US Army Corps of Engineers®
New York District

NEW YORK AND NEW JERSEY HARBOR DEEPENING CHANNEL IMPROVEMENTS

NAVIGATION STUDY

FINAL INTEGRATED FEASIBILITY REPORT & ENVIRONMENTAL ASSESSMENT

APPENDIX A5:

Clean Air Act /General Conformity Determination

1. Introduction

1.1. General Description of Selected Plan

The Recommended Plan is identified as deepening the selected pathways from Ambrose Channel, Anchorage Channel and Port Jersey Channel, the Kill Van Kull, Newark Bay Channel, South Elizabeth Channel, and Elizabeth Channel to -55 feet MLLW. Chapter 5 of the integrated Main Report & EA contains more information, including tables and figures.

1.2. Authority and Purpose.

In March 2018, an Initial Appraisal Report, per compliance with Section 216 of WRDA 1970, was completed to determine if there is potential federal interest to undertake modifications to the existing 50-foot federal navigation project. The Initial Appraisal Report states that the accelerating expansion of the volume of trade that has taken place since the existing 50-foot federal navigation project was authorized has led to the existing project's dimensions, based on the design vessel the Regina Maersk as recommended in the 1999 Study, being superseded in use in the Port of New York and New Jersey much sooner than anticipated in the 1999 Study. This fact has a material effect on the economics and engineering design of the 50-foot federal navigation project. The Initial Appraisal Report found "a comparison of these facts with the requirements §216 indicates that all of the requirements of §216 have been meet." The Initial Appraisal Report made the recommendation to "investigate and determine if there is a Federal interest in continuing the project with the preparation of cost-shared feasibility report for analyzing alternatives to address the identified problems though possible modifications of the project."

As an outcome of the Initial Appraisal Report, the resulting study is called the New York and New Jersey Harbor Deepening Channel Improvements, Navigation Feasibility Study (NYNJHDCI Study). Water Resources Development Act 1970 Section 216 limits the analysis of the NYNJHDCI Study to the constructed 50-foot federal navigation project.

The HDCI project is anticipated to start construction during the first quarter of 2025 and will proceed over a multi-year period of up to ten calendar years. This document represents the General Conformity Determination required under 40CFR§93.154 by the United States Army Corps of Engineers (USACE). USACE is the lead Federal agency that will contract, oversee, approve, and fund the project's work, and thus is responsible for making the General Conformity determination for this project.

2. Background

USACE has coordinated this determination with the New Jersey Department of Environmental Protection (NJDEP), the New York State Department of Environmental Conservation (NYSDEC), and Region 2 of the U.S. Environmental Protection Agency (EPA). Relative to the National Ambient Air Quality Standards (NAAQS), the project area includes parts of counties in New York and New Jersey that are currently classified as "serious" nonattainment for the 2008 8-hour ozone standard, “moderate” nonattainment for the 2015 8-hour ozone standard, and “maintenance” for both the 2006 particulate matter less than 2.5 microns ($PM_{2.5}$) and the 1971 carbon monoxide (CO) standards (40CFR§81.333). Only three of the counties in which work will take place are within the CO maintenance area: Essex, Hudson, and Union Counties, all in New Jersey. The ozone nonattainment counties are part of the Ozone Transport Region. Ozone is controlled through the regulation of its precursor emissions, which include oxides of nitrogen (NO_x) and volatile organic compounds (VOCs). Sulfur dioxide (SO_2) is a precursor for $PM_{2.5}$.

3. Description of Emissions

The equipment associated with this project that is evaluated under General Conformity (40CFR§93.153) includes direct and indirect nonroad diesel powered emission sources, such as dredging equipment and support vessels. The primary pollutant of concern with this type of equipment is NO_x, because VOCs, $PM_{2.5}$, SO_2, and CO are generated at significantly lower rates. The NO_x emissions associated with the project are estimated to be as much as 497 tons per calendar year in 2025 through 2039. Emission estimates are provided as Attachment A. The project exceeds the NO_x trigger level of 50 tons in any calendar year and as a result, the USACE is required to fully offset the NO_x emissions of this project. The project will not exceed the ozone related VOC trigger level of 50 tons (for areas in an ozone transport region) in any calendar year, nor the $PM_{2.5}$, SO_2, or CO maintenance areas’ related trigger levels of 100 tons in any calendar year, per pollutant.

4. Emission Offsets

The USACE is committed to fully offsetting the NOx emissions generated as a result of the work associated with this project. USACE recognizes that the feasibility and cost-effectiveness of each offset option is influenced by whether the emission reductions can be achieved without introducing delay to the construction schedule that would prevent timely completion of the project to provide the benefits for which the project is being undertaken.

USACE will demonstrate conformity with the New York and New Jersey State Implementation Plans by utilizing the emission offset options listed below. The demonstration can consist of any combination of options and is not required to include all options or any single option to meet conformity. The options for meeting general conformity requirements include the following:

a. Emission reductions from project and/or non-project related sources in an appropriately close vicinity to the project location. In assessing the potential impact of this offset option, USACE recognizes the possibility of lengthening the time period in which offsets can be generated as appropriate and allowable under the general conformity rule (40CFR§93.163 and §93.165).
b. Use of Surplus NOx Emission Offsets (SNEOs) generated under the Harbor Deepening Project (HDP) and/or subsequent projects for which SNEOs have been produced. As part of the mitigation of the HDP and later projects, USACE and the Port Authority of New York & New Jersey have developed emission reduction programs coordinated through the Regional Air Team (RAT). The RAT is comprised

of the USACE, NYSDEC, New Jersey Department of Environmental Protection, United States Environmental Protection Agency (EPA) Region 2, and other stakeholders. SNEOs will be applied in concurrence with the agreed upon SNEO Protocols to ensure the offsets are real, surplus, and not double counted.

c. Development of a Marine Vessel Engine Repower Program (MVERP) which replaces older, higher emitting marine engines with cleaner engines, the delta in emissions being used to offset project emissions. The MVERP approach worked successfully for offsetting the HDP's construction emissions. The details of the MVERP, its implementation, and tracking would be coordinated with the RAT.

d. Use of Cross-State Air Pollution Rule (CSAPR) ozone season NO_x Allowances with a distance ratio applied to allowances, similar to the one used by stationary sources.

e. Rescheduling the project by elongating the construction schedule so as not to exceed the 100 tons per year threshold for NOx in any one calendar year. This option is least likely to be exercised.

