.S. Territory, estimates were made to identify aircraft operations occurring within or outside of U.S. Territory boundaries. For purposes of the air quality analysis conducted for this EIS/OEIS, aircraft operations in those areas landward of San Nicolas Island were included within the U.S. Territory emissions estimates (i.e., inclusive of Range Areas 3B/W2, 3D, and 3A; refer to Figure C-1). In all cases, these estimates were based on actual operational scenarios.

Step 2: Determine type of engine modes. In consultation with AESO, the type of operations were used to determine standard engine modes (i.e., power settings) for aircraft during takeoff, landing, etc. for each aircraft type. As described above, to estimate the air quality baseline for Sea Range operations, it was assumed that aircraft would be operating predominantly in the cruise mode. Emissions for operations which occur above 3,000 feet (914 m) were not considered in this analysis. For estimating baseline emissions associated with the Sea Range, the taxis, takeoffs, and landings associated with Sea Range aircraft were accounted for in the NAS Point Mugu baseline airfield emissions, and were not included in the Sea Range aircraft emission estimates. Emissions following takeoff from the NAS Point Mugu airfield, and all Sea Range operations occurring below 3,000 feet (914 m) were included in the Sea Range emissions estimates. For those aircraft operating below 3,000 feet (914 m), cruise mode was used to provide an estimate of emissions from air operations. For all aircraft, the time spent between the surface and 3,000 feet (914 m) was based on aircraft profiles (e.g., the F-18 spends most of its operating time at altitudes above 3,000 feet (914 m) while the S-3 aircraft spends a large amount of time operating below this altitude [e.g., during inert mine shape drop exercises]).

Step 3: Determine number and type of engine. For each aircraft type, the number of engines and engine type were cataloged according to source reference information obtained from AESO.

Step 4: Determine time in mode. The time in mode (TIM) for U.S. Navy and U.S. Air Force aircraft were obtained from AESO. TIM differs for jet engine aircraft versus propeller-driven aircraft.

Step 5: Determine emission factors. For each engine type, the emission factors were obtained from AESO.

Step 6: Calculate emission estimates. Emissions were calculated by multiplying together the number of operations (Step 1) at a specific mode (Step 2), number of engines (Step 3), the time spent



in each mode (Step 4), and the corresponding emission factors (Step 5). Emission rates in this report were calculated for the use of JP-5 fuel. Emissions were estimated separately for those operations occurring within and outside of U.S. Territory, as described above in Step 1.

C.3.3.2 Minimum Components/Preferred Alternatives

For the Minimum Components and Preferred Alternatives, separate emission estimates were made to assess potential air quality impacts under NEPA and EO 12114 (Table C.6-4 – included in Section C.6, Emission Calculations). In addition, as a subset of the NEPA analysis, emission estimates were made to assess Clean Air Act conformity applicability. For each of these assessments, estimated annual emissions from aircraft operations included the following sources:

A - NEPA

Aircraft operations below 3,000 feet (914 m) in those areas landward of San Nicolas Island were included within the U.S. Territory emissions estimates (i.e., inclusive of Range Areas 3B/W2, 3D, and 3A; refer to Figure C-1). This includes all airfield operations at NAS Point Mugu associated with the proposed activities. For the purposes of assessing Clean Air Act conformity applicability, only those aircraft operations occurring below 3,000 feet (914 m) and within 3 NM (5.6 km) of the coastline were included in the emissions estimate (see Section C.5).

B - EO 12114

Aircraft operations below 3,000 feet (914 m) in those areas seaward of the U.S. Territorial Waters limit were included within the EO 12114 emissions estimates (refer to Figure C-1).

The following describes each step used to prepare the emission estimates.

Step 1: Determine the number and type of aircraft operation. The number and type of operation for aircraft that would operate at NAS Point Mugu and in the Sea Range to support the proposed activities were obtained from data collected in support of this EIS/OEIS (refer to Chapter 2 and Appendix B of the EIS/OEIS). For the proposed additional FLEETEX, all aircraft activities associated with FLEETEX operations scheduled and controlled by NAWCWPNS Point Mugu were included in the emissions estimates (57 sorties/291 operations). An aircraft carrier participating in a FLEETEX may also operate other aircraft outside NAWCWPNS scheduling and control. This activity typically takes place in non-Territorial Waters of the Sea Range, and except for taking off and landing, operations typically occur above 3,000 feet (914 m). Since the emissions below 3,000 feet (914 m) would be minor and would occur well offshore, they were not included in the quantitative estimates of FLEETEX emissions. For purposes of distinguishing between potential NEPA impacts and potential EO 12114 impacts, estimates were made to identify aircraft operations occurring within or outside of U.S. Territory. For purposes of the air quality analysis conducted for this EIS/OEIS, aircraft operations in those areas landward of San Nicolas Island were included within the U.S. Territory emissions estimates (i.e., inclusive of Range Areas 3B/W2, 3D, and 3A; refer to Figure C-1). The NEPA analysis included all airfield operations at NAS Point Mugu associated with the proposed activities. In all cases, these estimates were based on proposed operational scenarios.

Step 2: Determine type of engine modes. In consultation with AESO, the type of operations were used to determine standard engine modes (i.e., power settings) for aircraft during takeoff, landing, etc. for each aircraft type. Emissions for operations that would occur above 3,000 feet (914 m) were not

considered in this analysis. Emissions associated with all taxis, takeoffs, and landings were included in the emission estimates. In addition, all Sea Range operations occurring below 3,000 feet (914 m) were included in the emissions estimates. For those aircraft operating below 3,000 feet (914 m) within the Sea Range, cruise mode was used to provide an estimate of emissions from air operations. For all aircraft, the time spent between the surface and 3,000 feet (914 m) was based on aircraft profiles associated with the proposed activities.

Step 3: Determine number and type of engine. For each aircraft type, the number of engines and engine type were cataloged according to source reference information obtained from AESO.

Step 4: Determine time in mode. The time in mode (TIM) for U.S. Navy and U.S. Air Force aircraft were obtained from AESO. TIM differs for jet engine aircraft versus propeller-driven aircraft.

Step 5: Determine emission factors. For each engine type, the emission factors were obtained from AESO.

Step 6: Calculate emission estimates. Emissions were calculated by multiplying together the number of operations (Step 1) at a specific mode (Step 2), number of engines (Step 3), the time spent in each mode (Step 4), and the corresponding emission factors (Step 5). Emission rates in this report were calculated for the use of JP-5 fuel. Emissions were estimated separately for those operations occurring within and outside of U.S. Territory, as described above in Step 1.

C.3.4 Marine Vessel Emissions

Marine vessels in the Sea Range include project ships, range project ships, and range support vessels. The methodology for estimating emissions involves evaluating the type of operation for each vessel type, the time in mode of operation for each vessel, the number of operations of each vessel type, and emission factors for each vessel type. Baseline marine vessel emissions were estimated using Sea Range operations data from FY95, the year for which the most complete operational data were available.

The methodology described below was used to estimate emissions from marine vessels in the Sea Range for the No Action Alternative (Table C.6-5 – included in Section C.6, Emission Calculations) as well as the Minimum Components and Preferred Alternatives (Table C.6-6 – included in Section C.6, Emission Calculations). The methodology is based on the best available data as provided by Naval Sea Systems Command (NAVSEA).

Step 1: Determine the number and type of marine vessel operations. For the No Action Alternative, the number and type of operations for marine vessels operating in the Sea Range in FY95 were estimated based on available information (refer to Section 3.0 and Appendix B of this EIS/OEIS). The number and type of operations for marine vessels operating in the Sea Range for the Minimum Components Alternative and the Preferred Alternative were estimated based on proposed action information (refer to Chapter 2 and Appendix B of this EIS/OEIS). For purposes of identifying potential NEPA impacts from potential EO 12114 impacts, estimates were made to distinguish between vessel operations occurring within or outside of U.S. Territory. For purposes of the air quality analysis conducted for this EIS/OEIS, vessel operations in those areas landward of San Nicolas Island were included within the U.S. Territory emissions estimates (i.e., inclusive of Range Areas 3B/W2, 3D, and 3A; refer to Figure C-1). In all cases, these estimates were made in consultation with NAWCWPNS Point Mugu and were based on actual operational scenarios.



Step 2: Determine number and type of engine. For each marine vessel type, the number of engines and engine type were cataloged according to source reference information obtained from NAVSEA.

Step 3: Determine time in mode. Using available data from NAWCWPNS Point Mugu, operations scenarios were developed to determine time in mode for each vessel activity.

Step 4: Determine emission factors. For each engine type, the emission factors were provided by NAVSEA. Emission factors are a combination of main propulsion engines and generator sets for diesel and gas turbine ships, boilers, and emergency diesel generators for steam powered ships, and emergency diesel generators alone for nuclear powered ships.

Step 6: Calculate emission estimates. Emissions were calculated by multiplying together the number of operations (Step 1) by the time in mode (Step 3), and the corresponding emission factors (Step 4). Emissions were estimated separately for those occurring within and outside of U.S. Territory, as described above in Step 1.

C.3.5 Missile/Target Emissions

Missile/target emissions were estimated based on estimates of the type and number of missiles/targets and the type of propellant or fuel used in the missile/targets. The methodology described below was used to estimate emissions from missile and target activities for the No Action Alternative (Table C.6-7 – included in Section C.6, Emission Calculations) as well as the Minimum Components and Preferred Alternatives (Table C.6-8 – included in Section C.6, Emission Calculations).

Step 1: Determine the number and type of missile/target operations. The number and type of missiles/targets used at Point Mugu in FY95 were estimated based on available information for the baseline year (refer to Section 3.0 and Appendix B of this EIS/OEIS) and alternatives addressed within this EIS/OEIS (refer to Chapter 2 and Appendix B of this EIS/OEIS). For purposes of identifying potential NEPA impacts from potential EO 12114 impacts, estimates were made to distinguish between missile and target operations occurring within or outside of U.S. Territory. For purposes of the air quality analysis conducted for this EIS/OEIS, missile and target operations in those areas landward of San Nicolas Island were included within the U.S. Territory emissions estimates (i.e., inclusive of Range Areas 3B/W2, 3D, and 3A; refer to Figure C-1). In all cases, these estimates were made in consultation with NAWCWPNS Point Mugu and were based on actual operational scenarios.

Step 2: Determine type of fuel or propellant. For each missile/target type, the type of fuel or propellant used in the missile/target was cataloged according to source reference information obtained from NAWCWPNS Point Mugu.

Step 3: Determine emission factors. For each engine type, the emission factors were obtained from documentation provided by the Navy or other sources of military information.

Step 4: Calculate emission estimates. Emissions were calculated by multiplying together the number of operations (Step 1) and the corresponding emission factors (Step 3), based on the type of fuel or propellant (Step 2).

C.4 EMISSIONS TRANSPORT ANALYSIS

In order to address the issue of how emissions from additional Sea Range operations may impact various southern California air districts, an estimate of the percentage of emissions released in U.S. Territorial Waters of the NAWCWPNS Point Mugu Sea Range that could potentially reach shore along southern California and beyond was made using an annual mean surface wind analysis. NAS Point Mugu airfield emissions, as well as those emissions generated within 3 NM (5.6 km) of shore, are included in the conformity applicability analysis (see Section C.5) and are assumed to impact the Ventura County air basin; these emissions are excluded from the emissions transport analysis.

Assuming that emissions in the Sea Range area are distributed uniformly, the averaged wind blows about 34 percent to the South Coast air district, about 43 percent to the San Diego air district, and about 23 percent to Mexico as shown in Figure C-2¹. Air districts within the region of influence are shown in Figure C-3. The effects of local wind circulations and eddies in transporting the emissions to other regions are not shown because they are averaged out over time to show an annualized picture. Also, concentrations and dilution of pollutants are not considered in this estimate, nor are the effects of winds aloft which can blow from directions different from the surface wind.

Based on this analysis of annual mean surface wind vectors in the ROI, for the NEPA analysis it was assumed that all emissions generated from the Minimum Components Alternative and the Preferred Alternative within U.S. Territory would end up onshore. Therefore, after emission estimates were calculated for the additional emission sources associated with the Minimum Components and Preferred Alternatives, the total emissions estimated to occur within U.S. Territory (excluding those emissions within 3 NM (5.6 km) of shore and assumed to impact Ventura County) were multiplied by the percentages calculated in the emissions transport analysis. These percentages provide an estimate of the maximum offshore emissions that could be transported to different regions onshore.

C.5 CLEAN AIR ACT CONFORMITY APPLICABILITY

C.5.1 Point Mugu Sea Range

Under the provisions of 40 CFR Parts 51 and 93, federal actions are required to be in conformity with the State Implementation Plan (SIP) for those areas that are categorized as nonattainment or maintenance areas for any criteria pollutant. The proposed action includes activities in Ventura County, which is classified as a severe nonattainment area for ozone. Because of its location in a nonattainment area, the proposed action at the Point Mugu Sea Range must be evaluated to determine whether the provisions of 40 CFR Part 93, Subpart B, the General Conformity Rule, are applicable to the action, and to demonstrate that the proposed action is in conformity with the applicable SIP.

In accordance with the DoN's Draft Interim Guidance on Compliance with the CAA General Conformity Rule, the first step in evaluating the proposed project's conformity status is to conduct a conformity applicability evaluation. A proposed action can be exempted from the provisions of the General Conformity Rule if the following conditions apply:

¹ The annual mean surface wind used to compute emission transport estimates was based on Navy analyses of winds from 17 stations along the coast and offshore southern California. Periods of record for these stations averaged about 13 years for the island and offshore sites, and about 43 years for the coastal and inland sites. In Figure C-2, the region enclosed by the red line indicates the area of potential emissions from new Sea Range activity. The light blue arrows represent the smoothed surface wind field obtained from the individual wind stations (yellow circles) and their averaged annual wind (thin black lines).



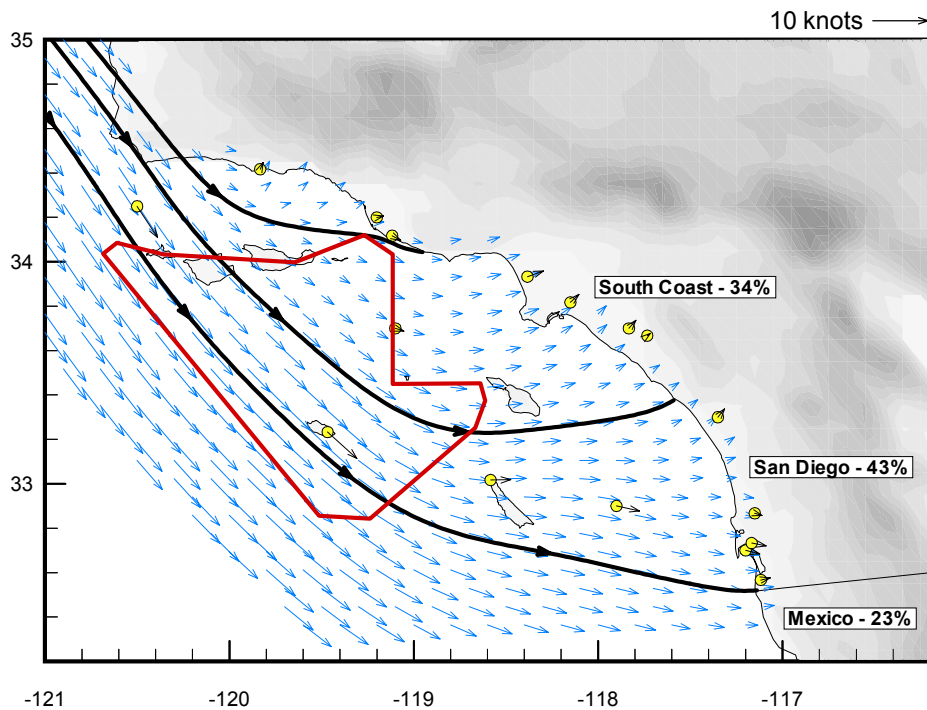


Figure C-2
Emission Transport Estimate for NEPA Air Quality Analysis
Using Mean Annual Surface Winds

- (1) The proposed action's emissions are below the *de minimis* emission levels set forth in the General Conformity Rule.
- (2) The proposed action is specifically exempted under the provisions of 40 CFR 93.153(d).

For the purpose of identifying conformity requirements associated with the Point Mugu Sea Range proposals, the proposed action was evaluated to determine whether the proposed activities are exempt from the provisions of the General Conformity Rule and the requirements to conduct a full conformity determination. The requirements for a conformity applicability evaluation do not apply to the following:

- (1) The portion of an action that includes major new or modified stationary sources that require a permit under the New Source Review (NSR) program or Prevention of Significant Deterioration (PSD) program;
- (2) Actions in response to emergencies or natural disasters;
- (3) Research, investigations, studies, demonstrations, or training where no environmental detriment is incurred and/or the particular action furthers air quality research;
- (4) Alteration and addition of existing structures as specifically required by new or existing applicable environmental legislation or regulations;

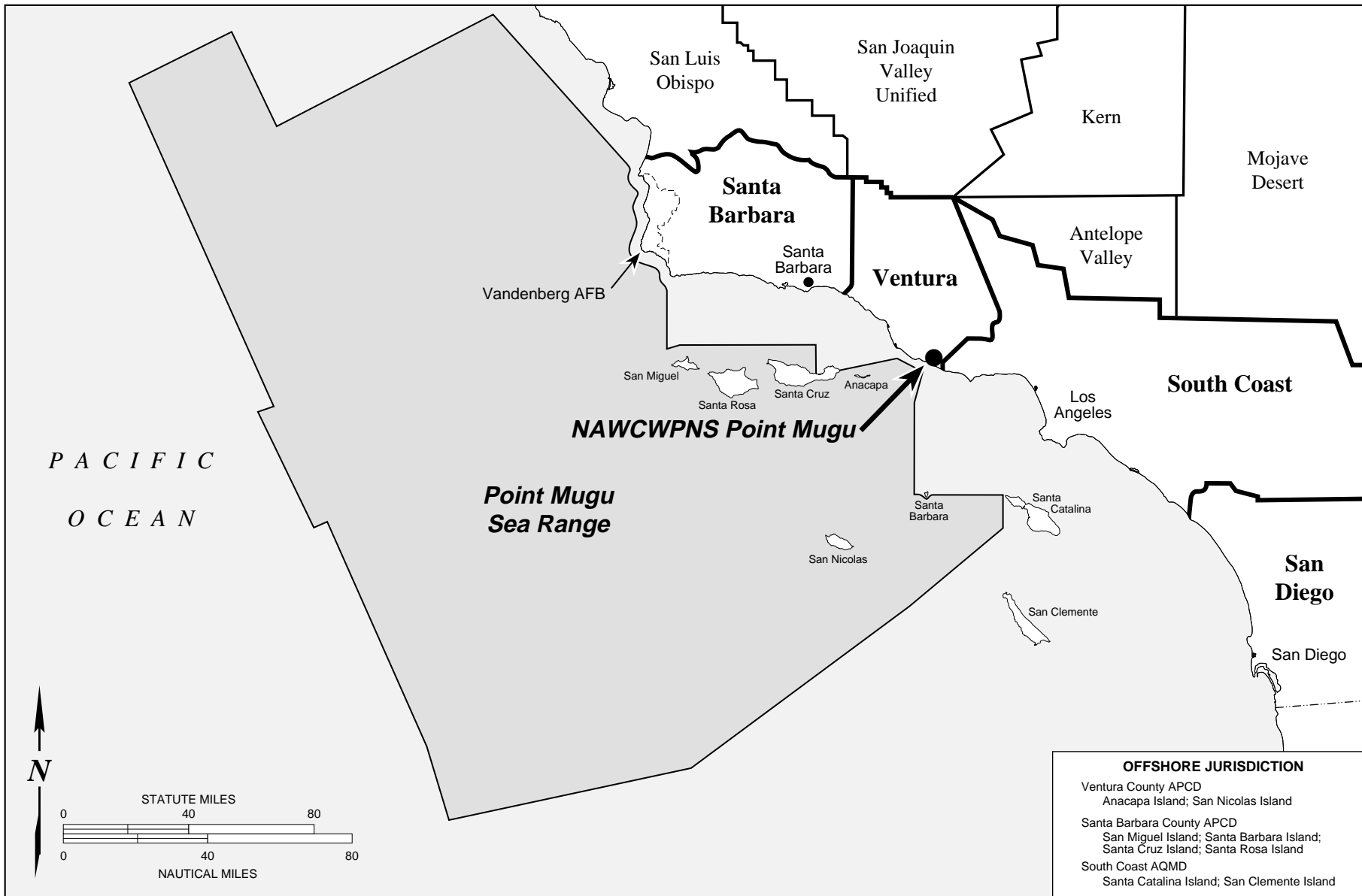


Figure C-3
Air Districts in the Region of Influence



- (5) Direct emissions from remedial and removal actions carried out under the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) and associated regulations to the extent such emissions either comply with the substantive requirements of NSR/PSD program or are exempted from other environmental regulation; or
- (6) Federal actions which are part of a continuing response to an emergency or disaster and which are to be taken more than six months after the commencement of the response to the emergency or disaster if the federal agency makes a written determination that it is impractical to prepare the conformity analyses or the federal agency makes a new determination of conformity.

Because Ventura County is classified as a severe nonattainment area for ozone, it was necessary to compare the proposed project's emissions increases with *de minimis* levels that apply for the area in which the action is located. Table C.5-1 below shows the *de minimis* levels for nonattainment pollutants in Ventura County.

Table C.5-1. *De minimis* Levels for Determination of Applicability of General Conformity Rule

Air Basin	<i>De minimis</i> Levels, tons/year				
	ROG/HC	NO _x	NO ₂	CO	PM ₁₀
Ventura County	25	25	--	--	--

If emissions of criteria pollutants associated with the proposed action are below the *de minimis* levels, and the emissions are not regionally significant (i.e., greater than 10 percent of the air basin's emissions budget), the proposed action is exempt from the requirements of a full conformity determination under the General Conformity Rule. If emissions of criteria pollutants associated with the proposed action are above the *de minimis* levels, the proposed action must undergo a full conformity determination to demonstrate that the action:

- (1) will not cause or contribute to new violations of an air quality standard;
- (2) will not interfere with the provisions in the applicable SIP for maintenance of any standard;
- (3) will not increase the frequency or severity of existing violations of federal air quality standards; and
- (4) will not delay the timely attainment of federal air quality standards.

The conformity applicability analysis to evaluate whether the proposed action's emissions are below the *de minimis* levels was conducted in accordance with the DoN guidance. In accordance with that guidance, certain classes of sources were evaluated as described below. Emissions associated with the proposed action include emissions from the following source categories:

- Aircraft Operations
- Marine Vessel Operations
- Missile/Target Operations

Because all missile and target operations associated with the proposed action would be above 3,000 feet (914 m) or beyond 3 NM (5.6 km) from shore, emissions from this source category were not included within the conformity applicability analysis.

The proposed action involves the following activities:

- Theater Missile Defense Element – Boost Phase Intercept, Upper Tier, Lower Tier, and Nearshore Intercept
- Training Element - FLEETEX and Special Warfare Training
- Facility Modernization Element - NAS Point Mugu and San Nicolas Island

For the purpose of evaluating the applicability of the General Conformity Rule to the proposed action, a representative emissions baseline was established to provide a basis of comparison for the emissions associated with the proposed action. The most recent emissions data available for NAS Point Mugu were developed as part of the EIS process for the proposed realignment of four E-2 squadrons (Southwest Division 1998). The emissions associated with the proposed action that are subject to consideration in the General Conformity Rule were then evaluated against the baseline to determine whether the emissions associated with the proposed action were below the *de minimis* levels for the Ventura County air district, and to determine whether the emissions were considered regionally significant.

C.5.1.1 Aircraft Emissions

Aircraft emissions occurring below 3,000 feet (914 m) above ground level within the 3 NM (5.6 km) limit must be included in a conformity applicability analysis and/or a conformity determination (Table C.6-9 – included in Section C.6, Emission Calculations).

