TABLE B-1. ESTIMATED ANNUAL AIR EMISSIONS FROM FUEL COMBUSTION SOURCES AT THE AMUNDSEN-SCOTT STATION DURING YEAR 1 OF PROJECT ICE CUBE

Air Pollutant		Power & Water Production Fuel Usage: 1,209,600 L/yr		Heating Fuel Usage: 151,200 L/yr		Diesel-Powered Equipment Fuel Usage: 151,200 L/yr		Gasoline -Powered Equipment Fuel Usage: 15,000 L/yr		Total Emissions
Type	**Constituent**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**(kg/yr)**
Characteristic Air Pollutants	Sulfur Oxides	4.05E-04	4.89E+02	6.93E-03	1.05E+03	3.74E-03	5.65E+02	6.35E-04	9.52E+00	**2.11E+03**
	Nitrogen Oxides	4.65E-02	5.63E+04	2.41E-03	3.64E+02	4.43E-02	6.69E+03	1.15E-02	1.73E+02	**6.35E+04**
	Carbon Monoxide	1.72E-02	2.08E+04	6.01E-04	9.09E+01	1.85E-02	2.79E+03	4.76E-01	7.14E+03	**3.08E+04**
	Exhaust Hydrocarbons	5.05E-04	NCA	NCA	NCA	4.05E-03	6.13E+02	1.56E-02	2.34E+02	**8.47E+02**
	Particulate Matter	2.75E-04	3.33E+02	2.41E-04	3.64E+01	3.62E-03	5.47E+02	7.29E-04	1.09E+01	**9.27E+02**
	Carbon Dioxide	2.36E+00	2.86E+06	2.66E+00	4.03E+05	NCA	NCA	NCA	NCA	**3.26E+06**
	Aldehydes	1.02E-03	1.24E+03	NCA	NCA	8.15E-04	1.23E+02	5.34E-04	8.01E+00	**1.37E+03**
	Total Organic Carbon (TOC)	5.27E-03	6.37E+03	6.69E-05	1.01E+01	NCA	NCA	NCA	NCA	**6.38E+03**
	Non-methane TOC	NCA	NCA	4.09E-05	6.18E+00	NCA	NCA	NCA	NCA	**6.18E+00**
	Methane	NCA	NCA	2.60E-05	3.93E+00	NCA	NCA	NCA	NCA	**3.93E+00**
	Nitrous Oxide	NCA	NCA	1.32E-05	2.00E+00	NCA	NCA	NCA	NCA	**2.00E+00**
	Polycyclic Organic Matter (POM)	NCA	NCA	3.97E-07	6.00E-02	NCA	NCA	NCA	NCA	**6.00E-02**
Volatile Organics	Benzene	1.37E-05	1.65E+01	2.53E-08	3.82E-03	NCA	NCA	NCA	NCA	**1.65E+01**
	Ethylbenzene	NCA	NCA	7.65E-09	1.16E-03	NCA	NCA	NCA	NCA	**1.16E-03**
	Xylenes	4.17E-06	5.05E+00	NCA	1.98E-03	NCA	NCA	NCA	NCA	**5.05E+00**
	Toluene	5.99E-06	7.24E+00	7.46E-07	1.13E-01	NCA	NCA	NCA	NCA	**7.35E+00**
	1,1,1-Trichloroethane	NCA	NCA	2.84E-08	4.29E-03	NCA	NCA	NCA	NCA	**4.29E-03**
	Propylene	3.78E-05	4.57E+01	NCA	NCA	NCA	NCA	NCA	NCA	**4.57E+01**
	Formaldehyde	1.73E-05	2.09E+01	3.97E-06	6.00E-01	NCA	NCA	NCA	NCA	**2.15E+01**
Semi-Volatile Organics	Acetaldehyde	1.12E-05	1.36E+01	NCA	NCA	NCA	NCA	NCA	NCA	**1.36E+01**
	Naphthalene	1.24E-06	1.50E+00	1.36E-07	2.05E-02	NCA	NCA	NCA	NCA	**1.52E+00**
	Acenaphthene	NCA	NCA	2.54E-09	3.84E-04	NCA	NCA	NCA	NCA	**3.84E-04**
	Acenaphthylene	NCA	NCA	3.04E-11	4.60E-06	NCA	NCA	NCA	NCA	**4.60E-06**
	Anthracene	2.74E-08	3.31E-02	1.47E-10	2.22E-05	NCA	NCA	NCA	NCA	**3.31E-02**
	Benz(a)anthracene	2.46E-08	2.97E-02	4.82E-10	7.29E-05	NCA	NCA	NCA	NCA	**2.98E-02**
	Benzo(b,k)fluoranthene	NCA	NCA	1.78E-10	2.69E-05	NCA	NCA	NCA	NCA	**2.69E-05**
