DEPARTMENT OF THE ARMY
CORPS OF ENGINEERS, NEW YORK DISTRICT
JACOB K. JAVITS FEDERAL BUILDING
26 FEDERAL PLAZA
NEW YORK, NY 10278-0090

United States Army Corps of Engineers, New York District
FINAL General Conformity Determination Notice

On October 30, 2012, New York State (DR-4085) and New Jersey State (DR-4086) declared Super Storm Sandy a Major Disaster. In response to the unprecedented breadth and scope of the damages sustained along the New York and New Jersey coastlines, the U.S. Congress passed Public Law (PL) 113-2 "Disaster Relief Appropriations Act 2013", also known as House Resolution (H.R.) 152-2 Title II which was signed into law on January 29, 2013. PL 113-2, which states "That the amounts... are designated by the Congress as being for an emergency requirement pursuant to section 251(b)(2)(A)(i) of the Balanced Budget and Emergency Deficit Control Act of 1985", provides funding for numerous projects to repair, restore and fortify the coastline in both states as a result of the continuing emergency as people and property along the coast remain in a vulnerable condition until the coastline is restored and fortified. To this end, New Jersey Governor Christie signed Executive Order No. 140 on September 25, 2013, which authorized the means for the State to acquire all lands outside the State's ownership needed to ensure the sustainability of its coastline, and improve safeguards to diminish the impacts of future storm events, including flood protection for coastal communities that were impacted by the storm. To protect the investments by the Federal, State, local governments and individuals to rebuild damaged sites, it is imperative that these emergency disaster relief projects proceed as expeditiously as possible.

There are a number of coastal projects that were previously proposed and authorized but unconstructed (ABU). The Atlantic Coast of New Jersey, Sandy Hook to Barnegat Inlet Beach Erosion Control Project, Section I - Sea Bright to Ocean Township: Elberon to Loch Arbour Reach located in Monmouth County, New Jersey [River and Harbor Act of July 3, 1958, in accordance with House Document No.332, 85th Congress, second session, as modified by Section 854 of the Water Resources Development Act of 1986 (PL99-662) and further modified by Section 4 of the Water Resources Development Act of 1988 (PL100-676) and Section 102 (r) of the Water Resources Development Act of 1992 (PL102-580)] project is an ABU project that is anticipated to start construction during or after October 2014 and 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.

USACE has coordinated this determination with the New Jersey Department of Environmental Protection (NJDEP) [see NJDEP letter provided as Attachment A]. The New York, Northern New Jersey, Long Island, Connecticut nonattainment area is currently classified as "marginal" nonattainment for the 2008 8-hour ozone standard, maintenance of the carbon monoxide (CO) standard, and maintenance for the 2006 particulate matter smaller than 2.5 microns ($PM_{2.5}$) standard. Ozone is controlled through

the regulation of its precursor emissions, which include oxides of nitrogen (NOx) and volatile organic compounds (VOCs). The area is in the Ozone Transport Region.

The equipment associated with this project that is evaluated under General Conformity (40CFR§93.153) includes direct and indirect nonroad diesel sources, such as dredging equipment and land based earth-moving equipment. The primary precursor of concern with this type of equipment is NOx, as VOCs and CO are generated at significantly lower rates. The NOx emissions associated with the project are estimated to range from 137.1 to 548.6 tons per calendar year for 2014 and 2015, respectively (see emissions estimates provided as Attachment B). The project exceeds the NOx trigger level of 100 tons in any calendar year and as a result, the USACE is required to fully offset the NOx emissions of this project. The project does not exceed the ozone related VOC trigger level of 50 tons (for areas in an ozone transport region) in any calendar year, nor the CO and $PM_{2.5}$ maintenance areas' related trigger level of 100 tons in any calendar year.

USACE is committed to fully offsetting the emissions generated as a result of the disaster relief coastal 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 disaster relief.