Based on the project description for the proposed action, 150 additional aircraft sorties (730 total operations) were projected for the Preferred Alternative. However, during a FLEETEX, much of the aircraft activity originates from aircraft carriers located well offshore and outside U.S. Territorial Waters. Of the 12 total aircraft participating in the FLEETEX, only 3 of the aircraft types (F-4, C-130, and P-3) originate from the NAS Point Mugu airfield. In addition, the B-747 that would participate in the proposed boost phase intercept activities would come from another airfield and would remain above 3,000 feet (914 m) during the entire event. The remainder of aircraft activity associated with the proposed action was assumed to originate from NAS Point Mugu and their emissions were included in the conformity applicability determination. The breakdown of sorties and operations is presented in Table C.5-2.

C.5.1.2 Marine Vessels

In accordance with DoN guidance, marine vessel emissions that occur more than 3 NM (5.6 km) offshore are not included in the conformity applicability analysis.

Range support boats and project ships originate from Port Hueneme. All other ships associated with operations in the Sea Range travel from other installations and spend their entire travel time at a distance outside the 3 NM (5.6 km) limit while on the Sea Range.

To estimate emissions associated with the proposed action from the range support boats and project ships, an average operating speed of 10 knots was used to compute the amount of time it would take to travel from Port Hueneme out to 3 NM (5.6 km) from shore (18 minutes). An additional 12 minutes was then included to account for the slower operating speeds of boats around harbor areas, as



Table C.5-2. Aircraft Sorties and Operations Associated with the Proposed Action

Proposed Action Components	Aircraft Type	Engine Model	Number of Sorties/Operations
Theater Missile Defense Element			
Boost Phase Intercept	P-3	T56-A-16	6/30
	E2-C	T56-A-16	3/15
	E-3	T56-A-16	3/15
	B-747 ¹	JT9D-7	3/12
	F-15	F100-220	3/12
	F-18	F404-GE-400	6/24
	F-16	F100-100	6/24
Upper Tier	P-3	T56-A-16	6/30
	E-2C	T56-A-427	3/15
	E-3	T56-A-16	3/15
Lower Tier	P-3	T56-A-16	6/30
	E-2C	T56-A-427	3/15
	E-3	T56-A-16	3/15
	C-130	T56-A-16	3/15
Nearshore Intercept	F-18	F-404-GE-400	8/32
	P-3	T56-A-16	8/40
	C-130	T56-A-16	8/40
	Bell -H	T63-A-700	8/40
Training Element			
Additional FLEETEX	F-4	J79-GE-10B	2/16
	F-14 ²	TF30-P-414	14/70
	F-18 ²	F404-GE-400	14/70
	C-130	T56-A-16	5/25
	P-3	T56-A-16	2/10
	E-2C ²	T56-A-427	3/15
	S-3 ²	T34-GE-400	5/25
	AV-8B ²	F-402-RR-404	2/10
	A-6 ²	J-52-P-8B	2/10
	EA-6 ²	J-52-P-408	2/10
	AH-1 ²	T700-GE-401	4/20
	SH-60B ²	T700-GE-700	2/10
Additional Special Warfare Training	AV-8B ²	F-402-RR-404	2/10
	C-130 ²	T56-A-16	2/10

¹ Aircraft originates from another airfield.

² Aircraft originates from an aircraft carrier or landing ship located outside U.S. Territory.

well as the time vessels may spend at dock. It was therefore conservatively assumed that the total amount of time the range support boats and project ships would spend within the 3 NM (5.6 km) limit was 0.5 hour to travel out to the Sea Range, and 0.5 hour to travel back to Port Hueneme (total of 1 hour). Since tugs operate at much slower speeds, it was assumed that the time a tug would spend within the 3 NM (5.6 km) limit was 1.5 hours (total of 3 hours). These travel times were used to estimate emissions associated with marine vessel operations (Table C.6-10 – included in Section C.6, Emission Calculations).

C.5.2 Actions Occurring in Ventura County

The activities occurring in Ventura County have been evaluated in this conformity applicability analysis to assess their status and requirements relative to the General Conformity Rule. The Ventura County Air Pollution Control District (VCAPCD) is the agency responsible for the attainment and maintenance of air quality standards in the Ventura County Air Basin. According to representatives of the VCAPCD, the VCAPCD has adopted the provisions of the Federal General Conformity Rule by reference.

Activities associated with the proposed action occurring in the Ventura County Air Basin include increased aircraft sorties originating at NAS Point Mugu and range support marine vessels traveling to and from the Sea Range from Port Hueneme, which is also located in Ventura County. Other activities would occur on San Nicolas Island. While San Nicolas Island is considered part of the Ventura County Air Basin, its attainment status is different from the mainland Ventura County. San Nicolas Island is currently classified as “unclassified/attainment” for air quality standards by the USEPA. The provisions of the General Conformity Rule therefore do not apply to activities occurring on San Nicolas Island in support of the proposed action. Table C.5-3 presents a summary of the emission sources, and NO_x and ROG/HC emissions associated with the sources, that would occur below 3,000 AGL (914 m) and within 3 NM (5.6 km) of the shoreline.

Table C.5-3. Emission Sources Associated with the Proposed Action

Source	Emissions, tons/year	
	NO _x	ROG/HC
Aircraft	0.86	0.48
Marine Vessels	0.91	0.12
Totals	1.77	0.60
<i>de minimis</i> levels	25	25.00
Above <i>de minimis</i>?	No	No

The proposed action’s emissions are below both the *de minimis* levels and below 10 percent of the emissions budget for NO_x and ROG/HC in the Ventura County SIP. Therefore, the General Conformity Rule is not applicable to the proposed action.

C.6 EMISSION CALCULATIONS

The following tables provide details on the emission calculations as described in Section C.3 of this Appendix. Additional details on assumptions used to generate emission estimates are provided as footnotes in each table.



Table C.6-1. Summary of Emissions at NAS Point Mugu

Emission Source Category	Emissions, tons/year				
	CO	NO _x	ROG/HC	SO _x	PM ₁₀
NAS Point Mugu¹					
Personal Vehicle Work Trips	408.30	29.26	40.99	0.75	78.32
Government Vehicle Use	24.39	5.67	5.05	0.07	8.03
Aircraft Operations	103.77	89.29	37.65	6.04	29.38
Fuel Farm, JP-8B Jet Fuel	0.00	0.00	0.00	0.00	0.00
Natural Gas Use	0.70	1.61	0.12	0.01	0.01
Engine Test Cells	1.33	4.19	0.18	0.53	1.57
Aircraft Engine Maintenance Runups	5.69	6.30	5.48	0.34	3.93
Coating and Cleaning	0.00	0.00	3.66	0.00	0.00
GSE - Diesel Engines	2.41	25.42	1.86	5.20	1.76
GSE - Gasoline Engines	125.30	3.03	4.92	0.16	0.16
Incinerator	0.00	0.00	0.00	0.00	0.00
Fuel Farm, Aviation Gasoline	0.00	0.00	2.71	0.00	0.00
Fuel Farm, Vehicle Gasoline	0.00	0.00	1.95	0.00	0.00
Fuel Oil Boilers	0.01	0.06	0.00	0.13	0.01
Natural Gas Low NO _x Boilers	0.35	0.71	0.09	0.01	0.05
Propane Combustion	0.00	0.00	0.00	0.00	0.00
Other Natural Gas Use	0.64	3.22	0.17	0.02	0.10
Navy Exchange Gas Station	0.00	0.00	0.89	0.00	0.00
Public Works Gas Station	0.00	0.00	0.21	0.00	0.00
Lawn Mowers	nd	1.69	11.80	nd	nd
Aircraft Refueling	0.00	0.00	0.15	0.00	0.00
Aircraft Painting	0.00	0.00	0.10	0.00	0.00
Solvent Use	0.00	0.00	0.11	0.00	0.00
Abrasive Blasting	0.00	0.00	0.00	0.00	0.01
TOTAL	672.89	170.45	118.08	13.26	123.33

¹ Emissions for NAS Point Mugu are based on 1996 emissions estimates in addition to emissions associated with the realignment of E-2 squadrons as calculated for the Final Environmental Statement for the Realignment of E-2 Squadrons from MCAS Miramar (Southwest Division 1998).

Source: Tables D-16 (E-2 Engine Runups), D-18 (E-2 Ground Support Equipment - presented as either diesel or gas engine), D-20 (E-2 Miscellaneous Stationary Sources - offbase housing emissions not included), D-40 (Personnel Vehicle Emissions for E-2 Personnel - offbase vehicle use not included), D-54 (Government Vehicle Use by E-2 Squadrons), and D-63 (NAWS Point Mugu Emissions) from the Final Environmental Impact Statement for the Realignment of E-2 Squadrons from MCAS Miramar (Southwest Division 1998). Estimates of 1996 aircraft maintenance runups are based on 1990 emissions numbers reduced to reflect 1996 estimates consistent with the reduction assumptions for 1996 as reflected in the E-2 FEIS as calculated by the NAS Environmental Division (S. George 1998).

Table C.6-2. Aircraft Operation Emissions at NAS Point Mugu

Aircraft	Emissions, tons/year				
	CO	NO _x	ROG/HC	SO _x	PM ₁₀
P-3	4.95	17.06	2.23	1.19	4.97
C-130	8.50	27.11	3.60	1.91	8.03
C-12	0.00	0.00	0.00	0.00	0.00
A-7	0.00	0.00	0.00	0.00	0.00
F-86	0.00	0.00	0.00	0.00	0.00
A-3	0.00	0.00	0.00	0.00	0.00
A-6	0.00	0.00	0.00	0.00	0.00
F-4	21.47	2.15	6.73	0.29	3.65
F-14	32.25	10.68	14.09	0.93	3.46
F/A-18	9.83	4.08	3.38	0.19	1.21
T-38	9.47	0.18	1.33	0.16	0.83
H-46	0.00	0.00	0.00	0.00	0.00
UH-1	0.00	0.00	0.00	0.00	0.00
206B	0.46	0.12	0.15	0.05	0.02
CV-440	0.00	0.00	0.00	0.00	0.00
H-60	0.82	0.87	0.20	0.09	0.38
CV-340	5.24	0.03	0.75	0.02	0.01
CV-580	1.26	2.97	0.42	0.22	0.95
Metroliner	0.35	0.78	0.10	0.06	0.25
General Aviation	1.83	0.01	0.05	0.00	0.00
Other Carriers	0.61	1.15	0.09	0	0.07
E-2	6.73	22.1	4.53	0.93	5.55
TOTAL	103.77	89.29	37.65	6.04	29.38

Source: Tables D-15 and D-66 from the Final Environmental Impact Statement for the Realignment of E-2 Squadrons from MCAS Miramar (Southwest Division 1998).

Table C.6-3. Point Mugu Sea Range Aircraft Emissions-No Action (page 1 of 8)

Eng Type	Eng Model	Number of Sorties	Total Number of Operations	Total Time Btwn 0-3000 Ft	Cruise Mode		Number of Operations for Each Mode						Duration of Mode						
					Time w/in US Waters min	Time Outside US Waters min	Taxi	Approach		Cruise	Climbout		T/O	Taxi min	Approach		Climbout		T/O min
								LTO	T/G		LTO	T/G			LTO	T/G			
Takeoffs/Landings from San Nicolas Island in the Sea Range																			
F-4	J79-GE-10B	149	596	15.50	0.00	0.00	149	149	0	0	149	0	149	13.00	1.60	0.00	0.50	0.00	0.40
Takeoffs/Landings from NAS Point Mugu																			
F-14	TF30-P-414	222	0	0.00	0.00	0.00	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
F-18	F404-GE-400	308	0	0.00	0.00	0.00	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
C-130	T56-A-16	69	0	0.00	0.00	0.00	0	0	0	0	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
P-3	T56-A-16	31	31	40.00	33.00	7.00	0	0	0	31	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00
Takeoffs/Landings From Aircraft Carriers Located Outside US Waters																			
E-2C	T56-A-427	10	50	56.83	20.00	0.00	10	10	0	10	10	0	10	30.00	4.50	0.00	2.00	0.00	0.33
S-3	T34-GE-400	32	160	126.83	45.00	45.00	32	32	0	32	32	0	32	30.00	4.50	0.00	2.00	0.00	0.33
AV-8B	F402-RR-404	5	25	52.93	10.00	10.00	5	5	0	5	5	0	5	30.00	1.60	0.00	1.00	0.00	0.33

Table C.6-3. Point Mugu Sea Range Aircraft Emissions-No Action (page 2 of 8)

Eng Type	CO Emission Indexes					NO _x Emission Indexes					ROG/HC Emission Indexes					SO _x Emission Indexes					PM ₁₀ Emission Indexes				
	Taxi	Appr	Cruise	Climb	T/O	Taxi	Appr	Cruise	Climb	T/O	Taxi	Appr	Cruise	Climb	T/O	Taxi	Appr	Cruise	Climb	T/O	Taxi	Appr	Cruise	Climb	T/O
	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
F-4	139.26	68.59	68.59	15.97	509.57	1.67	14.48	14.48	102.58	157.78	56.84	11.67	11.67	14.03	21.15	0.50	1.37	1.37	4.00	14.00	19.62	28.12	28.12	43.81	-
F-14	51.07	18.88	18.88	9.73	514.81	2.96	22.56	22.56	138.18	228.96	33.54	8.40	8.40	6.35	11.47	0.37	1.16	1.16	2.82	19.12	8.24	22.09	22.09	21.01	-
F-18	85.69	43.64	43.64	9.02	656.54	0.72	6.88	6.88	216.05	261.82	36.30	5.01	5.01	2.66	3.69	0.25	0.65	0.65	3.43	11.36	8.42	15.53	15.53	24.13	-
C-130	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
P-3	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-2C	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
S-3	41.67	15.44	16.84	22.62	22.62	0.77	1.58	5.24	28.56	28.56	7.97	1.41	1.75	1.74	1.74	0.18	0.18	0.37	1.52	1.52	1.47	3.43	-	5.92	5.92
AV-8B	120.90	50.70	50.70	28.90	28.90	2.00	49.50	49.50	156.40	156.40	22.40	3.50	3.50	3.10	3.10	0.45	2.47	2.47	4.28	4.28	-	-	-	-	-

Table C.6-3. Point Mugu Sea Range Aircraft Emissions-No Action (page 3 of 8)

In US Waters																	
Eng Type	CO Annual Emissions									NO _x Annual Emissions							
	# of	Taxi	Appr	Appr	Cruise	Climb	Climb	T/O	Total	Taxi	Appr	Appr	Cruise	Climb	Climb	T/O	Total
	Eng	t/y	LTO	T/G	t/y	t/y	T/G	t/y	CO	t/y	LTO	T/G	t/y	LTO	T/G	t/y	NO _x
F-4	2	4.50E+00	2.73E-01	0.00E+00	0.00E+00	1.98E-02	0.00E+00	5.06E-01	5.29	5.39E-02	5.75E-02	0.00E+00	0.00E+00	1.27E-01	0.00E+00	1.57E-01	0.40
F-14	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
F-18	2	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
C-130	4	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
P-3	4	0.00E+00	0.00E+00	0.00E+00	2.86E-02	0.00E+00	0.00E+00	0.00E+00	0.03	0.00E+00	0.00E+00	0.00E+00	6.76E-01	0.00E+00	0.00E+00	0.00E+00	0.68
E-2C	2	--	--	--	2.80E-03	--	--	--	0.00	--	--	--	6.61E-02	--	--	--	0.07
S-3	2	--	--	--	4.04E-01	--	--	--	0.40	--	--	--	1.26E-01	--	--	--	0.13
AV-8B	1.00	--	--	--	0.02	--	--	--	0.02	--	--	--	0.02	--	--	--	0.02
TOTAL									5.74								1.30

Table C.6-3. Point Mugu Sea Range Aircraft Emissions-No Action (page 4 of 8)

In US Waters

Eng Type	ROG/HC Annual Emissions								SO _x Annual Emissions							
	Taxi	Appr	Appr	Cruise	Climb	Climb	T/O	Total	Taxi	Appr	Appr	Cruise	Climb	Climb	T/O	Total
	t/y	LTO	T/G	t/y	LTO	T/G	t/y		ROG/HC	t/y	LTO	T/G	t/y	LTO	T/G	
F-4	1.83E+00	4.64E-02	0.00E+00	0.00E+00	1.74E-02	0.00E+00	2.10E-02	1.92	1.61E-02	5.44E-03	0.00E+00	0.00E+00	4.97E-03	0.00E+00	1.39E-02	0.04
F-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
F-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
C-130	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
P-3	0.00E+00	0.00E+00	0.00E+00	1.33E-02	0.00E+00	0.00E+00	0.00E+00	0.01	0.00E+00	0.00E+00	0.00E+00	2.73E-02	0.00E+00	0.00E+00	0.00E+00	0.03
E-2C	--	--	--	1.30E-03	--	--	--	0.00	--	--	--	2.67E-03	--	--	--	0.00
S-3	--	--	--	4.20E-02	--	--	--	0.04	--	--	--	8.88E-03	--	--	--	0.01
AV-8B	--	--	--	0.00	--	--	--	0.00	--	--	--	0.00	--	--	--	0.00
TOTAL								1.97								0.08

Table C.6-3. Point Mugu Sea Range Aircraft Emissions-No Action (page 5 of 8)

Eng Type	In US Waters								Outside US Waters								
	PM ₁₀ Annual Emissions								CO Annual Emissions								
	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total PM ₁₀	# of Eng	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total CO
F-4	6.33E-01	1.12E-01	0.00E+00	0.00E+00	5.44E-02	0.00E+00	0.00E+00	0.80	2	--	--	--	0.00E+00	--	--	--	0.00
F-14	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	2	--	--	--	0.00E+00	--	--	--	0.00
F-18	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	2	--	--	--	0.00E+00	--	--	--	0.00
C-130	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00	4	--	--	--	0.00E+00	--	--	--	0.00
P-3	0.00E+00	0.00E+00	0.00E+00	1.50E-01	0.00E+00	0.00E+00	0.00E+00	0.15	4	--	--	--	6.08E-03	--	--	--	0.01
E-2C	--	--	--	1.47E-02	--	--	--	0.01	2	2.14E-02	6.30E-04	0.00E+00	0.00E+00	4.83E-04	0.00E+00	7.98E-05	0.02
S-3	--	--	--	0.00E+00	--	--	--	0.00	2	6.67E-01	3.71E-02	0.00E+00	4.04E-01	2.41E-02	0.00E+00	3.98E-03	1.14
AV-8B	--	--	--	0.00	--	--	--	0.00	1	1.51E-01	3.38E-03	0.00E+00	2.11E-02	1.20E-03	0.00E+00	3.97E-04	0.18
TOTAL								0.96									1.35

Table C.6-3. Point Mugu Sea Range Aircraft Emissions-No Action (page 6 of 8)

Outside US Waters																
Eng Type	NO _x Annual Emissions								ROG/HC Annual Emissions							
	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total NO _x	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total ROG/HC
F-4	--	--	--	0.00E+00	--	--	--	0.00	--	--	--	0.00E+00	--	--	--	0.00
F-14	--	--	--	0.00E+00	--	--	--	0.00	--	--	--	0.00E+00	--	--	--	0.00
F-18	--	--	--	0.00E+00	--	--	--	0.00	--	--	--	0.00E+00	--	--	--	0.00
C-130	--	--	--	0.00E+00	--	--	--	0.00	--	--	--	0.00E+00	--	--	--	0.00
P-3	--	--	--	1.43E-01	--	--	--	0.14	--	--	--	2.82E-03	--	--	--	0.00
E-2C	2.40E-02	1.49E-02	0.00E+00	0.00E+00	7.73E-03	0.00E+00	1.27E-03	0.05	5.35E-03	2.93E-04	0.00E+00	0.00E+00	1.17E-04	0.00E+00	1.93E-05	0.01
S-3	1.23E-02	3.79E-03	0.00E+00	1.26E-01	3.05E-02	0.00E+00	5.03E-03	0.18	1.28E-01	3.38E-03	0.00E+00	4.20E-02	1.86E-03	0.00E+00	3.06E-04	0.18
AV-8B	2.50E-03	3.30E-03	0.00E+00	2.06E-02	6.52E-03	0.00E+00	2.15E-03	0.04	2.80E-02	2.33E-04	0.00E+00	1.46E-03	1.29E-04	0.00E+00	4.26E-05	0.03
TOTAL								0.41								0.22

Table C.6-3. Point Mugu Sea Range Aircraft Emissions-No Action (page 7 of 8)

Outside US Waters																
Eng Type	SC _x Annual Emissions								PM ₁₀ Annual Emissions							
	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total SO _x	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total PM ₁₀
F-4	--	--	--	0.00E+00	--	--	--	0.00	--	--	--	0.00E+00	--	--	--	0.00
F-14	--	--	--	0.00E+00	--	--	--	0.00	--	--	--	0.00E+00	--	--	--	0.00
F-18	--	--	--	0.00E+00	--	--	--	0.00	--	--	--	0.00E+00	--	--	--	0.00
C-130	--	--	--	0.00E+00	--	--	--	0.00	--	--	--	0.00E+00	--	--	--	0.00
P-3	--	--	--	5.79E-03	--	--	--	0.01	--	--	--	3.19E-02	--	--	--	0.03
E-2C	1.50E-03	6.00E-04	0.00E+00	0.00E+00	2.97E-04	0.00E+00	4.90E-05	0.00	8.35E-03	3.31E-03	0.00E+00	0.00E+00	1.63E-03	0.00E+00	2.70E-04	0.01
S-3	2.88E-03	4.32E-04	0.00E+00	8.88E-03	1.62E-03	0.00E+00	2.68E-04	0.01	2.35E-02	8.23E-03	0.00E+00	0.00E+00	6.31E-03	0.00E+00	1.04E-03	0.04
AV-8B	5.63E-04	1.65E-04	0.00E+00	1.03E-03	1.78E-04	0.00E+00	5.89E-05	0.00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00
TOTAL								0.02								0.08

Table C.6-3. Point Mugu Sea Range Aircraft Emissions-No Action (page 8 of 8)

NOTES:

1. The total number of sorties for each aircraft type was determined from FY95 operating records for the Point Mugu Sea Range. There are no touch and go operations associated with the Sea Range No-Action Alternative. The duration of mode is the estimated time spent on each flight operation.
2. The E-2C, S-3, and AV-8B takeoff and land from aircraft carriers located outside US waters.
The F-4 takes off and lands at San Nicolas Island (located in US waters).
All other aircraft takeoff and land from NAS Point Mugu and their emissions are included in the NAS Point Mugu Airfield analysis.
(Denoted by the "-" in the calculated emissions portion of the spreadsheet.)
NOTE: NAS Point Mugu Airfield emissions are from the FEIS for the Realignment of E-2 Squadrons from MCAS Miramar.
3. Sea Range Emissions include flight time below 3,000 feet and are sub-divided into flights occurring within and outside of US Territory.
4. Unless otherwise noted, the emission indexes for Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Reactive Organic Gases (ROG), and Particulate Matter were obtained from AESO Report No. 6-90, Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines, dated June 1990.
The Sulfur Oxides (SO_x) emission indexes were obtained by multiplying the engine fuel flow rate in pounds per hour by the mass fraction of sulfur in fuel (0.4 pounds per 1000 pounds of fuel - AESO Report No. 6-90).
Emission indexes were given in pounds per 1,000 pounds of fuel. The units were converted to pounds per hour using the following formula:
Emission Index (lbs/hr) = Emission Index (lbs/1,000 lbs of fuel) x fuel flow (lb/hr) x (1/1,000).
5. Times in mode and emission indexes for the F/A-18 aircraft are from AESO Memo Report No. 9815A, Aircraft Emission Estimates: F/A-18 Landing and Take Off Cycle and Maintenance Testing Using JP-5, dated October 1998. Taxi mode assumed to equal the sum of the Taxi Out Modes of Warm-Up, Taxi Out, Checks, and Unstick plus the Taxi In Modes of On Runway (WOW), Taxi In, Hot Refuel, Taxi to Apron, Cool/Shut Down, and Unstick.
6. Emission indexes for the F-14 aircraft are from AESO Memo Report No. 9813 Revision B, Aircraft Emission Estimates: F-14 Landing and Take Off Cycle Using JP-5, dated October 1998.
7. Source of emission indexes for the E-2 aircraft are from the T56-A-16 engine. This engine has the closest emission characteristics to the T56-A-427.
8. Cruise mode emission factors are from table provided by Gary Paetow at AESO dated December 1998. Emission factors for the S-3 differ slightly from those used in this analysis because better data were available from the Air Force. PM₁₀ emission indexes were not available. (Denoted by the "-" in the PM10 emission factor portion of the spreadsheet.)
9. PM₁₀ Emission indexes are not available for the T56-A-16 engine. The T64-GE-6B indexes were substituted because this engine has the closest characteristics to the T56-A-16.
10. PM₁₀ Emission indexes were not available for the F402-RR-404 engine. (Denoted by the "-" in the PM₁₀ emission factor portion of the spreadsheet.)
11. PM₁₀ Emission indexes are not available for afterburner power setting for jet aircraft. (Denoted by the "-" in the PM₁₀ emission factor portion of the spreadsheet.)
12. Duration of mode data for the F-4 aircraft were obtained from default values listed in Table 5-1 from the Procedures for Emission Inventory Preparation Volume IV: Mobile Sources. EPA. 1992. The reported data are in minutes (min).
13. Cruise time in mode for all aircraft types provided by the Point Mugu Environmental Division.
14. The duration of mode data for the E-2C, S-3, and AV-8B aircraft are from AESO Memo Report No. 9626, Gaseous Emissions from Aircraft Carrier A/C Launch Operations dated June 1996. This report does not include approach times in mode to the A/C carrier. The taxi time was doubled to obtain a conservative estimate of the taxi in and taxi out times.
The approach times are from default values listed in Procedures for Emission Inventory Preparation Volume IV: Mobile Sources. EPA 1992.
15. The F-4, F-14, F/A-18, and C-130 do not cruise below 3,000 feet. (Personal Communication with Jeff Ballow, NAWCWPNS 1998.)
16. Emissions stated as 0.00 E+00 refer to zero emissions due to lack of operations or emission factors.
17. Methodology used to calculate aircraft emissions follows EPA guidelines found in Procedures for Emission Inventory Preparation Volume IV: Mobile Sources. EPA 1992.
18. Formula: (Number of Operations) x (Time in Mode) x (1 hour/60 minutes) x (# of Engines) x (Emission Index) x (1 ton/2,000 pounds) = Emissions (tons/year).

