

EP - AIR QUALITY

OMB Control No. 1010-0151
OMB Approval Expires: xx/xx/xxxx

COMPANY	
AREA	
BLOCK	
LEASE	
FACILITY	
WELL	
COMPANY CONTACT	
TELEPHONE NO.	
REMARKS	

AIR EMISSIONS COMPUTATION FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines				Diesel Recip. Engine		Diesel Turbines		REF.	DATE	Reference Links
	SCF/hp-hr	9.524	SCF/hp-hr	7.343	SCF/hp-hr	7.343	GA/hp-hr	0.0514	GA/hp-hr	0.0514			
Equipment/Emission Factors	units	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3			
Natural Gas Turbine	g/hp-hr		0.0086	0.0086	0.0028	1.4515	0.0095	N/A	0.3719	N/A	AP42 3.1-1.6 3.1-2a	460	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c01.pdf
RECIP - 2 Cycle Lean Natural Gas	g/hp-hr		0.1293	0.1293	0.0020	6.9998	0.4262	N/A	1.2009	N/A	AP42 3.2-1	760	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c02.pdf
RECIP - 4 Cycle Lean Natural Gas	g/hp-hr		0.0002	0.0002	0.0020	2.8814	0.4014	N/A	1.8849	N/A	AP42 3.2-2	760	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c04.pdf
RECIP - 4 Cycle Rich Natural Gas	g/hp-hr		0.0323	0.0323	0.0020	7.7224	0.3021	N/A	11.2608	N/A	AP42 3.2-3	760	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c04.pdf
Diesel Recip. < 600 hp	g/hp-hr	1	1	1	0.0279	14.1	1.04	N/A	3.03	N/A	AP42 3.3-1	1096	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c03.pdf
Diesel Recip. > 600 hp	g/hp-hr	0.32	0.182	0.178	0.0055	10.9	0.29	N/A	2.5	N/A	AP42 3.4 1.4 3.4.2	1096	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c04.pdf
Diesel Boiler	lb/MMscf	0.0440	0.0420	0.0125	0.0389	1.0980	0.0064	5.14E-05	0.2160	0.0036	AP42 1.3-3, 1.3-6, 1.3-9 and 1.3-10, 1.3-11, 1.3-12a	998 and 910	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c01.pdf#https://cfpub.epa.gov
Diesel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0013	4.45E-05	0.0105	N/A	AP42 3.1-1.6 3.1-2a, AP42 3.1-1.4 3.1-2a	460	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c01.pdf#https://cfpub.epa.gov
Dual Fuel Turbine	g/hp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0009	4.45E-05	0.3719	0.0000	AP42 3.1-1.6 3.1-2a, AP42 3.1-1.4 3.1-2a	460	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c01.pdf#https://cfpub.epa.gov
Vessels - Propulsion	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	319	
Vessels - Drilling Prime Engine, Auxiliary	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	319	https://www3.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels - Diesel Boiler	g/hp-hr	0.0465	0.1491	0.1417	0.0400	1.4014	0.0020	3.73E-05	0.1491	0.0003	USEPA 2017 NEI TSP (Units converted) refer to Diesel Boiler reference	319	
Vessels - Well Stimulation	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	319	
Natural Gas Heater/Boiler/Burner	lb/MMscf	7.60	1.90	1.90	0.60	190.00	5.50	5.00E-04	84.00	3.2	AP42 1.4-1.4 1.4-2, Pb and NH3: WAF6/F6 (08/2014)	998 and 910	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c04.pdf#https://cfpub.epa.gov
Combustion Flare (no smoke)	lb/MMscf	0.00	0.00	0.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	218	