Due to the unpredictable nature of dredge-related construction, the project emissions will be monitored as appropriate and regularly reported to the RAT to assist the USACE in ensuring that the project is fully offset.

5. Summary

In summary, USACE will achieve conformity for NO_x using the options outlined above, as coordinated with the NJDEP, NYSDEC, and EPA, and coordinated through the RAT.

Peter Weppler

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Chief, Environmental Analyses Branch
Planning Division

Attachment A

Documentation of General Conformity Related Emission Estimates

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:

$$E = hrs \times LF \times EF$$

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:

$$\text{250 horsepower} \times 0.43 \times \text{1,000 hours} = \text{107,500 hphr}$$

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:

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

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. As noted above, the emission factors have been chosen to be moderately conservative so as not to underestimate project emissions.

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
NAN - Harbor Deepening Channel Improvement
General Conformity-Related Emission Estimates
September 2021

General Conformity-applicable emissions per calendar year based on anticipated project duration

	Estimated Emissions, tons per year														
Pollutant	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**
NO_x	428	497	497	497	433	436	436	436	436	436	358	279	279	279	105
VOC	14	17	17	17	15	15	15	15	15	15	13	10	10	10	4
$PM_{2.5}$	20	24	24	24	21	21	21	21	21	21	18	14	14	14	5
SO_2	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
CO	56	64	64	64	55	55	55	55	55	55	44	32	32	32	12

Months of work per year		**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**
Hopper dredge	cu yds	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**	**Yr 8**	**Yr 9**	**Yr 10**	**Yr 11**	**Yr 12**	**Yr 13**	**Yr 14**	**Yr 15**
Total months	50															
No window	10,189,394	12	12	12	12	2										
Window	10,976,326					6	8	8	8	8	8	4				
Volume:	21,165,720															
Mechanical dredge																
Total months	113															
No window	0															
Window	12,071,814	6	8	8	8	8	8	8	8	8	8	8	8	8	8	3
Volume:	12,071,814															

Tons of emissions per year

NO_x		**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**	**2036**	**2037**	**2038**	**2039**
Hopper dredge	% of cu yds	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**	**Yr 8**	**Yr 9**	**Yr 10**	**Yr 11**	**Yr 12**	**Yr 13**	**Yr 14**	**Yr 15**
No window	48.1%	218	218	218	218	36	0	0	0	0	0	0	0	0	0	0
Window	51.9%	0	0	0	0	118	157	157	157	157	157	78	0	0	0	0
Mechanical dredge																
No window	0.0%	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Window	100.0%	209	279	279	279	279	279	279	279	279	279	279	279	279	279	105
Annual totals, tons per year		428	497	497	497	433	436	436	436	436	436	358	279	279	279	105

USACE - New York District
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VOCs															
Hopper dredge	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**	**Yr 8**	**Yr 9**	**Yr 10**	**Yr 11**	**Yr 12**	**Yr 13**	**Yr 14**	**Yr 15**
No window	7	7	7	7	1	0	0	0	0	0	0	0	0	0	0
Window	0	0	0	0	4	5	5	5	5	5	2	0	0	0	0
Mechanical dredge															
No window	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Window	8	10	10	10	10	10	10	10	10	10	10	10	10	10	4
Annual totals, tons per year	14	17	17	17	15	15	15	15	15	15	13	10	10	10	4

SO_2															
Hopper dredge	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**	**Yr 8**	**Yr 9**	**Yr 10**	**Yr 11**	**Yr 12**	**Yr 13**	**Yr 14**	**Yr 15**
No window	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Window	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Mechanical dredge															
No window	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Window	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Annual totals, tons per year	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1

$PM_{2.5}$															
Hopper dredge	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**	**Yr 8**	**Yr 9**	**Yr 10**	**Yr 11**	**Yr 12**	**Yr 13**	**Yr 14**	**Yr 15**
No window	10	10	10	10	2	0	0	0	0	0	0	0	0	0	0
Window	0	0	0	0	5	7	7	7	7	7	3	0	0	0	0
Mechanical dredge															
No window	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Window	11	14	14	14	14	14	14	14	14	14	14	14	14	14	5
Annual totals, tons per year	20	24	24	24	21	21	21	21	21	21	18	14	14	14	5

CO															
Hopper dredge	**Yr 1**	**Yr 2**	**Yr 3**	**Yr 4**	**Yr 5**	**Yr 6**	**Yr 7**	**Yr 8**	**Yr 9**	**Yr 10**	**Yr 11**	**Yr 12**	**Yr 13**	**Yr 14**	**Yr 15**
No window	32	32	32	32	5	0	0	0	0	0	0	0	0	0	0
Window	0	0	0	0	17	23	23	23	23	23	11	0	0	0	0
Mechanical dredge															
No window	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Window	24	32	32	32	32	32	32	32	32	32	32	32	32	32	12
Annual totals, tons per year	56	64	64	64	55	55	55	55	55	55	44	32	32	32	12