US Army Corps
of Engineers®
New York District

Passaic River Tidal Protection Area, New Jersey
Coastal Storm Risk Management
Feasibility Study

Final Integrated Hurricane Sandy
General Reevaluation Report
& Environmental Assessment

Appendix B2
Clean Air Act Conformity
Record of Non-Applicability

March 2019

Environmental Analysis Branch
(CENAN-PL-E)

March 27, 2019

RECORD OF NON-APPLICABILITY (RONA)

Project Name: Passaic River Tidal Feasibility Study
Reference: Equipment list and schedule provided 9/25/2017 updated 3/27/2019

Project/Action Point of Contact: Matthew Voisine

Begin Date: November 2021

End Date: November 2022

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 significantly less than the 100 tons trigger levels for NO_x VOC, $PM_{2.5}$, SO_x or CO for each project year (40CFR§93.153(b)(1) & (2)). The estimated annual NO_x emissions for the project are 6.18 tons for 2020 and 1.98 tons for 2021. VOC, $PM_{2.5}$, and CO are significantly lower than the NO_x emission estimates as NO_x is the primary mass criteria pollutant from diesel equipment. Total annual emissions by pollutant provided in attachment.

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

27 March 2019
Date

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Peter Weppler
Chief
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Encl

Emissions have been estimated using project planning information developed by the New York District, consisting of anticipated 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 pollutants than older engines. The NO_x 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:

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

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.

Marine engine load factors are primarily from a document associated with the New York and New Jersey Harbor Deepening Project (HDP): “Marine and Land-Based Mobile Source Emission Estimates for the Consolidated Schedule of 50-Foot Deepening Project, January 2004,” and from EPA’s 1998 Regulatory Impact Analysis (RIA): “EPA Regulatory Impact Analysis: Control of Commercial Marine Vessels.” 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. The NO_x emission factors for marine engines have been developed primarily from EPA documentation for the Category 1 and 2 standards (RIA, "Control of Emission from Marine Engines, November 1999) and are consistent with emission factors used in documenting emissions from the HDP, while the VOC emission factors for marine engines are from the Port Authority of New York and New Jersey’s “2010 Multi-Facility Emissions Inventory” which represent the range of marine engines operating in the New Jersey harbor and coastal region in terms of age and regulatory tier level. Nonroad equipment NO_x emission factors have been derived from EPA emission standards and documentation, while the nonroad VOC emission factors have been based on EPA’s Diesel Emissions Quantifier (DEQ, accessed at: www.epa.gov/cleandiesel/quantifier/), run for moderately old equipment (model year1995). On-road vehicle emission factors have also been developed from the DEQ, assuming a mixture of Class 8, Class 6, and Class 5 (the smallest covered by the DEQ) on-road trucks.

As noted above, the emission factors have been chosen to be moderately conservative so as not to underestimate project emissions. Actual project emissions will be estimated and tracked during the course of the project and will be based on the characteristics and operating hours of the specific equipment chosen by the contractor to do the work.

The following pages summarize the estimated emissions of pollutants relevant to General Conformity, NO_x, VOC, $PM_{2.5}$, and SO_x in sum for the project and by calendar year based on the schedule information also presented (in terms of operating months per year). Following this summary information are project details 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 by piece of equipment.

Overall Summary

	Total Tons for Project				
Equipment Type	NO_x	VOC	SO_x	$PM_{2.5}$	CO
Off-road equipment	6.2	0.12	0.003	0.104	0.787
On-road vehicles	0.006	0.0004	0.000	0.000	0.002
Totals	**6.18**	**0.124**	**0.003**	**0.104**	**0.789**

Schedule of Construction Activity

Work Area	**Schedule**	**Months of Construction Activity**		**Totals**
		2021	2022	
Contracts 1, 2, and 3	Nov. 2021 – Nov. 2022	2	10	12

General Conformity-Applicable Emissions per Calendar Year

	Year of Construction Activity	
Emissions by Year	**2021**	**2022**
NO_x	1.98	4.20
VOC	0.040	0.084
SO_x	0.001	0.002
$PM_{2.5}$	0.252	0.537