Combustion Flare (light smoke)	lb/MMscf	2.10	2.10	2.10	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	218	
Combustion Flare (medium smoke)	lb/MMscf	19.50	10.50	10.50	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	218	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c01.pdf
Combustion Flare (heavy smoke)	lb/MMscf	21.00	21.00	21.00	0.57	71.40	35.93	N/A	325.5	N/A	AP42 13.5-1, 13.5-2	218	
Liquid Flaring	lb/MMscf	0.42	0.0666	0.0651	5.364	0.84	0.01428	5.14E-05	0.21	0.0036	AP42 1.3-3 through 1.3-9 and 1.3-9	510	https://www3.epa.gov/ttrchie1/ap42/c03/final/c03c01.pdf
Storage Tank	lb/yr/compartment						4.300				2014 Gulfwide Inventory, Avg. emss (Upper bound of 95% CI)	2017	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-inventory
Fugitive	lb/yr/compartment						0.0000				AP42 13.5-1	1293	https://www.epa.gov/
Diycol Dehydrator	lb/yr/vent						19.240				2011 Gulfwide Inventory, Avg. emss (Upper bound of 95% CI)	2014	https://www.boem.gov/environment/environmental-studies/2011-gulfwide-inventory
Cold Vent	lb/yr/vent						44.747				2014 Gulfwide Inventory, Avg. emss (Upper bound of 95% CI)	2017	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-inventory
Waste Incinerator	lb/ton		15.0	15.0	2.5	2.0	N/A	N/A	20.0	N/A	AP 42 2.1-13	1096	https://www3.epa.gov/ttrchie1/ap42/c02/final/c02c01.pdf
Drill Ice - Loader	lb/gal	0.043	0.043	0.043	0.040	0.804	0.049	N/A	0.130	0.003	USEPA NCR04/AD2008 model, TSP (Units converted) refer to Diesel Recip. <600 reference	2009	
Drill Ice - Other Construction Equipment	lb/gal	0.043	0.043	0.043	0.040	0.804	0.049	N/A	0.130	0.003	USEPA NCR04/AD2008 model, TSP (Units converted) refer to Diesel Recip. <600 reference	2009	
Drill Ice - Other Survey Equipment	lb/gal	0.043	0.043	0.043	0.040	0.804	0.049	N/A	0.130	0.003	USEPA NCR04/AD2008 model, TSP (Units converted) refer to Diesel Recip. <600 reference	2009	
Drill Ice - Tractor	lb/gal	0.043	0.043	0.043	0.040	0.804	0.049	N/A	0.130	0.003	USEPA NCR04/AD2008 model, TSP (Units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/moves/norcoas2008a-installation-and-updates
Drill Ice - Truck (for gravel island)	lb/gal	0.043	0.043	0.043	0.040	0.804	0.049	N/A	0.130	0.003	USEPA NCR04/AD2008 model, TSP (Units converted) refer to Diesel Recip. <600 reference	2009	
Drill Ice - Truck (for surveys)	lb/gal	0.043	0.043	0.043	0.040	0.804	0.049	N/A	0.130	0.003	USEPA NCR04/AD2008 model, TSP (Units converted) refer to Diesel Recip. <600 reference	2009	
Man Camp - Operation (max people/day)	ton/person/day		0.0004	0.0004	0.0004	0.006	0.001	N/A	0.001	N/A	BOEM 2014-1001	2014	https://www.boem.gov/sites/default/files/uploads/files/BOEM-BOEM_News
Vessels - Ice Management Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	319	https://www3.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data
Vessels - Hovercraft Diesel	g/hp-hr	0.320	0.1931	0.1873	0.0047	7.6669	0.2204	2.24E-05	1.2025	0.0022	USEPA 2017 NEI TSP refer to Diesel Recip. > 600 hp reference	319	https://www3.epa.gov/air-emissions-inventories/2017-national-emissions-inventory-nei-data

