South Coast
Air Quality Management District
21865 Copley Drive, Diamond Bar, CA 91765-4178
(909) 396-2000 • www.aqmd.gov

September 26, 2024

Colonel Mark A. Shoemaker, USSF
Commander
Space Launch Delta 30
747 Nebraska Ave, Ste A302
Vandenberg SFB, CA 93437-6261

RE: General Conformity Determination for the increased SpaceX launch operations at Vandenberg Space Force Base during 2025–2030

To. Mr. Shoemaker,

This letter is in response to your letter dated September 24, 2024 requesting South Coast Air Quality Management District (South Coast AQMD) to accommodate the anticipated emissions within the South Coast Air Basin (Basin) from the SpaceX increased launch operations at Vandenberg Space Force Base (VSFB) in the Air Quality Management Plan (AQMP)/State Implementation Plan (SIP) emissions budget for general conformity purposes.

The general conformity determination process is intended to demonstrate that a proposed Federal action will not: (1) cause or contribute to new violations of a national ambient air quality standard (NAAQS); (2) interfere with provisions in the applicable SIP for maintenance of any NAAQS; (3) increase the frequency or severity of existing violations of any standard; or (4) delay the timely attainment of any standard. As such, for general conformity determination, the proposed federal action needs to conform to the latest approved SIP/AQMP.

The Basin is designated as an extreme non-attainment area for ozone, serious non-attainment area for PM2.5 and maintenance area for Carbon Monoxide. To accommodate projects subject to general conformity requirements and to streamline the review process, general conformity budgets for NOx and VOC emissions were established in an AQMP. The 2016 AQMP[1], which is the latest SIP approved by U.S. EPA, established set aside accounts to accommodate emissions subject to general conformity requirements. The set-aside accounts include 2 tons per day (tpd) or 730 tons per year (tpy) of NOx and 0.5 tpd or 182.5 tpy of VOC each year starting in 2017 through 2030, and 0.5 tpd (182.5 tpy) of NOx and 0.2 tpd (73 tpy) of VOC in 2031. Emissions from this set-aside account are granted on a first-come-first-serve basis, and as of September 2024, a limited amount of NOx and VOC emissions remain available. It's important to note that the

[1] https://www.aqmd.gov/home/air-quality/air-quality-management-plans/final-2016-aqmp

general conformity set-aside accounts are subject to change in future AQMPs. The 2022 AQMP[2], for instance, introduces control measure EGM-02, which seeks to eliminate the general conformity set-aside account after 2031. Instead, EGM-02 proposes to require that new federal project emissions be accommodated with appropriate mitigation or offset of the increased emissions. The 2022 AQMP was submitted to U.S. EPA via California Air Resource Board (CARB) in February 2023 and is currently under review.

The proposed U.S. Space Force (USSF) project (Proposed Action) involves increasing the annual SpaceX Falcon launch cadence at VSFB through launches at Space Launch Complex (SLC)-4. The project proposes to transport first stages from the Port of Long Beach to the VSFB Harbor via a "roll-on-roll-off" barge. A support tug would be launched from the Port of Long Beach or Port Hueneme and travel up the coast to assist the barge and primary tug in maneuvering into and out of the VSFB Harbor. The Proposed Action would include up to 50 events per year utilizing roll-on-roll-off operations.

South Coast AQMD staff has reviewed the emissions anticipated from the Proposed Action based on the information provided in your letter. We have determined that the NOx emissions exceeding the de minimis thresholds can be accommodated within the general conformity budgets established in the 2016 AQMP. Table 1 below shows the emissions from operation activities during 2025 to 2030 that are accommodated within the SIP set-aside budget established in the 2016 AQMP.