DESCRIPTION OF EQUIPMENT	HOURS	HORSEPOWER	HPHOURS	GRAMS PER HPHOURS NOx	VOC	SOx	PM2.5	CO	TONS NOx	VOC	SOx	PM2.5	CO
TRACTOR, CRAWLER (DOZER), 251-300 HP (187-224 KW), POWERSHIFT, W/UNIVERSAL BLADE	7.3505	300	2205.15	9.5	0.19	0.005	0.16	1.21	0.023092	0.000462	0.000012	0.000389	0.002941
HYDRAULIC EXCAVATOR, CRAWLER, 55,000 LB (24,948 KG), 1.50 CY (1.2 M3) BUCKET, 23.3' (7.1 M) MAX DIGGING DEPTH	218.839	300	65651.7	9.5	0.19	0.005	0.16	1.21	0.687505	0.013750	0.000362	0.011579	0.087566
TRACTOR, CRAWLER (DOZER), 181-250 HP (135-186 KW), POWERSHIFT, LGP, W/UNIVERSAL BLADE	53.5643	250	13391.075	9.5	0.19	0.005	0.16	1.21	0.140232	0.002805	0.000074	0.002362	0.017861
CRANE, MECHANICAL, LATTICE BOOM, CRAWLER, DRAGLINE/CLAMSHELL, 0.50 CY (0.4 M3), 17 TON (15 MT), 100' (30.5 M) BOOM (ADD BUCKET)	6.1874	225	1392.165	9.5	0.19	0.005	0.16	1.21	0.014579	0.000292	0.000008	0.000246	0.001857
CRANE, MECHANICAL, LATTICE BOOM, CRAWLER, DRAGLINE/CLAMSHELL, 2.5 CY (1.9 M3), 60 TON (54 MT), 50' (15.2 M) BOOM (ADD BUCKET)	0.0014	225	0.315	9.5	0.19	0.005	0.16	1.21	0.000003	0.000000	0.000000	0.000000	0.000000
HYDRAULIC EXCAVATOR, ATTACHMENT, MATERIAL HANDLING, 1.50 CY (1.2 M3) W/TIPS (ADD TO 55,000-70,000 LB (24,948-31,751 KG) HYDRAULIC EXCAVATOR)	0.0014	300	0.42	9.5	0.19	0.005	0.16	1.21	0.000004	0.000000	0.000000	0.000000	0.000001
HYDRAULIC EXCAVATOR, CRAWLER, 39,400 LBS, 1.12 CY BUCKET, 19.58' MAX DIGGING DEPTH	82.917	300	24875.1	9.5	0.19	0.005	0.16	1.21	0.260492	0.005210	0.000137	0.004387	0.033178
LOADER, FRONT END, WHEEL, ARTICULATED, 2.75 CY (2.1 M3) BUCKET, 4X4,	82.917	175	14510.475	9.5	0.19	0.005	0.16	1.21	0.151954	0.003039	0.000080	0.002559	0.019354
SCREENING & CRUSHING PLANTS, SCREENING PLANT, 7' X 10', VIBRATORY SLOPE SCREENS, W/HOPPER/ 60" FEEDER CONVEYOR, TRAILER MTD	82.917	300	24875.1	9.5	0.19	0.005	0.16	1.21	0.260492	0.005210	0.000137	0.004387	0.033178
LANDSCAPING EQUIPMENT, HYDROSEEDER, 3,000 GAL (11,356 L) TRUCK MOUNTED	7.0592	175	1235.36	9.5	0.19	0.005	0.16	1.21	0.012937	0.000259	0.000007	0.000218	0.001648
LOADER, FRONT END, WHEEL, ARTICULATED, 2.75 CY (2.1 M3) BUCKET, 4X4,	13.1472	175	2300.76	9.5	0.19	0.005	0.16	1.21	0.024094	0.000482	0.000013	0.000406	0.003069
AIR HOSE, 3.00", 100', HARDROCK	12.2006	100	1220.06	9.5	0.19	0.005	0.16	1.21	0.012776	0.000256	0.000007	0.000215	0.001627
