3.2 Air Quality

Supplemental Environmental Impact Statement/ Overseas Environmental Impact Statement Mariana Islands Training and Testing

TABLE OF CONTENTS

List of Figures

List of Tables

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3.2 Air Quality

The purpose of this section is to supplement the analysis of impacts on air quality presented in the 2015 Mariana Islands Training and Testing (MITT) Final Environmental Impact Statement/Overseas Environmental Impact Statement (EIS/OEIS) with new information relevant to proposed changes in training and testing activities conducted at sea and on Farallon de Medinilla (FDM). Information presented in the 2015 Final MITT EIS/OEIS that remains valid is noted as such and referenced in the appropriate sections. Any new or updated information describing the affected environment and analysis of impacts on air quality associated with the Proposed Action is provided in this section.

3.2.1 Methods

3.2.1.1 National Ambient Air Quality Standards

National ambient air quality and criteria pollutant attainment limits are defined by National Ambient Air Quality Standards, promulgated by the United States (U.S.) Environmental Protection Agency, and are requisite to protect the public health and welfare. Areas that exceed a standard are designated as "nonattainment" for that pollutant, while areas in compliance with a standard are in "attainment" for that pollutant. An area may be nonattainment for some pollutants and attainment for others simultaneously.

States and U.S. territories, through their air quality management agencies, are required to prepare and implement State Implementation Plans for nonattainment areas, which demonstrate how the area will meet the National Ambient Air Quality Standards. Areas that have achieved attainment may be designated as "maintenance areas," subject to maintenance plans showing how the area will continue to meet federal air quality standards. Nonattainment areas for some criteria pollutants are further classified, depending on the severity of their air quality problem, to facilitate their management:

- Ozone – marginal, moderate, serious, severe, and extreme
- Carbon Monoxide – moderate and serious
- Particulate Matter – moderate and serious

The U.S. Environmental Protection Agency delegates the regulation of air quality to the state once the state has an approved State Implementation Plan. The Clean Air Act (CAA) also allows states to establish air quality standards more stringent than the National Ambient Air Quality Standards.

The MITT Study Area is mostly offshore of the Territory of Guam and the Commonwealth of the Northern Mariana Islands and some onshore and nearshore areas. Some elements of the Proposed Action would occur onshore and within or over state waters. Most of the Study Area is offshore, beyond territory and commonwealth boundaries where attainment status is unclassified and CAA National Ambient Air Quality Standards do not apply. However, given fluctuations in wind direction, air quality in adjacent onshore areas may be affected by releases of air pollutants from offshore Study Area sources. Therefore, National Ambient Air Quality Standards attainment status of adjacent onshore areas is considered in determining whether appropriate controls on air pollution sources in the adjacent offshore state waters is warranted.

3.2.1.2 Conformity Analyses in Nonattainment and Maintenance Areas

Federal actions are required to conform with the approved State Implementation Plan for those areas of the United States designated as nonattainment or maintenance air quality areas for any criteria pollutant under the CAA (40 Code of Federal Regulations sections 51 and 93). The purpose of the

General Conformity Rule is to demonstrate that the Proposed Action would not cause or contribute to new violations of an air quality standard and that the Proposed Action would not adversely affect the attainment and maintenance of federal ambient air quality standards. A federal action would not conform if it increased the severity of any existing violations of an air quality standard or delayed the attainment of a standard, required interim emissions reductions, or delayed any other air quality milestone. To ensure that federal activities do not impede local efforts to control air pollution, Section 176(c) of the CAA (42 United States Code section 7506(c)) prohibits federal agencies from engaging in or approving actions that do not conform to an approved State Implementation Plan. The emissions thresholds that trigger the conformity requirements are called *de minimis* thresholds.

Federal agency compliance with the General Conformity Rule can be demonstrated in several ways. The requirement can be satisfied by a determination that the Proposed Action is not subject to the General Conformity Rule, by a Record of Non-Applicability, or by a Conformity Determination. Compliance is presumed if the net increase in emissions from a federal action would be less than the relevant *de minimis* threshold. If net emissions increases exceed the *de minimis* thresholds, then a formal conformity determination must be prepared.