Table 1. The Proposed Action Emissions Accommodated in 2016 AQMP General Conformity Budgets (tons per year)*

Pollutants	Emission Phase	2025	2026	2027	2028	2029	2030
NOx	Operation	31.26	31.26	31.26	31.26	31.26	31.26

*USSF commits to track actual emission of the Proposed Action within the Basin annually and return the surplus credits, if any, to South Coast AQMD general conformity budget

The emissions submitted by USSF in their request were conservatively estimated to align with those in the Draft Environmental Assessment,[3] and represent the maximum potential emissions that could result from the Proposed Action. To ensure that the actual project emissions are accounted for in the South Coast AQMD's set-aside account accurately, USSF will prepare an annual report to track project activities within the Basin, quantify the associated emissions, and

[2] https://www.aqmd.gov/home/air-quality/air-quality-management-plans/air-quality-mgt-plan
[3] Available at https://www.vandenberg.spaceforce.mil/About-Us/Environmental/EAS/

submit to the South Coast AQMD by March 30 each year. If the actual emissions from the Proposed Action are lower than the emissions identified in this letter, any surplus credits will be returned to the South Coast AQMD annually, as specified in Attachment 2 of the USSF's request letter.

Emissions from the Federal agency's future SpaceX launch activities within the Basin, scheduled for 2031 to 2055, are not included in this determination. A separate General Conformity Determination process will be required, which will be developed in collaboration with the South Coast AQMD at a future date.

In summary, based on our evaluation, the proposed USSF project to be conducted in 2025 through 2030 will conform to the latest EPA approved AQMP as the project's emissions are accommodated within the AQMP's emissions budgets, and the proposed project is not expected to result in any new or additional violations of the NAAQS or impede the projected attainment of the NAAQS in the years 2025 through 2030.

If you have any questions, please contact me at (909) 396-3244 or imacmillan@aqmd.gov or Dr. Sang-Mi Lee, Rules and Planning Manager at (909)-396-3169 or slee@aqmd.gov.

Sincerely,

Ian MacMillan
Assistant Deputy Executive Officer
Planning, Rule Development & Implementation
South Coast Air Quality Management District

Attachments:

1. Letter from U.S. Space Force dated September 24, 2024
2. Appendix A of Air Quality and Greenhouse Gas Emissions Technical Report: Falcon Program Expansion at Vandenberg Space Force Base, California. September 2024.
   Available at: https://www.vandenberg.spaceforce.mil/About-Us/Environmental/EAS/

eCC: Tom Kelly, US EPA Region IX
Barbara Baird, South Coast AQMD
Kathryn Roberts, South Coast AQMD
Sarah Rees, South Coast AQMD
Sang-Mi Lee, South Coast AQMD
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Marc Carreras Sospedra, South Coast AQMD
Rui Zhang, South Coast AQMD

DEPARTMENT OF THE AIR FORCE
UNITED STATES SPACE FORCE
SPACE LAUNCH DELTA 30

September 24, 2024

Colonel Mark A. Shoemaker, USSF
Commander
Space Launch Delta 30
747 Nebraska Ave, Ste A302
Vandenberg SFB CA 93437-6261

Dr. Sarah Rees, Deputy Executive Officer
South Coast Air Quality Management District
Planning, Rule Development and Area Source Division
21865 Copley Drive
Diamond Bar CA 91765

Dear Dr. Rees

The general conformity findings outlined in this letter have been prepared by Dudek on behalf of Space Launch Delta 30 (SLD 30) to summarize the anticipated direct and indirect criteria pollutant emissions for the proposed Falcon Program Expansion Project (Proposed Action).

The Proposed Action is to increase the annual Falcon launch cadence at Vandenberg Space Force Base (VSFB) through launches at Space Launch Complex (SLC)-4. While most of the operations occur on VSFB, there are marine vessel operations that occur within the South Coast Air Basin (SCAB). The Proposed Action proposes to transport first stages from the Port of Long Beach to the VSFB Harbor via a "roll-on-roll-off" barge. The first stage would be pulled by a Tier 3 (or higher) tug from the Port of Long Beach into the VSFB Harbor. A support tug would be launched from the Port of Long Beach or Port Hueneme and travel up the coast to assist the barge and primary tug in maneuvering into and out of the VSFB Harbor. The Proposed Action would include up to 50 events per year utilizing roll-on-roll-off operations.