	Benzo(g,h,I)perylene	NCA	NCA	2.72E-10	4.11E-05	NCA	NCA	NCA	NCA	**4.11E-05**
	Chrysene	5.17E-09	6.25E-03	2.86E-10	4.33E-05	NCA	NCA	NCA	NCA	**6.29E-03**
	Dibenzo(a,h)anthracene	NCA	NCA	2.01E-10	3.04E-05	NCA	NCA	NCA	NCA	**3.04E-05**
	Fluoranthene	1.11E-07	1.35E-01	5.82E-10	8.80E-05	NCA	NCA	NCA	NCA	**1.35E-01**
	Fluorene	4.27E-07	5.17E-01	5.38E-10	8.13E-05	NCA	NCA	NCA	NCA	**5.17E-01**
	Indo(1,2,3-cd)pyrene	NCA	NCA	2.57E-10	3.89E-05	NCA	NCA	NCA	NCA	**3.89E-05**
	Octochloro-dibenzo-dioxin	NCA	NCA	3.73E-13	5.64E-08	NCA	NCA	NCA	NCA	**5.64E-08**
	Phenanthrene	4.30E-07	5.21E-01	1.26E-09	1.91E-04	NCA	NCA	NCA	NCA	**5.21E-01**
	Pyrene	7.00E-08	8.46E-02	5.11E-10	7.73E-05	NCA	NCA	NCA	NCA	**8.47E-02**
Metals	Arsenic	NCA	NCA	6.15E-08	9.30E-03	NCA	NCA	NCA	NCA	**9.30E-03**
	Beryllium	NCA	NCA	3.66E-08	5.53E-03	NCA	NCA	NCA	NCA	**5.53E-03**
	Cadmium	NCA	NCA	1.61E-07	2.43E-02	NCA	NCA	NCA	NCA	**2.43E-02**
	Chromium	NCA	NCA	8.42E-07	1.27E-01	NCA	NCA	NCA	NCA	**1.27E-01**
	Mercury	NCA	NCA	4.39E-08	6.64E-03	NCA	NCA	NCA	NCA	**6.64E-03**
	Manganese	NCA	NCA	2.05E-07	3.10E-02	NCA	NCA	NCA	NCA	**3.10E-02**
	Nickel	NCA	NCA	2.63E-07	3.98E-02	NCA	NCA	NCA	NCA	**3.98E-02**
	Lead	NCA	NCA	1.30E-07	1.97E-02	NCA	NCA	NCA	NCA	**1.97E-02**

NOTES: NCA = No characterization data available.

TABLE B-9. ESTIMATED ANNUAL AIR EMISSIONS FROM FUEL COMBUSTION SOURCES OPERATED BY PROJECT ICE CUBE DURING YEAR 7 (16 holes drilled)

Air Pollutant		Power & Water Production Fuel Usage: 120,960 L/yr		Water Heating Fuel Usage: 266,112 L/yr		Space Heating Fuel Usage: 48,384 L/yr		Diesel-Powered Equipment Fuel Usage: 48,384 L/yr		Gasoline -Powered Equipment Fuel Usage: 2,000 L/yr		
Type	**Constituent**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L) [1]**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Total Emissions (kg/yr)**
Characteristic Air Pollutants	Sulfur Oxides	4.25E-03	5.13E+02	6.93E-03	1.84E+03	6.93E-03	3.35E+02	3.74E-03	1.81E+02	6.35E-04	1.27E+00	**2.54E+03**
	Nitrogen Oxides	6.46E-02	7.81E+03	7.08E-04	1.88E+02	2.41E-03	1.16E+02	4.43E-02	2.14E+03	1.15E-02	2.30E+01	**1.02E+04**
	Carbon Monoxide	1.39E-02	1.68E+03	5.37E-04	1.43E+02	6.01E-04	2.91E+01	1.85E-02	8.93E+02	4.76E-01	9.52E+02	**3.67E+03**
	Exhaust Hydrocarbons	NCA	NCA	NCA	NCA	NCA	NCA	4.05E-03	1.96E+02	1.56E-02	3.13E+01	**2.27E+02**
	Particulate Matter	4.54E-03	5.49E+02	1.15E-04	3.05E+01	2.41E-04	1.16E+01	3.62E-03	1.75E+02	7.29E-04	1.46E+00	**7.56E+02**
	Carbon Dioxide	2.40E+00	2.90E+05	2.66E+00	7.08E+05	2.66E+00	1.29E+05	NCA	NCA	NCA	NCA	**9.99E+05**
