

DOCD/DPP - AIR QUALITY

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

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

LEASE TERM PIPELINE CONSTRUCTION INFORMATION:		
YEAR	NUMBER OF PIPELINES	TOTAL NUMBER OF CONSTRUCTION DAYS
2020		
2021		
2022		
2023		
2024		
2025		
2026		
2027		
2028		
2029		

AIR EMISSIONS COMPUTATION FACTORS

Fuel Usage Conversion Factors	Natural Gas Turbines		Natural Gas Engines		Diesel Recip. Engine		Diesel Turbines		REF.	DATE	Reference Links		
	SCH/tp-hr	9.524	SCH/tp-hr	7.143	GAL/tp-hr	0.0514	GAL/tp-hr	0.0514					
Equipment/Emission Factors	units	TSP	PM10	PM2.5	SOx	NOx	VOC	PB	CO	NH3			
Natural Gas Turbine	gtp-hr		0.0086	0.0086	0.0026	1.4515	0.0005	N/A	0.3719	N/A	AP42 3.1-16.3.1-2a	460	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s01.pdf
RECIP - 2 Cycle Lean Natural Gas	gtp-hr		0.1293	0.1293	0.0020	6.9986	0.4582	N/A	1.2009	N/A	AP42 3.1-1	760	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s02.pdf
RECIP - 4 Cycle Lean Natural Gas	gtp-hr		0.0002	0.0002	0.0020	2.8914	0.4034	N/A	1.8949	N/A	AP42 3.2-2	760	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s02.pdf
RECIP - 4 Cycle Rich Natural Gas	gtp-hr		0.0523	0.0523	0.0020	7.7224	0.1021	N/A	3.1968	N/A	AP42 3.1-3	760	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s02.pdf
Diesel Recip. < 600 hp	gtp-hr	1	1	1	0.0279	14.1	1.04	N/A	3.03	N/A	AP42 3.1-1	1096	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s03.pdf
Diesel Recip. > 600 hp	gtp-hr	0.32	0.182	0.178	0.0055	10.9	0.29	N/A	2.5	N/A	AP42 3.4-1 & 3.4-2	1096	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s04.pdf
Diesel Boiler	lbs/hr	0.0840	0.0400	0.0105	0.0089	1.0080	0.0084	5.14E-05	0.2100	0.0236	AP42 3.4-6, PB and NH3, WAF/RR (890018)	908 and 910	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s04.pdf
Diesel Turbine	gtp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0013	4.45E-05	0.0105	N/A	AP42 3.1-1 & 3.1-2a	460	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s04.pdf
Dual Fuel Turbine	gtp-hr	0.0381	0.0137	0.0137	0.0048	2.7941	0.0009	4.45E-05	0.3719	0.0000	AP42 3.1-1 & 3.1-2a, AP42 3.1-1 & 3.1-2b	460	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s04.pdf
Vessels - Propulsion	gtp-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	gtp-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://www.epa.gov/air-emissionsinventories/2017-national-emissions-inventories
Vessels - Diesel Boiler	gtp-hr	0.0468	0.1493	0.1417	0.0400	1.4914	0.0020	3.78E-05	0.1491	0.0003	USEPA 2017 NEI TSP (units converted) refer to Diesel Boiler Reference	319	
Vessels - Weld Simulation	gtp-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	lbs/MMscf	7.60	1.90	1.90	0.60	190.00	5.50	5.00E-04	84.00	3.2	AP42 3.4-1 & 3.4-2, PB and NH3, WAF/RR (890018)	798 and 818	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s04.pdf
Combustion Flare (no smoke)	bs/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)	bs/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)	bs/MMscf	10.50	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/ttrchie/ap42/ch03/final/c03s04.pdf
Combustion Flare (heavy smoke)	bs/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	https://www3.epa.gov/ttrchie/ap42/ch03/final/c03s04.pdf
Liquid Flaring	lb/day	0.42	0.0966	0.0951	5.964	0.84	0.01428	5.14E-05	0.21	0.0336	AP42 1.3-1, except 1.3-3 and 1.3-5	510	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-environmental-study
Storage Tank	tons/yr/tank						4.300				2014 Gulfwide Inventory, Avg. emiss. (upper bound of 99% CI)	2017	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-environmental-study
Fluorides	lbs/hr/component						0.0005				API Study	1293	https://www.apiwebstore.org/publications/item/cq79879438a-8bc0-4abc-bbc
Glycol Dehydrator	tons/yr/deshydrator						19.240				2011 Gulfwide Inventory, Avg. emiss. (upper bound of 99% CI)	2014	https://www.boem.gov/environment/environmental-studies/2011-gulfwide-environmental-study
Cold Vent	tons/yr/vent						44.747				2014 Gulfwide Inventory, Avg. emiss. (upper bound of 99% CI)	2017	https://www.boem.gov/environment/environmental-studies/2014-gulfwide-environmental-study
Waste Incinerator	lb/ton		15.0	15.0	2.5	2.0	N/A	N/A	20.0	N/A	AP42 2.1-2	1096	https://www3.epa.gov/ttrchie/ap42/ch02/final/c02s01.pdf
On-ice - Loader	lb/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model: TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice - Other Construction Equipment	lb/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model: TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice - Other Survey Equipment	lb/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model: TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice - Tractor	lb/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model: TSP (units converted) refer to Diesel Recip. <600 reference	2009	https://www.epa.gov/moves/nrroad2008a-installation-and-updates
On-ice - Truck (for gravel island)	lb/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model: TSP (units converted) refer to Diesel Recip. <600 reference	2009	
On-ice - Truck (for surveys)	lb/gal	0.043	0.043	0.043	0.040	0.604	0.049	N/A	0.130	0.003	USEPA NONROAD2008 model: TSP (units converted) refer to Diesel Recip. <600 reference	2009	
Man Camp - Operation (max. people/day)	tons/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_Newsroom/2014-10-10-BOEM-Newsroom-2014-10-10.pdf
Vessels - Ice Management Diesel	gtp-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://www.epa.gov/air-emissionsinventories/2017-national-emissions-inventories
Vessels - Hovercraft Diesel	gtp-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://www.epa.gov/air-emissionsinventories/2017-national-emissions-inventories