The Proposed Action is subject to the National Environmental Policy Act (NEPA) and requires a General Conformity Determination under the U.S. Clean Air Act. SLD 30 is currently preparing an Environmental Assessment for this Project. Annual net emissions anticipated to occur in the SCAB related to the Proposed Action were calculated and are presented in Tables 1 and 2 in Attachment 1. As shown in those tables, emissions of nitrogen oxides (NOx) within the SCAB are projected to be 31.26 tons per year, which exceeds the general conformity de minimis level of 10 tons per year, during years 2025 through 2030. NOx is a precursor pollutant to ozone, a pollutant for which the SCAB is designated as an "extreme" nonattainment area for multiple ozone national ambient air quality standards. All other air emissions are projected to be below de minimis levels for all years in which emissions were inventoried. There would be no construction emissions within the SCAB.

Attachment 1 also provides the anticipated average daily NOx emissions associated with the Proposed Action. While emissions were conservatively assumed to be constant through the operation of the proposed project's lifetime, it is reasonable to assume that emissions would go down over time due to increases in efficiency and marine vessel upgrades. Furthermore, the anticipated emissions from the Proposed Action, which align with those in the Draft Environmental Assessment, represent the maximum potential emissions that could result from the Proposed Action. To ensure that the South Coast Air Quality Management District (SCAQMD) emission budget accurately reflects the actual project emissions, SLD 30 will prepare an annual report to track project activities within the SCAB, quantify the associated emissions, and submit to the SCAQMD by March 30 each year. If the actual emissions from the Proposed Action are lower than the projected, any surplus credits will be returned to the SCAQMD annually. A detailed calculation methodology for the annual reporting is included in Attachment 2. SLD 30's Draft Environmental Assessment, Request for General Conformity Determination, and associated attachments are available online at: https://www.vandenberg.spaceforce.mil/About-Us/Environmental/EAS/.

We respectfully request that the SCAQMD affirm that these emissions levels can be accommodated within the general conformity budget established in the Final 2016 Air Quality Management Plan (Appendix VI-D). We understand that this SIP set aside budget is reserved to handle General Conformity projects that exceed de minimis levels.

If you have any questions or would like to discuss the undertaking in more detail, please contact Ms. Bea Kephart, (805) 605-7924, beatrice.kephart@spaceforce.mil.

Sincerely

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MARK A. SHOEMAKER, Colonel, USSF
Commander

2 Attachments:
1: Project Emissions
2: Annual Reporting Methodology

Attachment 1: Project Emissions

Table 1. Annual Project Operational Emissions – Proposed Action SCAQMD

Emission Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons Per Year					
Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
Emergency Generators	0.00	0.00	0.00	0.00	0.00	0.00
Worker Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
Fleet Vehicle Use	0.00	0.00	0.00	0.00	0.00	0.00
Vendor-Contractor Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road Equipment	0.00	0.00	0.00	0.00	0.00	0.00
RP-1, RSV Loading, and Payload Fueling	0.00	0.00	0.00	0.00	0.00	0.00
Roll-On-Roll-Off	2.54	31.62	46.38	0.57	0.71	0.71
Launch	0.00	0.00	0.00	0.00	0.00	0.00
Payload Fairing Recovery	0.14	0.67	0.28	0.11	0.05	0.05
Landings	0.00	1.07	0.00	0.00	0.00	0.00
Total	**2.68**	**33.36**	**46.66**	**0.68**	**0.76**	**0.76**
Baseline	**0.34**	**2.10**	**1.35**	**0.05**	**0.07**	**0.07**
Delta (Proposed Action – Baseline)	**2.34**	**31.26**	**45.31**	**0.63**	**0.69**	**0.69**
General Conformity De Minimis Thresholds	*10*	*10*	*100*	-	*100*	*70*
Threshold Exceeded?	**No**	**Yes**	**No**	**No**	**No**	**No**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = reported value less than 0.01.
See Appendix A for complete results.
Totals may not sum due to rounding.