3.2.2 Affected Environment

3.2.2.1 Climate of the Study Area

Climate in the MITT Study Area was discussed in detail in the 2015 MITT Final EIS/OEIS. The climate within the Study Area has not changed since the publication of the 2015 MITT Final EIS/OEIS (Climatemps.com, 2017). However, greenhouse gas emissions were analyzed in this Supplemental EIS (SEIS)/OEIS by illustrating their cumulative contribution to climate change.

3.2.2.2 Regional Emissions

Regional emissions have changed since the publication of the 2015 MITT Final EIS/OEIS. Guam and Saipan still contain the majority of the stationary sources of air pollutants within the Study Area. The largest point source emitters for air pollutants were the power-generating facilities at Piti and Tanguisson. However, the power-generating facility at Tanguisson has been retired since then and an explosion and fire at the power-generating facility in Piti has left two turbines inoperable. This has reduced the amount of pollutants being released into the atmosphere from manmade sources. In addition to anthropogenic sources, volcanic activity within the Study Area naturally contributes to sulfur dioxide concentrations in the region.

3.2.2.3 Existing Air Quality

Guam and the Commonwealth of the Northern Mariana Islands, including FDM, meet all national and local ambient air quality standards except for sulfur dioxide. The area of Piti-Cabras is nonattainment for the 2010 sulfur dioxide primary National Ambient Air Quality Standards. The nonattainment area extends in a circle with a radius of 6.074 kilometers from the power-generating facilities. This circle encompasses the majority of Apra Harbor, Agat Bay, and nearshore areas, which includes the Piti Floating Mine Neutralization Site.

Piti and Tanguisson are in nonattainment of the 1971 sulfur dioxide primary National Ambient Air Quality Standards (U.S. Environmental Protection Agency, 2017). These nonattainment areas extend in a circle with a radius of 2.2 miles from the power-generating facilities. However, the retirement of the Tanguisson facility and reduction in functionality of the Piti facility have decreased pollutant emissions and could potentially affect the attainment status for these areas. In general, the islands are considered

to have good ambient air quality due to geographic isolation and favorable climate. Consistent winds (shown in Figure 3.2-1) and rain help to remove and carry away pollutants from the islands.

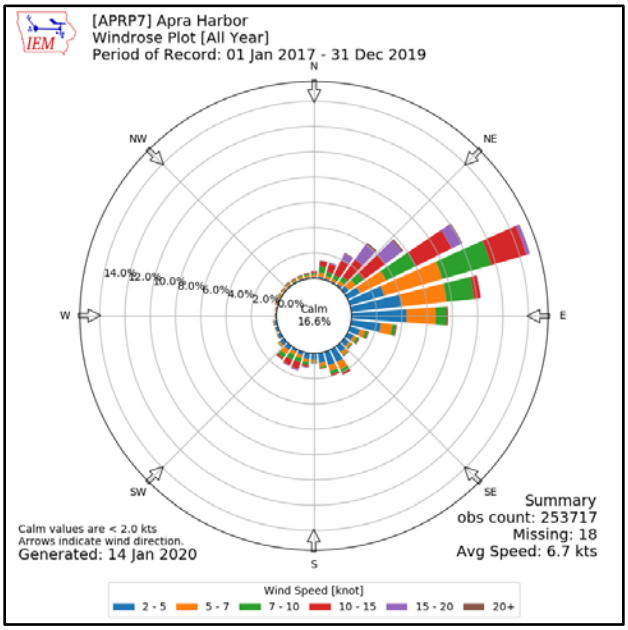

Figure 3.2-1: Annual Wind Speed and Direction at Apra Harbor, Guam

3.2.3 Environmental Consequences

The 2015 MITT Final EIS/OEIS analyzed potential impacts on air quality resulting from proposed training and testing activities. This supplemental analysis will update and consider changes to air quality resulting from proposed changes to training and testing activities conducted at sea and on FDM (see Tables 2.5-1 and 2.5-2). The Study Area includes pierside locations in Apra Harbor. For purposes of this SEIS/OEIS, pierside locations include channels and routes to and from the Navy port in the Apra Harbor Naval Complex, and associated wharves and facilities within the Navy port.