Sulfur Content Source	Value	Units
Fuel Gas	3.38	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	7.05 lbs/gal
Heat Value	19,300 Btu/lb

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

Natural Gas Flare Parameters	Value	Units
CO2 Content of Flare Gas	0.8525	lb VOC/lb mol gas
Natural Gas Flare Efficiency	98	%

AIR EMISSIONS CALCULATIONS - 4TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	CONTACT	PHONE	REMARKS																			
OPERATIONS	EQUIPMENT	EQUIPMENT ID	RATING	MAX FUEL GALLER	ACT FUEL GALLER	RUN TIME	MAXIMUM POUNDS PER HOUR													ESTIMATED TONS							
							HF SCFHR	SCFD	HRID	DYR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO
<p>DRILLING</p> <p>VESELS Drilling - Propulsion Engine - Diesel VESELS Drilling - Propulsion Engine - Diesel VESELS Drilling - Propulsion Engine - Diesel VESELS - Diesel Boiler VESELS - Drilling Prime Engine, Auxiliary</p>																											
<p>PIPELINE</p> <p>VESELS - Pipeline Laying - Diesel VESELS - Pipeline Burying - Diesel</p>																											
<p>FACILITY INSTALLATION</p> <p>VESELS - Heavy Lift Vessel/Derrick Barge Diesel</p>																											
<p>PRODUCTION</p> <p>RECIP-400hp Diesel RECIP-400hp Diesel VESELS - Shuttle Tankers VESELS - Well Stimulation Natural Gas Turbine Diesel Turbine Dual Fuel Turbine RECIP - 2 Cycle Lean Natural Gas RECIP - 4 Cycle Lean Natural Gas RECIP - 4 Cycle Rich Natural Gas Diesel Boiler Natural Gas Heater/Boiler/Burner</p>																											
<p>MISC.</p> <p>STORAGE TANK COMBUSTION FLARE - no smoke COMBUSTION FLARE - light smoke COMBUSTION FLARE - medium smoke COMBUSTION FLARE - heavy smoke SOLVENT FLUPTIVES SLURRY DEHYDRATOR WASTE INCINERATOR</p>																											
<p>DRILLING</p> <p>Line Piping</p>																											
<p>WELL TEST</p> <p>COMBUSTION FLARE - no smoke COMBUSTION FLARE - light smoke COMBUSTION FLARE - medium smoke COMBUSTION FLARE - heavy smoke</p>																											
<p>ALASKA-SPECIFIC SOURCES</p> <p>VESELS VESELS - Ice Management Diesel</p>																											
<p>2022 Facility Total Emissions</p>																											
<p>EXEMPTION CALCULATION</p> <p>DISTANCE FROM LAND IN MILES</p>																											
<p>DRILLING</p> <p>VESELS - Crew Diesel VESELS - Supply Diesel VESELS - Tug Diesel</p>																											
<p>PIPELINE</p> <p>VESELS - Support Diesel, Laying VESELS - Support Diesel, Burying</p>																											
<p>INSTALLATION</p> <p>VESELS - Crew Diesel VESELS - Material Top Diesel</p>																											
<p>FACILITY</p> <p>VESELS - Crew Diesel VESELS - Supply Diesel</p>																											
<p>PRODUCTION</p> <p>VESELS - Support Diesel</p>																											
<p>ALASKA-SPECIFIC SOURCES</p> <p>On-ice Equipment Max Camp - Operation (maximum people per day) VESELS On-ice - Leader On-ice - Other Construction Equipment On-ice - Other Survey Equipment On-ice - Tracker On-ice - Truck (for gravel island) On-ice - Truck (for surveys) Max Camp - Operation VESELS - Helicopter Diesel 2022 Max Facility Total Emissions</p>																											