	Aldehydes	1.02E-03	1.24E+02	NCA	NCA	NCA	NCA	8.15E-04	3.94E+01	5.34E-04	1.07E+00	**1.64E+02**
	Total Organic Carbon (TOC)	5.27E-03	6.37E+02	6.69E-05	1.78E+01	6.69E-05	3.23E+00	NCA	NCA	NCA	NCA	**6.55E+02**
	Non-methane TOC	NCA	NCA	4.09E-05	1.09E+01	4.09E-05	1.98E+00	NCA	NCA	NCA	NCA	**1.09E+01**
	Methane	NCA	NCA	2.60E-05	6.91E+00	2.60E-05	1.26E+00	NCA	NCA	NCA	NCA	**6.91E+00**
	Nitrous Oxide	NCA	NCA	1.32E-05	3.52E+00	1.32E-05	6.40E-01	NCA	NCA	NCA	NCA	**3.52E+00**
	Polycyclic Organic Matter (POM)	NCA	NCA	3.97E-07	1.06E-01	3.97E-07	1.92E-02	NCA	NCA	NCA	NCA	**1.06E-01**
Volatile Organics	Benzene	1.37E-05	1.65E+00	2.53E-08	6.72E-03	2.53E-08	1.22E-03	NCA	NCA	NCA	NCA	**1.66E+00**
	Ethylbenzene	NCA	NCA	7.65E-09	2.04E-03	7.65E-09	3.70E-04	NCA	NCA	NCA	NCA	**2.04E-03**
	Xylenes	4.17E-06	5.05E-01	NCA	3.49E-03	1.31E-08	6.34E-04	NCA	NCA	NCA	NCA	**5.08E-01**
	Toluene	5.99E-06	7.24E-01	7.46E-07	1.98E-01	7.46E-07	3.61E-02	NCA	NCA	NCA	NCA	**9.23E-01**
	1,1,1-Trichloroethane	NCA	NCA	2.84E-08	7.55E-03	2.84E-08	1.37E-03	NCA	NCA	NCA	NCA	**7.55E-03**
	Propylene	3.78E-05	4.57E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**4.57E+00**
	Formaldehyde	1.73E-05	2.09E+00	3.97E-06	1.06E+00	3.97E-06	1.92E-01	NCA	NCA	NCA	NCA	**3.15E+00**
Semi-Volatile Organics	Acetaldehyde	1.12E-05	1.36E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**1.36E+00**
	Naphthalene	1.24E-06	1.50E-01	1.36E-07	3.62E-02	1.36E-07	6.57E-03	NCA	NCA	NCA	NCA	**1.86E-01**
	Acenaphthene	NCA	NCA	2.54E-09	6.75E-04	2.54E-09	1.23E-04	NCA	NCA	NCA	NCA	**6.75E-04**
	Acenaphthylene	NCA	NCA	3.04E-11	8.10E-06	3.04E-11	1.47E-06	NCA	NCA	NCA	NCA	**8.10E-06**
	Anthracene	2.74E-08	3.31E-03	1.47E-10	3.90E-05	1.47E-10	7.10E-06	NCA	NCA	NCA	NCA	**3.35E-03**
	Benz(a)anthracene	2.46E-08	2.97E-03	4.82E-10	1.28E-04	4.82E-10	2.33E-05	NCA	NCA	NCA	NCA	**3.10E-03**
	Benzo(b,k)fluoranthene	NCA	NCA	1.78E-10	4.74E-05	1.78E-10	8.61E-06	NCA	NCA	NCA	NCA	**4.74E-05**
	Benzo(g,h,I)perylene	NCA	NCA	2.72E-10	7.23E-05	2.72E-10	1.31E-05	NCA	NCA	NCA	NCA	**7.23E-05**
	Chrysene	5.17E-09	6.25E-04	2.86E-10	7.62E-05	2.86E-10	1.38E-05	NCA	NCA	NCA	NCA	**7.01E-04**
	Dibenzo(a,h)anthracene	NCA	NCA	2.01E-10	5.34E-05	2.01E-10	9.72E-06	NCA	NCA	NCA	NCA	**5.34E-05**
	Fluoranthene	1.11E-07	1.35E-02	5.82E-10	1.55E-04	5.82E-10	2.82E-05	NCA	NCA	NCA	NCA	**1.36E-02**
	Fluorene	4.27E-07	5.17E-02	5.38E-10	1.43E-04	5.38E-10	2.60E-05	NCA	NCA	NCA	NCA	**5.18E-02**
	Indo(1,2,3-cd)pyrene	NCA	NCA	2.57E-10	6.85E-05	2.57E-10	1.25E-05	NCA	NCA	NCA	NCA	**6.85E-05**
	Octochloro-dibenzo-dioxin	NCA	NCA	3.73E-13	9.92E-08	3.73E-13	1.80E-08	NCA	NCA	NCA	NCA	**9.92E-08**