Table C.6-4. Point Mugu Sea Range Aircraft Emissions-Proposed Action (page 1 of 10)

Proposed Action Element	Engine Type	Engine Model	Number of Sorties	Total Number of Operations	Total Time Btwn 0-3000 Ft	Cruise Mode		Number of Operations for Each Mode						
						Time w/in US Waters min	Time Outside US Waters min	Taxi	Approach		Cruise		Climbout	T/O
								LTO	T/G	LTO	T/G			
THEATER MISSILE DEFENSE ELEMENT Boost Phase Intercept	P-3	T56-A-16	6	30	71.20	33.00	7.00	6	6	0	6	6	0	6
	E2-C	T56-A-427	3	15	51.20	20.00	0.00	3	3	0	3	3	0	3
	E-3	T56-A-16	3	15	71.20	33.00	7.00	3	3	0	3	3	0	3
	B-747	JT9D-7	3	12	0.00	0.00	0.00	3	3	0	0	3	0	3
	F-15	F100-220	3	12	15.50	0.00	0.00	3	3	0	0	3	0	3
	F-18	F404-GE-400	6	24	51.37	0.00	0.00	6	6	0	0	6	0	6
	F-16	F100-100	6	24	15.50	0.00	0.00	6	6	0	0	6	0	6
Upper Tier	P-3	T56-A-16	6	30	71.20	33.00	7.00	6	6	0	6	6	0	6
	E-2C	T56-A-427	3	15	51.20	20.00	0.00	3	3	0	3	3	0	3
	E-3	T56-A-16	3	15	71.20	33.00	7.00	3	3	0	3	3	0	3
Lower Tier	P-3	T56-A-16	6	30	71.20	33.00	7.00	6	6	0	6	6	0	6
	E-2C	T56-A-427	3	15	51.20	20.00	0.00	3	3	0	3	3	0	3
	E-3	T56-A-16	3	15	71.20	33.00	7.00	3	3	0	3	3	0	3
	C-130	T56-A-16	3	15	64.20	33.00	0.00	3	3	0	3	3	0	3
Nearshore Intercept	F-18	F404-GE-400	8	32	51.37	0.00	0.00	8	8	0	0	8	0	8
	P-3	T56-A-16	8	40	71.20	33.00	7.00	8	8	0	8	8	0	8
	C-130	T56-A-16	8	40	64.20	33.00	0.00	8	8	0	8	8	0	8
	Bell -H	T63-A-700	8	40	149.60	100.00	20.00	8	8	0	8	8	0	8
Testing Element FLEETEX	F-4	J79-GE-10B	2	16	15.50	0.00	0.00	4	4	0	0	4	0	4
	F-14	TF30-P-414	14	70	42.93	0.00	10.00	14	14	0	14	14	0	14
	F-18	F404-GE-400	14	70	42.93	0.00	10.00	14	14	0	14	14	0	14
	C-130	T56-A-16	5	25	64.20	33.00	0.00	5	5	0	5	5	0	5
	P-3	T56-A-16	2	10	71.20	33.00	7.00	2	2	0	2	2	0	2
	E-2C	T56-A-427	3	15	48.83	0.00	12.00	3	3	0	3	3	0	3
	S-3	TF34-GE-400	5	25	126.83	45.00	45.00	5	5	0	5	5	0	5
	AV-8B	F402-RR-404	2	10	122.93	60.00	30.00	2	2	0	2	2	0	2
	A-6	J-52-P-8B	2	10	44.93	0.00	12.00	2	2	0	2	2	0	2
	EA-6	J-52-P-408	2	10	44.93	0.00	12.00	2	2	0	2	2	0	2
	AH-1	T700-GE-401	4	20	130.13	60.00	30.00	4	4	0	4	4	0	4
	SH-60B	T700-GE-700	2	10	160.13	0.00	120.00	2	2	0	2	2	0	2
	Special Warfare Training	AV-8B	F402-RR-404	2	10	88.15	10.00	10.00	2	2	0	2	2	0
C-130		T56-A-16	2	10	72.20	33.00	0.00	2	2	0	2	2	0	2

Table C.6-4. Point Mugu Sea Range Aircraft Emissions-Proposed Action (page 2 of 10)

Engine Type	Engine Model	Duration of Mode						CO Emission Indexes					NO _x Emission Indexes				
		Taxi min	Approach		Climbout		T/O min	Taxi lb/hr	Appr lb/hr	Cruise lb/hr	Climb lb/hr	T/O lb/hr	Taxi lb/hr	Appr lb/hr	Cruise lb/hr	Climb lb/hr	T/O lb/hr
			LTO min	T/G min	LTO min	T/G min											
P-3	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
E2-C	T56-A-427	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
E-3	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
B-747	JT9D-7	0.00	0.00	0.00	0.00	0.00	0.00	142.43	44.62	44.62	6.60	3.23	5.73	36.26	36.26	282.33	474.57
F-15	F100-220	13.00	1.60	0.00	0.50	0.00	0.40	20.50	9.00	17.40	18.72	2435.43	4.20	33.00	20.10	457.59	729.30
F-18	F404-GE-400	44.07	4.30	0.00	2.50	0.00	0.50	85.69	43.64	43.64	9.02	656.54	0.72	6.88	6.88	216.05	261.82
F-16	F100-100	13.00	1.60	0.00	0.50	0.00	0.40	20.50	9.00	17.40	18.72	2435.43	4.20	33.00	20.10	457.59	729.30
P-3	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
E-2C	T56-A-427	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
E-3	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
P-3	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
E-2C	T56-A-427	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
E-3	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
C-130	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
F-18	F404-GE-400	44.07	4.30	0.00	2.50	0.00	0.50	85.69	43.64	43.64	9.02	656.54	0.72	6.88	6.88	216.05	261.82
P-3	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
C-130	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
Bell -H	T63-A-700	16.00	6.80	0.00	6.80	0.00		4.83	4.05	4.05	2.50	1.62	0.09	0.30	0.30	0.81	1.09
F-4	J79-GE-10B	13.00	1.60	0.00	0.50	0.00	0.40	139.26	68.59	68.59	15.97	509.57	1.67	14.48	14.48	102.58	157.78
F-14	TF30-P-414	30.00	1.60	0.00	1.00	0.00	0.33	51.07	18.88	18.88	9.73	514.81	2.96	22.56	22.56	138.18	228.96
F-18	F404-GE-400	30.00	1.60	0.00	1.00	0.00	0.33	85.69	43.64	43.64	9.02	656.54	0.72	6.88	6.88	216.05	261.82
C-130	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
P-3	T56-A-16	21.50	6.80	0.00	2.20	0.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
E-2C	T56-A-427	30.00	4.50	0.00	2.00	0.00	0.33	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18
S-3	TF34-GE-400	30.00	4.50	0.00	2.00	0.00	0.33	41.67	15.44	16.84	22.62	22.62	0.77	1.58	5.24	28.56	28.56
AV-8B	F402-RR-404	30.00	1.60	0.00	1.00	0.00	0.33	120.90	50.70	50.70	28.90	28.90	2.00	49.50	49.50	156.40	156.40
A-6	J-52-P-8B	30.00	1.60	0.00	1.00	0.00	0.33	43.37	24.23	24.23	12.98	5.22	1.22	14.58	14.58	43.64	96.16
EA-6	J-52-P-408	30.00	1.60	0.00	1.00	0.00	0.33	43.60	28.30	28.30	18.30	13.90	1.86	15.71	15.71	48.21	116.76
AH-1	T700-GE-401	30.00	6.80	0.00	2.00	0.00	1.33	4.60	4.79	4.79	4.43	4.60	2.11	1.73	1.73	2.46	2.11
SH-60B	T700-GE-700	30.00	6.80	0.00	2.00	0.00	1.33	4.60	4.79	4.79	4.43	4.60	2.11	1.73	1.73	2.46	2.11
AV-8B	F402-RR-404	59.00	5.00	2.00	1.00	1.00	0.15	120.90	50.70	50.70	28.90	28.90	2.00	49.50	49.50	156.40	156.40
C-130	T56-A-16	21.50	6.80	7.00	2.20	1.00	0.70	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18

Table C.6-4. Point Mugu Sea Range Aircraft Emissions-Proposed Action (page 3 of 10)

Engine Type	Engine Model	ROG/HC Emission Indexes					SO _x Emission Indexes					PM ₁₀ Emission Indexes				
		Taxi	Appr	Cruise	Climb	T/O	Taxi	Appr	Cruise	Climb	T/O	Taxi	Appr	Cruise	Climb	T/O
		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
P-3	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E2-C	T56-A-427	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-3	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
B-747	JT9D-7	55.11	4.65	4.65	1.32	0.81	0.74	1.86	1.86	5.28	6.46	-	-	-	-	-
F-15	F100-220	2.40	1.80	5.70	0.52	4.42	0.42	1.20	1.20	4.16	17.68	0.10	0.99	-	8.63	-
F-18	F404-GE-400	36.30	5.01	5.01	2.66	3.69	0.25	0.65	0.65	3.43	11.36	8.42	15.53	15.53	24.13	-
F-16	F100-100	2.40	1.80	5.70	0.52	4.42	0.42	1.20	1.20	4.16	17.68	0.10	0.99	-	8.63	-
P-3	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-2C	T56-A-427	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-3	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
P-3	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-2C	T56-A-427	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-3	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
C-130	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
F-18	F404-GE-400	36.30	5.01	5.01	2.66	3.69	0.25	0.65	0.65	3.43	11.36	8.42	15.53	15.53	24.13	0.00
P-3	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
C-130	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
Bell-H	T63-A-700	1.24	0.34	0.34	0.04	0.02	0.02	0.04	0.04	0.07	0.09					
F-4	J79-GE-10B	56.84	11.67	11.67	14.03	21.15	0.50	1.37	1.37	4.00	14.00	19.62	28.12	28.12	43.81	-
F-14	TF30-P-414	33.54	8.40	8.40	6.35	11.47	0.37	1.16	1.16	2.82	19.12	8.24	22.09	22.09	21.01	-
F-18	F404-GE-400	36.30	5.01	5.01	2.66	3.69	0.25	0.65	0.65	3.43	11.36	8.42	15.53	15.53	24.13	-
C-130	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
P-3	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-2C	T56-A-427	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
S-3	TF34-GE-400	7.97	1.41	1.75	1.74	1.74	0.18	0.18	0.37	1.52	1.52	1.47	3.43	-	5.92	5.92
AV-8B	F402-RR-404	22.40	3.50	3.50	3.10	3.10	0.45	2.47	2.47	4.28	4.28	-	-	-	-	-
A-6	J-52-P-8B	33.30	4.58	4.58	2.90	7.93	0.27	0.92	0.92	1.73	2.95	16.91	-	-	-	52.13
EA-6	J-52-P-408	22.07	3.57	3.57	3.85	5.40	0.31	1.02	1.02	2.30	3.79	16.90	-	-	-	52.10
AH-1	T700-GE-401	0.22	0.21	0.21	0.25	0.22	0.16	0.14	0.14	0.18	0.16	1.65	1.43	1.43	1.84	1.65
SH-60B	T700-GE-700	0.22	0.21	0.21	0.25	0.22	0.16	0.14	0.14	0.18	0.16	1.65	1.43	1.43	1.84	1.65
AV-8B	F402-RR-404	22.40	3.50	3.50	3.10	3.10	0.45	2.47	2.47	4.28	4.28	3.40	3.40	3.40	3.40	3.40
C-130	T56-A-16	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90

Table C.6-4. Point Mugu Sea Range Aircraft Emissions-Proposed Action (page 5 of 10)

		In US Waters																
Engine Type	# of ENG	ROG/HC Annual Emissions								SO _x Annual Emissions								
		Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total ROG/HC	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total SO _x	
P-3	4	4.60E-03	5.30E-04	0.00E+00	2.57E-03	1.54E-04	0.00E+00	4.90E-05		1.29E-03	1.09E-03	0.00E+00	5.28E-03	3.92E-04	0.00E+00	1.25E-04		
E2-C	2	1.15E-03	1.33E-04	0.00E+00	3.90E-04	3.85E-05	0.00E+00	1.23E-05		3.23E-04	2.72E-04	0.00E+00	8.00E-04	9.79E-05	0.00E+00	3.12E-05		
E-3	4	2.30E-03	2.65E-04	0.00E+00	1.29E-03	7.70E-05	0.00E+00	2.45E-05		6.45E-04	5.44E-04	0.00E+00	2.64E-03	1.96E-04	0.00E+00	6.23E-05		
B-747	4	--	--	--	--	--	--	--		--	--	--	--	--	--	--		
F-15	2	1.56E-03	1.44E-04	0.00E+00	0.00E+00	1.30E-05	0.00E+00	8.84E-05		2.73E-04	9.60E-05	0.00E+00	0.00E+00	1.04E-04	0.00E+00	3.54E-04		
F-18	2	1.60E-01	2.15E-03	0.00E+00	0.00E+00	6.65E-04	0.00E+00	1.85E-04		1.10E-03	2.80E-04	0.00E+00	0.00E+00	8.58E-04	0.00E+00	5.68E-04		
F-16	1	1.56E-03	1.44E-04	0.00E+00	0.00E+00	1.30E-05	0.00E+00	8.84E-05		2.73E-04	9.60E-05	0.00E+00	0.00E+00	1.04E-04	0.00E+00	3.54E-04		
Total		1.71E-01	3.37E-03	0.00E+00	4.25E-03	9.61E-04	0.00E+00	4.47E-04	0.18	3.91E-03	2.38E-03	0.00E+00	8.72E-03	1.75E-03	0.00E+00	1.49E-03	0.02	
P-3	4	4.60E-03	5.30E-04	0.00E+00	2.57E-03	1.54E-04	0.00E+00	4.90E-05		1.29E-03	1.09E-03	0.00E+00	5.28E-03	3.92E-04	0.00E+00	1.25E-04		
E-2C	2	1.15E-03	1.33E-04	0.00E+00	3.90E-04	3.85E-05	0.00E+00	1.23E-05		3.23E-04	2.72E-04	0.00E+00	8.00E-04	9.79E-05	0.00E+00	3.12E-05		
E-3	4	2.30E-03	2.65E-04	0.00E+00	1.29E-03	7.70E-05	0.00E+00	2.45E-05		6.45E-04	5.44E-04	0.00E+00	2.64E-03	1.96E-04	0.00E+00	6.23E-05		
Total		8.05E-03	9.28E-04	0.00E+00	4.25E-03	2.70E-04	0.00E+00	8.58E-05	0.01	2.26E-03	1.90E-03	0.00E+00	8.72E-03	6.85E-04	0.00E+00	2.18E-04	0.01	
P-3	4	4.60E-03	5.30E-04	0.00E+00	2.57E-03	1.54E-04	0.00E+00	4.90E-05		1.29E-03	1.09E-03	0.00E+00	5.28E-03	3.92E-04	0.00E+00	1.25E-04		
E-2C	2	1.15E-03	1.33E-04	0.00E+00	3.90E-04	3.85E-05	0.00E+00	1.23E-05		3.23E-04	2.72E-04	0.00E+00	8.00E-04	9.79E-05	0.00E+00	3.12E-05		
E-3	4	2.30E-03	2.65E-04	0.00E+00	1.29E-03	7.70E-05	0.00E+00	2.45E-05		6.45E-04	5.44E-04	0.00E+00	2.64E-03	1.96E-04	0.00E+00	6.23E-05		
C-130	4	2.30E-03	2.65E-04	0.00E+00	1.29E-03	7.70E-05	0.00E+00	2.45E-05		6.45E-04	5.44E-04	0.00E+00	2.64E-03	1.96E-04	0.00E+00	6.23E-05		
Total		1.04E-02	1.19E-03	0.00E+00	5.54E-03	3.47E-04	0.00E+00	1.10E-04	0.02	2.90E-03	2.45E-03	0.00E+00	1.14E-02	8.81E-04	0.00E+00	2.80E-04	0.02	
F-18	2	2.13E-01	2.87E-03	0.00E+00	0.00E+00	8.87E-04	0.00E+00	2.46E-04		1.47E-03	3.73E-04	0.00E+00	0.00E+00	1.14E-03	0.00E+00	7.57E-04		
P-3	4	6.13E-03	7.07E-04	0.00E+00	3.43E-03	2.05E-04	0.00E+00	6.53E-05		1.72E-03	1.45E-03	0.00E+00	7.04E-03	5.22E-04	0.00E+00	1.66E-04		
C-130	4	6.13E-03	7.07E-04	0.00E+00	3.43E-03	2.05E-04	0.00E+00	6.53E-05		1.72E-03	1.45E-03	0.00E+00	7.04E-03	5.22E-04	0.00E+00	1.66E-04		
Bell -H	1	1.32E-03	1.54E-04	0.00E+00	2.27E-03	1.81E-05	0.00E+00	0.00E+00		2.13E-05	1.81E-05	0.00E+00	2.67E-04	3.17E-05	0.00E+00	0.00E+00		
Total		2.27E-01	4.44E-03	0.00E+00	9.13E-03	1.32E-03	0.00E+00	3.77E-04	0.24	4.93E-03	3.29E-03	0.00E+00	1.43E-02	2.22E-03	0.00E+00	1.09E-03	0.03	
F-4	2	4.93E-02	1.24E-03	0.00E+00	0.00E+00	4.68E-04	0.00E+00	5.64E-04		4.33E-04	1.46E-04	0.00E+00	0.00E+00	1.33E-04	0.00E+00	3.73E-04		
F-14	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
F-18	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
C-130	4	3.83E-03	4.42E-04	0.00E+00	2.15E-03	1.28E-04	0.00E+00	4.08E-05		1.08E-03	9.07E-04	0.00E+00	4.40E-03	3.26E-04	0.00E+00	1.04E-04		
P-3	4	1.53E-03	1.77E-04	0.00E+00	8.58E-04	5.13E-05	0.00E+00	1.63E-05		4.30E-04	3.63E-04	0.00E+00	1.76E-03	1.31E-04	0.00E+00	4.15E-05		
E-2C	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
S-3	2	--	--	--	6.56E-03	--	--	--		--	--	--	1.39E-03	--	--	--		
AV-8B	1	--	--	--	3.50E-03	--	--	--		--	--	--	2.47E-03	--	--	--		
A-6	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
EA-6	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
AH-1	2	--	--	--	8.40E-04	--	--	--		--	--	--	5.60E-04	--	--	--		
SH-60B	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
Total		5.46E-02	1.86E-03	0.00E+00	1.39E-02	6.47E-04	0.00E+00	6.21E-04	0.07	1.94E-03	1.42E-03	0.00E+00	1.06E-02	5.90E-04	0.00E+00	5.19E-04	0.02	
AV-8B	1	2.20E-02	2.92E-04	0.00E+00	5.83E-04	5.17E-05	0.00E+00	7.75E-06		4.43E-04	2.06E-04	0.00E+00	4.12E-04	7.13E-05	0.00E+00	1.07E-05		
C-130	4	1.53E-03	1.77E-04	0.00E+00	8.58E-04	5.13E-05	0.00E+00	1.63E-05		4.30E-04	3.63E-04	0.00E+00	1.76E-03	1.31E-04	0.00E+00	4.15E-05		
Total		2.36E-02	4.68E-04	0.00E+00	1.44E-03	1.03E-04	0.00E+00	2.41E-05	0.03	8.73E-04	5.69E-04	0.00E+00	2.17E-03	2.02E-04	0.00E+00	5.22E-05	0.00	
Total									0.55								0.10	

C-30

Table C.6-4. Point Mugu Sea Range Aircraft Emissions-Proposed Action (page 6 of 10)