3.2.3.1 Criteria Pollutants

Estimated emissions are compared against baseline emissions (Table 3.2-1). While most of the emissions would be off shore, only emissions that would be released below 3,000 feet of elevation and within 3 nautical miles (NM) of the coastline are analyzed for their impacts on ambient air quality. Pollutants that would be emitted more than 3 NM offshore would be intermittent and distributed across a very large area of ocean (501,873 square nautical miles), and would not be concentrated in any one area. Therefore, pollutants emitted beyond 3 NM are not expected to impact the general public in Guam or the Commonwealth of the Northern Mariana Islands. Emissions calculations for the Baseline, Alternative 1, and Alternative 2 can be seen in Appendix D (Air Quality Emissions Calculations). Baseline emissions are derived from those presented in Alternative 1 of the 2015 MITT Final EIS/OEIS (Table 3.2-7). However, this SEIS/OEIS only addresses at-sea activities and activities occurring at FDM, whereas the 2015 MITT Final EIS/OEIS addressed those activities in addition to land-based activities. Therefore, only those activities that are covered under this SEIS/OEIS are considered in the baseline emissions.

Table 3.2-1: Baseline Pollutant Emissions for At-Sea and FDM Training and Testing Activities that Occur Within 3 Nautical Miles of the Coast from Aircraft, Vessels, and Ordnance (tpy)

Criteria Pollutant	NO_x	CO	VOC	SO_x	PM_{10}	$PM_{2.5}$
Aircraft	111	163	23	8	48	43
Vessels	345	38	95	229	41	37
Ordnance	5	203	0	0	8	8
Total of At-Sea and FDM Emissions	461	404	118	237	97	88

Notes: NO_x = nitrogen oxides, CO = carbon monoxide, VOC = volatile organic compounds, SO_x = sulfur oxides, PM_{10} = particulate matter less than 10 microns in diameter, $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter, FDM = Farallon de Medinilla, tpy = tons per year. Baseline emissions are derived from those presented in Alternative 1 of the 2015 MITT Final EIS/OEIS.

3.2.3.1.1 Alternative 1

Under Alternative 1, estimated pollutant emissions from aircraft, vessels, and ordnance would increase, as shown in Table 3.2-2. Criteria pollutants emitted in the Study Area within territorial waters could be transported ashore but would not affect the attainment status of the relevant air quality control regions nor impact the general public. Under Alternative 1, the emissions increase for sulfur dioxide (SO_2) from all training and testing activities in the nonattainment areas of Guam in comparison to the baseline is estimated to be 17 tons per year. The *de minimis* threshold for a full conformity determination is an SO_2 emissions increase of 100 tons per year. Therefore, the General Conformity Rule does not apply under Alternative 1.

Table 3.2-2: Annual Emissions for At-Sea and FDM Training and Testing Activities that Occur Within 3 Nautical Miles of the Coast Under Alternative 1 from Aircraft, Vessels, and Ordnance (tpy)

Criteria Pollutant	NO_x	CO	VOC	SO_x	PM_{10}	$PM_{2.5}$
Aircraft Emissions	146	219	31	10	66	60
Vessel Emissions	377	43	134	244	43	39
Ordnance Emissions	5	205	0	0	9	9
Alternative 1 Emissions	**528**	**467**	**166**	**254**	**119**	**107**
Baseline Emissions	461	404	118	237	97	88
Changes in Emissions	**67**	**63**	**47**	**17**	**22**	**19**

Notes: NO_x = nitrogen oxide, CO = carbon monoxide, VOC = volatile organic compounds, SO_x = sulfur oxide, PM_{10} = particulate matter less than 10 microns, $PM_{2.5}$ = particulate matter less than 2.5 microns, tpy = tons per year. Individual values may not add exactly to total values due to rounding.

3.2.3.1.2 Alternative 2 (Preferred Alternative)

Under Alternative 2, there would be an increase in annual air emissions from the baseline (Table 3.2-3) as well as an increase in relation to Alternative 1 (Table 3.2-2). However, the change in emissions would not affect the attainment status of the relevant air quality control regions nor significantly impact the general public.

