Raritan Bay and Sandy Hook Bay, Highlands, New Jersey Coastal Storm Risk Management Feasibility Study

Final Integrated Feasibility Report and Environmental Assessment

May 2020

Appendix A6:
Clean Air Act Conformity
Record of Non-Applicability

Environmental Analysis Branch
(CENAN-PL-E)

January 17, 2020

RECORD OF NON-APPLICABILITY (RONA)

Project Name: Borough of Highlands Coastal Storm Risk Management Feasibility Study

Reference: Data files 110119_ Equipment Hours.pdf and 10292019_Schedule.pdf and email discussion 1 November 2019 and 7 November 2019

Project/Action Point of Contact: Matthew Voisine 917.790.8718

Begin Date: Q1 2022

End Date: Q2 2025

1. The project described above has been evaluated for Section 176 of the Clean Air Act. Project related emissions associated with the federal action were estimated to evaluate the applicability of General Conformity regulations (40CFR§93 Subpart B).

2. The requirements of this rule do not apply because the total direct and indirect emissions from this project are less than the 50 tons trigger levels for NO_x, and VOCs, and less than 100 tons of $PM_{2.5}$, CO, and SO_2 for each project year (40CFR§93.153(b)(1) & (2)) and for the project as a whole. The estimated total NO_x emissions for the project are 27.7 tons. Emissions of VOC, $PM_{2.5}$, CO, and SO_2 are also all well below the applicable trigger levels (see attached estimates).

3. The project is presumed to conform with the General Conformity requirements and is exempted from Subpart B under 40CFR§93.153(c)(1).

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Peter Weppler
Chief, Environmental Analysis Branch

Encl

Emissions have been estimated using project planning information developed by the New York District, consisting of anticipated dredging volumes, equipment types and estimates of the horsepower and operating hours of the diesel engines powering the equipment. In addition to this planning information, conservative factors have been used to represent the average level of engine load of operating engines (load factors) and the average emissions of typical engines used to power the equipment (emission factors). The basic emission estimating equation is the following:

E = hrs x LF x EF

Where:

E = Emissions per period of time such as a year or the entire project.
hrs = Number of operating hours in the period of time (e.g., hours per year, hours per project).
LF = Load factor, an estimate of the average percentage of full load an engine is run at in its usual operating mode.
EF = Emission factor, an estimate of the amount of a pollutant (such as NO_x) that an engine emits while performing a defined amount of work.

In these estimates, the emission factors are in units of grams of pollutant per horsepower hour (g/hphr). For each piece of equipment, the number of horsepower hours (hphr) is calculated by multiplying the engine's horsepower by the load factor assigned to the type of equipment and the number of hours that piece of equipment is anticipated to work during the year or during the project. For example, a crane with a 250-horsepower engine would have a load factor of 0.43 (meaning on average the crane's engine operates at 43% of its maximum rated power output). If the crane were anticipated to operate 1,000 hours during the course of the project, the horsepower hours would be calculated by:

250 horsepower x 0.43 x 1,000 hours = 107,500 hphr

The emissions from diesel engines vary with the age of an engine and, most importantly, with when it was built. Newer engines of a given size and function typically emit lower levels of most pollutants than older engines. The emission factors used in these calculations assume that the equipment pre-dates most emission control requirements (known as Tier 0 engines in most cases), to provide a reasonable "upper bound" to the emission estimates. If newer engines are actually used in the work, then emissions will be lower than estimated for the same amount of work. In the example of the crane engine, a NO_x emission factor of 9.5 g/hphr would be used to estimate emissions from this crane on the project by the following equation:

$$\frac{\text{107,500 hphr x 9.5 g } NO_x\text{/hphr}}{\text{453.59 g/lb x 2,000 lbs/ton}} = \text{1.1 tons of } NO_x$$

As noted above, information on the equipment types, horsepower, and hours of operation associated with the project have been obtained from the project's plans and represent current best estimates of the equipment and work that will be required. Load factors have been obtained from various sources depending on the type of equipment. Land-side nonroad equipment load factors are from the documentation for EPA's NONROAD emission estimating model, "Median Life, Annual Activity, and Load Factor Values for Nonroad Engine Emissions Modeling, EPA420-P-04-005, April 2004."