Engine Type	# of ENG	In US Waters								Outside US Waters								
		PM ₁₀ Annual Emissions								CO Annual Emissions								
		Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total PM ₁₀	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total CO	
P-3	4	7.18E-03	6.00E-03	0.00E+00	2.91E-02	2.16E-03	0.00E+00	6.86E-04		4	--	--	--	1.18E-03	--	--	--	
E2-C	2	1.80E-03	1.50E-03	0.00E+00	4.41E-03	5.39E-04	0.00E+00	1.72E-04		2	--	--	--	0.00E+00	--	--	--	
E-3	4	3.59E-03	3.00E-03	0.00E+00	1.46E-02	1.08E-03	0.00E+00	3.43E-04		4	--	--	--	5.88E-04	--	--	--	
B-747	4	--	--	--	--	--	--	--		4	--	--	--	--	--	--	--	
F-15	2	6.50E-05	7.92E-05	0.00E+00	0.00E+00	2.16E-04	0.00E+00	0.00E+00		2	--	--	--	0.00E+00	--	--	--	
F-18	2	3.71E-02	6.68E-03	0.00E+00	0.00E+00	6.03E-03	0.00E+00	0.00E+00		2	--	--	--	0.00E+00	--	--	--	
F-16	1	6.50E-05	7.92E-05	0.00E+00	0.00E+00	2.16E-04	0.00E+00	0.00E+00		1	--	--	--	0.00E+00	--	--	--	
Total		4.98E-02	1.73E-02	0.00E+00	4.81E-02	1.02E-02	0.00E+00	1.20E-03	0.13	Total	0.00E+00	0.00E+00	0.00E+00	1.76E-03	0.00E+00	0.00E+00	0.00E+00	0.00
P-3	4	7.18E-03	6.00E-03	0.00E+00	2.91E-02	2.16E-03	0.00E+00	6.86E-04		4	--	--	--	1.18E-03	--	--	--	
E-2C	2	1.80E-03	1.50E-03	0.00E+00	4.41E-03	5.39E-04	0.00E+00	1.72E-04		2	--	--	--	0.00E+00	--	--	--	
E-3	4	3.59E-03	3.00E-03	0.00E+00	1.46E-02	1.08E-03	0.00E+00	3.43E-04		4	--	--	--	5.88E-04	--	--	--	
Total		1.26E-02	1.05E-02	0.00E+00	4.81E-02	3.77E-03	0.00E+00	1.20E-03	0.08	Total	0.00E+00	0.00E+00	0.00E+00	1.76E-03	0.00E+00	0.00E+00	0.00E+00	0.00
P-3	4	7.18E-03	6.00E-03	0.00E+00	2.91E-02	2.16E-03	0.00E+00	6.86E-04		4	--	--	--	1.18E-03	--	--	--	
E-2C	2	1.80E-03	1.50E-03	0.00E+00	4.41E-03	5.39E-04	0.00E+00	1.72E-04		2	--	--	--	0.00E+00	--	--	--	
E-3	4	3.59E-03	3.00E-03	0.00E+00	1.46E-02	1.08E-03	0.00E+00	3.43E-04		4	--	--	--	5.88E-04	--	--	--	
C-130	4	3.59E-03	3.00E-03	0.00E+00	1.46E-02	1.08E-03	0.00E+00	3.43E-04		4	--	--	--	0.00E+00	--	--	--	
Total		1.62E-02	1.35E-02	0.00E+00	6.26E-02	4.85E-03	0.00E+00	1.54E-03	0.10	Total	0.00E+00	0.00E+00	0.00E+00	1.76E-03	0.00E+00	0.00E+00	0.00E+00	0.00
F-18	2	4.95E-02	8.90E-03	0.00E+00	0.00E+00	8.04E-03	0.00E+00	0.00E+00		2	--	--	--	0.00E+00	--	--	--	
P-3	4	9.57E-03	8.00E-03	0.00E+00	3.88E-02	2.87E-03	0.00E+00	9.15E-04		4	--	--	--	1.57E-03	--	--	--	
C-130	4	9.57E-03	8.00E-03	0.00E+00	3.88E-02	2.87E-03	0.00E+00	9.15E-04		4	--	--	--	0.00E+00	--	--	--	
Bell -H	1	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		1	--	--	--	5.40E-03	--	--	--	
Total		6.86E-02	2.49E-02	0.00E+00	7.76E-02	1.38E-02	0.00E+00	1.83E-03	0.19	Total	0.00E+00	0.00E+00	0.00E+00	6.97E-03	0.00E+00	0.00E+00	0.00E+00	0.01
F-4	2	1.70E-02	3.00E-03	0.00E+00	0.00E+00	1.46E-03	0.00E+00	0.00E+00		2				0.00E+00				
F-14	2	--	--	--	0.00E+00	--	--	--		2	3.57E-01	7.05E-03	0.00E+00	4.41E-02	2.27E-03	0.00E+00	3.96E-02	
F-18	2	--	--	--	0.00E+00	--	--	--		2	6.00E-01	1.63E-02	0.00E+00	1.02E-01	2.10E-03	0.00E+00	5.06E-02	
C-130	4	5.98E-03	5.00E-03	0.00E+00	2.43E-02	1.80E-03	0.00E+00	5.72E-04		4	--	--	--	0.00E+00	--	--	--	
P-3	4	2.39E-03	2.00E-03	0.00E+00	9.70E-03	7.19E-04	0.00E+00	2.29E-04		4	--	--	--	3.92E-04	--	--	--	
E-2C	2	--	--	--	0.00E+00	--	--	--		2	6.41E-03	1.89E-04	0.00E+00	5.04E-04	1.45E-04	0.00E+00	2.39E-05	
S-3	2	--	--	--	0.00E+00	--	--	--		2	1.04E-01	5.79E-03	0.00E+00	6.32E-02	3.77E-03	0.00E+00	6.22E-04	
AV-8B	1	--	--	--	0.00E+00	--	--	--		1	6.05E-02	1.35E-03	0.00E+00	2.54E-02	4.82E-04	0.00E+00	1.59E-04	
A-6	2	--	--	--	0.00E+00	--	--	--		2	4.34E-02	1.29E-03	0.00E+00	9.69E-03	4.33E-04	0.00E+00	5.74E-05	
EA-6	2	--	--	--	0.00E+00	--	--	--		2	4.36E-02	1.51E-03	0.00E+00	1.13E-02	6.10E-04	0.00E+00	1.53E-04	
AH-1	2	--	--	--	5.72E-03	--	--	--		2	9.20E-03	2.17E-03	0.00E+00	9.58E-03	5.91E-04	0.00E+00	4.08E-04	
SH-60B	2	--	--	--	0.00E+00	--	--	--		2	4.60E-03	1.09E-03	0.00E+00	1.92E-02	2.95E-04	0.00E+00	2.04E-04	
Total		2.54E-02	1.00E-02	0.00E+00	3.97E-02	3.98E-03	0.00E+00	8.00E-04	0.08	Total	1.23E+00	3.67E-02	0.00E+00	2.85E-01	1.07E-02	0.00E+00	9.18E-02	1.65
AV-8B	1	3.34E-03	2.83E-04	0.00E+00	5.67E-04	5.67E-05	0.00E+00	8.50E-06		1	--	--	--	8.45E-03	--	--	--	
C-130	4	2.39E-03	2.00E-03	0.00E+00	9.70E-03	7.19E-04	0.00E+00	2.29E-04		4	--	--	--	0.00E+00	--	--	--	
Total		5.74E-03	2.28E-03	0.00E+00	1.03E-02	7.75E-04	0.00E+00	2.37E-04	0.02	Total	0.00E+00	0.00E+00	0.00E+00	8.45E-03	0.00E+00	0.00E+00	0.00E+00	0.01
Total									0.60									1.67

C-31

Table C.6-4. Point Mugu Sea Range Aircraft Emissions-Proposed Action (page 7 of 10)

		Outside US Waters															
Engine Type	# of ENG	NO _x Annual Emissions								ROG/HC Annual Emissions							
		Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total NO _x	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total ROG/HC
P-3	4	--	--	--	2.77E-02	--	--	--		--	--	--	5.46E-04	--	--	--	
E2-C	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
E-3	4	--	--	--	1.39E-02	--	--	--		--	--	--	2.73E-04	--	--	--	
B-747	4	--	--	--	--	--	--	--		--	--	--	--	--	--	--	
F-15	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
F-18	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
F-16	1	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
Total		0.00E+00	0.00E+00	0.00E+00	4.16E-02	0.00E+00	0.00E+00	0.00E+00	0.04	0.00E+00	0.00E+00	0.00E+00	8.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00
P-3	4	--	--	--	2.77E-02	--	--	--		--	--	--	5.46E-04	--	--	--	
E-2C	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
E-3	4	--	--	--	1.39E-02	--	--	--		--	--	--	2.73E-04	--	--	--	
Total		0.00E+00	0.00E+00	0.00E+00	4.16E-02	0.00E+00	0.00E+00	0.00E+00	0.04	0.00E+00	0.00E+00	0.00E+00	8.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00
P-3	4	--	--	--	2.77E-02	--	--	--		--	--	--	5.46E-04	--	--	--	
E-2C	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
E-3	4	--	--	--	1.39E-02	--	--	--		--	--	--	2.73E-04	--	--	--	
C-130	4	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
Total		0.00E+00	0.00E+00	0.00E+00	4.16E-02	0.00E+00	0.00E+00	0.00E+00	0.04	0.00E+00	0.00E+00	0.00E+00	8.19E-04	0.00E+00	0.00E+00	0.00E+00	0.00
F-18	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
P-3	4	--	--	--	3.70E-02	--	--	--		--	--	--	7.28E-04	--	--	--	
C-130	4	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
Bell -H	1	--	--	--	4.00E-04	--	--	--		--	--	--	4.53E-04	--	--	--	
Total		0.00E+00	0.00E+00	0.00E+00	3.74E-02	0.00E+00	0.00E+00	0.00E+00	0.04	0.00E+00	0.00E+00	0.00E+00	1.18E-03	0.00E+00	0.00E+00	0.00E+00	0.00
F-4	2				0.00E+00								0.00E+00				
F-14	2	2.07E-02	8.42E-03	0.00E+00	5.26E-02	3.22E-02	0.00E+00	1.76E-02		2.35E-01	3.14E-03	0.00E+00	1.96E-02	1.48E-03	0.00E+00	8.83E-04	
F-18	2	5.04E-03	2.57E-03	0.00E+00	1.61E-02	5.04E-02	0.00E+00	2.02E-02		2.54E-01	1.87E-03	0.00E+00	1.17E-02	6.21E-04	0.00E+00	2.84E-04	
C-130	4				0.00E+00					--	--	--	0.00E+00	--	--	--	
P-3	4				9.25E-03					--	--	--	1.82E-04	--	--	--	
E-2C	2	7.20E-03	4.46E-03	0.00E+00	1.19E-02	2.32E-03	0.00E+00	3.82E-04		1.61E-03	8.78E-05	0.00E+00	2.34E-04	3.50E-05	0.00E+00	5.78E-06	
S-3	2	1.93E-03	5.93E-04	0.00E+00	1.97E-02	4.76E-03	0.00E+00	7.85E-04		1.99E-02	5.29E-04	0.00E+00	6.56E-03	2.90E-04	0.00E+00	4.79E-05	
AV-8B	1	1.00E-03	1.32E-03	0.00E+00	2.48E-02	2.61E-03	0.00E+00	8.60E-04		1.12E-02	9.33E-05	0.00E+00	1.75E-03	5.17E-05	0.00E+00	1.71E-05	
A-6	2	1.22E-03	7.78E-04	0.00E+00	5.83E-03	1.45E-03	0.00E+00	1.06E-03		3.33E-02	2.44E-04	0.00E+00	1.83E-03	9.67E-05	0.00E+00	8.72E-05	
EA-6	2	1.86E-03	8.38E-04	0.00E+00	6.28E-03	1.61E-03	0.00E+00	1.28E-03		2.21E-02	1.90E-04	0.00E+00	1.43E-03	1.28E-04	0.00E+00	5.94E-05	
AH-1	2	4.22E-03	7.84E-04	0.00E+00	3.46E-03	3.28E-04	0.00E+00	1.87E-04		4.40E-04	9.52E-05	0.00E+00	4.20E-04	3.33E-05	0.00E+00	1.95E-05	
SH-60B	2	2.11E-03	3.92E-04	0.00E+00	6.92E-03	1.64E-04	0.00E+00	9.35E-05		2.20E-04	4.76E-05	0.00E+00	8.40E-04	1.67E-05	0.00E+00	9.75E-06	
Total		4.53E-02	2.02E-02	0.00E+00	1.57E-01	9.59E-02	0.00E+00	4.24E-02	0.36	5.78E-01	6.29E-03	0.00E+00	4.45E-02	2.75E-03	0.00E+00	1.41E-03	0.63
AV-8B	1	--	--	--	8.25E-03	--	--	--		--	--	--	5.83E-04	--	--	--	
C-130	4	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
Total		0.00E+00	0.00E+00	0.00E+00	8.25E-03	0.00E+00	0.00E+00	0.00E+00	0.01	0.00E+00	0.00E+00	0.00E+00	5.83E-04	0.00E+00	0.00E+00	0.00E+00	0.00
Total									0.53								0.63

Table C.6-4. Point Mugu Sea Range Aircraft Emissions-Proposed Action (page 8 of 10)

		Outside US Waters																
Engine Type	# of ENG	SO _x Annual Emissions								PM ₁₀ Annual Emissions								
		Taxi	Appr LTO	Appr T/G	Cruise	Climb LTO	Climb T/G	T/O	Total SO _x	Taxi	Appr LTO	Appr T/G	Cruise	Climb LTO	Climb T/G	T/O	Total PM ₁₀	
		t/y	t/y	t/y	t/y	t/y	t/y	t/y		t/y	t/y	t/y	t/y	t/y	t/y	t/y		
P-3	4	--	--	--	1.12E-03	--	--	--		--	--	--	6.17E-03	--	--	--		
E2-C	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
E-3	4	--	--	--	5.60E-04	--	--	--		--	--	--	3.09E-03	--	--	--		
B-747	4	--	--	--	--	--	--	--		--	--	--	--	--	--	--		
F-15	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
F-18	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
F-16	1	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
Total		0.00E+00	0.00E+00	0.00E+00	1.68E-03	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	9.26E-03	0.00E+00	0.00E+00	0.00E+00	0.01	
P-3	4	--	--	--	1.12E-03	--	--	--		--	--	--	6.17E-03	--	--	--		
E-2C	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
E-3	4	--	--	--	5.60E-04	--	--	--		--	--	--	3.09E-03	--	--	--		
Total		0.00E+00	0.00E+00	0.00E+00	1.68E-03	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	9.26E-03	0.00E+00	0.00E+00	0.00E+00	0.01	
P-3	4	--	--	--	1.12E-03	--	--	--		--	--	--	6.17E-03	--	--	--		
E-2C	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
E-3	4	--	--	--	5.60E-04	--	--	--		--	--	--	3.09E-03	--	--	--		
C-130	4	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
Total		0.00E+00	0.00E+00	0.00E+00	1.68E-03	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	9.26E-03	0.00E+00	0.00E+00	0.00E+00	0.01	
F-18	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
P-3	4	--	--	--	1.49E-03	--	--	--		--	--	--	8.23E-03	--	--	--		
C-130	4	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
Bell -H	1	--	--	--	5.33E-05	--	--	--		--	--	--	0.00E+00	--	--	--		
Total		0.00E+00	0.00E+00	0.00E+00	1.55E-03	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	8.23E-03	0.00E+00	0.00E+00	0.00E+00	0.01	
F-4	2				0.00E+00								0.00E+00					
F-14	2	2.59E-03	4.33E-04	0.00E+00	2.71E-03	6.58E-04	0.00E+00	1.47E-03		5.77E-02	8.25E-03	0.00E+00	5.15E-02	4.90E-03	0.00E+00	0.00E+00		
F-18	2	1.75E-03	2.43E-04	0.00E+00	1.52E-03	8.00E-04	0.00E+00	8.75E-04		5.89E-02	5.80E-03	0.00E+00	3.62E-02	5.63E-03	0.00E+00	0.00E+00		
C-130	4	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
P-3	4	--	--	--	3.73E-04	--	--	--		--	--	--	2.06E-03	--	--	--		
E-2C	2	4.50E-04	1.80E-04	0.00E+00	4.80E-04	8.90E-05	0.00E+00	1.47E-05		2.51E-03	9.92E-04	0.00E+00	2.65E-03	4.90E-04	0.00E+00	8.09E-05		
S-3	2	4.50E-04	6.75E-05	0.00E+00	1.39E-03	2.53E-04	0.00E+00	4.18E-05		3.68E-03	1.29E-03	0.00E+00	0.00E+00	9.87E-04	0.00E+00	1.63E-04		
AV-8B	1	2.25E-04	6.59E-05	0.00E+00	1.24E-03	7.13E-05	0.00E+00	2.35E-05		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00		
A-6	2	2.70E-04	4.91E-05	0.00E+00	3.68E-04	5.77E-05	0.00E+00	3.25E-05		1.69E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.73E-04		
EA-6	2	3.10E-04	5.44E-05	0.00E+00	4.08E-04	7.67E-05	0.00E+00	4.17E-05		1.69E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	5.73E-04		
AH-1	2	3.20E-04	6.35E-05	0.00E+00	2.80E-04	2.40E-05	0.00E+00	1.42E-05		3.30E-03	6.48E-04	0.00E+00	2.86E-03	2.45E-04	0.00E+00	1.46E-04		
SH-60B	2	1.60E-04	3.17E-05	0.00E+00	5.60E-04	1.20E-05	0.00E+00	7.09E-06		1.65E-03	3.24E-04	0.00E+00	5.72E-03	1.23E-04	0.00E+00	7.32E-05		
Total		6.53E-03	1.19E-03	0.00E+00	9.32E-03	2.04E-03	0.00E+00	2.52E-03	0.02	1.62E-01	1.73E-02	0.00E+00	1.01E-01	1.24E-02	0.00E+00	1.61E-03	0.29	
AV-8B	1	--	--	--	4.12E-04	--	--	--		--	--	--	5.67E-04	--	--	--		
C-130	4	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--		
Total		0.00E+00	0.00E+00	0.00E+00	4.12E-04	0.00E+00	0.00E+00	0.00E+00	0.00	0.00E+00	0.00E+00	0.00E+00	5.67E-04	0.00E+00	0.00E+00	0.00E+00	0.00	
Total									0.02								0.33	

Table C.6-4. Point Mugu Sea Range Aircraft Emissions-Proposed Action (page 9 of 10)

NOTES:

1. The total number of sorties for each aircraft type were provided by NAWCWPNS Personnel in June 1996. There are no touch and go operations associated with the proposed action. The duration of mode is the estimated time spent in each flight operation. Total time between 0-3,000 ft includes cruise time within US waters, outside US waters, taxi, approach, climbout, and takeoff times.
2. All aircraft (except the F-4, C-130, and P-3 which takeoff and land at NAS Point Mugu) participating in FLEETEX activities takeoff and land on aircraft carriers located outside US waters. Note: The F-4 is flown from Point Mugu to San Nicolas Island. Once there, it is flown remotely as a target (emissions associated with target operations are included in the missile/target estimate under "QF-4"). Following its use as a target, the F-4 is flown remotely back to San Nicolas Island where an operator mans the aircraft and flies it back to NAS Point Mugu. Therefore, there are a total of two takeoffs and two landings associated with each manned F-4 sortie.
3. Aircraft involved in Boost Phase Intercept Testing, Theater-Wide Defense Testing, Area Defense Testing, Nearshore Intercept Testing, and Special Warfare Testing takeoff and land at NAS Point Mugu (except for the B-747-see note # 23). Denoted by the "--" in the calculated emissions portion of the spreadsheet.
4. Unless otherwise noted, the emission indexes for Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Reactive Organic Gases (ROG), and Particulate Matter were obtained from AESO Report No. 6-90, Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines, dated June 1990. The Sulfur Oxides (SO_x) emission indexes were obtained by multiplying the engine fuel flow rate in pounds per hour by the mass fraction of sulfur in fuel (0.4 pounds per 1,000 pounds of fuel -AESO Report No. 6-90). Emission indexes were given in pounds per 1,000 pounds of fuel. The units were converted to pounds per hour using the following formula:
$$\text{Emission Index (lbs/hr)} = \text{Emission Index (lbs/1,000 lbs of fuel)} \times \text{fuel flow (lb/hr)} \times (1/1,000).$$
5. Emission indexes for the B-747, F-15, and F-16 are from Procedures for Emission Inventory Preparation Volume IV: Mobile Sources. EPA 1992. Source of F-15 emission indexes are from the F100-PW-100 engine. This engine has the closest emission characteristics to the F100-220.
6. Times in mode and emission indexes for the F/A-18 aircraft are from AESO Memo Report No. 9815A, Aircraft Emission Estimates: F/A-18 Landing and Take Off Cycle and Maintenance Testing Using JP-5, dated October 1998. Taxi mode assumed to equal the sum of the Taxi Out Modes of Warm-Up, Taxi Out, Checks, and Unstick plus the Taxi In Modes of On Runway (WOW), Taxi In, Hot Refuel, Taxi to Apron, Cool/Shut Down, and Unstick.
7. Emission indexes for the F-14 aircraft are from AESO Memo Report No. 9813 Revision B, Aircraft Emission Estimates: F-14 Landing and Take Off Cycle Using JP-5, dated October 1998.
8. Emission indexes for the AH-1 and SH-60B helicopters are from AESO Memo Report No. 9824, Aircraft Emission Estimates: AH-1W Landing and Takeoff Cycle and Maintenance Testing Using JP-5, dated October 1998.
9. Source of emission indexes for the E-2 aircraft are from the T56-A-16 engine. This engine has the closest emission characteristics to the T56-A-427.
10. Cruise mode emission factors are from table provided by Gary Paetow at AESO dated December 1998. Emission factors for the F-15, F-16, and S-3 differ slightly from those used in this analysis because better data was available from the Air Force. PM₁₀ emission indexes were not available. (Denoted by the "-" in the PM₁₀ emission factor portion of the spreadsheet.)
11. PM₁₀ Emission indexes are not available for the T56-A-16 engine. The T64-GE-6B indexes were substituted because this engine has the closest characteristics to the T56-A-16.
12. PM₁₀ Emission indexes for the J52-P-408 engine were not available and substituted with the emission indexes for the J52-P-6B. This engine has the closest characteristics to the J52-P-408. PM₁₀ emission indexes were not available for the approach setting. (Denoted by the "-" in the PM₁₀ emission factor portion of the spreadsheet.)
13. PM₁₀ Emission indexes were not available for the F402-RR-404, JT9D-7, and the T63-A-5A engines. (Denoted by the "-" in the PM₁₀ emission factor portion of the spreadsheet.)
14. PM₁₀ Emission indexes are not available for afterburner power setting for jet aircraft. (Denoted by the "-" in the PM₁₀ emission factor portion of the spreadsheet.)
15. Duration of mode data for the F-4, F-15, F-16, and Bell-H were obtained from default values listed in Table 5-1 from the Procedures for Emission Inventory Preparation Volume IV: Mobile Sources. EPA 1992. The reported data are in minutes (min).
16. No duration of mode data is given for the takeoff (hover) setting for the Bell-1 helicopter. This time is assumed to be included in the climbout time.
17. Duration of mode data for the E-2 aircraft are from the 1996 Aircraft Emissions Inventory Report. AESO. May 1998. Taxi mode assumed to equal the sum of the Taxi Out Modes of Warm-up, Taxi Out, and Checks plus the Taxi In Modes of On Runway (WOW) and Taxi In. Due to similar engine types, the E-3, C-130, and P-3 are assumed to have the same duration of modes as the E-2.
18. Cruise time in mode for all aircraft provided by the Point Mugu Environmental Division.

Table C.6-4. Point Mugu Sea Range Aircraft Emissions-Proposed Action (page 10 of 10)

NOTES (continued):

19. The duration of mode data for aircraft participating in FLEETEX activities (except for the F-4, C-130, and P-3 which takeoff and land from NAS Point Mugu) are from AESO Memo Report No. 9626, Gaseous Emissions from Aircraft Carrier A/C Launch Operations dated June 1996. This report does not include approach times in mode to the A/C carrier. The taxi time was doubled to obtain a conservative estimate of the taxi in and taxi out times. The approach times are from default values listed in Procedures for Emission Inventory Preparation Volume IV: Mobile Sources. EPA 1992.
20. For Boost Phase Intercept Testing, the F-15, F/A-18, and the F-16 do not cruise below 3,000 feet (Personal Communication with Jeff Ballow, NAWCWPNS 1998).
21. For Nearshore Intercept Testing, the F-18 does not cruise below 3,000 feet. (Personal Communication with Jeff Ballow, NAWCWPNS 1998).
22. For FLEETEX activities, the F-4 does not cruise below 3,000 feet (Personal Communication with Jeff Ballow, NAWCWPNS 1998).
23. The B-747 takes off and lands at another airfield and cruises above 3,000 feet and the emissions are not included in this analysis.
24. Emissions stated as 0.00 E+00 refer to zero emissions due to lack of operations or emission factors.
25. Methodology used to calculate aircraft emissions follows EPA guidelines found in Procedures for Emission Inventory Preparation Volume IV: Mobile Sources (EPA 1992).
26. Formula: (Number of Operations) x (Time in Mode) x (1 hour/60 minutes) x (# of Engines) x (Emission Index) x (1 ton/2,000 pounds) = Emissions (tons/year).