	Phenanthrene	4.30E-07	5.21E-02	1.26E-09	3.36E-04	1.26E-09	6.11E-05	NCA	NCA	NCA	NCA	**5.24E-02**
	Pyrene	7.00E-08	8.46E-03	5.11E-10	1.36E-04	5.11E-10	2.47E-05	NCA	NCA	NCA	NCA	**8.60E-03**
Metals	Arsenic	NCA	NCA	6.15E-08	1.64E-02	6.15E-08	2.97E-03	NCA	NCA	NCA	NCA	**1.64E-02**
	Beryllium	NCA	NCA	3.66E-08	9.74E-03	3.66E-08	1.77E-03	NCA	NCA	NCA	NCA	**9.74E-03**
	Cadmium	NCA	NCA	1.61E-07	4.28E-02	1.61E-07	7.79E-03	NCA	NCA	NCA	NCA	**4.28E-02**
	Chromium	NCA	NCA	8.42E-07	2.24E-01	8.42E-07	4.07E-02	NCA	NCA	NCA	NCA	**2.24E-01**
	Mercury	NCA	NCA	4.39E-08	1.17E-02	4.39E-08	2.12E-03	NCA	NCA	NCA	NCA	**1.17E-02**
	Manganese	NCA	NCA	2.05E-07	5.45E-02	2.05E-07	9.92E-03	NCA	NCA	NCA	NCA	**5.45E-02**
	Nickel	NCA	NCA	2.63E-07	7.01E-02	2.63E-07	1.27E-02	NCA	NCA	NCA	NCA	**7.01E-02**
	Lead	NCA	NCA	1.30E-07	3.47E-02	1.30E-07	6.30E-03	NCA	NCA	NCA	NCA	**3.47E-02**

NOTES: NCA = No characterization data available.
[1] Emissions Factors for Nitrogen Oxides, Carbon Monoxide, Particulate Matter and Carbon Dioxide based on stacktesting data for Model 75 Water Heaters; emission factors for all other parameters derived from U.S. EPA Office of Air and Radiation, *Compilation of Air Pollutant Emission Factors. AP-42* , Volume II, Mobile Sources, Fourth Edition. September 1985.

TABLE B-8. ESTIMATED ANNUAL AIR EMISSIONS FROM FUEL COMBUSTION SOURCES OPERATED BY PROJECT ICE CUBE DURING YEAR 6 (16 holes drilled)

Air Pollutant		Power & Water Production Fuel Usage: 120,960 L/yr		Water Heating Fuel Usage: 266,112 L/yr		Space Heating Fuel Usage: 48,384 L/yr		Diesel-Powered Equipment Fuel Usage: 48,384 L/yr		Gasoline -Powered Equipment Fuel Usage: 2,000 L/yr		
Type	**Constituent**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L) [1]**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Total Emissions (kg/yr)**
Characteristic Air Pollutants	Sulfur Oxides	4.25E-03	5.13E+02	6.93E-03	1.84E+03	6.93E-03	3.35E+02	3.74E-03	1.81E+02	6.35E-04	1.27E+00	**2.54E+03**
	Nitrogen Oxides	6.46E-02	7.81E+03	7.08E-04	1.88E+02	2.41E-03	1.16E+02	4.43E-02	2.14E+03	1.15E-02	2.30E+01	**1.02E+04**
	Carbon Monoxide	1.39E-02	1.68E+03	5.37E-04	1.43E+02	6.01E-04	2.91E+01	1.85E-02	8.93E+02	4.76E-01	9.52E+02	**3.67E+03**
	Exhaust Hydrocarbons	NCA	NCA	NCA	NCA	NCA	NCA	4.05E-03	1.96E+02	1.56E-02	3.13E+01	**2.27E+02**
	Particulate Matter	4.54E-03	5.49E+02	1.15E-04	3.05E+01	2.41E-04	1.16E+01	3.62E-03	1.75E+02	7.29E-04	1.46E+00	**7.56E+02**
	Carbon Dioxide	2.40E+00	2.90E+05	2.66E+00	7.08E+05	2.66E+00	1.29E+05	NCA	NCA	NCA	NCA	**9.99E+05**
	Aldehydes	1.02E-03	1.24E+02	NCA	NCA	NCA	NCA	8.15E-04	3.94E+01	5.34E-04	1.07E+00	**1.64E+02**