AIR EMISSIONS CALCULATIONS - 6TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	CONTACT	PHONE	REMARKS																			
OPERATIONS	EQUIPMENT	EQUIPMENT ID	RATING	MAX FUEL GALLONS	ACT FUEL GALLONS	RUN TIME	MAXIMUM POUNDS PER HOUR											ESTIMATED TONS									
							HF SCFHR	SCFD	HRID	DYR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO
<p>DRILLING</p> <p>VESELS - Drilling - Propulsion Engine - Diesel VESELS - Drilling - Propulsion Engine - Diesel VESELS - Drilling - Propulsion Engine - Diesel VESELS - Drilling - Propulsion Engine - Diesel VESELS - Diesel Boiler VESELS - Drilling Prime Engine, Auxiliary</p>																											
<p>PIPELINE</p> <p>VESELS - Pipeline Laying - Diesel VESELS - Pipeline Burying - Diesel</p>																											
<p>FACILITY INSTALLATION</p> <p>VESELS - Heavy Lift Vessel/Derrick Barge Diesel</p>																											
<p>PRODUCTION</p> <p>RECIP-400hp Diesel RECIP-400hp Diesel VESELS - Shuttle Tankers VESELS - Well Stimulation Natural Gas Turbine Diesel Turbine Dual Fuel Turbine RECIP - 2 Cycle Lean Natural Gas RECIP - 4 Cycle Lean Natural Gas RECIP - 4 Cycle Rich Natural Gas Diesel Boiler Natural Gas Heater/Boiler/Burner</p>																											
<p>MISC.</p> <p>STORAGE TANK COMBUSTION FLARE - no smoke COMBUSTION FLARE - light smoke COMBUSTION FLARE - medium smoke COMBUSTION FLARE - heavy smoke SOIL VENT FLIGHTS SLURRY DEHYDRATOR WASTE INCINERATOR</p>																											
<p>DRILLING</p> <p>Well Frac WELL TEST</p>																											
<p>ALASKA-SPECIFIC SOURCES</p> <p>VESELS VESELS - Ice Management Diesel</p>																											
<p>2020 Facility Total Emissions</p> <p>0.0</p>																											
<p>EXEMPTION CALCULATION</p> <p>DISTANCE FROM LAND IN MILES</p>																											
<p>DRILLING</p> <p>VESELS - Crew Diesel VESELS - Supply Diesel VESELS - Tug Diesel</p>																											
<p>PIPELINE</p> <p>VESELS - Support Diesel, Laying VESELS - Support Diesel, Burying</p>																											
<p>INSTALLATION</p> <p>VESELS - Crew Diesel VESELS - Material Top Diesel VESELS - Crew Diesel VESELS - Supply Diesel</p>																											
<p>FACILITY</p> <p>VESELS - Material Top Diesel VESELS - Crew Diesel VESELS - Supply Diesel</p>																											
<p>PRODUCTION</p> <p>On-ice Equipment Man Camp - Operation (maximum people per day) VESELS VESELS On-ice - Loader On-ice - Other Construction Equipment On-ice - Other Survey Equipment On-ice - Tractor On-ice - Truck (for gravel island) On-ice - Truck (for surveys) Man Camp - Operation VESELS - Helicopter Diesel</p>																											
<p>ALASKA-SPECIFIC SOURCES</p> <p>VESELS - Helicopter Diesel</p>																											
<p>2020 Man-Camp Total Emissions</p> <p>0.0</p>																											