Under Alternative 2, the emissions increase for SO_2 from all training and testing activities in the nonattainment areas of Guam in comparison to the baseline is estimated to be 17 tons per year. The *de minimis* threshold for a full conformity determination is an SO_2 emissions increase of 100 tons per year. Therefore, the General Conformity Rule does not apply under Alternative 2. A Record of Non-Applicability has been prepared (Appendix D, Section D.5).

Table 3.2-3: Annual Emissions for At-Sea and FDM Training and Testing Activities that Occur Within 3 Nautical Miles of the Coast Under Alternative 2 from Aircraft, Vessels, and Ordnance (tpy)

Criteria Pollutant	NO_x	CO	VOC	SO_x	PM_{10}	$PM_{2.5}$
Aircraft Emissions	146	219	31	10	66	60
Vessel Emissions	398	48	137	303	55	50
Ordnance Emissions	6	205	0	0	10	9
Alternative 2 Emissions	**549**	**473**	**168**	**313**	**131**	**119**
Baseline Emissions	461	404	118	237	97	88
Difference	**89**	**68**	**50**	**76**	**34**	**31**

Notes: NO_x = nitrogen oxides, CO = carbon monoxide, VOC = volatile organic compounds, SO_x = sulfur oxides, PM_{10} = particulate matter less than 10 microns in diameter, $PM_{2.5}$ = particulate matter less than 2.5 microns in diameter, tpy = tons per year. Individual values may not add exactly to total values due to rounding.

3.2.3.1.3 No Action Alternative

Under the No Action Alternative, proposed training and testing activities would not occur. Other military activities not associated with this Proposed Action would continue to occur. Therefore, implementation of the No Action Alternative would mean that the emissions shown in Table 3.2-1 would no longer be produced; however, there would be no measurable change in air quality conditions.

3.2.3.2 Hazardous Air Pollutants

These emissions are typically one or more orders of magnitude smaller than concurrent emissions of criteria air pollutants, and could become a concern when large amounts of fuel, explosives, or other materials are consumed during a single activity or in one location. Hazardous air pollutants are analyzed qualitatively in relation to the prevalence of the sources emitting these pollutants during training and testing activities. The 2015 MITT Final EIS/OEIS concluded that emissions of hazardous air pollutants are not significant and would mostly occur far from land. While there are increases in hazardous air pollutants from the Proposed Action, the results of the analysis as described in the 2015 MITT Final EIS/OEIS does not appreciably change and remains valid. Therefore, human health is not anticipated to be significantly impacted by emissions of hazardous air pollutants in the Study Area.

3.2.3.3 Greenhouse Gases

Table 3.2-4 summarizes the greenhouse gas emissions that would be generated under baseline conditions, Alternative 1, and Alternative 2. Greenhouse gas emissions would decrease from the baseline by approximately 4 percent under Alternative 1 and Alternative 2. Since greenhouse gases are relevant in a global scope, they are analyzed based on the extent to which they would contribute to climate change. Implementation of Alternative 1 or 2 would generate a decrease from baseline contributions.

Table 3.2-4: Annual Greenhouse Gas Emissions Under All Three Alternatives

	Annual Greenhouse Gas Emissions (metric tons per year)			
	CO_2	N_2O	CH_4	CO_2e
Baseline Emissions	696,436	23	20	703,853
Alternative 1	668,301	22	19	675,418
Alternative 2	666,794	22	19	673,895
Nationwide Emissions	-	-	-	6,511,000,000

Notes: CO_2 = carbon dioxide, N_2O = nitrous oxide, CH_4 = methane, CO_2e= carbon dioxide equivalent

3.2.4 Public Comments

The public did not raise any issues during the scoping period in regard to air quality. No comments were received from the public during the Draft SEIS/OEIS commenting period related to air quality.

REFERENCES

Climatemps.com. (2017). *Guam Climate & Temperature*. Retrieved from http://www.mariana-islands.climatemps.com/.

U.S. Environmental Protection Agency. (2017). *Nonattainment Areas for Criteria Pollutants (Green Book)*. Retrieved from https://www.epa.gov/green-book.

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