	Total Organic Carbon (TOC)	5.27E-03	6.37E+02	6.69E-05	1.78E+01	6.69E-05	3.23E+00	NCA	NCA	NCA	NCA	**6.55E+02**
	Non-methane TOC	NCA	NCA	4.09E-05	1.09E+01	4.09E-05	1.98E+00	NCA	NCA	NCA	NCA	**1.09E+01**
	Methane	NCA	NCA	2.60E-05	6.91E+00	2.60E-05	1.26E+00	NCA	NCA	NCA	NCA	**6.91E+00**
	Nitrous Oxide	NCA	NCA	1.32E-05	3.52E+00	1.32E-05	6.40E-01	NCA	NCA	NCA	NCA	**3.52E+00**
	Polycyclic Organic Matter (POM)	NCA	NCA	3.97E-07	1.06E-01	3.97E-07	1.92E-02	NCA	NCA	NCA	NCA	**1.06E-01**
Volatile Organics	Benzene	1.37E-05	1.65E+00	2.53E-08	6.72E-03	2.53E-08	1.22E-03	NCA	NCA	NCA	NCA	**1.66E+00**
	Ethylbenzene	NCA	NCA	7.65E-09	2.04E-03	7.65E-09	3.70E-04	NCA	NCA	NCA	NCA	**2.04E-03**
	Xylenes	4.17E-06	5.05E-01	NCA	3.49E-03	1.31E-08	6.34E-04	NCA	NCA	NCA	NCA	**5.08E-01**
	Toluene	5.99E-06	7.24E-01	7.46E-07	1.98E-01	7.46E-07	3.61E-02	NCA	NCA	NCA	NCA	**9.23E-01**
	1,1,1-Trichloroethane	NCA	NCA	2.84E-08	7.55E-03	2.84E-08	1.37E-03	NCA	NCA	NCA	NCA	**7.55E-03**
	Propylene	3.78E-05	4.57E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**4.57E+00**
	Formaldehyde	1.73E-05	2.09E+00	3.97E-06	1.06E+00	3.97E-06	1.92E-01	NCA	NCA	NCA	NCA	**3.15E+00**
Semi-Volatile Organics	Acetaldehyde	1.12E-05	1.36E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**1.36E+00**
	Naphthalene	1.24E-06	1.50E-01	1.36E-07	3.62E-02	1.36E-07	6.57E-03	NCA	NCA	NCA	NCA	**1.86E-01**
	Acenaphthene	NCA	NCA	2.54E-09	6.75E-04	2.54E-09	1.23E-04	NCA	NCA	NCA	NCA	**6.75E-04**
	Acenaphthylene	NCA	NCA	3.04E-11	8.10E-06	3.04E-11	1.47E-06	NCA	NCA	NCA	NCA	**8.10E-06**
	Anthracene	2.74E-08	3.31E-03	1.47E-10	3.90E-05	1.47E-10	7.10E-06	NCA	NCA	NCA	NCA	**3.35E-03**
	Benz(a)anthracene	2.46E-08	2.97E-03	4.82E-10	1.28E-04	4.82E-10	2.33E-05	NCA	NCA	NCA	NCA	**3.10E-03**
	Benzo(b,k)fluoranthene	NCA	NCA	1.78E-10	4.74E-05	1.78E-10	8.61E-06	NCA	NCA	NCA	NCA	**4.74E-05**
	Benzo(g,h,I)perylene	NCA	NCA	2.72E-10	7.23E-05	2.72E-10	1.31E-05	NCA	NCA	NCA	NCA	**7.23E-05**
	Chrysene	5.17E-09	6.25E-04	2.86E-10	7.62E-05	2.86E-10	1.38E-05	NCA	NCA	NCA	NCA	**7.01E-04**
	Dibenzo(a,h)anthracene	NCA	NCA	2.01E-10	5.34E-05	2.01E-10	9.72E-06	NCA	NCA	NCA	NCA	**5.34E-05**
	Fluoranthene	1.11E-07	1.35E-02	5.82E-10	1.55E-04	5.82E-10	2.82E-05	NCA	NCA	NCA	NCA	**1.36E-02**
	Fluorene	4.27E-07	5.17E-02	5.38E-10	1.43E-04	5.38E-10	2.60E-05	NCA	NCA	NCA	NCA	**5.18E-02**
	Indo(1,2,3-cd)pyrene	NCA	NCA	2.57E-10	6.85E-05	2.57E-10	1.25E-05	NCA	NCA	NCA	NCA	**6.85E-05**
	Octochloro-dibenzo-dioxin	NCA	NCA	3.73E-13	9.92E-08	3.73E-13	1.80E-08	NCA	NCA	NCA	NCA	**9.92E-08**
	Phenanthrene	4.30E-07	5.21E-02	1.26E-09	3.36E-04	1.26E-09	6.11E-05	NCA	NCA	NCA	NCA	**5.24E-02**