Table C.6-5. Point Mugu Sea Range Marine Vessel Emissions-No Action (page 1 of 4)

Nomenclature	Ship Type	Engines				Emission Factors (lb/hr)				
		Propulsion	No.	Generator	No.	CO	NO _x	ROG/HC	SO _x	PM
	Project Ships									
SDTS (DDG 31)	Self Defense Test Ship	CAT 3512	2	DDC 16V-71T 7163-7305	2	19.45	60.80	1.77	7.51	1.54
FFG 7	Guided Missile Frigate	GE LM2500	2	DDC/S&S 114D001	4	33.56	85.80	3.94	32.56	4.34
FFG 7	<i>Guided Missile Frigate-FLEETEX</i>	GE LM2500	2	DDC/S&S 114D001	4	33.56	85.80	3.94	32.56	4.34
DDG 51	Guided Missile Destroyer	GE LM2500	4	ALLISON 501-K34	3	33.18	153.47	2.21	74.67	6.30
DDG 51	<i>Guided Missile Destroyer-FLEETEX</i>	GE LM2500	4	ALLISON 501-K34	3	33.18	153.47	2.21	74.67	6.30
CG 47	Guided Missile Cruiser	GE LM2500	4	ALLISON 501-K17	3	35.87	89.68	2.78	50.17	4.51
CG 47	<i>Guided Missile Cruiser-FLEETEX</i>	GE LM2500	4	ALLISON 501-K17	3	35.87	89.68	2.78	50.17	4.51
DD 963	Destroyer	GE LM2500	4	ALLISON 501-K17	3	45.59	107.65	3.38	60.74	5.58
DD963	<i>Destroyer-FLEETEX</i>	GE LM2500	4	ALLISON 501-K17	3	45.59	107.65	3.38	60.74	5.58
LPD 1	Landing Platform Dock	Steam		FM 38F5-1/4 (EDG)	2	3.54	21.69	2.67	62.42	13.17
CVN 68	Aircraft Carrier	Nuclear		EMD 16-645E5 (EDG)	4	1.30	17.58	0.32	2.09	0.16
CV 63	Aircraft Carrier	Steam		FM 38ND8-1/8 (EDG)	3	25.20	131.29	16.24	380.18	80.23
CV 63	<i>Aircraft Carrier-FLEETEX</i>	Steam		FM 38ND8-1/8 (EDG)	3	25.20	131.29	16.24	380.18	80.23
AO 177	Fleet Oiler	Steam		FM 38D8-1/8 (EDG)	1	3.13	19.60	2.34	55.16	11.64
AO 177	<i>Fleet Oiler-FLEETEX</i>	Steam		FM 38D8-1/8 (EDG)	1	3.13	19.60	2.34	55.16	11.64
LHA 1	Landing Helicopter Assault Ship	Steam		ALCO 16-251C (EDG)	2	7.90	46.80	5.62	132.15	27.85
LSD 41	Landing Ship Dock	COLT PC2.5V	4	FM 38D8-1/8	4	26.40	348.65	16.12	49.19	16.72
Canadian DDG (FFG 7)	Canadian Ship (CODOG)	GE LM2500	2	DDC/S&S 114D001	4	33.56	85.80	3.94	32.56	4.34
Canadian DDG (FFG 7)	<i>Canadian Ship-FLEETEX</i>	GE LM2500	2	DDC/S&S 114D001	4	33.56	85.80	3.94	32.56	4.34
Contract	Contract Ship	Steam				6.50	11.00	0.40	35.00	2.20
LHD 1	Landing Helicopter Dock	Steam		ALCO 16-251C (EDG)	2	6.79	40.11	4.79	112.37	23.67
EATS (AOE 6)	Multi-Purpose Stores Ship	GE LM2500	4	CAT 3608	5	50.67	457.70	6.97	184.24	14.69
	Range Project Boats									
SL-90	Project Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
SL-90	<i>Project Boat-FLEETEX</i>	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
SL-120	Project Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
SL-120	<i>Project Boat-FLEETEX</i>	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
Tug (YTB 575)	Project Boat	FM 38D8-1/8	1	DD 6-71	2	51.27	20.55	2.77	4.83	0.48
Tug (YTB 575)	<i>Project Boat-FLEETEX</i>	FM 38D8-1/8	1	DD 6-71	2	51.27	20.55	2.77	4.83	0.48

Table C.6-5. Point Mugu Sea Range Marine Vessel Emissions-No Action (page 2 of 4)

Nomenclature	Ship Type	Engines				Emission Factors (lb/hr)				
		Propulsion	No.	Generator	No.	CO	NO _x	ROG/HC	SO _x	PM
Range Support Boats										
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR18-36-1	<i>Support Boat-FLEETEX</i>	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR0-18-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR0-18-1	<i>Support Boat-FLEETEX</i>	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR36-72	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR36-72	<i>Support Boat-FLEETEX</i>	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR0-18-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR0-18-2	<i>Support Boat-FLEETEX</i>	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR72+	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR72+	<i>Support Boat-FLEETEX</i>	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR36-72-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR36-72-2	<i>Support Boat-FLEETEX</i>	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR36-60-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR36-60-1	<i>Support Boat-FLEETEX</i>	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR18-36-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR18-36-2	<i>Support Boat-FLEETEX</i>	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
Yellow Gear (four squadrons)										
	TA-75	210 hp	1			0.20	1.65	0.22	0.33	0.07
	A/S 32K-1A	27 hp	1			0.07	0.23	0.29	0.03	0.02
	JG-40	125 hp	1			0.20	1.65	0.22	0.33	0.07

Table C.6-5. Point Mugu Sea Range Marine Vessel Emissions-No Action (page 3 of 4)

Nomenclature	Time in Mode (hrs)	Time w/in US seas	Time outside US seas	No. of Events	Emissions In US Waters(tons/yr)						Emissions Outside US Waters(tons/yr)					
					CO	NO _x	ROG/HC	SO _x	PM	# of Hrs	CO	NO _x	ROG/HC	SO _x	PM	# of Hrs
SDTS (DDG 31)	13	10	3	49	4.76	14.89	0.43	1.84	0.38	490	1.43	4.47	0.13	0.55	0.11	147
FFG 7	13	1	12	43	0.72	1.84	0.08	0.70	0.09	43	8.66	22.14	1.02	8.40	1.12	516
FFG 7	82	0	82	2	0.00	0.00	0.00	0.00	0.00	0	2.75	7.04	0.32	2.67	0.36	164
DDG 51	13	1	12	29	0.48	2.23	0.03	1.08	0.09	29	5.77	26.70	0.38	12.99	1.10	348
DDG 51	82	0	82	2	0.00	0.00	0.00	0.00	0.00	0	2.72	12.58	0.18	6.12	0.52	164
CG 47	13	0	13	21	0.00	0.00	0.00	0.00	0.00	0	4.90	12.24	0.38	6.85	0.62	273
CG 47	82	0	82	2	0.00	0.00	0.00	0.00	0.00	0	2.94	7.35	0.23	4.11	0.37	164
DD 963	13	1	12	20	0.46	1.08	0.03	0.61	0.06	20	5.47	12.92	0.41	7.29	0.67	240
DD963	82	0	82	2	0.00	0.00	0.00	0.00	0.00	0	3.74	8.83	0.28	4.98	0.46	164
LPD 1	13	1	12	20	0.04	0.22	0.03	0.62	0.13	20	0.43	2.60	0.32	7.49	1.58	240
CVN 68	13	0	13	10	0.00	0.00	0.00	0.00	0.00	0	0.08	1.14	0.02	0.14	0.01	130
CV 63	13	0	13	12	0.00	0.00	0.00	0.00	0.00	0	1.97	10.24	1.27	29.65	6.26	156
CV 63	82	0	82	2	0.00	0.00	0.00	0.00	0.00	0	2.07	10.77	1.33	31.17	6.58	164
AO 177	13	0	13	5	0.00	0.00	0.00	0.00	0.00	0	0.10	0.64	0.08	1.79	0.38	65
AO 177	82	0	82	2	0.00	0.00	0.00	0.00	0.00	0	0.26	1.61	0.19	4.52	0.95	164
LHA 1	13	1	12	7	0.03	0.16	0.02	0.46	0.10	7	0.33	1.97	0.24	5.55	1.17	84
LSD 41	13	1	12	6	0.08	1.05	0.05	0.15	0.05	6	0.95	12.55	0.58	1.77	0.60	72
Canadian DDG (FFG 7)	13	1	12	2	0.03	0.09	0.00	0.03	0.00	2	0.40	1.03	0.05	0.39	0.05	24
Canadian DDG (FFG 7)	82	0	82	2	0.00	0.00	0.00	0.00	0.00	0	2.75	7.04	0.32	2.67	0.36	164
Contract	13	10	3	4	0.13	0.22	0.01	0.70	0.04	40	0.04	0.07	0.00	0.21	0.01	12
LHD 1	13	1	12	3	0.01	0.06	0.01	0.17	0.04	3	0.12	0.72	0.09	2.02	0.43	36
EATS (AOE 6)	13	4	9	5	0.51	4.58	0.07	1.84	0.15	20	1.14	10.30	0.16	4.15	0.33	45
SL-90	13	10	3	30	0.68	2.48	0.32	0.63	0.15	300	0.20	0.74	0.09	0.19	0.05	90
SL-90	82	64	18	2	0.29	1.06	0.13	0.27	0.06	128	0.08	0.30	0.04	0.08	0.02	36
SL-120	13	10	3	22	0.50	1.82	0.23	0.46	0.11	220	0.15	0.54	0.07	0.14	0.03	66
SL-120	82	64	18	2	0.29	1.06	0.13	0.27	0.06	128	0.08	0.30	0.04	0.08	0.02	36
Tug (YTB 575)	63	47	16	21	25.30	10.14	1.37	2.38	0.24	987	8.61	3.45	0.47	0.81	0.08	336
Tug (YTB 575)	132	99	33	2	5.08	2.03	0.27	0.48	0.05	198	1.69	0.68	0.09	0.16	0.02	66

Table C.6-5. Point Mugu Sea Range Marine Vessel Emissions-No Action (page 4 of 4)

Nomenclature	Time in Mode (hrs)	Time w/in US seas	Time outside US seas	No. of Events	Emissions In US Waters(tons/yr)						Emissions Outside US Waters(tons/yr)					
					CO	NO _x	ROG/HC	SO _x	PM	# of Hrs	CO	NO _x	ROG/HC	SO _x	PM	# of Hrs
AVR18-36-1	13	10	3	64	1.44	5.28	0.67	1.34	0.32	640	0.43	1.58	0.20	0.40	0.10	192
AVR18-36-1	82	64	18	2	0.29	1.06	0.13	0.27	0.06	128	0.08	0.30	0.04	0.08	0.02	36
AVR0-18-1	13	10	3	48	1.08	3.96	0.50	1.01	0.24	480	0.32	1.19	0.15	0.30	0.07	144
AVR0-18-1	82	64	18	2	0.29	1.06	0.13	0.27	0.06	128	0.08	0.30	0.04	0.08	0.02	36
AVR36-72	13	10	3	42	0.95	3.47	0.44	0.88	0.21	420	0.28	1.04	0.13	0.26	0.06	126
AVR36-72	82	64	18	2	0.29	1.06	0.13	0.27	0.06	128	0.08	0.30	0.04	0.08	0.02	36
AVR0-18-2	13	10	3	22	0.50	1.82	0.23	0.46	0.11	220	0.15	0.54	0.07	0.14	0.03	66
AVR0-18-2	82	64	18	2	0.29	1.06	0.13	0.27	0.06	128	0.08	0.30	0.04	0.08	0.02	36
AVR72+	13	10	3	15	0.34	1.24	0.16	0.32	0.08	150	0.10	0.37	0.05	0.09	0.02	45
AVR72+	82	64	18	2	0.29	1.06	0.13	0.27	0.06	128	0.08	0.30	0.04	0.08	0.02	36
AVR36-72-2	13	10	3	10	0.23	0.83	0.11	0.21	0.05	100	0.07	0.25	0.03	0.06	0.02	30
AVR36-72-2	82	64	18	2	0.29	1.06	0.13	0.27	0.06	128	0.08	0.30	0.04	0.08	0.02	36
AVR36-60-1	13	10	3	6	0.14	0.50	0.06	0.13	0.03	60	0.04	0.15	0.02	0.04	0.01	18
AVR36-60-1	82	64	18	2	0.29	1.06	0.13	0.27	0.06	128	0.08	0.30	0.04	0.08	0.02	36
AVR18-36-2	13	10	3	2	0.05	0.17	0.02	0.04	0.01	20	0.01	0.05	0.01	0.01	0.00	6
AVR18-36-2	82	64	18	2	0.29	1.06	0.13	0.27	0.06	128	0.08	0.30	0.04	0.08	0.02	36
Yellow Gear (four squadrons)																
TA-75	21.6	0	21.6	2	0.00	0.00	0.00	0.00	0.00	0	0.00	0.04	0.00	0.01	0.00	43.2
A/S 32K-1A	21.6	0	21.6	2	0.00	0.00	0.00	0.00	0.00	0	0.00	0.00	0.01	0.00	0.00	43.2
JG-40	21.6	0	21.6	2	0.00	0.00	0.00	0.00	0.00	0	0.00	0.04	0.00	0.01	0.00	43.2
Total					46.38	70.68	6.49	19.24	3.36	5755.00	61.91	188.57	9.74	148.89	24.70	5210.60

Assumptions:

- Emission factors for ships and craft are based on Navy ship profiles (underway) and engine emission data except AVR's, SL's, and SDTS (all emission factors provided by NAVSEA; M. Osborne 1998).
- AVR's and SL's emission factors are derived from EPA emission factors for small craft diesel propulsion and generator engines, Tables I-12(b) and I-12(a) (Nonroad Engine and Vehicle Study, EPA, Nov. 1991).
- Generators on steam and nuclear ships are emergency diesel generators (EDG's) and designated (EDG).
- All CVNs operate on nuclear power and have EDG's operating while underway.
- All engines operate in underway mode during an entire activity.
- For range and support boats, excluding tugs, activities take place over a period of 3 hours, plus 5 hours of travel time from Port Hueneme to the operations area within the Sea Range (total of 13 hours).
- For tugs, activities take place over a period of 3 hours, plus 30 hours of travel time from Port Hueneme to the operations area within the Sea Range (total of 63 hours).
- Ships coming to the Sea Range from other areas spend a total of 13 hours within the Sea Range, inclusive of preparation, clearance, operation, and transit.
- FLEETEX activities take place over a period of 72 hours (3 days), plus 10 hours of transit time within the Sea Range, 2 times per year (tug requires longer transit time [see #7]).
- Vessels taking part in FLEETEX are: (1) FFG, (1) DDG, (1) CG, (1) DD, (1) CVN, (1) AO, (1) DDG -Can., plus support & project boats.
- Yellow Gear is assumed to function 30% of the time during FLEETEX operation, less transit time.
- Canadian Frigate modeled as FFG-7 with only gas turbines operating, assumed diesel was not operating during these exercises.
- Emission factors are a combination of main propulsion engines and generator sets for diesel and gas turbine ships, boilers and EDG's for steam powered ships, and EDG's alone for nuclear powered ships.

* Emissions from vessel surface targets are included in Missile/Target activities.

Table C.6-6. Point Mugu Sea Range Marine Vessel Emissions-Proposed Action (page 1 of 4)

Nomenclature	Ship Type	Engines				Emission Factors (lb/hr)				
		Propulsion	No.	Generator	No.	CO	NO _x	ROG/HC	SO _x	PM
Theater Missile Defense Element										
Boost Phase Intercept										
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
Upper Tier										
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
DD 963	Destroyer	GE LM2500	4	ALLISON 501-K17	3	45.59	107.65	3.38	60.74	5.58
CG 47	Guided Missile Cruiser	GE LM2500	4	ALLISON 501-K17	3	35.87	89.68	2.78	50.17	4.51
Total										
Lower Tier										
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
DD 963	Destroyer	GE LM2500	4	ALLISON 501-K17	3	45.59	107.65	3.38	60.74	5.58
CG 47	Guided Missile Cruiser	GE LM2500	4	ALLISON 501-K17	3	35.87	89.68	2.78	50.17	4.51
Total										
Nearshore Intercept										
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
DD 963	Destroyer	GE LM2500	4	ALLISON 501-K17	3	45.59	107.65	3.38	60.74	5.58
CG 47	Guided Missile Cruiser	GE LM2500	4	ALLISON 501-K17	3	35.87	89.68	2.78	50.17	4.51
Total										
Training Element										
FLEETEX										
Project Ships										
FFG 7	Guided Missile Frigate	GE LM2500	2	DDC/S&S 114D001	4	33.56	85.80	3.94	32.56	4.34
DDG 51	Guided Missile Destroyer	GE LM2500	4	ALLISON 501-K34	3	33.18	153.47	2.21	74.67	6.30
CG 47	Guided Missile Cruiser	GE LM2500	4	ALLISON 501-K17	3	35.87	89.68	2.78	50.17	4.51
DD 963	Destroyer	GE LM2500	4	ALLISON 501-K17	3	45.59	107.65	3.38	60.74	5.58
CVN 68	Aircraft Carrier	Nuclear		EMD 16-645E5 (EDG)	4	1.30	17.58	0.32	2.09	0.16
AO 177	Fleet Oiler	Steam		FM 38D8-1/8 (EDG)	1	3.13	19.60	2.34	55.16	11.64
Range Project Boats										
SL-90	Project Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
SL-120	Project Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
Tug (YTB 575)	Project Boat	FM 38D8-1/8	1	DD 6-71	2	51.27	20.55	2.77	4.83	0.48
HM-10	Project Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00

Table C.6-6. Point Mugu Sea Range Marine Vessel Emissions-Proposed Action (page 2 of 4)

Nomenclature	Ship Type	Engines				Emission Factors (lb/hr)				
		Propulsion	No.	Generator	No.	CO	NO _x	ROG/HC	SO _x	PM
	Range Support Boats									
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR0-18-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR36-72	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR0-18-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR72+	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR36-72-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR36-60-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
AVR18-36-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
	Yellow Gear (four squadrons)									
	TA-75	210 hp	1			0.20	1.65	0.22	0.33	0.07
	A/S 32K-1A	27 hp	1			0.07	0.23	0.29	0.03	0.02
	JG-40	125 hp	1			0.20	1.65	0.22	0.33	0.07
	Total									
	Special Warfare Training									
AVR36-72-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
HM-10	Project Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00
	Total									

Table C.6-6. Point Mugu Sea Range Marine Vessel Emissions-Proposed Action (page 3 of 4)

Nomenclature	Time in Mode (hrs)	Time w/in US Territory	Time out of US Territory	No. of Events	Time within US Territory Annual Emissions(tons/yr)					Time out of US Territory Annual Emissions(tons/yr)				
					CO	NO _x	ROG/HC	SO _x	PM ₁₀	CO	NO _x	ROG/HC	SO _x	PM ₁₀
Theater Missile Defense Element														
Boost Phase Intercept														
AVR18-36-1	21	15	6	15	0.51	1.86	0.24	0.47	0.11	0.20	0.74	0.09	0.19	0.05
Upper Tier														
AVR18-36-1	21	15	6	18	0.61	2.23	0.28	0.57	0.14	0.24	0.89	0.11	0.23	0.05
DD 963	72	0	72	4	0.00	0.00	0.00	0.00	0.00	6.57	15.50	0.49	8.75	0.80
CG 47	72	0	72	1	0.00	0.00	0.00	0.00	0.00	1.29	3.23	0.10	1.81	0.16
Total					0.61	2.23	0.28	0.57	0.14	8.10	19.62	0.70	10.78	1.02
Lower Tier														
AVR18-36-1	21	15	6	18	0.61	2.23	0.28	0.57	0.14	0.24	0.89	0.11	0.23	0.05
DD 963	72	0	72	4	0.00	0.00	0.00	0.00	0.00	6.57	15.50	0.49	8.75	0.80
CG 47	72	0	72	1	0.00	0.00	0.00	0.00	0.00	1.29	3.23	0.10	1.81	0.16
Total					0.61	2.23	0.28	0.57	0.14	8.10	19.62	0.70	10.78	1.02
Nearshore Intercept														
AVR18-36-1	21	15	6	40	1.35	4.95	0.63	1.26	0.30	0.54	1.98	0.25	0.50	0.12
DD 963	72	6	66	8	1.09	2.58	0.08	1.46	0.13	12.04	28.42	0.89	16.03	1.47
CG 47	72	6	66	2	0.22	0.54	0.02	0.30	0.03	2.37	5.92	0.18	3.31	0.30
Total					2.66	8.07	0.73	3.02	0.46	14.94	36.32	1.33	19.85	1.89
Training Element														
FLEETEX														
FFG 7	82	0	82	1	0.00	0.00	0.00	0.00	0.00	1.38	3.52	0.16	1.34	0.18
DDG 51	82	0	82	1	0.00	0.00	0.00	0.00	0.00	1.36	6.29	0.09	3.06	0.26
CG 47	82	0	82	1	0.00	0.00	0.00	0.00	0.00	1.47	3.68	0.11	2.06	0.19
DD 963	82	0	82	1	0.00	0.00	0.00	0.00	0.00	1.87	4.41	0.14	2.49	0.23
CVN 68	82	0	82	1	0.00	0.00	0.00	0.00	0.00	0.05	0.72	0.01	0.09	0.01
AO 177	82	0	82	1	0.00	0.00	0.00	0.00	0.00	0.13	0.80	0.10	2.26	0.48
SL-90	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01
SL-120	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01
Tug (YTB 575)	132	99	33	1	2.54	1.02	0.14	0.24	0.02	0.85	0.34	0.05	0.08	0.01
HM-10	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01

Table C.6-6. Point Mugu Sea Range Marine Vessel Emissions-Proposed Action (page 4 of 4)

Nomenclature	Time in Mode (hrs)	Time w/in US Territory	Time out of US Territory	No. of Events	Time within US Territory Annual Emissions(tons/yr)					Time out of US Territory Annual Emissions(tons/yr)				
					CO	NO _x	ROG/HC	SO _x	PM ₁₀	CO	NO _x	ROG/HC	SO _x	PM ₁₀
AVR18-36-1	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01
AVR0-18-1	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01
AVR36-72	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01
AVR0-18-2	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01
AVR72+	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01
AVR36-72-2	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01
AVR36-60-1	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01
AVR18-36-2	82	64	18	1	0.14	0.53	0.07	0.13	0.03	0.04	0.15	0.02	0.04	0.01
Yellow Gear (four squadrons)														
TA-75	21.6	0	21.6	1	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
A/S 32K-1A	21.6	0	21.6	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
JG-40	21.6	0	21.6	1	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
Total					4.12	6.83	0.88	1.72	0.38	7.55	21.44	0.88	11.79	1.44
Special Warfare Training														
AVR36-72-2	82	64	18	2	0.29	1.06	0.13	0.27	0.06	0.08	0.30	0.04	0.08	0.02
HM-10	82	64	18	2	0.29	1.06	0.13	0.27	0.06	0.08	0.30	0.04	0.08	0.02
Total					0.58	2.11	0.27	0.54	0.13	0.16	0.59	0.08	0.15	0.04
TOTALS					9.08	23.32	2.68	6.88	1.35	39.06	98.33	3.78	53.54	5.45

Assumptions:

1. Emission factors for ships and craft are based on Navy ship profiles (underway) and engine emission data except AVR's, SL's, and SDTS (all emission factors provided by NAVSEA; M. Osborne 1998).
2. AVR's and SL's emission factors are derived from EPA emission factors for small craft diesel propulsion and generator engines, Tables I-12(b) and I-12(a) (Nonroad Engine and Vehicle Study, EPA, Nov. 1991).
3. Generators on steam and nuclear ships are emergency diesel generators (EDG's) and designated (EDG).
4. All CVNs operate on nuclear power and have EDG's operating while underway.
5. All engines operate in underway mode during an entire activity.
6. For range project and support boats, TMD activities take place over a period of 3 hours, plus 18 hours of travel, preparation, and clearance time within the Sea Range (total of 21 hours).
7. Ships coming from other areas to participate in TMD activities spend 72 hours within the Sea Range inclusive of preparation, clearance, potential test delays, testing, and transit.
8. FLEETEX activities take place over a period of 72 hours (3 days), plus 10 hours of transit time within the Sea Range (tug requires longer transit time [30 hours one way] to operations area).
9. Vessels taking part in FLEETEX are: (1) FFG, (1) DDG, (1) CG, (1) DD, (1) CVN, (1) AO, (1) DDG -Can., plus support & project boats.
10. Yellow Gear is assumed to function 30% of the time during FLEETEX operation, less transit time.
11. Canadian Frigate modeled as FFG-7 with only gas turbines operating, assumed diesel was not operating during these exercises.
12. Emission factors are a combination of main propulsion engines and generator sets for diesel and gas turbine ships, boilers and EDG's for steam powered ships, and EDG's alone for nuclear powered ships.