Sulfur Content Source	Value	Units
Fuel Gas	2.38	ppm
Diesel Fuel	0.0015	% weight
Produced Gas (Flare)	3.38	ppm
Produced Oil (Liquid Flaring)	1	% weight

Density and Heat Value of Diesel Fuel	
Density	7.50 lb/gal
Heat Value	19,300 Btu/lb

Heat Value of Natural Gas	
Heat Value	1,050 MBtu/MMscf

Natural Gas Flare Parameters	Value	Units
VOC Content of Flare Gas	0.681E	lb VOC/lb-mol gas
Natural Gas Flare Efficiency	98	%

AR EMISSIONS CALCULATIONS - 1ST YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	CONTACT	PHONE	REMARKS																								
OPERATIONS	EQUIPMENT	EQUIPMENT ID	RATING	MAX. FUEL	ACT. FUEL	RUN TIME	MAXIMUM POUNDS PER HOUR										ESTIMATED TONS															
							HP	SCFM	SCFD	HRID	DYR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3			
Drilling		Diesel Engines		MBTU/HR		SCFM		SCFD		HRID		DYR																				
DRILLING	VESSELS - Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	VESSELS - Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling - Propulsion Engine - Diesel		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Diesel Boiler		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	VESSELS - Drilling Prime Engine - Auxiliary		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Facility Installation		VESSELS - Heavy Lift Vessel/Derrick Barge Diesel		BPO		0		0.00		0		0																				
DRILLING	Liquid Flaring		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
WELL TEST	COMBUSTION FLARE - no smoke		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COMBUSTION FLARE - light smoke		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COMBUSTION FLARE - medium smoke		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	COMBUSTION FLARE - heavy smoke		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
ALASKA-SPECIFIC SOURCES		VESSELS		MW		HRID		DYR																								
	VESSELS - Ice Management Diesel		0	0	0.00	0	0	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2020 Facility Total Emissions		DISTANCE FROM LAND IN MILES		0.0																												
DRILLING		VESSELS - Crew Diesel		0		0		0.00		0		0																				
		VESSELS - Supply Diesel		0		0		0.00		0		0																				
		VESSELS - Tug Diesel		0		0		0.00		0		0																				
FACILITY		VESSELS - Material Tug Diesel		0		0		0.00		0		0																				
INSTALLATION		VESSELS - Crew Diesel		0		0		0.00		0		0																				
		VESSELS - Supply Diesel		0		0		0.00		0		0																				
PRODUCTION		VESSELS - Support Diesel		0		0		0.00		0		0																				
ALASKA-SPECIFIC SOURCES		On-Ice Equipment		GAL/HR		GAL/D																										
Man Camp - Operation (maximum people per day)		VESSELS		PEOPLE/DAY		HRID		DYR																								
		On-Ice - Loader		0		0		0.00		0		0																				
		On-Ice - Other Construction Equipment		0		0		0.00		0		0																				
		On-Ice - Other Survey Equipment		0		0		0.00		0		0																				
		On-Ice - Tracker		0		0		0.00		0		0																				
		On-Ice - Truck (for gravel island)		0		0		0.00		0		0																				
		On-Ice - Truck (for surveys)		0		0		0.00		0		0																				
		Man Camp - Operation		0		0		0.00		0		0																				
		VESSELS - Hovercraft Diesel		0		0		0.00		0		0																				
2020 New Facility Total Emissions								0.00		0.00		0.00																				

AIR EMISSIONS CALCULATIONS - 4TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	CONTACT	PHONE	REMARKS																	
OPERATIONS	EQUIPMENT	EQUIPMENT ID	RATING	MAX. FUEL GAL/HR	ACT. FUEL GAL/D	RUN TIME	MAXIMUM POUNDS PER HOUR													ESTIMATED TONS					
							TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	
Drilling VESSELS - Drilling - Propulsion Engine - Diesel VESSELS - Drilling - Propulsion Engine - Diesel VESSELS - Drilling - Propulsion Engine - Diesel VESSELS - Drilling - Propulsion Engine - Diesel VESSELS - Diesel Boiler VESSELS - Drilling Prime Engine - Auxiliary																									
Facility Installation VESSELS - Heavy Lift Vessel/Derrick Barge - Diesel																									
Well Test WELL TEST COMBUSTION FLARE - no smoke COMBUSTION FLARE - light smoke COMBUSTION FLARE - medium smoke COMBUSTION FLARE - heavy smoke																									
Alaska Specific Sources VESSELS VESSELS - Ice Management Diesel																									
Exemption Calculation DISTANCE FROM LAND IN MILES 0.5																									
Production VESSELS - Crew Diesel VESSELS - Supply Diesel VESSELS - Tug Diesel VESSELS - Material Tug Diesel VESSELS - Crew Diesel VESSELS - Supply Diesel VESSELS - Support Diesel																									
Alaska Specific Sources On-Ice Equipment Max Camp - Operation (maximum people per day) VESSELS VESSELS - Loader VESSELS - Other Construction Equipment VESSELS - Other Survey Equipment VESSELS - Tractor VESSELS - Truck (for gravel island) VESSELS - Truck (for surveys) Max Camp - Operation VESSELS - Hovercraft Diesel																									
2022 New Facility Total Emissions																									

AIR EMISSIONS CALCULATIONS

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL				
0									
Year	Facility Emitted Substance								
	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3
2020	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2021	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2022	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2023	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2024	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2025	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2026	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2027	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2028	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2029	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Allowable	0.00			0.00	0.00	0.00		0.00	