

APPENDIX E

AIR QUALITY CALCULATIONS

**ENVIRONMENTAL ASSESSMENT FOR ST. LUCIE
INLET SOUTH JETTY REHABILITATION**

ST. LUCIE INLET, MARTIN COUNTY, FLORIDA

NEPA ID#: EAXX-202-00-K3P-1742397469



**U.S. Army Corps of Engineers
JACKSONVILLE DISTRICT**

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Calculation of Construction Emissions Using Fuel Volumes					
	GHG	Fuel Volume ¹ (Gallons)	Emissions Factor ² (Grams of Emissions/ Gallons of Fuel)	Emissions ³ (grams)	Fuel Volumes Debugging - Error Message
No Action Alternative	CO ₂	0	10,210.00	0.00	Input Fuel Volume Data
	CH ₄	0	6.51	0.00	Input Fuel Volume Data
	N ₂ O	0	0.17	0.00	Input Fuel Volume Data

Calculation of Construction Emissions Using Fuel Volumes					
	GHG	Fuel Volume ¹ (Gallons)	Emissions Factor ² (Grams of Emissions/ Gallons of Fuel)	Emissions ³ (grams)	Fuel Volumes Debugging - Error Message
Alternative 2 Off-Shore	CO ₂	1,075,000	10,210.00	10975750000	Sufficient Data Has Been Input
	CH ₄	1,075,000	6.51	6998250	Sufficient Data Has Been Input
	N ₂ O	1,075,000	0.17	182750	Sufficient Data Has Been Input

Calculation of Construction Emissions Using Fuel Volumes					
	GHG	Fuel Volume ¹ (Gallons)	Emissions Factor ² (Grams of Emissions/ Gallons of Fuel)	Emissions ³ (grams)	Fuel Volumes Debugging - Error Message
Alternative 2 Upland	CO ₂	72,000	10,210.00	735120000	Sufficient Data Has Been Input
	CH ₄	72,000	1.01	72720	Sufficient Data Has Been Input
	N ₂ O	72,000	0.94	67680	Sufficient Data Has Been Input

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Total Construction Emissions from Fuel and Miles						NEAT Input ↓		
		Emissions Total (grams)	Emissions Total (pounds)	Emissions Total (Metric Tons)	CO ₂ e MT			Emissions Total (grams)
No Action Alternative	CO ₂	Input Data	Input Data	Input Data	#VALUE!	Total No Action Alternative	CO ₂	#VALUE!
	CH ₄	Input Data	Input Data	Input Data	#VALUE!		CH ₄	#VALUE!
	N ₂ O	Input Data	Input Data	Input Data	#VALUE!		N ₂ O	#VALUE!

Σ #REF!

Total Construction Emissions from Fuel and Miles						NEAT Input ↓				
		Emissions Total (grams)	Emissions Total (pounds)	Emissions Total (Metric Tons)	CO ₂ e MT		Annual Emissions (grams)	Total Emissions (grams)	Total Emissions (Metric Tons)	Total CO ₂ e MT
Alternative 2 Off Shore	CO ₂	10,975,750,000	24197406.48	10,975.75	10,975.75	Total Alternative 2	CO ₂	5,855,435,000	11,710,870,000	11,710.87
	CH ₄	6,998,250	15428.51285	7.00	174.96		CH ₄	3,499,125	7,070,970	7.07
	N ₂ O	182,750	402.8951128	0.18	54.46		N ₂ O	91,375	250,430	0.25

Σ 11,205.17

11,962.27

Total Emissions from Fuel and Miles					
		Emissions Total (grams)	Emissions Total (pounds)	Emissions Total (Metric Tons)	CO ₂ e MT
Alternative 2 Upland	CO ₂	735,120,000	1620663.504	735.12	735.12
	CH ₄	72,720	160.3202878	0.07272	1.82
	N ₂ O	67,680	149.2089808	0.06768	20.17