Emission factors have also been sourced from a variety of documents and other sources depending on engine type and pollutant. Nonroad equipment NOx and other emission factors have been derived from EPA emission standards and documentation. On-road emission factors have been developed from the MOVES2014b model based on model year 1995 trucks. As noted above, the emission factors have been chosen to be moderately conservative so as not to underestimate project emissions. Equipment turnover by the time the project is undertaken will likely result in newer equipment performing the work than assumed in this analysis, meaning the emissions presented in this analysis are likely higher than will actually occur.

The following pages summarize the estimated emissions in sum for the project including the anticipated equipment and engine information developed by the New York District, the load factors and emission factors as discussed above, and the estimated emissions for the project.

USACE - New York District
Borough of Highlands (NJ) Coastal Storm Risk Management Feasibility Study
Detailed Equipment Emission Estimates
6 November 2019
FINAL

Project Emission Summary

Pollutant	2022	2023	2024	2025	Project Total
		tons per year			
NO_x	7.9	7.9	7.9	4.0	27.7
VOC	0.11	0.11	0.11	0.06	0.39
SO_x	0.003	0.003	0.003	0.001	0.010
$PM_{2.5}$	0.09	0.09	0.09	0.05	0.33
CO	0.7	0.7	0.7	0.4	2.5

Description, off-road equipment	Engine	Horsepower (approx.)	Load Factor	Hours	hphrs	Emission factors, grams per hphr					Project emissions, tons				
						NO_x	VOC	SO_x	$PM_{2.5}$	CO	NO_x	VOC	SO_x	$PM_{2.5}$	CO
Prime contractor															
Compactor, roller, vibratory	Other diesel engines	100	0.59	99	5,832	9.5	0.19	0.0050	0.16	1.21	0.1	0.00	0.000	0.00	0.0
Crane, hydraulic, self-propelled, yard	Crane	120	0.43	7	360	9.5	0.19	0.0050	0.16	1.21	0.0	0.00	0.000	0.00	0.0
Crane, hydraulic, self-propelled, rough terrain	Crane	175	0.43	47	3,518	9.5	0.19	0.0050	0.16	1.21	0.0	0.00	0.000	0.00	0.0
Crane, hydraulic, truck mounted	Crane	275	0.43	3	300	9.5	0.19	0.0050	0.16	1.21	0.0	0.00	0.000	0.00	0.0
Crane, hydraulic, truck mounted	Crane	175	0.43	36	2,694	9.5	0.19	0.0050	0.16	1.21	0.0	0.00	0.000	0.00	0.0
Cranes, hydraulic, truck mtd, all terrain	Crane	275	0.43	10	1,213	9.5	0.19	0.0050	0.16	1.21	0.0	0.00	0.000	0.00	0.0
Crane, mechanical, lattice boom, crawler, dragline/clamshell	Crane	225	0.43	1,220	118,025	9.5	0.19	0.0050	0.16	1.21	1.2	0.02	0.001	0.02	0.2
Crane, mechanical, lattice boom, crawler, lifting	Crane	175	0.43	46	3,456	9.5	0.19	0.0050	0.16	1.21	0.0	0.00	0.000	0.00	0.0
Generator set, skid mounted, 35 kw	Generator	60	0.43	93	2,403	9.5	0.19	0.0050	0.16	1.21	0.0	0.00	0.000	0.00	0.0
Hydraulic excavator, crawler, 30,000 lb	Excavator	500	0.59	31	9,112	9.5	0.19	0.0050	0.16	1.21	0.1	0.00	0.000	0.00	0.0
Loader/backhoe, wheel, 1.10 cy	Rubber tired loader	135	0.59	246	19,607	9.5	0.19	0.0050	0.16	1.21	0.2	0.00	0.000	0.00	0.0
Pile hammer, driver/extractor, vibratory, 107 ton	Other diesel engines	100	0.59	93	5,495	9.5	0.19	0.0050	0.16	1.21	0.1	0.00	0.000	0.00	0.0
Concrete vibrator, 2.5" (63.5 mm) dia	Generator	10	0.43	67	287	9.5	0.19	0.0050	0.16	1.21	0.0	0.00	0.000	0.00	0.0
Subcontractor															
Tractor, crawler (dozer)	Dozer	90	0.59	587	31,159	9.5	0.19	0.0050	0.16	1.21	0.3	0.01	0.000	0.01	0.0
Compactor, roller, vibratory	Other diesel engines	100	0.59	3,086	182,071	9.5	0.19	0.0050	0.16	1.21	1.9	0.04	0.001	0.03	0.2
Cranes, mechanical, lattice boom, crawler, dragline/clamshell	Crane	265	0.43	2,836	323,129	9.5	0.19	0.0050	0.16	1.21	3.4	0.07	0.002	0.06	0.4
Crane, mechanical, lattice boom, crawler, dragline/clamshell	Crane	225	0.43	4,668	451,651	9.5	0.19	0.0050	0.16	1.21	4.7	0.09	0.002	0.08	0.6
Generator set, skid mounted, 35 kw	Generator	60	0.43	4,668	120,440	9.5	0.19	0.0050	0.16	1.21	1.3	0.03	0.001	0.02	0.2
Grader, motor, articulated	Grader	215	0.59	10	1,267	9.5	0.19	0.0050	0.16	1.21	0.0	0.00	0.000	0.00	0.0
Hydraulic excavator, crawler	Excavator	500	0.59	696	205,406	9.5	0.19	0.0050	0.16	1.21	2.2	0.04	0.001	0.04	0.3
Loader/backhoe, wheel, 1.10 cy (0.84 m3) front end bucket	Rubber tired loader	135	0.59	978	77,886	9.5	0.19	0.0050	0.16	1.21	0.8	0.02	0.000	0.01	0.1
Pile hammer, driver/extractor, vibratory	Other diesel engines	100	0.59	4,668	275,425	9.5	0.19	0.0050	0.16	1.21	2.9	0.06	0.002	0.05	0.4
Tractor, crawler (dozer)	Dozer	250	0.59	52	7,713	9.5	0.19	0.0050	0.16	1.21	0.1	0.00	0.000	0.00	0.0
Welder, engine driven, diesel	Generator	25	0.43	984	10,583	9.5	0.19	0.0050	0.16	1.21	0.1	0.00	0.000	0.00	0.0
Concrete vibrator, 2.5" (63.5 mm) dia	Other diesel engines	10	0.59	1,984	11,703	9.5	0.19	0.0050	0.16	1.21	0.1	0.00	0.000	0.00	0.0
Total off-road					**1,870,735**						**19.6**	**0.39**	**0.010**	**0.33**	**2.5**