USACE will demonstrate conformity with the New Jersey State Implementation Plan by utilizing the emission offset options listed below. The demonstration can consist of any combination of options, and is not required to include all or any single options 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 on the construction schedule, 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). As part of the mitigation of the HDP, USACE and the Port Authority of New York & New Jersey developed emission reduction programs coordinated through the Regional Air Team (RAT). The RAT is comprised of the USACE, New York State Department of Environmental Conservation, NJDEP, United States Environmental Protection Agency (EPA), 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. Use of a portion of the Department of Defense Joint Base McGuire and Lakehurst State Implementation Plan emissions budget, as determined by the NJDEP, and in coordination with the EPA.
d. Use of Clean Air Interstate Rule (CAIR) ozone season NOx Allowances with a distance ratio applied to allowances, similar to the one used by stationary sources.

Due to unpredictable nature of dredge-related construction and the preliminary estimates of sand required to restore the integrity of the coastlines, 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.

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

30 July 2014
Date

Paul E. Owen, P.E.
Commander, USACE-New York District

Attachment A

Bob Martin, Commissioner, NJDEP Letter to Colonel Paul E. Owen, P.E., Commander New York District, USACE and Lieutenant Colonel John C. Becking, PE., Commander Philadelphia District, USACE
November 4, 2013

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
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CHRIS CHRISTIE
Governor

KIM GUADAGNO
Lt. Governor

BOB MARTIN
Commissioner

November 4, 2013

Colonel Paul E. Owen, P.E
Commander-NY District
U.S. Army Corps of Engineers
26 Federal Plaza
New York, NY 10278

Lieutenant Colonel John C. Becking, P.E (Chris)
Commander-Philadelphia District
U.S. Army Corps of Engineers
Wanamaker Building
100 Penn Square East
Philadelphia, PA 19107-3390

Re: Clean Air Act and Superstorm Sandy Coastal Restoration and Repair Projects

Dear Colonel Owen and Colonel Becking:

The purpose of this letter is to assist the United States Army Corps of Engineers (USACE) in complying with the requirements of the Clean Air Act as USACE performs coastal restoration and repair projects in New Jersey.

Superstorm Sandy significantly diminished the protective value of New Jersey's beach and dune system, leaving New Jersey coastal communities vulnerable to damage from future storms. The New Jersey Department of Environmental Protection has been working with your Districts to ensure that federal emergency coastal restoration and repair projects start as quickly as possible.

Emissions of oxides of nitrogen (NO_x) for several of the Authorized but Unconstructed beach and dune repair/restoration projects will be greater than 100 tons/calendar year. As a result, USACE must demonstrate that those projects meet the so-called "General Conformity" requirements of the Clean Air Act. Under the General Conformity rule, federal agencies must work with state governments in a nonattainment area (such as New Jersey) with the goal of ensuring that federal actions conform to the air quality plans established by the state.

USACE must demonstrate compliance for the following projects:

1. Sea Bright to Ocean Township Beach Erosion Control Project (Elberon to Loch Arbour)
2. Manasquan Inlet to Barnegat Inlet
3. Barnegat Inlet to Little Egg Harbor Inlet (Long Beach Island)
4. Brigantine Inlet to Great Egg Harbor Inlet (Absecon Island)
5. Great Egg Harbor Inlet to Townsends Inlet

NJDEP does not have the authority to exempt USACE from General Conformity requirements.

Due to the extraordinary nature of the emergency created by Sandy and the ongoing threat to health and safety that would arise from any delay in undertaking these projects, all compliance options should be jointly considered, including invoking the emergency exemption in the Conformity Rules at 40 C.F.R. § 93.153(e), and seeking a Presidential exemption under section 118(b) of the Clean Air Act.

Alternatively, the USACE may comply with General Conformity for the projects by purchasing ozone season NOx allowances created pursuant to the federal Clean Air Interstate Rule (CAIR) (an emissions program created by the United States Environmental Protection Agency to reduce emissions from power generation facilities). The Department requests that USACE give greater weight to allowances from facilities close to New Jersey in its purchases. See N.J.A.C 7:27-18.5(c) Table 2. USACE may also use Surplus NO_x emission Offsets (SNEOs) that were generated by USACE and others as part of the New York - New Jersey Harbor Deepening Project. Further, the Department of Defense may be willing to reallocate to USACE emissions from its emissions budget for Joint Base McGuire and Lakehurst.