* Emissions from vessel surface targets are included in Missile/Target activities.

Table C.6-7. Point Mugu Sea Range Missile Target Activities-Proposed Action (page 1 of 4)

Missile/Target Activities in the Sea Range	Engine Type	No. Fired	No. Fired	No. Fired	% time	Propellant/Fuel
			w/in US Ter.	Outside US Ter.	0-3000'	weights (lb)
<i>Missiles</i>						
AIM-7 Sparrow (a) (m)	Propellant	82	NA	NA	0%	98.5
AIM-9 Sidewinder (a)	Propellant	46	4	42	20%	43.2
AIM-54 Phoenix (a) (m)	Propellant	30	NA	NA	0%	365
AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM) (a) (m)	Propellant	10	NA	NA	10%	102.9
AGM-84 Harpoon (b)	J402 Engine	12	2	10	100%	128
Standoff Land Attack Missile (SLAM) (b)	J402 Engine	9	0	9	70%	128
AGM-88 High Speed Anti-Radiation Missile (HARM) (c)	Propellant	6	0	6	70%	282
AGM-65 Maverick (c)	Propellant	1	0	1	70%	64
AGM-154 Joint Standoff Weapon (JSOW) (c) (m)	Propellant (i)	4	NA	NA	0%	282
SM-1&2 Standard Missile (c)	Propellant	56	0	56	80%	1555
FIM-92 Stinger (c)	Propellant	19	19	0	100%	9.6
HAWK (c)	Propellant	4	4	0	100%	630
RGM-109/UGM-109 Tomhawk (d)	F107-WR-402	1	0	1	100%	232
SSM (c)	Propellant (i)	7	7	0	80%	282
Other Missiles (c)	Propellant (j)	29	10	19	70%	133.6
RIM-7 Sea Sparrow (a)	Propellant	6	0	6	70%	133.6
Naval-configuration Army Tactical Missile System (NATACMS) (e)	J402 Engine	1	0	1	70%	128
BATS	Propellant	18	18	0	100%	134
<i>Naval Gunfire</i>						
Aircraft and Vessel Gunfire Activities (n)	N/A	9998	3333	6665	100%	
<i>Targets</i>						
<u>Airborne Targets</u>						
AQM-37 (a) (m)	Propellant	29	NA	NA	0%	281.7
MQM-8 (a)	Propellant (h)	9	9	0	82%	281.7
TDU-34 (a) (m)	Propellant (h)	1	0	1	0%	
			Hours per Operation	Time w/in US	Time Outside US	% Time 0-3,000'
QF-4 NOLO (g)	J79-GE-10B	24	2	2	0	30%
BQM-74 (g)	J400-WR-404 (k)	141	1	0.15	0.85	30%
BQM-34 (g)	J85-GE-100 (l)	22	1	0.17	0.83	30%
			Hours per Operation	Time w/in US	Time Outside US	% Time 0-3,000'
<u>Surface Targets</u>						
QST-35	5 Mercury Marine V-8	34	13	10	3	100%
Mobile Ship Target (MST)	2 671 Diesel	21	13	10	3	100%
QST-33	1 Mercury Marine V-8	20	13	10	3	100%
Tow Bar	None	8				
Pontoon Boat (IVANDUCK)	None	5				
Floating at Sea Target (FAST)	None	2				
Improved Surface Tow Target (ISTT)	None	2				
Hulk (Old Destroyer)	None	1				

Table C.6-7. Point Mugu Sea Range Missile Target Activities-Proposed Action (page 2 of 4)

Missile/Target Activities in the Sea Range	Emission Factor, lbs/1000 lbs fuel						Emissions w/in US Territory (tons/yr)					
	CO	NO _x	ROG/HC	SO _x	PM ₁₀ (f)	HCl	CO	NO _x	ROG/HC	SO _x	PM ₁₀	HCl
<i>Missiles</i>												
AIM-7 Sparrow (a) (m)	424.7	--	--	--	329.9	456.2	NA	NA	NA	NA	NA	NA
AIM-9 Sidewinder (a)	424.7	--	--	--	329.9	456.2	0.01	NA	NA	NA	0.01	0.01
AIM-54 Phoenix (a) (m)	424.7	--	--	--	329.9	456.2	NA	NA	NA	NA	NA	NA
AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM) (a) (m)	424.7	--	--	--	329.9	456.2	NA	NA	NA	NA	NA	NA
AGM-84 Harpoon (b)	1.2	9.65	0.38	0.54	2.21	--	0.00	0.00	0.00	0.00	0.00	NA
Standoff Land Attack Missile (SLAM) (b)	1.2	9.65	0.38	0.54	2.21	--	0.00	0.00	0.00	0.00	0.00	NA
AGM-88 High Speed Anti-Radiation Missile (HARM) (c)	424.7	--	--	--	329.9	456.2	0.00	NA	NA	NA	0.00	0.00
AGM-65 Maverick (c)	424.7	--	--	--	329.9	456.2	0.00	NA	NA	NA	0.00	0.00
AGM-154 Joint Standoff Weapon (JSOW) (c) (m)	424.7	--	--	--	329.9	456.2	NA	NA	NA	NA	NA	NA
SM-1&2 Standard Missile (c)	424.7	--	--	--	329.9	456.2	0.00	NA	NA	NA	0.00	0.00
FIM-92 Stinger (c)	424.7	--	--	--	329.9	456.2	0.04	NA	NA	NA	0.03	0.04
HAWK (c)	424.7	--	--	--	329.9	456.2	0.54	NA	NA	NA	0.42	0.57
RGM-109/UGM-109 Tomhawk (d)	2.74	8.27	1.8	0.54	5.8	--	0.00	0.00	0.00	0.00	0.00	NA
SSM (c)	424.7	--	--	--	329.9	456.2	0.34	NA	NA	NA	0.26	0.36
Other Missiles (c)	424.7	--	--	--	329.9	456.2	0.20	NA	NA	NA	0.15	0.21
RIM-7 Sea Sparrow (a)	424.7	--	--	--	329.9	456.2	0.00	NA	NA	NA	0.00	0.00
Naval-configuration Army Tactical Missile System (NATACMS) (e)	1.2	9.65	0.38	0.54	2.21	456.2	0.00	0.00	0.00	0.00	0.00	0.00
BATS	0.25	0.00	0.01	--	0.21	0.22						
Emission Factor (grams/round)												
	CO	NO_x	ROG/HC	SO_x	PM₁₀							
<i>Naval Gunfire</i> Aircraft and Vessel Gunfire Activities (n)	24.08	0.0004	0.0043	0.0004	--		0.09	0.00	0.00	0.00	0.00	
Emission Factor, lbs/1000 lbs fuel												
	CO	NO_x	ROG/HC	SO_x	PM₁₀	HCl						
<i>Targets</i> <u>Airborne Targets</u> AQM-37 (a) (m)	424.7	--	--	--	329.9	456.2	NA	NA	NA	NA	NA	NA
MQM-8 (a)	424.7	--	--	--	329.9	456.2	0.44	NA	NA	NA	0.34	0.47
TDU-34 (a) (m)							NA	NA	NA	NA	NA	NA
Emission Factor, lbs/hr												
	CO	NO_x	ROG/HC	SO_x	PM₁₀							
QF-4 NOLO (g)	49.63	16.75	9.79	1.82	17.33		0.36	0.12	0.07	0.01	0.12	NA
BQM-74 (g)	0.937	2.825	0.547	0.185	1.984		0.00	0.01	0.00	0.00	0.01	NA
BQM-34 (g)	61.15	12.21	1.37	1.0775	17.33		0.03	0.01	0.00	0.00	0.01	NA
Emission Factor, lbs/hr												
	CO	NO_x	ROG/HC	SO_x	PM₁₀							
<u>Surface Targets</u> QST-35	723.3	18.75	24.25	0.95	1.15		122.96	3.19	4.12	0.16	0.20	NA
Mobile Ship Target (MST)	7.46	13.98	0.28	0.06	0.46		0.78	1.47	0.03	0.01	0.05	NA
QST-33	144.7	3.75	4.85	0.19	0.23		14.47	0.38	0.49	0.02	0.02	NA
Tow Bar							NA	NA	NA	NA	NA	NA
Pontoon Boat (IVANDUCK)							NA	NA	NA	NA	NA	NA
Floating at Sea Target (FAST)							NA	NA	NA	NA	NA	NA
Improved Surface Tow Target (ISTT)							NA	NA	NA	NA	NA	NA
Hulk (Old Destroyer)							NA	NA	NA	NA	NA	NA
TOTAL							140.26	5.18	4.71	0.20	1.62	1.66

C-45

Table C.6-7. Point Mugu Sea Range Missile Target Activities-Proposed Action (page 3 of 4)

Missile/Target Activities in the Sea Range	Emissions Outside US Territory (tons/yr)					
	CO	NO _x	ROG/HC	SO _x	PM ₁₀	HCl
<i>Missiles</i>						
AIM-7 Sparrow (a) (m)	NA	NA	NA	NA	NA	NA
AIM-9 Sidewinder (a)	0.08	NA	NA	NA	0.06	0.08
AIM-54 Phoenix (a) (m)	NA	NA	NA	NA	NA	NA
AIM-120 Advanced Medium-Range Air-to-Air Missile (AMRAAM) (a) (m)	NA	NA	NA	NA	NA	NA
AGM-84 Harpoon (b)	0.00	0.01	0.00	0.00	0.00	NA
Standoff Land Attack Missile (SLAM) (b)	0.00	0.00	0.00	0.00	0.00	NA
AGM-88 High Speed Anti-Radiation Missile (HARM) (c)	0.25	NA	NA	NA	0.20	0.27
AGM-65 Maverick (c)	0.01	NA	NA	NA	0.01	0.01
AGM-154 Joint Standoff Weapon (JSOW) (c) (m)	NA	NA	NA	NA	NA	NA
SM-1&2 Standard Missile (c)	14.79	NA	NA	NA	11.49	15.89
FIM-92 Stinger (c)	0.00	NA	NA	NA	0.00	0.00
HAWK (c)	0.00	NA	NA	NA	0.00	0.00
RGM-109/UGM-109 Tomhawk (d)	0.00	0.00	0.00	0.00	0.00	NA
SSM (c)	0.00	NA	NA	NA	0.00	0.00
Other Missiles (c)	0.38	NA	NA	NA	0.29	0.41
RIM-7 Sea Sparrow (a)	0.12	NA	NA	NA	0.09	0.13
Naval-configuration Army Tactical Missile System (NATACMS) (e)	0.00	0.00	0.00	0.00	0.00	0.02
BATS	0.00	0.00	0.00	NA	0.00	0.00
<i>Naval Gunfire</i>						
Aircraft and Vessel Gunfire Activities (n)	0.18	0.00	0.00	0.00	0.00	0.00
<i>Targets</i>						
<u>Airborne Targets</u>						
AQM-37 (a) (m)	NA	NA	NA	NA	NA	NA
MQM-8 (a)	0.00	NA	NA	NA	0.00	0.00
TDU-34 (a) (m)	NA	NA	NA	NA	NA	NA
QF-4 NOLO (g)	0.00	0.00	0.00	0.00	0.00	NA
BQM-74 (g)	0.02	0.05	0.01	0.00	0.04	NA
BQM-34 (g)	0.17	0.03	0.00	0.00	0.05	NA
<u>Surface Targets</u>						
QST-35	36.89	0.96	1.24	0.05	0.06	NA
Mobile Ship Target (MST)	0.23	0.44	0.01	0.00	0.01	NA
QST-33	4.34	0.11	0.15	0.01	0.01	NA
Tow Bar	NA	NA	NA	NA	NA	NA
Pontoon Boat (IVANDUCK)	NA	NA	NA	NA	NA	NA
Floating at Sea Target (FAST)	NA	NA	NA	NA	NA	NA
Improved Surface Tow Target (ISTT)	NA	NA	NA	NA	NA	NA
Hulk (Old Destroyer)	NA	NA	NA	NA	NA	NA
TOTAL	57.46	1.60	1.41	0.06	12.31	16.81

Table C.6-7. Point Mugu Sea Range Missile Target Activities-Proposed Action (page 4 of 4)

- (a) Source: Range Surveillance Center, George Sreg, Personal Communication, 3 September 1996, assumed to include emissions from 1-boost and 1-sustain phases of combustion.
 - (b) Source: Standoff Land Attack Missile and SLAM Derivative Exercise Missile Firings, Environmental Assessment, 3 October 1996.
Harpoon is similar to SLAM.
 - (c) Assumed to have the same emissions as the AIM series missiles.
 - (d) Source: AESO Memorandum Report 9704, February 1997.
 - (e) Assumed to have the same emissions as the SLAM.
 - (f) For Missiles, Al₂O₃ emissions are assumed to be all PM₁₀.
 - (g) For those airborne targets for which no fuel weight was available, one hour of flight time at cruise setting was assumed per operation (two hours for the QF-4).
 - (h) Propellant weights were assumed to be similar to AQM-37.
 - (i) Propellant weights were assumed to be similar to HARM.
 - (j) Propellant weights were assumed to be similar to Sea Sparrow.
 - (k) Emission factors for J402 engine used for J400 engine.
 - (l) Emission factors for J85-GE-2 engine at 75% power setting used for J85-GE-100 engine.
 - (m) Fired or launched at an altitude above 3,000'.
 - (n) Emission factors for the Naval Gunfire - CIWS Activities from the Environmental Assessment Operation of the Phalanx System San Nicolas Island, California.
Emission factors for PM₁₀ were not available.
Assume 1/3 of gunfire occurs within US Territory and remainder occurs outside of US Territory (email from Alex Stone, NAS Point Mugu dated December 7, 1998).
Formula for emissions calculations: (Number of Rounds) x (Emission Factor-grams/round) x (1 lb/454 grams) x (1 ton/2,000 lbs).
- Note: Emission factors that were not available are denoted by the "--" symbol in the spreadsheet.

Table C.6-8. Missile/Target Emissions-Proposed Action (page 1 of 4)

Missile/Target Activities in the Sea Range	Engine Type	No. Fired	No. Fired w/in US Territory	No. Fired Outside US Territory	Propellant/Fuel weights (lb)	Emission Factor, lb/lb fuel						
						CO	NO _x	ROG/HC	SO _x	PM ₁₀ (f)	HCl	
Theater Missile Defense Element												
<i>Boost Phase Intercept</i>												
<u>Targets</u>												
MGM-52 Lance Missile Target (a)	Propellant	3	3	0	1475	--	0.69	--	--	--	--	--
<i>Upper Tier</i>												
<u>Missiles</u>												
SM-3 Missiles	Propellant	6	0	6	2076	0.25	0.000001	0.01	--	0.21	0.22	
<u>Targets</u>												
MGM-52 Lance Missile Target (a)	Propellant	3	2	1	1475	--	0.69	--	--	--	--	
Total												
<i>Lower Tier</i>												
<u>Missiles</u>												
SM-2 Bk IV-A	Propellant	3	1	2	1842	0.25	0.000001	0.01	--	0.21	0.22	
<u>Targets</u>												
MGM-52 Lance Missile Target (a)	Propellant	3	1	2	1475	--	0.69	--	--	--	--	
Total												
<i>Nearshore Intercept</i>												
<u>Missiles</u>												
SM-2	Propellant	8	8	0	1842	0.25	0.000001	0.01	--	0.21	0.22	
<u>Targets</u>												
BQM-74 ©	J400-WR-404 (d)	8	8	0	1	0.94	2.825	0.547	0.185	1.984	--	
Total												
Training Element												
<i>FLEETEX</i>												
<u>Missiles</u>												
AIM-7 Sparrow (f)	Propellant	9	NA	NA	98.5	0.25	0.000001	0.01	--	0.21	0.22	
AIM-9 Sidewinder	Propellant	11	1	10	43.2	0.25	0.000001	0.01	--	0.21	0.22	
AIM-54 Phoenix (f)	Propellant	3	NA	NA	366	0.25	0.000001	0.01	--	0.21	0.22	
FIM-92 Stinger	Propellant	3	3	0	9.6	0.25	0.000001	0.01	--	0.21	0.22	
SM-1&2 Standard Missile	Propellant	4	0	4	1940	0.25	0.000001	0.01	--	0.21	0.22	
AGM-84 Harpoon (b)	J402 Engine (d)	4	1	3	282	1.2	9.65	0.38	0.54	2.21	--	
<u>Targets</u>												
BQM-74 ©	J400-WR-404 (d)	21	3	18	1	0.94	2.825	0.547	0.185	1.984	--	
BQM-34 ©	J85-GE-100 (e)	1	1	0	1	61.2	12.21	1.37	1.0775	17.33	--	
AQM-37 (f)	Propellant	3	NA	NA	291		0.69	--	--	--	--	
MQM-8	Propellant	3	3	0	128	0.25	0.000001	0.01	--	0.21	0.22	
BATS	Propellant	1	1	0	134	0.25	0.000001	0.01	--	0.21	0.22	

C-48

Table C.6-8. Missile/Target Emissions-Proposed Action (page 2 of 4)

Missile/Target Activities in the Sea Range	Engine Type	No. Fired	No. Fired w/in US Ter.	No. Fired Outside US Ter.	% time 0-3000'	Emission Factor, grams/round				
						CO	NO _x	ROG/HC	SO _x	PM ₁₀
Vessel Gunfire Activities (g)	N/A	3000	0	3000	100%	24.1	0.0004	0.0043	0.0004	--
						Emission Factor, lb/hr				
			Operational Hours	Hours w/in US Territory	Hours Outside US Territory	CO	NO _x	ROG/HC	SO _x	PM ₁₀
<u>Surface Targets</u>										
QST-35	5 Mercury Marine V-8	4	13	10	3	723	18.75	24.25	0.95	1.15
Total										

Table C.6-8. Missile/Target Emissions-Proposed Action (page 3 of 4)

Missile/Target Activities in the Sea Range	Emissions w/in US Territory, tons/yr						Emissions outside US Territory, tons/yr					
	CO	NO _x	ROG/HC	SO _x	PM ₁₀	HCl	CO	NO _x	ROG/HC	SO _x	PM ₁₀	HCl
Theater Missile Defense Element												
<i>Boost Phase Intercept</i>												
<u>Targets</u>												
MGM-52 Lance Missile Target (a)	NA	1.53	NA	NA	NA	NA	NA	0.00	NA	NA	NA	NA
<i>Upper Tier</i>												
<u>Missiles</u>												
SM-3 Missiles	0.00	0.00	0.00	NA	0.00	0.00	1.56	0.00	0.06	NA	1.31	1.37
<u>Targets</u>												
MGM-52 Lance Missile Target (a)	NA	1.02	NA	NA	NA	NA	NA	0.51	NA	NA	NA	NA
Total	0.00	1.02	0.00	0.00	0.00	0.00	1.56	0.51	0.06	0.00	1.31	1.37
<i>Lower Tier</i>												
<u>Missiles</u>												
SM-2 Bk IV-A	0.23	0.00	0.01	NA	0.19	0.20	0.46	0.00	0.02	NA	0.39	0.41
<u>Targets</u>												
MGM-52 Lance Missile Target (a)	NA	0.51	NA	NA	NA	NA	NA	1.02	NA	NA	NA	NA
Total	0.23	0.51	0.01	0.00	0.19	0.20	0.46	1.02	0.02	0.00	0.39	0.41
<i>Nearshore Intercept</i>												
<u>Missiles</u>												
SM-2	1.84	0.00	0.07	NA	1.55	1.62	0.00	0.00	0.00	NA	0.00	0.00
<u>Targets</u>												
BQM-74 (c)	0.00	0.01	0.00	0.00	0.01	NA	0.00	0.00	0.00	0.00	0.00	NA
Total	1.84	0.01	0.07	0.00	1.56	1.62	0.00	0.00	0.00	0.00	0.00	0.00
Training Element												
<i>FLEETEX</i>												
<u>Missiles</u>												
AIM-7 Sparrow (f)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
AIM-9 Sidewinder	0.01	0.00	0.00	NA	0.00	0.00	0.05	0.00	0.00	NA	0.05	0.05
AIM-54 Phoenix (f)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
FIM-92 Stinger	0.00	0.00	0.00	NA	0.00	0.00	0.00	0.00	0.00	NA	0.00	0.00
SM-1&2 Standard Missile	0.00	0.00	0.00	NA	0.00	0.00	0.97	0.00	0.04	NA	0.81	0.85
AGM-84 Harpoon (b)	0.17	1.36	0.05	0.08	0.31	NA	0.51	4.08	0.16	0.23	0.93	NA
<u>Targets</u>												
BQM-74 (c)	0.00	0.00	0.00	0.00	0.00	NA	0.01	0.03	0.00	0.00	0.02	NA
BQM-34 (c)	0.03	0.01	0.00	0.00	0.01	NA	0.00	0.00	0.00	0.00	0.00	NA
AQM-37 (f)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
MQM-8	0.05	0.00	0.00	NA	0.04	0.04	0.00	0.00	0.00	NA	0.00	0.00
BATS	0.02	0.00	0.00	NA	0.01	0.01	0.00	0.00	0.00	NA	0.00	0.00

C-50

Table C.6-8. Missile/Target Emissions-Proposed Action (page 4 of 4)

Missile/Target Activities in the Sea Range	Emissions w/in US Territory, tons/yr						Emissions outside US Territory, tons/yr					
	CO	NO _x	ROG/HC	SO _x	PM ₁₀	HCl	CO	NO _x	ROG/HC	SO _x	PM ₁₀	HCl
Vessel Gunfire Activities (g)	0.00	0.00	0.00	0.00	NA		0.08	0.00	0.00	0.00	NA	
<u>Surface Targets</u>												
QST-35	14.47	0.38	0.49	0.02	0.02	0.00	4.34	0.11	0.15	0.01	0.01	0.00
Total	14.78	1.75	0.54	0.10	0.39	0.05	5.96	4.22	0.35	0.24	1.82	0.90
TOTAL EMISSIONS	16.85	4.82	0.62	0.10	2.14	1.87	7.98	5.75	0.43	0.24	3.52	2.68

NOTES:

Source: U.S. Navy 60G-2-2-11-1. Combustion products and emission factors for propellants were derived from the U. S. Navy, Survey and Evaluation of Environmental Impact of Naval Weapons Center Activities.

(a) Propellants are fuming nitric acid and hydrazine; emissions assumed to be all NO_x.

(b) Source: Standoff Land Attack Missile and SLAM Derivative Exercise Missile Firings, Environmental Assessment, 3 October 1996.

(c) For those airborne targets for which no fuel weight was available, one hour of flight time at cruise setting was assumed per operation.

(d) Source: AESO 6-90; Emission factors for J402 engine used for J400 engine.

(e) Source: AESO 6-90; Emission factors for J85-GE-2 engine at 75% power setting used for J85-GE-100 engine.

(f) High altitude missile fired or launched above 3,000 feet.

(g) Emission factors for the Naval Gunfire - CIWS Activities from the Environmental Assessment Operation of the Phalanx System San Nicolas Island, California.

Emission factors for PM₁₀ were not available.

Assume all gunfire occurs outside US Territory (NAWS Point Mugu 1998).