	Pyrene	7.00E-08	8.46E-03	5.11E-10	1.36E-04	5.11E-10	2.47E-05	NCA	NCA	NCA	NCA	**8.60E-03**
Metals	Arsenic	NCA	NCA	6.15E-08	1.64E-02	6.15E-08	2.97E-03	NCA	NCA	NCA	NCA	**1.64E-02**
	Beryllium	NCA	NCA	3.66E-08	9.74E-03	3.66E-08	1.77E-03	NCA	NCA	NCA	NCA	**9.74E-03**
	Cadmium	NCA	NCA	1.61E-07	4.28E-02	1.61E-07	7.79E-03	NCA	NCA	NCA	NCA	**4.28E-02**
	Chromium	NCA	NCA	8.42E-07	2.24E-01	8.42E-07	4.07E-02	NCA	NCA	NCA	NCA	**2.24E-01**
	Mercury	NCA	NCA	4.39E-08	1.17E-02	4.39E-08	2.12E-03	NCA	NCA	NCA	NCA	**1.17E-02**
	Manganese	NCA	NCA	2.05E-07	5.45E-02	2.05E-07	9.92E-03	NCA	NCA	NCA	NCA	**5.45E-02**
	Nickel	NCA	NCA	2.63E-07	7.01E-02	2.63E-07	1.27E-02	NCA	NCA	NCA	NCA	**7.01E-02**
	Lead	NCA	NCA	1.30E-07	3.47E-02	1.30E-07	6.30E-03	NCA	NCA	NCA	NCA	**3.47E-02**

NOTES: NCA = No characterization data available.
[1] Emissions Factors for Nitrogen Oxides, Carbon Monoxide, Particulate Matter and Carbon Dioxide based on stacktesting data for Model 75 Water Heaters; emission factors for all other parameters derived from U.S. EPA Office of Air and Radiation, *Compilation of Air Pollutant Emission Factors. AP-42* , Volume II, Mobile Sources, Fourth Edition. September 1985.

TABLE B-7. ESTIMATED ANNUAL AIR EMISSIONS FROM FUEL COMBUSTION SOURCES OPERATED BY PROJECT ICE CUBE DURING YEAR 5 (16 holes drilled)

Air Pollutant		Power & Water Production Fuel Usage: 120,960 L/yr		Water Heating Fuel Usage: 266,112 L/yr		Space Heating Fuel Usage: 48,384 L/yr		Diesel-Powered Equipment Fuel Usage: 48,384 L/yr		Gasoline -Powered Equipment Fuel Usage: 2,000 L/yr		
Type	**Constituent**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L) [1]**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Total Emissions (kg/yr)**
Characteristic Air Pollutants	Sulfur Oxides	4.25E-03	5.13E+02	6.93E-03	1.84E+03	6.93E-03	3.35E+02	3.74E-03	1.81E+02	6.35E-04	1.27E+00	**2.54E+03**
	Nitrogen Oxides	6.46E-02	7.81E+03	7.08E-04	1.88E+02	2.41E-03	1.16E+02	4.43E-02	2.14E+03	1.15E-02	2.30E+01	**1.02E+04**
	Carbon Monoxide	1.39E-02	1.68E+03	5.37E-04	1.43E+02	6.01E-04	2.91E+01	1.85E-02	8.93E+02	4.76E-01	9.52E+02	**3.67E+03**
	Exhaust Hydrocarbons	NCA	NCA	NCA	NCA	NCA	NCA	4.05E-03	1.96E+02	1.56E-02	3.13E+01	**2.27E+02**
	Particulate Matter	4.54E-03	5.49E+02	1.15E-04	3.05E+01	2.41E-04	1.16E+01	3.62E-03	1.75E+02	7.29E-04	1.46E+00	**7.56E+02**
	Carbon Dioxide	2.40E+00	2.90E+05	2.66E+00	7.08E+05	2.66E+00	1.29E+05	NCA	NCA	NCA	NCA	**9.99E+05**
	Aldehydes	1.02E-03	1.24E+02	NCA	NCA	NCA	NCA	8.15E-04	3.94E+01	5.34E-04	1.07E+00	**1.64E+02**
	Total Organic Carbon (TOC)	5.27E-03	6.37E+02	6.69E-05	1.78E+01	6.69E-05	3.23E+00	NCA	NCA	NCA	NCA	**6.55E+02**