Σ 757.11

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PEAT Model Step	Data Source	Assumptions
Step 1: Project Data	St. Lucie Inlet South Jetty Rehab	
Step 2: Construction Emissions	Stallings, EN-C	Est for Alt 2 only. Assume Alt 3 and 4 generate less emissions than Alt 2. Alt 1 = No Emissions
Step 3: O&M Emissions	N/A	No O&M
Step 4: Wetland and Aquatic Habitat Emissions	Lebow, PD-EC	Wetland loss due to clearing and grubbing for staging and access
Step 5: Embodied Carbon in Materials		
Step 6: Net Emissions		Construction only

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Alternative Sequential Identifier	Input Names for Project Alternatives/Construction Phases:	Construction Timing			Operations & Maintenance, Monitoring and Management Timing		
		Starting Year	Ending Year	Construction Years Total	Starting Year	Ending Year	O&M Project Lifetime (default is 50 years)
1	No Action - Alternative 1	Choose Construction Starting Year	Choose Construction End Year	Ending year input must be equal or more than starting year value	Choose a Construction End Year First	Choose a Construction End Year First	50
2	Alternative 2	2027	2029	2	2030	2080	50
3	Alternative 3	Choose Construction Starting Year	Choose Construction End Year	Ending year input must be equal or more than starting year value	Choose a Construction End Year First	Choose a Construction End Year First	50
4	Alternative 4	Choose Construction Starting Year	Choose Construction End Year	Ending year input must be equal or more than starting year value	Choose a Construction End Year First	Choose a Construction End Year First	50
5	Alternative 5	Choose Construction Starting Year	Choose Construction End Year	Ending year input must be equal or more than starting year value	Choose a Construction End Year First	Choose a Construction End Year First	50
6	Alternative 6	Choose Construction Starting Year	Choose Construction End Year	Ending year input must be equal or more than starting year value	Choose a Construction End Year First	Choose a Construction End Year First	50
7	Alternative 7	Choose Construction Starting Year	Choose Construction End Year	Ending year input must be equal or more than starting year value	Choose a Construction End Year First	Choose a Construction End Year First	50
8	Alternative 8	Choose Construction Starting Year	Choose Construction End Year	Ending year input must be equal or more than starting year value	Choose a Construction End Year First	Choose a Construction End Year First	50

Note - the O&M project lifetime gets used to calculate Net emissions and also carries through to the social costs which are calculated for each specific year. The dates of construction start and end carry through most all subsequent steps for calculations.

Choose the no-action alternative from the drop down menu below:

No Action

Note: drop down menu will not automatically refresh when a new name is written for the no-action alternative above, and must be re-selected from the drop down menu after changing the name.

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No Action - Alternative 1	Year:	Choose Construction Start and End Years in the Project Data Sheet			Choose Construction Start and End Years in the Project Data Sheet		
Air Quality Pollutant Emissions (Clean Air Act)		Grams	Pounds	Metric Tons	Grams	Pounds	Metric Tons
Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC)			0.00	0.00		0.00	0.00
Carbon Monoxide (CO)			0.00	0.00		0.00	0.00
Sulfur Oxides (SOx)			0.00	0.00		0.00	0.00
Nitrous Oxides (NOx)			0.00	0.00		0.00	0.00
Particulate Matter - 2.5 micron (PM _{2.5})			0.00	0.00		0.00	0.00
Particulate Matter - 10 micron (PM ₁₀)			0.00	0.00		0.00	0.00
Lead (Pb)			0.00	0.00		0.00	0.00
Greenhouse Gas Emissions (NEPA)	Year:	Choose Construction Start and End Years in the Project Data Sheet			Choose Construction Start and End Years in the Project Data Sheet		
Carbon Dioxide (CO ₂)		0.00	0.00	0.00	0.00	0.00	0.00
Methane (CH ₄)		0.00	0.00	0.00	0.00	0.00	0.00
Nitrous Oxide (N ₂ O)		0.00	0.00	0.00	0.00	0.00	0.00
Alternative 2	Year:	2027			2028		
Air Quality Pollutant Emissions (Clean Air Act)		Grams	Pounds	Metric Tons	Grams	Pounds	Metric Tons
Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC)			0.00	0.00		0.00	0.00
Carbon Monoxide (CO)			0.00	0.00		0.00	0.00
Sulfur Oxides (SOx)			0.00	0.00		0.00	0.00
Nitrous Oxides (NOx)			0.00	0.00		0.00	0.00
Particulate Matter - 2.5 micron (PM _{2.5})			0.00	0.00		0.00	0.00
Particulate Matter - 10 micron (PM ₁₀)			0.00	0.00		0.00	0.00
Lead (Pb)			0.00	0.00		0.00	0.00
Greenhouse Gas Emissions (NEPA)	Year:	2027			2028		
Carbon Dioxide (CO ₂)		5,855,435,000.00	12,909,034.99	5,855.45	5,855,435,000.00	12,909,034.99	5,855.45
Methane (CH ₄)		3,499,125.00	7,714.26	3.50	3,499,125.00	7,714.26	3.50
Nitrous Oxide (N ₂ O)		91,375.00	201.45	0.09	91,375.00	201.45	0.09