Formula for emissions calculations: (Number of Rounds) x (Emission Factor-grams/round) x (1 lb/454 grams) x (1 ton/2,000 lbs).

Note: Emission factors that were not available are denoted by the "--" symbol in the spreadsheet.

Table C.6-9. Point Mugu Sea Range Aircraft Emissions/Conformity Applicability (page 1 of 6)

THEATER MISSILE DEFENSE ELEMENT	Engine Type	Engine Model	Number of Sorties	Total Number of Operations	Total Time Btwn 0-3000 Ft	Cruise Mode	Number of Operations for Each Mode					Duration of Mode							
						Time w/in 3NM/ below 3,000 ft min	Taxi	Approach	Cruise	Climbout	T/O	Taxi	Approach	Climbout	T/O				
							LTO	T/G	LTO	T/G	LTO	T/G	min	min	min	min			
Boost Phase Intercept	P-3	T56-A-16	6	24	31.20	0.00	6	6	0	0	6	0	6	21.50	6.80	0.00	2.20	0.00	0.70
	E2-C	T56-A-427	3	12	31.20	0.00	3	3	0	0	3	0	3	21.50	6.80	0.00	2.20	0.00	0.70
	E-3	T56-A-16	3	12	31.20	0.00	3	3	0	0	3	0	3	21.50	6.80	0.00	2.20	0.00	0.70
	B-747	JT9D-7	3	12	0.00	0.00	3	3	0	0	3	0	3	0.00	0.00	0.00	0.00	0.00	0.00
	F-15	F100-220	3	12	15.50	0.00	3	3	0	0	3	0	3	13.00	1.60	0.00	0.50	0.00	0.40
	F-18	F404-GE-400	6	24	51.37	0.00	6	6	0	0	6	0	6	44.07	4.30	0.00	2.50	0.00	0.50
	F-16	F100-100	6	24	15.50	0.00	6	6	0	0	6	0	6	13.00	1.60	0.00	0.50	0.00	0.40
Upper Tier	P-3	T56-A-16	6	24	31.20	0.00	6	6	0	0	6	0	6	21.50	6.80	0.00	2.20	0.00	0.70
	E-2C	T56-A-427	3	12	31.20	0.00	3	3	0	0	3	0	3	21.50	6.80	0.00	2.20	0.00	0.70
	E-3	T56-A-16	3	12	31.20	0.00	3	3	0	0	3	0	3	21.50	6.80	0.00	2.20	0.00	0.70
Lower Tier	P-3	T56-A-16	6	24	31.20	0.00	6	6	0	0	6	0	6	21.50	6.80	0.00	2.20	0.00	0.70
	E-2C	T56-A-427	3	12	31.20	0.00	3	3	0	0	3	0	3	21.50	6.80	0.00	2.20	0.00	0.70
	E-3	T56-A-16	3	12	31.20	0.00	3	3	0	0	3	0	3	21.50	6.80	0.00	2.20	0.00	0.70
	C-130	T56-A-16	3	12	31.20	0.00	3	3	0	0	3	0	3	21.50	6.80	0.00	2.20	0.00	0.70
Nearshore Intercept	F-18	F404-GE-400	8	32	51.37	0.00	8	8	0	0	8	0	8	44.07	4.30	0.00	2.50	0.00	0.50
	P-3	T56-A-16	8	32	31.20	0.00	8	8	0	0	8	0	8	21.50	6.80	0.00	2.20	0.00	0.70
	C-130	T56-A-16	8	32	31.20	0.00	8	8	0	0	8	0	8	21.50	6.80	0.00	2.20	0.00	0.70
	Bell -H	T63-A-700	8	32	29.60	0.00	8	8	0	0	8	0	8	16.00	6.80	0.00	6.80	0.00	
Training Element FLEETEX	F-4	J79-GE-10B	2	8	15.50	0.00	2	2	0	0	2	0	2	13.00	1.60	0.00	0.50	0.00	0.40
	F-14	TF30-P-414	14	0	32.93	0.00	0	0	0	0	0	0	0	30.00	1.60	0.00	1.00	0.00	0.33
	F-18	F404-GE-400	14	0	32.93	0.00	0	0	0	0	0	0	0	30.00	1.60	0.00	1.00	0.00	0.33
	C-130	T56-A-16	5	20	31.20	0.00	5	5	0	0	5	0	5	21.50	6.80	0.00	2.20	0.00	0.70
	P-3	T56-A-16	2	8	31.20	0.00	2	2	0	0	2	0	2	21.50	6.80	0.00	2.20	0.00	0.70
	E-2C	T56-A-427	3	0	36.83	0.00	0	0	0	0	0	0	0	30.00	4.50	0.00	2.00	0.00	0.33
	S-3	TF34-GE-400	5	0	36.83	0.00	0	0	0	0	0	0	0	30.00	4.50	0.00	2.00	0.00	0.33
	AV-8B	F402-RR-404	2	0	32.93	0.00	0	0	0	0	0	0	0	30.00	1.60	0.00	1.00	0.00	0.33
	A-6	J-52-P-8B	2	0	32.93	0.00	0	0	0	0	0	0	0	30.00	1.60	0.00	1.00	0.00	0.33
	EA-6	J-52-P-408	2	0	32.93	0.00	0	0	0	0	0	0	0	30.00	1.60	0.00	1.00	0.00	0.33
	AH-1	T700-GE-401	4	0	40.13	0.00	0	0	0	0	0	0	0	30.00	6.80	0.00	2.00	0.00	1.33
	SH-60B	T700-GE-700	2	0	40.13	0.00	0	0	0	0	0	0	0	30.00	6.80	0.00	2.00	0.00	1.33
	Special Warfare Training	AV-8B	F402-RR-404	2	8	68.15	0.00	2	2	0	0	2	0	2	59.00	5.00	2.00	1.00	1.00
C-130		T56-A-16	2	8	39.20	0.00	2	2	0	0	2	0	2	21.50	6.80	7.00	2.20	1.00	0.70

Table C.6-9. Point Mugu Sea Range Aircraft Emissions/Conformity Applicability (page 2 of 6)

Engine Type	Engine Model	CO Emission Indexes					NO _x Emission Indexes					ROG/HC Emission Indexes					SO _x Emission Indexes					PM ₁₀ Emission Indexes				
		Taxi	Appr	Cruise	Climb	T/O	Taxi	Appr	Cruise	Climb	T/O	Taxi	Appr	Crui	Clim	T/O	Taxi	Appr	Crui	Clim	T/O	Taxi	Appr	Crui	Clim	T/O
		lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr	lb/hr
P-3	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-2C	T56-A-427	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-3	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
B-747	JT9D-7	142.43	44.62	44.62	6.60	3.23	5.73	36.26	36.26	282.33	474.57	55.11	4.65	4.65	1.32	0.81	0.74	1.86	1.86	5.28	6.46	-	-	-	-	-
F-15	F100-220	20.50	9.00	17.40	18.72	2435.43	4.20	33.00	20.10	457.59	729.30	2.40	1.80	5.70	0.52	4.42	0.42	1.20	1.20	4.16	17.68	0.10	0.99	-	8.63	-
F-18	F404-GE-400	85.69	43.64	43.64	9.02	656.54	0.72	6.88	6.88	216.05	261.82	36.30	5.01	5.01	2.66	3.69	0.25	0.65	0.65	3.43	11.36	8.42	15.53	15.53	24.13	-
F-16	F100-100	20.50	9.00	17.40	18.72	2435.43	4.20	33.00	20.10	457.59	729.30	2.40	1.80	5.70	0.52	4.42	0.42	1.20	1.20	4.16	17.68	0.10	0.99	-	8.63	-
P-3	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-2C	T56-A-427	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-3	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
P-3	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-2C	T56-A-427	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-3	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
C-130	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
F-18	F404-GE-400	85.69	43.64	43.64	9.02	656.54	0.72	6.88	6.88	216.05	261.82	36.30	5.01	5.01	2.66	3.69	0.25	0.65	0.65	3.43	11.36	8.42	15.53	15.53	24.13	0.00
P-3	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
C-130	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
Bell-H	T63-A-700	4.83	4.05	4.05	2.50	1.62	0.09	0.30	0.30	0.81	1.09	1.24	0.34	0.34	0.04	0.02	0.02	0.04	0.04	0.07	0.09	-	-	-	-	-
F-4	J79-GE-10B	139.26	68.59	68.59	15.97	509.57	1.67	14.48	14.48	102.58	157.78	56.84	11.67	11.67	14.03	21.15	0.50	1.37	1.37	4.00	14.00	19.62	28.12	28.12	43.81	-
F-14	TF30-P-414	51.07	18.88	18.88	9.73	514.81	2.96	22.56	22.56	138.18	228.96	33.54	8.40	8.40	6.35	11.47	0.37	1.16	1.16	2.82	19.12	8.24	22.09	22.09	21.01	-
F-18	F404-GE-400	85.69	43.64	43.64	9.02	656.54	0.72	6.88	6.88	216.05	261.82	36.30	5.01	5.01	2.66	3.69	0.25	0.65	0.65	3.43	11.36	8.42	15.53	15.53	24.13	-
C-130	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
P-3	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
E-2C	T56-A-427	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90
S-3	TF34-GE-400	41.67	15.44	16.84	22.62	22.62	0.77	1.58	5.24	28.56	28.56	7.97	1.41	1.75	1.74	1.74	0.18	0.18	0.37	1.52	1.52	1.47	3.43	-	5.92	5.92
AV-8B	F402-RR-404	120.90	50.70	50.70	28.90	28.90	2.00	49.50	49.50	156.40	156.40	22.40	3.50	3.50	3.10	3.10	0.45	2.47	2.47	4.28	4.28	-	-	-	-	-
A-6	J-52-P-8B	43.37	24.23	24.23	12.98	5.22	1.22	14.58	14.58	43.64	96.16	33.30	4.58	4.58	2.90	7.93	0.27	0.92	0.92	1.73	2.95	16.91	-	-	-	52.13
EA-6	J-52-P-408	43.60	28.30	28.30	18.30	13.90	1.86	15.71	15.71	48.21	116.76	22.07	3.57	3.57	3.85	5.40	0.31	1.02	1.02	2.30	3.79	16.90	-	-	-	52.10
AH-1	T700-GE-401	4.60	4.79	4.79	4.43	4.60	2.11	1.73	1.73	2.46	2.11	0.22	0.21	0.21	0.25	0.22	0.16	0.14	0.14	0.18	0.16	1.65	1.43	1.43	1.84	1.65
SH-60B	T700-GE-700	4.60	4.79	4.79	4.43	4.60	2.11	1.73	1.73	2.46	2.11	0.22	0.21	0.21	0.25	0.22	0.16	0.14	0.14	0.18	0.16	1.65	1.43	1.43	1.84	1.65
AV-8B	F402-RR-404	120.90	50.70	50.70	28.90	28.90	2.00	49.50	49.50	156.40	156.40	22.40	3.50	3.50	3.10	3.10	0.45	2.47	2.47	4.28	4.28	3.40	3.40	3.40	3.40	3.40
C-130	T56-A-16	4.27	0.84	0.84	1.45	1.45	4.80	19.82	19.82	23.18	23.18	1.07	0.39	0.39	0.35	0.35	0.30	0.80	0.80	0.89	0.89	1.67	4.41	4.41	4.90	4.90

C-53

Table C.6-9. Point Mugu Sea Range Aircraft Emissions/Conformity Applicability (page 3 of 6)

Engine Type	Engine Model	# of Eng.	CO Annual Emissions								NO _x Annual Emissions							
			Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total CO	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total NO _x
P-3	T56-A-16	4	1.84E-02	1.14E-03	0.00E+00	0.00E+00	6.38E-04	0.00E+00	2.03E-04		2.06E-02	2.70E-02	0.00E+00	0.00E+00	1.02E-02	0.00E+00	3.25E-03	
E2-C	T56-A-16	2	4.59E-03	2.86E-04	0.00E+00	0.00E+00	1.60E-04	0.00E+00	5.08E-05		5.16E-03	6.74E-03	0.00E+00	0.00E+00	2.55E-03	0.00E+00	8.11E-04	
E-3	T56-A-16	4	9.18E-03	5.71E-04	0.00E+00	0.00E+00	3.19E-04	0.00E+00	1.02E-04		1.03E-02	1.35E-02	0.00E+00	0.00E+00	5.10E-03	0.00E+00	1.62E-03	
B-747	JT9D-7	4	--	--	--	--	--	--	--		--	--	--	--	--	--	--	
F-15	F100-220	2	1.33E-02	7.20E-04	0.00E+00	0.00E+00	4.68E-04	0.00E+00	4.87E-02		2.73E-03	2.64E-03	0.00E+00	0.00E+00	1.14E-02	0.00E+00	1.46E-02	
F-18	F404-GE-400	2	3.78E-01	1.88E-02	0.00E+00	0.00E+00	2.26E-03	0.00E+00	3.28E-02		3.17E-03	2.96E-03	0.00E+00	0.00E+00	5.40E-02	0.00E+00	1.31E-02	
F-16	F100-100	1	1.33E-02	7.20E-04	0.00E+00	0.00E+00	4.68E-04	0.00E+00	4.87E-02		2.73E-03	2.64E-03	0.00E+00	0.00E+00	1.14E-02	0.00E+00	1.46E-02	
	Total		4.36E-01	2.22E-02	0.00E+00	0.00E+00	4.31E-03	0.00E+00	1.31E-01	0.59	4.48E-02	5.54E-02	0.00E+00	0.00E+00	9.47E-02	0.00E+00	4.79E-02	0.24
P-3	T56-A-16	4	1.84E-02	1.14E-03	0.00E+00	0.00E+00	6.38E-04	0.00E+00	2.03E-04		2.06E-02	2.70E-02	0.00E+00	0.00E+00	1.02E-02	0.00E+00	3.25E-03	
E-2C	T56-A-427	2	4.59E-03	2.86E-04	0.00E+00	0.00E+00	1.60E-04	0.00E+00	5.08E-05		5.16E-03	6.74E-03	0.00E+00	0.00E+00	2.55E-03	0.00E+00	8.11E-04	
E-3	T56-A-16	4	9.18E-03	5.71E-04	0.00E+00	0.00E+00	3.19E-04	0.00E+00	1.02E-04		1.03E-02	1.35E-02	0.00E+00	0.00E+00	5.10E-03	0.00E+00	1.62E-03	
	Total		3.21E-02	2.00E-03	0.00E+00	0.00E+00	1.12E-03	0.00E+00	3.55E-04	0.04	3.61E-02	4.72E-02	0.00E+00	0.00E+00	1.78E-02	0.00E+00	5.68E-03	0.11
P-3	T56-A-16	4	1.84E-02	1.14E-03	0.00E+00	0.00E+00	6.38E-04	0.00E+00	2.03E-04		2.06E-02	2.70E-02	0.00E+00	0.00E+00	1.02E-02	0.00E+00	3.25E-03	
E-2C	T56-A-427	2	4.59E-03	2.86E-04	0.00E+00	0.00E+00	1.60E-04	0.00E+00	5.08E-05		5.16E-03	6.74E-03	0.00E+00	0.00E+00	2.55E-03	0.00E+00	8.11E-04	
E-3	T56-A-16	4	9.18E-03	5.71E-04	0.00E+00	0.00E+00	3.19E-04	0.00E+00	1.02E-04		1.03E-02	1.35E-02	0.00E+00	0.00E+00	5.10E-03	0.00E+00	1.62E-03	
C-130	T56-A-16	4	9.18E-03	5.71E-04	0.00E+00	0.00E+00	3.19E-04	0.00E+00	1.02E-04		1.03E-02	1.35E-02	0.00E+00	0.00E+00	5.10E-03	0.00E+00	1.62E-03	
	Total		4.13E-02	2.57E-03	0.00E+00	0.00E+00	1.44E-03	0.00E+00	4.57E-04	0.05	4.64E-02	6.06E-02	0.00E+00	0.00E+00	2.29E-02	0.00E+00	7.30E-03	0.14
F-18	F404-GE-400	2	5.04E-01	2.50E-02	0.00E+00	0.00E+00	3.01E-03	0.00E+00	4.38E-02		4.23E-03	3.94E-03	0.00E+00	0.00E+00	7.20E-02	0.00E+00	1.75E-02	
P-3	T56-A-16	4	2.45E-02	1.52E-03	0.00E+00	0.00E+00	8.51E-04	0.00E+00	2.71E-04		2.75E-02	3.59E-02	0.00E+00	0.00E+00	1.36E-02	0.00E+00	4.33E-03	
C-130	T56-A-16	4	2.45E-02	1.52E-03	0.00E+00	0.00E+00	8.51E-04	0.00E+00	2.71E-04		2.75E-02	3.59E-02	0.00E+00	0.00E+00	1.36E-02	0.00E+00	4.33E-03	
Bell -H	T63-A-700	1	5.15E-03	1.84E-03	0.00E+00	0.00E+00	1.14E-03	0.00E+00	0.00E+00		9.60E-05	1.36E-04	0.00E+00	0.00E+00	3.67E-04	0.00E+00	0.00E+00	
	Total		5.58E-01	2.99E-02	0.00E+00	0.00E+00	5.84E-03	0.00E+00	4.43E-02	0.64	5.94E-02	7.60E-02	0.00E+00	0.00E+00	9.96E-02	0.00E+00	2.61E-02	0.26
F-4	J79-GE-10B	2	6.03E-02	3.66E-03	0.00E+00	0.00E+00	2.66E-04	0.00E+00	6.79E-03		7.24E-04	7.72E-04	0.00E+00	0.00E+00	1.71E-03	0.00E+00	2.10E-03	
F-14	TF30-P-414	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
F-18	F404-GE-400	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
C-130	T56-A-16	4	1.53E-02	9.52E-04	0.00E+00	0.00E+00	5.32E-04	0.00E+00	1.69E-04		1.72E-02	2.25E-02	0.00E+00	0.00E+00	8.50E-03	0.00E+00	2.70E-03	
P-3	T56-A-16	4	6.12E-03	3.81E-04	0.00E+00	0.00E+00	2.13E-04	0.00E+00	6.77E-05		6.88E-03	8.99E-03	0.00E+00	0.00E+00	3.40E-03	0.00E+00	1.08E-03	
E-2C	T56-A-427	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
S-3	TF34-GE-400	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
AV-8B	F402-RR-404	1	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
A-6	J-52-P-8B	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
EA-6	J-52-P-408	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
AH-1	T70 -GE-401	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
SH-60B	T700-GE-700	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
	Total		8.18E-02	4.99E-03	0.00E+00	0.00E+00	1.01E-03	0.00E+00	7.03E-03	0.09	2.48E-02	3.22E-02	0.00E+00	0.00E+00	1.36E-02	0.00E+00	5.89E-03	0.08
AV-8B	F402-RR-404	1	1.19E-01	4.23E-03	0.00E+00	0.00E+00	4.82E-04	0.00E+00	7.23E-05		1.97E-03	4.13E-03	0.00E+00	0.00E+00	2.61E-03	0.00E+00	3.91E-04	
C-130	T56-A-16	4	6.12E-03	3.81E-04	0.00E+00	0.00E+00	2.13E-04	0.00E+00	6.77E-05		6.88E-03	8.99E-03	0.00E+00	0.00E+00	3.40E-03	0.00E+00	1.08E-03	
	Total		1.25E-01	4.61E-03	0.00E+00	0.00E+00	6.94E-04	0.00E+00	1.40E-04	0.13	8.85E-03	1.31E-02	0.00E+00	0.00E+00	6.01E-03	0.00E+00	1.47E-03	0.03
TOTAL										1.54								0.86

C-54

Table C.6-9. Point Mugu Sea Range Aircraft Emissions/Conformity Applicability (page 4 of 6)

Engine Type	Engine Model	# of Eng.	ROG/HC Annual Emissions							SO _x Annual Emissions								
			Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total ROG/HC	Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	Total SO _x
P-3	T56-A-16	4	4.60E-03	5.30E-04	0.00E+00	0.00E+00	1.54E-04	0.00E+00	4.90E-05		1.29E-03	1.09E-03	0.00E+00	0.00E+00	3.92E-04	0.00E+00	1.25E-04	
E2-C	T56-A-16	2	1.15E-03	1.33E-04	0.00E+00	0.00E+00	3.85E-05	0.00E+00	1.23E-05		3.23E-04	2.72E-04	0.00E+00	0.00E+00	9.79E-05	0.00E+00	3.12E-05	
E-3	T56-A-16	4	2.30E-03	2.65E-04	0.00E+00	0.00E+00	7.70E-05	0.00E+00	2.45E-05		6.45E-04	5.44E-04	0.00E+00	0.00E+00	1.96E-04	0.00E+00	6.23E-05	
B-747	JT9D-7	4	--	--	--	--	--	--	--		--	--	--	--	--	--	--	
F-15	F100-220	2	1.56E-03	1.44E-04	0.00E+00	0.00E+00	1.30E-05	0.00E+00	8.84E-05		2.73E-04	9.60E-05	0.00E+00	0.00E+00	1.04E-04	0.00E+00	3.54E-04	
F-18	F404-GE-400	2	1.60E-01	2.15E-03	0.00E+00	0.00E+00	6.65E-04	0.00E+00	1.85E-04		1.10E-03	2.80E-04	0.00E+00	0.00E+00	8.58E-04	0.00E+00	5.68E-04	
F-16	F100-100	1	1.56E-03	1.44E-04	0.00E+00	0.00E+00	1.30E-05	0.00E+00	8.84E-05		2.73E-04	9.60E-05	0.00E+00	0.00E+00	1.04E-04	0.00E+00	3.54E-04	
	Total		1.71E-01	3.37E-03	0.00E+00	0.00E+00	9.61E-04	0.00E+00	4.47E-04	0.18	3.91E-03	2.38E-03	0.00E+00	0.00E+00	1.75E-03	0.00E+00	1.49E-03	0.01
P-3	T56-A-16	4	4.60E-03	5.30E-04	0.00E+00	0.00E+00	1.54E-04	0.00E+00	4.90E-05		1.29E-03	1.09E-03	0.00E+00	0.00E+00	3.92E-04	0.00E+00	1.25E-04	
E-2C	T56-A-427	2	1.15E-03	1.33E-04	0.00E+00	0.00E+00	3.85E-05	0.00E+00	1.23E-05		3.23E-04	2.72E-04	0.00E+00	0.00E+00	9.79E-05	0.00E+00	3.12E-05	
E-3	T56-A-16	4	2.30E-03	2.65E-04	0.00E+00	0.00E+00	7.70E-05	0.00E+00	2.45E-05		6.45E-04	5.44E-04	0.00E+00	0.00E+00	1.96E-04	0.00E+00	6.23E-05	
	Total		8.05E-03	9.28E-04	0.00E+00	0.00E+00	2.70E-04	0.00E+00	8.58E-05	0.01	2.26E-03	1.90E-03	0.00E+00	0.00E+00	6.85E-04	0.00E+00	2.18E-04	0.01
P-3	T56-A-16	4	4.60E-03	5.30E-04	0.00E+00	0.00E+00	1.54E-04	0.00E+00	4.90E-05		1.29E-03	1.09E-03	0.00E+00	0.00E+00	3.92E-04	0.00E+00	1.25E-04	
E-2C	T56-A-427	2	1.15E-03	1.33E-04	0.00E+00	0.00E+00	3.85E-05	0.00E+00	1.23E-05		3.23E-04	2.72E-04	0.00E+00	0.00E+00	9.79E-05	0.00E+00	3.12E-05	
E-3	T56-A-16	4	2.30E-03	2.65E-04	0.00E+00	0.00E+00	7.70E-05	0.00E+00	2.45E-05		6.45E-04	5.44E-04	0.00E+00	0.00E+00	1.96E-04	0.00E+00	6.23E-05	
C-130	T56-A-16	4	2.30E-03	2.65E-04	0.00E+00	0.00E+00	7.70E-05	0.00E+00	2.45E-05		6.45E-04	5.44E-04	0.00E+00	0.00E+00	1.96E-04	0.00E+00	6.23E-05	
	Total		1.04E-02	1.19E-03	0.00E+00	0.00E+00	3.47E-04	0.00E+00	1.10E-04	0.01	2.90E-03	2.45E-03	0.00E+00	0.00E+00	8.81E-04	0.00E+00	2.80E-04	0.01
F-18	F404-GE-400	2	2.13E-01	2.87E-03	0.00E+00	0.00E+00	8.87E-04	0.00E+00	2.46E-04		1.47E-03	3.73E-04	0.00E+00	0.00E+00	1.14E-03	0.00E+00	7.57E-04	
P-3	T56-A-16	4	6.13E-03	7.07E-04	0.00E+00	0.00E+00	2.05E-04	0.00E+00	6.53E-05		1.72E-03	1.45E-03	0.00E+00	0.00E+00	5.22E-04	0.00E+00	1.66E-04	
C-130	T56-A-16	4	6.13E-03	7.07E-04	0.00E+00	0.00E+00	2.05E-04	0.00E+00	6.53E-05		1.72E-03	1.45E-03	0.00E+00	0.00E+00	5.22E-04	0.00E+00	1.66E-04	
Bell -H	T63-A-700	1	1.32E-03	1.54E-04	0.00E+00	0.00E+00	1.81E-05	0.00E+00	0.00E+00		2.13E-05	1.81E-05	0.00E+00	0.00E+00	3.17E-05	0.00E+00	0.00E+00	
	Total		2.27E-01	4.44E-03	0.00E+00	0.00E+00	1.32E-03	0.00E+00	3.77E-04	0.23	4.93E-03	3.29E-03	0.00E+00	0.00E+00	2.22E-03	0.00E+00	1.09E-03	0.01
F-4	J79-GE-10B	2	2.46E-02	6.22E-04	0.00E+00	0.00E+00	2.34E-04	0.00E+00	2.82E-04		2.17E-04	7.31E-05	0.00E+00	0.00E+00	6.67E-05	0.00E+00	1.87E-04	
F-14	TF30-P-414	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
F-18	F404-GE-400	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
C-130	T56-A-16	4	3.83E-03	4.42E-04	0.00E+00	0.00E+00	1.28E-04	0.00E+00	4.08E-05		1.08E-03	9.07E-04	0.00E+00	0.00E+00	3.26E-04	0.00E+00	1.04E-04	
P-3	T56-A-16	4	1.53E-03	1.77E-04	0.00E+00	0.00E+00	5.13E-05	0.00E+00	1.63E-05		4.30E-04	3.63E-04	0.00E+00	0.00E+00	1.31E-04	0.00E+00	4.15E-05	
E-2C	T56-A-427	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
S-3	TF34-GE-400	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
AV-8B	F402-RR-404	1	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
A-6	J-52-P-8B	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
EA-6	J-52-P-408	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
AH-1	T70 -GE-401	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
SH-60B	T700-GE-700	2	--	--	--	0.00E+00	--	--	--		--	--	--	0.00E+00	--	--	--	
	Total		3.00E-02	1.24E-03	0.00E+00	0.00E+00	4.14E-04	0.00E+00	3.39E-04	0.03	1.72E-03	1.34E-03	0.00E+00	0.00E+00	5.24E-04	0.00E+00	3.32E-04	0.00
AV-8B	F402-RR-404	1	2.20E-02	2.92E-04	0.00E+00	0.00E+00	5.17E-05	0.00E+00	7.75E-06		4.43E-04	2.06E-04	0.00E+00	0.00E+00	7.13E-05	0.00E+00	1.07E-05	
C-130	T56-A-16	4	1.53E-03	1.77E-04	0.00E+00	0.00E+00	5.13E-05	0.00E+00	1.63E-05		4.30E-04	3.63E-04	0.00E+00	0.00E+00	1.31E-04	0.00E+00	4.15E-05	
	Total		2.36E-02	4.68E-04	0.00E+00	0.00E+00	1.03E-04	0.00E+00	2.41E-05	0.02	8.73E-04	5.69E-04	0.00E+00	0.00E+00	2.02E-04	0.00E+00	5.22E-05	0.00
TOTAL										0.48								0.04