	Non-methane TOC	NCA	NCA	4.09E-05	1.09E+01	4.09E-05	1.98E+00	NCA	NCA	NCA	NCA	**1.09E+01**
	Methane	NCA	NCA	2.60E-05	6.91E+00	2.60E-05	1.26E+00	NCA	NCA	NCA	NCA	**6.91E+00**
	Nitrous Oxide	NCA	NCA	1.32E-05	3.52E+00	1.32E-05	6.40E-01	NCA	NCA	NCA	NCA	**3.52E+00**
	Polycyclic Organic Matter (POM)	NCA	NCA	3.97E-07	1.06E-01	3.97E-07	1.92E-02	NCA	NCA	NCA	NCA	**1.06E-01**
Volatile Organics	Benzene	1.37E-05	1.65E+00	2.53E-08	6.72E-03	2.53E-08	1.22E-03	NCA	NCA	NCA	NCA	**1.66E+00**
	Ethylbenzene	NCA	NCA	7.65E-09	2.04E-03	7.65E-09	3.70E-04	NCA	NCA	NCA	NCA	**2.04E-03**
	Xylenes	4.17E-06	5.05E-01	NCA	3.49E-03	1.31E-08	6.34E-04	NCA	NCA	NCA	NCA	**5.08E-01**
	Toluene	5.99E-06	7.24E-01	7.46E-07	1.98E-01	7.46E-07	3.61E-02	NCA	NCA	NCA	NCA	**9.23E-01**
	1,1,1-Trichloroethane	NCA	NCA	2.84E-08	7.55E-03	2.84E-08	1.37E-03	NCA	NCA	NCA	NCA	**7.55E-03**
	Propylene	3.78E-05	4.57E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**4.57E+00**
	Formaldehyde	1.73E-05	2.09E+00	3.97E-06	1.06E+00	3.97E-06	1.92E-01	NCA	NCA	NCA	NCA	**3.15E+00**
Semi-Volatile Organics	Acetaldehyde	1.12E-05	1.36E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**1.36E+00**
	Naphthalene	1.24E-06	1.50E-01	1.36E-07	3.62E-02	1.36E-07	6.57E-03	NCA	NCA	NCA	NCA	**1.86E-01**
	Acenaphthene	NCA	NCA	2.54E-09	6.75E-04	2.54E-09	1.23E-04	NCA	NCA	NCA	NCA	**6.75E-04**
	Acenaphthylene	NCA	NCA	3.04E-11	8.10E-06	3.04E-11	1.47E-06	NCA	NCA	NCA	NCA	**8.10E-06**
	Anthracene	2.74E-08	3.31E-03	1.47E-10	3.90E-05	1.47E-10	7.10E-06	NCA	NCA	NCA	NCA	**3.35E-03**
	Benz(a)anthracene	2.46E-08	2.97E-03	4.82E-10	1.28E-04	4.82E-10	2.33E-05	NCA	NCA	NCA	NCA	**3.10E-03**
	Benzo(b,k)fluoranthene	NCA	NCA	1.78E-10	4.74E-05	1.78E-10	8.61E-06	NCA	NCA	NCA	NCA	**4.74E-05**
	Benzo(g,h,I)perylene	NCA	NCA	2.72E-10	7.23E-05	2.72E-10	1.31E-05	NCA	NCA	NCA	NCA	**7.23E-05**
	Chrysene	5.17E-09	6.25E-04	2.86E-10	7.62E-05	2.86E-10	1.38E-05	NCA	NCA	NCA	NCA	**7.01E-04**
	Dibenzo(a,h)anthracene	NCA	NCA	2.01E-10	5.34E-05	2.01E-10	9.72E-06	NCA	NCA	NCA	NCA	**5.34E-05**
	Fluoranthene	1.11E-07	1.35E-02	5.82E-10	1.55E-04	5.82E-10	2.82E-05	NCA	NCA	NCA	NCA	**1.36E-02**
	Fluorene	4.27E-07	5.17E-02	5.38E-10	1.43E-04	5.38E-10	2.60E-05	NCA	NCA	NCA	NCA	**5.18E-02**
	Indo(1,2,3-cd)pyrene	NCA	NCA	2.57E-10	6.85E-05	2.57E-10	1.25E-05	NCA	NCA	NCA	NCA	**6.85E-05**
	Octochloro-dibenzo-dioxin	NCA	NCA	3.73E-13	9.92E-08	3.73E-13	1.80E-08	NCA	NCA	NCA	NCA	**9.92E-08**
	Phenanthrene	4.30E-07	5.21E-02	1.26E-09	3.36E-04	1.26E-09	6.11E-05	NCA	NCA	NCA	NCA	**5.24E-02**
	Pyrene	7.00E-08	8.46E-03	5.11E-10	1.36E-04	5.11E-10	2.47E-05	NCA	NCA	NCA	NCA	**8.60E-03**