Coastal restoration and repair projects will enhance the sustainability of New Jersey's coastline and diminish the impacts of future storms. I would like to acknowledge the coordinated effort between USACE and the Department's staff to identify opportunities for these projects to meet their regulatory obligations and move forward in a timely manner. I appreciate your time and attention to this matter. Should you have any further questions or need for assistance, please do not hesitate to contact Jane Kozinski, Assistant Commissioner, at (609) 292-2795.

Sincerely,

Bob Martin
Commissioner

c: Jane Kozinski, Assistant Commissioner, NJDEP
Chris Salmi, Assistant Director, Division of Air Quality, NJDEP

Attachment B

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:

$$\mathbf{E = hrs \times LF \times EF}$$

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:

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

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:

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

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. 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 year 1995). 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, $PM_{2.5}$, SO_2, and CO 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.

USACE - New York District
NAN - ABU Sandy-Related Projects
General Conformity Related Emission Estimates
Emission Estimates & Supporting Information - Sea Bright to Ocean Township (Elberon to Loch Arbour) 10-Jan-14
DRAFT

Emissions per calendar year based on project duration

Pollutant	Estimated Emissions, tons per year								Total Emissions
	2013	2014	2015	2016	2017	2018	2019	2020	
NO_x	0.0	137.1	548.6	0.0	0.0	0.0	0.0	0.0	686
VOC	0.0	5.2	20.6	0.0	0.0	0.0	0.0	0.0	26
$PM_{2.5}$	0.0	7.1	28.5	0.0	0.0	0.0	0.0	0.0	36
SO_2	0.0	0.16	0.63	0.0	0.0	0.0	0.0	0.0	0.8
CO	0.0	17.9	71.5	0.0	0.0	0.0	0.0	0.0	89

Maximum emissions per year given the project duration as listed in the "project duration" table

Pollutant	Estimated Emissions, maximum tons per year									
	Water Side		Shore Crew Support				Groin Construction			
	Dredge	Auxiliary	Pumps	Dozer	Front-end loader	Total Dredging	Barge	Excavator	Front-end loader	Total Groin
NO_x	447.1	15.3	68.4	15.2	1.2	547.3	0.2	0.5	0.6	1.3
VOC	17.1	0.4	2.8	0.3	0.02	20.6	0.006	0.010	0.011	0.03
$PM_{2.5}$	23.5	0.6	4.1	0.3	0.02	28.4	0.009	0.009	0.009	0.03
SO_2	0.23	0.01	0.07	0.008	0.0006	0.32	0.0002	0.0003	0.0003	0.001
CO	48.9	2.7	17.7	1.9	0.2	71.4	0.04	0.07	0.07	0.18

Supporting information and data

				Shore crew		Groin construction		
	Dredge	Auxiliary	Pumps	Dozer	Front-end loader	Barge	Excav	Front-end loader
Horsepower	8,000	600	2,000	310	25	20	23	25
Load factors	0.66	0.40	0.80	0.59	0.59	0.40	0.59	0.59
Emission factors								
NO_x	9.7	7.3	4.9	9.5	9.5	7.3	9.5	9.5
VOC	0.37	0.20	0.20	0.19	0.19	0.20	0.19	0.19
$PM_{2.5}$	0.51	0.29	0.29	0.16	0.16	0.29	0.16	0.16
SO_2	0.005	0.005	0.005	0.005	0.005	0.005	0.005	0.005
CO	1.06	1.27	1.27	1.21	1.21	1.27	1.21	1.21

Project Duration and Working Months per Year

Cu yds	2013	2014	2015	2016	2017	2018	2019	2020	Total Months Dredging
4,450,000		3	12						15

USACE - New York District
NAN - ABU Sandy-Related Projects
General Conformity Related Emission Estimates
Methodology
DRAFT

1-Nov-13

The emission estimating methodology is designed to be conservatively high in terms of calculated horsepower-hours.
Operating parameters and schedules may be revised as project plans are developed in more detail.