CRANE, MECHANICAL, LATTICE BOOM, CRAWLER, DRAGLINE/CLAMSHELL, 2.5 CY (1.9 M3), 60 TON (54 MT), 50' (15.2 M) BOOM (ADD BUCKET)	700.27	225	157560.75	9.5	0.19	0.005	0.16	1.21	1.649978	0.033000	0.000868	0.027789	0.210155
PILE HAMMER, DRIVER/EXTRACTOR, VIBRATORY, 80 TON (73 MT) FORCE DRIVE (ADD LEADS & CRANE)	700.27	100	70027	9.5	0.19	0.005	0.16	1.21	0.733324	0.014666	0.000386	0.012351	0.093402
PILE HAMMER, SINGLE ACTING, PNUEMATIC (STEAM/AIR), 18,000 FT-LBS (ADD 750 CFM COMPRESSOR, LEADS & CRANE)	6.1003	100	610.03	9.5	0.19	0.005	0.16	1.21	0.006388	0.000128	0.000003	0.000108	0.000814
CONCRETE PUMP, PUMP & BOOM, 117 CY/HR (89 M3/HR), 75' (23 M) BOOM, TRUCK MOUNTED	71.669	250	17917.25	9.5	0.19	0.005	0.16	1.21	0.187630	0.003753	0.000099	0.003160	0.023898
CONCRETE VIBRATOR, 2.5" (63.5 MM) DIA, W/7.5 HP (5.6 KW) GENERATOR	307.153	250	76788.225	9.5	0.19	0.005	0.16	1.21	0.804127	0.016083	0.000423	0.013543	0.102420
AIR COMPRESSOR, 250 CFM (7 CMM), 100 PSI (689 KPA) (ADD HOSE)	96	100	9600	9.5	0.19	0.005	0.16	1.21	0.100531	0.002011	0.000053	0.001693	0.012805
PAVING BREAKER, 66 LB (30 KG) (ADD 100 CFM (2.8 CMM) COMPRESSOR)	192	100	19200	9.5	0.19	0.005	0.16	1.21	0.201063	0.004021	0.000106	0.003386	0.025609
PUMP, WATER, CENTRIFUGAL, DEWATERING, SKID MOUNTED, ENGINE DRIVE, 3" (76 MM) DIA, 17,600 GPM (66,623 LPM) @ 20' (6.1 M) HEAD (ADD HOSES)	216.191	100	21619.05	9.5	0.19	0.005	0.16	1.21	0.226395	0.004528	0.000119	0.003813	0.028836
PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 3" (76 MM) DIA x 20' (6.1 M) LENGTH, W/COUPLING/SECTION	216.191	100	21619.05	9.5	0.19	0.005	0.16	1.21	0.226395	0.004528	0.000119	0.003813	0.028836
PUMP, WATER, CENTRIFUGAL, TRASH, HOSE, SUCTION/DISCH, 3" (75 MM) DIA X 50' (15 M) WITH COUPLING (PER SECTION)	432.381	100	43238.1	9.5	0.19	0.005	0.16	1.21	0.452790	0.009056	0.000238	0.007626	0.057671
TOTALS			**589837.135**						**6.176782**	**0.123536**	**0.003251**	**0.104030**	**0.786727**
	HOURS	**MILES**											
TRUCK, HIGHWAY, 45,000 LB (20,412 KG) GVW, 6X4, 3 AXLE	7.0592	247.07		20.6	1.2	0.017	1.1	6.3	0.005610	0.000327	0.000005	0.000300	0.001716
TRUCK, HIGHWAY, CONVENTIONAL, 8,800 LB (3,992 KG) GVW, 4X4, 2 AXLE, 3/4 TON (0.68 MT) - PICKU	1.0466	36.63		20.6	1.2	0.017	1.1	6.3	0.000832	0.000048	0.000001	0.000044	0.000254
TOTALS	**8.1058**	**283.7**							**0.006442**	**0.000375**	**0.000005**	**0.000344**	**0.001970**
								GRAND TOTALS	**6.183224**	**0.123911**	**0.003256**	**0.104374**	**0.788697**