Table 2. Daily Project Operational Emissions – Proposed Action SCAQMD

Emission Source	VOC	NO_x	CO	SO_x	PM_{10}	$PM_{2.5}$
	Tons Per Day					
Solvent Use	0.00	0.00	0.00	0.00	0.00	0.00
Emergency Generators	0.00	0.00	0.00	0.00	0.00	0.00
Worker Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
Fleet Vehicle Use	0.00	0.00	0.00	0.00	0.00	0.00
Vendor-Contractor Vehicles	0.00	0.00	0.00	0.00	0.00	0.00
Off-Road Equipment	0.00	0.00	0.00	0.00	0.00	0.00
RP-1, RSV Loading, and Payload Fueling	0.00	0.00	0.00	0.00	0.00	0.00
Roll-On-Roll-Off	0.01	0.09	0.13	0.002	0.002	0.002
Launch	0.00	0.00	0.00	0.00	0.00	0.00
Payload Fairing Recovery	0.0004	0.002	0.001	0.0003	0.0001	0.0001
Landings	0.0000	0.003	0.0000	0.0000	0.0000	0.0000
Total	**0.01**	**0.09**	**0.13**	**0.002**	**0.002**	**0.002**
Baseline	**0.001**	**0.01**	**0.004**	**0.0001**	**0.0002**	**0.0002**
Delta (Proposed Action – Baseline)	**0.01**	**0.09**	**0.12**	**0.002**	**0.002**	**0.002**

Notes: VOC = volatile organic compound; NO_x = oxides of nitrogen; CO = carbon monoxide; SO_x = sulfur oxides; PM_{10} = coarse particulate matter; $PM_{2.5}$ = fine particulate matter; <0.01 = reported value less than 0.01.
See Appendix A for complete results.
Totals may not sum due to rounding.

Attachment 2: Annual Reporting Methodology

By March 30 of each year, SLD 30 will submit an annual report summarizing actual emissions occurred from the Proposed Action in the jurisdiction of the SCAQMD from the previous calendar year.

Onboard GPS data from the marine vessels will be used to ensure that emissions within the SCAQMD jurisdiction are accurately captured and reported. The emissions from the marine vessels will be calculated based on annual fuel consumption and engine run hours using the following equations:

Equation 1: Load Factor

$$LF = \frac{G \; x \; HHV}{Engines \; x \; HP \; x \; Hrs \; x \; BSFC}$$

Where:
LF = load factor
G = total gallons for the year of R99
HHV = higher heating value (137,000 btu/gallon for R99)
Engines = number of engines
HP = engine rating brake horsepower of the engine
Hrs = total engine hours for the year
BSFC = brake specific fuel consumption (7,420 btu/bhp-hr)

Equation 2: Emissions

$$Em = \frac{EF \; x \; kW \; x \; LF \; x \; Hrs \; x \; Engines}{453.6 \; x \; 2{,}000}$$

Where:
Em = Annual emissions (tons per year)
EF = pollutant specific emission factor (g/kW-hr)
kW = kilowatt rating of engine
LF = load factor of engine (from equation 1)
Hrs = total engine hours for the year
Engines = number of engines
453.6 = conversion factor (453.6 g = pound)
2,000 = conversion factor (2,000 pounds = ton)

Due to the lack of available jurisdiction specific records for the offroad equipment and the fact that offroad equipment comprise a small portion of the overall proposed emissions, SLD-30 will track the actual operating days for offroad equipment. This can be done based on detailed marine vessel trip information. The hours per day will be assumed to be the same as within the 2024 EA[1]. The emissions will be calculated using equation 3 below.

[1] Available at: https://www.vandenberg.spaceforce.mil/About-Us/Environmental/EAS/

Equation 3: Offroad Equipment Emissions

$$Em = \frac{EF\ x\ HP\ x\ LF\ x\ Hrs\ x\ Days}{453.6\ x\ 2{,}000}$$

Where:
EM = annual emissions (tons per year)
EF = pollutant specific emission factor (g/hp-hr)
HP = horsepower of engine
LF = load factor (from 2024 EIS)
Hrs = hours per day (from 2024 EIS)
Days = days per year
453.6 = conversion factor (453.6 g = pound)
2,000 = conversion factor (2,000 pounds = ton)