Equipment & Engines to be Used	Nominal Horsepower	Operating Hours/day	Operating Days/year	Load Factor	Emission Factors NOx	VOC g/hphr	PM2.5	CO	SO2
Dredge & related									
Dredge engines	8,000	22	assume 30 x 12	0.66	9.7	0.37	0.51	1.06	0.0050
Pump engines	2,000	22	assume 30 x 12	0.80	4.9	0.20	0.29	1.27	0.0048
Dredge auxiliary engines	600	22	assume 30 x 12	0.40	7.3	0.20	0.29	1.27	0.0048
Dozer	310	22	assume 30 x 12	0.59	9.5	0.19	0.16	1.21	0.0050
Loader (working dredged material)	25	22	assume 30 x 12	0.59	9.5	0.19	0.16	1.21	0.0050
Groin construction									
Loader (groin construction)	26	10	assume 30 x 12	0.59	9.5	0.19	0.16	1.21	0.0050
Excavator	23	10	assume 30 x 12	0.59	9.5	0.19	0.16	1.21	0.0050
Barge aux.	20	10	assume 30 x 12	0.40	7.3	0.20	0.29	1.27	0.0048

Terms		
Horsepower	hp	Total horsepower of type of dredge likely to be used on projects
Operating hours per day	hrs/day	Operating hours per day based on project engineer's experience
Operating days per year	days/yr	Estimated number of operating days per year based on volume of work, expected production rate, and schedule limitations resulting from environmental windows
Load factor	LF	Load factors from NONROAD model tables for similar equipment
Emission factors	EF	NOx EF derived from emission standards for similar engine types, g/hp-hr
		e.g., dredge Dodge Island equipped with Tier 0 propulsion engines, Tier 2 pump engines

Calculations

Emissions calculated using the following equation:

Emissions, tons per year = (hp x hrs/day x days/yr x LF x EF)/(453.59 g/lb x 2,000 lbs/ton)

VOC, PM2.5, CO emission factors:

2010 PANYNJ Emissions Inventory, marine vessel emisison factors used as a reasonable surrogate for the variety of vessels in use in the New York/New Jersey area in the absence of specific information regarding the vessels to be used on any specific project.

		VOC	PM2.5	CO
Propulsion (g/kWhr)	Table 5.35	0.50	0.68	1.42
Propulsion (g/hphr)		0.37	0.51	1.06
Auxiliary (g/kWhr)	Table 5.35	0.27	0.39	1.70
Auxiliary (g/hphr)		0.20	0.29	1.27

Off-road: DEQ results for representative 600 hp crawler tractor (MY 1995)

Default hrs/year: 936 Horsepower: 600

Emissions, short tons per year:	0.1925	0.1667	1.2671
Estimated EF, g/hphr:*	0.183	0.16	1.21
Conversion factor	1.053 VOC/THC		
Estimated VOC EF, g/hphr:	0.19		

* Hydrocarbons provided by DEQ converted to VOC

Assumed load factor for off-road: 0.59 (from PANYNJ Emissions Inventory)

Conversion factor 0.7457 kW/hp g/kWhr x kW/hp = g/hphr

SO2 emission factors:

Quantification of emissions from ships associated with ship movements between ports in the European Community
Final Report, July 2002, Entec UK Limited. Chapter 2

	g/kWhr	g/hphr	g S/hphr	g SO2/hphr
Medium and high speed auxiliary, distillate fuel (Table 2	217	162	0.0024	0.0048
Medium and high speed propulsion, distillate fuel (Tabl	223	166	0.0025	0.0050

(maneuvering)

ULSD as of 2014: 15 g S/1,000,000 g fuel

Land-side diesel engines exhibit similar fuel consumption characteristice as marine propulsion engines,* so the same SO2 EFs are used.

*Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling - Compression-Ignition
EPA-420-R-10-018 NR-009d July 2010
Table C1. Average Emission Test Results for 1988 to 1995 Model Ye 0.367 lb fuel/hphr
From the text: "Due to lack of data, the brake-specific fuel consumption (BSFC) for the 1988-and-later pre-control (Tier 0) engines is used for all engines, both earlier pre-control engines and later engines subject to emissions standards."
Converted to g/hphr: 167 g/hphr