AIR EMISSIONS CALCULATIONS - 10TH YEAR

COMPANY	AREA	BLOCK	LEASE	FACILITY	WELL	CONTACT	PHONE	REMARKS																			
OPERATIONS	EQUIPMENT	EQUIPMENT ID	RATING	MAX FUEL GALLON	ACT FUEL GALLON	RUN TIME	MAXIMUM POUNDS PER HOUR											ESTIMATED TONS									
							HF	SCFHR	SCFD	HRID	DYR	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb	CO	NH3	TSP	PM10	PM2.5	SOx	NOx	VOC	Pb
<p>Drilling</p> <p>VESELS - Drilling - Propulsion Engine - Diesel VESELS - Drilling - Propulsion Engine - Diesel VESELS - Drilling - Propulsion Engine - Diesel VESELS - Drilling - Propulsion Engine - Diesel VESELS - Diesel Boiler VESELS - Drilling Prime Engine, Auxiliary</p>																											
<p>Pipeline</p> <p>VESELS - Pipeline Laying - Diesel VESELS - Pipeline Burying - Diesel</p>																											
<p>Facility Installation</p> <p>VESELS - Heavy Lift Vessel/Derrick Barge Diesel</p>																											
<p>Production</p> <p>RECIP-400hp Diesel RECIP-400hp Diesel VESELS - Shuttle Tankers VESELS - Well Stimulation Natural Gas Turbine Diesel Turbine Dual Fuel Turbine RECIP - 2 Cycle Lean Natural Gas RECIP - 4 Cycle Lean Natural Gas RECIP - 4 Cycle Rich Natural Gas Diesel Boiler Natural Gas Heater/Boiler/Burner</p>																											
<p>MISC.</p> <p>STORAGE TANK COMBUSTION FLARE - no smoke COMBUSTION FLARE - light smoke COMBUSTION FLARE - medium smoke COMBUSTION FLARE - heavy smoke SOLVENT FLUPTIVES SLURRY DEHYDRATOR WASTE INCINERATOR</p>																											
<p>Drilling</p> <p>Line Piping</p>																											
<p>Well Test</p> <p>COMBUSTION FLARE - no smoke COMBUSTION FLARE - light smoke COMBUSTION FLARE - medium smoke COMBUSTION FLARE - heavy smoke</p>																											
<p>Alaska-Specific Sources</p> <p>VESELS VESELS - Ice Management Diesel</p>																											
<p>2020 Facility Total Emissions</p>																											
<p>Exemption Calculation</p> <p>0.0 DISTANCE FROM LAND IN MILES</p>																											
<p>Drilling</p> <p>VESELS - Crew Diesel VESELS - Supply Diesel VESELS - Tug Diesel</p>																											
<p>Pipeline</p> <p>VESELS - Support Diesel, Laying VESELS - Support Diesel, Burying VESELS - Crew Diesel</p>																											
<p>Facility</p> <p>VESELS - Supply Diesel VESELS - Material Top Diesel</p>																											
<p>Installation</p> <p>VESELS - Crew Diesel VESELS - Supply Diesel</p>																											
<p>Production</p> <p>On-ice Equipment Man Camp - Operation (maximum people per day) VESELS Man Camp - Operation (maximum people per day) VESELS On-ice - Loader On-ice - Other Construction Equipment On-ice - Other Survey Equipment On-ice - Tractor On-ice - Truck (for gravel island) On-ice - Truck (for surveys) Man Camp - Operation VESELS - Helicopter Diesel</p>																											
<p>2020 Non-Facility Total Emissions</p>																											

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	