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Gross and Net Total Emissions for the project alternatives are calculated below:

				Include O&M Air Pollutant Emissions In Net Calculations			YES
No Action - Alternative 1				Gross Emissions			Net Emissions
Pollutant Emissions (Clean Air Act)	Grams	Pounds	Metric Tons	Grams	Pounds	Metric Tons	
Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC)	0	0	0	#N/A	#N/A	#N/A	
Carbon Monoxide (CO)	0	0	0	#N/A	#N/A	#N/A	
Sulfur Oxides (SOx)	0	0	0	#N/A	#N/A	#N/A	
Nitrous Oxides (NOx)	0	0	0	#N/A	#N/A	#N/A	
Particulate Matter - 2.5 micron (PM _{2.5})	0	0	0	#N/A	#N/A	#N/A	
Particulate Matter - 10 micron (PM ₁₀)	0	0	0	#N/A	#N/A	#N/A	
Lead - (Pb)	0	0	0	#N/A	#N/A	#N/A	
Greenhouse Gas Emissions (NEPA)							
Carbon Dioxide (CO ₂)	0	0	0	#N/A	#N/A	#N/A	
Methane (CH ₄)	0	0	0	#N/A	#N/A	#N/A	
Nitrous Oxide (N ₂ O)	0	0	0	#N/A	#N/A	#N/A	
Carbon Dioxide Equivalents (CO ₂ e)	0	0	0	#N/A	#N/A	#N/A	
Alternative 2							
Pollutant Emissions (Clean Air Act)	Grams	Pounds	Metric Tons	Grams	Pounds	Metric Tons	
Reactive Organic Gases aka Volatile Organic Compounds (ROG/VOC)	0	0	0	#N/A	#N/A	#N/A	
Carbon Monoxide (CO)	0	0	0	#N/A	#N/A	#N/A	
Sulfur Oxides (SOx)	0	0	0	#N/A	#N/A	#N/A	
Nitrous Oxides (NOx)	0	0	0	#N/A	#N/A	#N/A	
Particulate Matter - 2.5 micron (PM _{2.5})	0	0	0	#N/A	#N/A	#N/A	
Particulate Matter - 10 micron (PM ₁₀)	0	0	0	#N/A	#N/A	#N/A	
Lead - (Pb)	0	0	0	#N/A	#N/A	#N/A	
Greenhouse Gas Emissions (NEPA)							
Carbon Dioxide (CO ₂)	11,710,870,000	25,818,070	11,711	#N/A	#N/A	#N/A	
Methane (CH ₄)	6,998,250	15,429	7	#N/A	#N/A	#N/A	
Nitrous Oxide (N ₂ O)	182,750	403	0	#N/A	#N/A	#N/A	
Carbon Dioxide Equivalents (CO ₂ e)	11,940,285,750	26,323,846	11,940	#N/A	#N/A	#N/A	