C-55

Table C.6-9. Point Mugu Sea Range Aircraft Emissions/Conformity Applicability (page 5 of 6)

Engine Type	Engine Model	PM ₁₀ Annual Emissions							Total PM ₁₀
		Taxi t/y	Appr LTO t/y	Appr T/G t/y	Cruise t/y	Climb LTO t/y	Climb T/G t/y	T/O t/y	
P-3	T56-A-16	7.18E-03	6.00E-03	0.00E+00	0.00E+00	2.16E-03	0.00E+00	6.86E-04	
E2-C	T56-A-16	1.80E-03	1.50E-03	0.00E+00	0.00E+00	5.39E-04	0.00E+00	1.72E-04	
E-3	T56-A-16	3.59E-03	3.00E-03	0.00E+00	0.00E+00	1.08E-03	0.00E+00	3.43E-04	
B-747	JT9D-7	--	--	--	--	--	--	--	
F-15	F100-220	6.50E-05	7.92E-05	0.00E+00	0.00E+00	2.16E-04	0.00E+00	0.00E+00	
F-18	F404-GE-400	3.71E-02	6.68E-03	0.00E+00	0.00E+00	6.03E-03	0.00E+00	0.00E+00	
F-16	F100-100	6.50E-05	7.92E-05	0.00E+00	0.00E+00	2.16E-04	0.00E+00	0.00E+00	
		4.98E-02	1.73E-02	0.00E+00	0.00E+00	1.02E-02	0.00E+00	1.20E-03	0.08
P-3	T56-A-16	7.18E-03	6.00E-03	0.00E+00	0.00E+00	2.16E-03	0.00E+00	6.86E-04	
E-2C	T56-A-427	1.80E-03	1.50E-03	0.00E+00	0.00E+00	5.39E-04	0.00E+00	1.72E-04	
E-3	T56-A-16	3.59E-03	3.00E-03	0.00E+00	0.00E+00	1.08E-03	0.00E+00	3.43E-04	
		1.26E-02	1.05E-02	0.00E+00	0.00E+00	3.77E-03	0.00E+00	1.20E-03	0.03
P-3	T56-A-16	7.18E-03	6.00E-03	0.00E+00	0.00E+00	2.16E-03	0.00E+00	6.86E-04	
E-2C	T56-A-427	1.80E-03	1.50E-03	0.00E+00	0.00E+00	5.39E-04	0.00E+00	1.72E-04	
E-3	T56-A-16	3.59E-03	3.00E-03	0.00E+00	0.00E+00	1.08E-03	0.00E+00	3.43E-04	
C-130	T56-A-16	3.59E-03	3.00E-03	0.00E+00	0.00E+00	1.08E-03	0.00E+00	3.43E-04	
		1.62E-02	1.35E-02	0.00E+00	0.00E+00	4.85E-03	0.00E+00	1.54E-03	0.04
F-18	F404-GE-400	4.95E-02	8.90E-03	0.00E+00	0.00E+00	8.04E-03	0.00E+00	0.00E+00	
P-3	T56-A-16	9.57E-03	8.00E-03	0.00E+00	0.00E+00	2.87E-03	0.00E+00	9.15E-04	
C-130	T56-A-16	9.57E-03	8.00E-03	0.00E+00	0.00E+00	2.87E-03	0.00E+00	9.15E-04	
Bell -H	T63-A-700	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	
		6.86E-02	2.49E-02	0.00E+00	0.00E+00	1.38E-02	0.00E+00	1.83E-03	0.11
F-4	J79-GE-10B	8.50E-03	1.50E-03	0.00E+00	0.00E+00	7.30E-04	0.00E+00	0.00E+00	
F-14	TF30-P-414	--	--	--	0.00E+00	--	--	--	
F-18	F404-GE-400	--	--	--	0.00E+00	--	--	--	
C-130	T56-A-16	5.98E-03	5.00E-03	0.00E+00	0.00E+00	1.80E-03	0.00E+00	5.72E-04	
P-3	T56-A-16	2.39E-03	2.00E-03	0.00E+00	0.00E+00	7.19E-04	0.00E+00	2.29E-04	
E-2C	T56-A-427	--	--	--	0.00E+00	--	--	--	
S-3	TF34-GE-400	--	--	--	0.00E+00	--	--	--	
AV-8B	F402-RR-404	--	--	--	0.00E+00	--	--	--	
A-6	J-52-P-8B	--	--	--	0.00E+00	--	--	--	
EA-6	J-52-P-408	--	--	--	0.00E+00	--	--	--	
AH-1	T70 -GE-401	--	--	--	0.00E+00	--	--	--	
SH-60B	T700-GE-700	--	--	--	0.00E+00	--	--	--	
		1.69E-02	8.50E-03	0.00E+00	0.00E+00	3.25E-03	0.00E+00	8.00E-04	0.03
AV-8B	F402-RR-404	3.34E-03	2.83E-04	0.00E+00	0.00E+00	5.67E-05	0.00E+00	8.50E-06	
C-130	T56-A-16	2.39E-03	2.00E-03	0.00E+00	0.00E+00	7.19E-04	0.00E+00	2.29E-04	
		5.74E-03	2.28E-03	0.00E+00	0.00E+00	7.75E-04	0.00E+00	2.37E-04	0.01
TOTAL									0.30

C-56

Table C.6-9. Point Mugu Sea Range Aircraft Emissions/Conformity Applicability (page 6 of 6)

NOTES:

1. The total number of sorties for each aircraft type was determined from NAWCWPNs Personnel in June 1996. There are no touch and go operations associated with the proposed action. The duration of mode is the estimate time spent on each flight operation.
2. All aircraft (except the F-4, C-130, and P-3 which takeoff and land at NAS Point Mugu) participating in FLEETEX activities takeoff and land on aircraft carriers located outside US waters. (Denoted by the "--" in the calculated emissions portion of the spreadsheet.)
3. Aircraft involved in Boost Phase Intercept Testing, Theater-Wide Defense Testing, Area Defense Testing, Nearshore Intercept Testing, and Special Warfare Testing takeoff and land at NAS Point Mugu (except for the B-747-see note #21).
4. Unless otherwise noted, the emission indexes for Carbon Monoxide (CO), Nitrogen Oxides (NO_x), Reactive Organic Gases (ROG), and Particulate Matter were obtained from AESO Report No. 6-90, Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines, dated June 1990. The Sulfur Oxides (SO_x) emission indexes were obtained by multiplying the engine fuel flow rate in pounds per hour by the mass fraction of sulfur in fuel (0.4 pounds per 1000 pounds of fuel - AESO Report No. 6-90). Emission indexes were given in pounds per 1,000 pounds of fuel. The units were converted to pounds per hour using the following formula:
$$\text{Emission Index (lbs/hr)} = \text{Emission Index (lbs/1,000 lbs of fuel)} \times \text{fuel flow (lb/hr)} \times (1/1,000)$$
5. Emission indexes for the B-747, F-15, and F-16 are from Procedures for Emission Inventory Preparation Volume IV: Mobile Sources. EPA 1992. Source of F-15 emission indexes are from the F100-PW-100 engine. This engine has the closest emission characteristics to the F100-220.
6. Times in mode and emission indexes for the F/A-18 aircraft are from AESO Memo Report No. 9815A, Aircraft Emission Estimates: F/A-18 Landing and Take Off Cycle and Maintenance Testing Using JP-5, dated October 1998. Taxi mode assumed to equal the sum of the Taxi Out Modes of Warm-Up, Taxi Out, Checks, and Unstick plus the Taxi In Modes of On Runway (WOW), Taxi In, Hot Refuel, Taxi to Apron, Cool/Shut Down, and Unstick.
7. Emission indexes for the F-14 aircraft are from AESO Memo Report No. 9813 Revision B, Aircraft Emission Estimates: F-14 Landing and Take Off Cycle Using JP-5, dated October 1998.
8. Emission indexes for the AH-1 and SH-60B helicopters are from AESO Memo Report No. 9824, Aircraft Emission Estimates: AH-1W Landing and Takeoff Cycle and Maintenance Testing Using JP-5, dated October 1998.
9. Source of emission indexes for the E-2 aircraft are from the T56-A-16 engine. This engine has the closest emission characteristics to the T56-A-427.
10. Cruise mode emission factors are from table provided by Gary Paetow at AESO dated December 1998. Emission factors for the F-15, F-16, and S-3 differ slightly from those used in this analysis because they are from a report from the Air Force. PM₁₀ emission indexes were not available. (Denoted by the "-" in the PM₁₀ emission factor portion of the spreadsheet.)
11. PM₁₀ Emission indexes are not available for the T56-A-16 engine. The T64-GE-6B indexes were substituted because this engine has the closest characteristics to the T56-A-16.
12. PM₁₀ Emission indexes for the J52-P-408 engine were not available and substituted with the emission indexes for the J52-P-6B. This engine has the closest characteristics to the J52-P-408. PM₁₀ emission indexes were not available for the approach setting. (Denoted by the "-" in the PM₁₀ emission factor portion of the spreadsheet.)
13. PM₁₀ Emission indexes were not available for the F402-RR-404, JT9D-7, and the T63-A-5A engines. (Denoted by the "-" in the PM₁₀ emission factor portion of the spreadsheet.)
14. PM₁₀ Emission indexes are not available for afterburner power setting for jet aircraft. (Denoted by the "-" in the PM₁₀ emission factor portion of the spreadsheet.)
15. Duration of mode data for the F-4, F-15, F-16, and Bell-H were obtained from default values listed in Table 5-1 from the Procedures for Emission Inventory Preparation Volume IV: Mobile Sources. EPA 1992. The reported data are in minutes (min).
16. No duration of mode data is given for the takeoff (hover) setting for the Bell-1 helicopter. This time is assumed to be included in the climbout time.
17. Duration of mode data for the E-2 aircraft are from the 1996 Aircraft Emissions Inventory Report. AESO. May 1998. Taxi mode assumed to equal the Taxi In Modes of On Runway (WOW) and Taxi In. Due to similar engine types, the sum of the Taxi Out Modes of Warm-up, Taxi Out, and Checks the E-3, C-130, and P-3 are assumed to have the same duration of modes as the E-2.
18. Cruise time in mode for all aircraft provided by the NAS Point Mugu Environmental Division.
19. The duration of mode data for aircraft participating in FLEETEX activities (except for the F-4, C-130, and P-3 which takeoff and land at NAS Point Mugu) are from AESO Memo Report No. 9626, Gaseous Emissions from Aircraft Carrier A/C Launch Operations dated June 1996. This report does not include approach times in mode to the A/C carrier. The taxi time was doubled to obtain a conservative estimate of the taxi in and taxi out times. The approach times are from default values listed in Procedures for Emission Inventory Preparation Volume IV: Mobile Sources. EPA. 1992.
20. For Conformity Applicability, it is assumed that all aircraft are above 3,000 feet or out more than 3 NM before they begin their cruise mode. Therefore these emissions are not included in this analysis.
21. The B-747 takes off and lands at another airfield and cruises above 3,000 feet and the emissions are not included in this analysis.
22. Emissions stated as 0.00 E+00 refer to zero emissions due to lack of operations or emission factors.
23. Methodology used to calculate aircraft emissions follows EPA guidelines found in Procedures for Emission Inventory Preparation Volume IV: Mobile Sources. EPA 1992.
24. Formula: (Number of Operations) x (Time in Mode) x (1 hour/60 minutes) x (# of Engines) x (Emission Index) x (1 ton/2,000 pounds) = Emissions (tons/year)

Table C.6-10. Point Mugu Sea Range Marine Vessel Emissions/Conformity Applicability (page 1 of 2)

Nomenclature	Ship Type	Engines				Emission Factors (lb/hr)					Time in Mode (hrs)	Time w/in 3NM	No. of Events	Time within 3NM Annual Emissions (tons/yr)				
		Propulsion	No.	Generator	No.	CO	NO _x	ROG/HC	SO _x	PM ₁₀				CO	NO _x	ROG/HC	SO _x	PM ₁₀
Theater Missile Defense Element																		
Boost Phase Intercept																		
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	21	1	15	0.03	0.12	0.02	0.03	0.01
Upper Tier																		
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	21	1	18	0.04	0.15	0.02	0.04	0.01
DD 963	Destroyer	GE LM2500	4	ALLISON 501-K17	3	45.59	107.65	3.38	60.74	5.58	72	0	4	0.00	0.00	0.00	0.00	0.00
CG 47	Guided Missile Cruiser	GE LM2500	4	ALLISON 501-K17	3	35.87	89.68	2.78	50.17	4.51	72	0	1	0.00	0.00	0.00	0.00	0.00
Total													0.04	0.15	0.02	0.04	0.01	
Lower Tier																		
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	21	1	18	0.04	0.15	0.02	0.04	0.01
DD 963	Destroyer	GE LM2500	4	ALLISON 501-K17	3	45.59	107.65	3.38	60.74	5.58	72	0	4	0.00	0.00	0.00	0.00	0.00
CG 47	Guided Missile Cruiser	GE LM2500	4	ALLISON 501-K17	3	35.87	89.68	2.78	50.17	4.51	72	0	1	0.00	0.00	0.00	0.00	0.00
Total													0.04	0.15	0.02	0.04	0.01	
Nearshore Intercept																		
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	21	1	40	0.09	0.33	0.04	0.08	0.02
DD 963	Destroyer	GE LM2500	4	ALLISON 501-K17	3	45.59	107.65	3.38	60.74	5.58	72	0	8	0.00	0.00	0.00	0.00	0.00
CG 47	Guided Missile Cruiser	GE LM2500	4	ALLISON 501-K17	3	35.87	89.68	2.78	50.17	4.51	72	0	2	0.00	0.00	0.00	0.00	0.00
Total													0.09	0.33	0.04	0.08	0.02	
Training Element																		
FLEETEX Project Ships																		
FFG 7	Guided Missile Frigate	GE LM2500	2	DDC/S&S 114D001	4	33.56	85.80	3.94	32.56	4.34	82	0	1	0.00	0.00	0.00	0.00	0.00
DDG 51	Guided Missile Destroyer	GE LM2500	4	ALLISON 501-K34	3	33.18	153.47	2.21	74.67	6.30	82	0	1	0.00	0.00	0.00	0.00	0.00
CG 47	Guided Missile Cruiser	GE LM2500	4	ALLISON 501-K17	3	35.87	89.68	2.78	50.17	4.51	82	0	1	0.00	0.00	0.00	0.00	0.00
DD 963	Destroyer	GE LM2500	4	ALLISON 501-K17	3	45.59	107.65	3.38	60.74	5.58	82	0	1	0.00	0.00	0.00	0.00	0.00
CVN 68	Aircraft Carrier	Nuclear		EMD 16-645E5 (EDG)	4	1.30	17.58	0.32	2.09	0.16	82	0	1	0.00	0.00	0.00	0.00	0.00
AO 177	Fleet Oiler	Steam		FM 38D8-1/8 (EDG)	1	3.13	19.60	2.34	55.16	11.64	82	0	1	0.00	0.00	0.00	0.00	0.00
Range Project Boats																		
SL-90	Project Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00
SL-120	Project Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00
Tug (YTB 575)	Project Boat	FM 38D8-1/8	1	DD 6-71	2	51.27	20.55	2.77	4.83	0.48	132	3	1	0.08	0.03	0.00	0.01	0.00
HM-10	Project Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00

Table C.6-10. Point Mugu Sea Range Marine Vessel Emissions/Conformity Applicability (page 2 of 2)

Nomenclature	Ship Type	Engines				Emission Factors (lb/hr)					Time in Mode (hrs)	Time w/in 3NM	No. of Events	Time within 3NM Annual Emissions(tons/yr)				
		Propulsion	No.	Generator	No.	CO	NO _x	ROG/HC	SO _x	PM ₁₀				CO	NO _x	ROG/HC	SO _x	PM ₁₀
Range Support Boats																		
AVR18-36-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00
AVR0-18-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00
AVR36-72	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00
AVR0-18-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00
AVR72+	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00
AVR36-72-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00
AVR36-60-1	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00
AVR18-36-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	1	0.00	0.01	0.00	0.00	0.00
Yellow Gear (four squadrons)																		
	TA-75	210 hp	1			0.20	1.65	0.22	0.33	0.07	21.6	0	1	0.00	0.00	0.00	0.00	0.00
	A/S 32K-1A	27 hp	1			0.07	0.23	0.29	0.03	0.02	21.6	0	1	0.00	0.00	0.00	0.00	0.00
	JG-40	125 hp	1			0.20	1.65	0.22	0.33	0.07	21.6	0	1	0.00	0.00	0.00	0.00	0.00
	Total													0.10	0.12	0.02	0.03	0.01
Special Warfare Training																		
AVR36-72-2	Support Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	2	0.00	0.02	0.00	0.00	0.00
HM-10	Project Boat	DD 16V-71	2	DD 2-71	2	4.50	16.50	2.10	4.20	1.00	82	1	2	0.00	0.02	0.00	0.00	0.00
	Total													0.01	0.03	0.00	0.01	0.00
TOTALS													0.32	0.91	0.12	0.23	0.05	

Assumptions:

- Emission factors for ships and craft are based on Navy ship profiles (underway) and engine emission data except AVR's, SL's, and SDTS (all emission factors provided by NAVSEA; M. Osborne 1998).
- AVR's and SL's emission factors are derived from EPA emission factors for small craft diesel propulsion and generator engines, Tables I-12(b) and I-12(a) (Nonroad Engine and Vehicle Study, EPA, Nov. 1991).
- Generators on steam and nuclear ships are emergency diesel generators (EDG's) and designated (EDG).
- All CVNs operate on nuclear power and have EDG's operating while underway.
- All engines operate in underway mode during an entire activity.
- With the exception of range support boats, none of the vessels involved with TMD activities come within 3 NM of shore.
- Range and project support boats (excluding tugs) spend 30 minutes traveling from Port Hueneme out to 3 NM (1 hour total).
- Tugs spend 1.5 hours traveling from Port Hueneme out to 3 NM (3 hours total).
- FLEETEX activities take place over a period of 72 hours (3 days), plus 10 hours of transit time within the Sea Range.
- Vessels taking part in FLEETEX are: (1) FFG, (1) DDG, (1) CG, (1) DD, (1) CVN, (1) AO, (1) DDG -Can (none of these ships come within 3 NM of shore), plus support & project boats (see #7 and #8 above).
- Yellow Gear is assumed to function 30% of the time during FLEETEX operation, less transit time.
- Canadian Frigate modeled as FFG-7 with only gas turbines operating, assumed diesel was not operating during these exercises.
- Emission factors are a combination of main propulsion engines and generator sets for diesel and gas turbine ships, boilers and EDG's for steam powered ships, and EDG's alone for nuclear powered ships.

* Emissions from vessel surface targets are included in Missile/Target activities.

Note: Column totals may not directly reflect the sum of column entries as all numbers have been rounded for ease of presentation.

RECORD OF NON-APPLICABILITY (RONA) FOR CLEAN AIR ACT CONFORMITY

Activity **Naval Air Warfare Center Weapons Division
Point Mugu, California**

Proposal Name **“Accommodate TMD Testing and Training, Additional Training Exercises, and Facility Modernization at the NAWCWPNS Point Mugu Sea Range”**

Proposed Action **The proposed action consists of accommodating TMD test and training, additional special warfare and Fleet training, and facility modernizations at the Point Mugu Sea Range.**

Emissions Summary and Conclusions **Project emissions are estimated to be less than the de minimis emissions level of 25 tons of VOC or NOX and 100 tons of other criteria pollutants (see DEIS, Appendix C). The Navy concludes that a formal Conformity Determination for this project is not required resulting in this Record of Non-Applicability (RONA).**

Affected Air Basin **South-Central Coast Air Basin, California**

Date RONA Prepared **15 September 1999**

RONA Prepared By **Alex Stone, EIS Project Manager
Code 529600E, Naval Air Warfare Center Weapons Division,
521 Ninth Street, Point Mugu, California, 930420-5001**

APPROVING OFFICIAL
Environmental Project Office

Date