Description, on-road vehicles*	Hours	Miles	Emission factors, grams per mile					Project emissions, tons				
			NO_x	VOC	SO_x	$PM_{2.5}$	CO	NO_x	VOC	SO_x	$PM_{2.5}$	CO
On-road truck, 45,000 lb	365	12,788	18.5	2.6	0.012	1.5	9.9	0.3	0.00	0.000	0.00	0.0
On-road truck, 35,000 lbs	154	5,406	18.5	2.6	0.012	1.5	9.9	0.1	0.00	0.000	0.00	0.0
On-road truck, 75,000 lbs	114	4,004	18.5	2.6	0.012	1.5	9.9	0.1	0.00	0.000	0.00	0.0
On-road truck, 45,000 lb	14	481	18.5	2.6	0.012	1.5	9.9	0.0	0.00	0.000	0.00	0.0
On-road truck, 45,000 lb	214	7,480	18.5	2.6	0.012	1.5	9.9	0.2	0.00	0.000	0.00	0.0
On-road truck, 35,000 lb	10,103	353,602	18.5	2.6	0.012	1.5	9.9	7.2	0.00	0.000	0.00	0.0
On-road truck, 75,000 lb	427	14,957	18.5	2.6	0.012	1.5	9.9	0.3	0.00	0.000	0.00	0.0
Total on-road	**11,392**	**398,717**						**8.1**	**0.00**	**0.000**	**0.00**	**0.0**
Emission totals, off-road & on-road								**27.7**	**0.39**	**0.010**	**0.33**	**2.5**

* On-road truck activity assuming travel at 35 mph average, conservative 1995 MY trucks