Metals	Arsenic	NCA	NCA	6.15E-08	1.64E-02	6.15E-08	2.97E-03	NCA	NCA	NCA	NCA	**1.64E-02**
	Beryllium	NCA	NCA	3.66E-08	9.74E-03	3.66E-08	1.77E-03	NCA	NCA	NCA	NCA	**9.74E-03**
	Cadmium	NCA	NCA	1.61E-07	4.28E-02	1.61E-07	7.79E-03	NCA	NCA	NCA	NCA	**4.28E-02**
	Chromium	NCA	NCA	8.42E-07	2.24E-01	8.42E-07	4.07E-02	NCA	NCA	NCA	NCA	**2.24E-01**
	Mercury	NCA	NCA	4.39E-08	1.17E-02	4.39E-08	2.12E-03	NCA	NCA	NCA	NCA	**1.17E-02**
	Manganese	NCA	NCA	2.05E-07	5.45E-02	2.05E-07	9.92E-03	NCA	NCA	NCA	NCA	**5.45E-02**
	Nickel	NCA	NCA	2.63E-07	7.01E-02	2.63E-07	1.27E-02	NCA	NCA	NCA	NCA	**7.01E-02**
	Lead	NCA	NCA	1.30E-07	3.47E-02	1.30E-07	6.30E-03	NCA	NCA	NCA	NCA	**3.47E-02**

NOTES: NCA = No characterization data available.

[1] Emissions Factors for Nitrogen Oxides, Carbon Monoxide, Particulate Matter and Carbon Dioxide based on stacktesting data for Model 75 Water Heaters; emission factors for all other parameters derived from U.S. EPA Office of Air and Radiation, *Compilation of Air Pollutant Emission Factors. AP-42* , Volume II, Mobile Sources, Fourth Edition. September 1985.

TABLE B-6. ESTIMATED ANNUAL AIR EMISSIONS FROM FUEL COMBUSTION SOURCES OPERATED BY PROJECT ICE CUBE DURING YEAR 4 (16 holes drilled)

Air Pollutant		Power & Water Production Fuel Usage: 120,960 L/yr		Water Heating Fuel Usage: 266,112 L/yr		Space Heating Fuel Usage: 48,384 L/yr		Diesel-Powered Equipment Fuel Usage: 48,384 L/yr		Gasoline -Powered Equipment Fuel Usage: 2,000 L/yr		
Type	**Constituent**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L) [1]**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Total Emissions (kg/yr)**
Characteristic Air Pollutants	Sulfur Oxides	4.25E-03	5.13E+02	6.93E-03	1.84E+03	6.93E-03	3.35E+02	3.74E-03	1.81E+02	6.35E-04	1.27E+00	**2.54E+03**
	Nitrogen Oxides	6.46E-02	7.81E+03	7.08E-04	1.88E+02	2.41E-03	1.16E+02	4.43E-02	2.14E+03	1.15E-02	2.30E+01	**1.02E+04**
	Carbon Monoxide	1.39E-02	1.68E+03	5.37E-04	1.43E+02	6.01E-04	2.91E+01	1.85E-02	8.93E+02	4.76E-01	9.52E+02	**3.67E+03**
	Exhaust Hydrocarbons	NCA	NCA	NCA	NCA	NCA	NCA	4.05E-03	1.96E+02	1.56E-02	3.13E+01	**2.27E+02**
	Particulate Matter	4.54E-03	5.49E+02	1.15E-04	3.05E+01	2.41E-04	1.16E+01	3.62E-03	1.75E+02	7.29E-04	1.46E+00	**7.56E+02**
	Carbon Dioxide	2.40E+00	2.90E+05	2.66E+00	7.08E+05	2.66E+00	1.29E+05	NCA	NCA	NCA	NCA	**9.99E+05**
	Aldehydes	1.02E-03	1.24E+02	NCA	NCA	NCA	NCA	8.15E-04	3.94E+01	5.34E-04	1.07E+00	**1.64E+02**
	Total Organic Carbon (TOC)	5.27E-03	6.37E+02	6.69E-05	1.78E+01	6.69E-05	3.23E+00	NCA	NCA	NCA	NCA	**6.55E+02**
	Non-methane TOC	NCA	NCA	4.09E-05	1.09E+01	4.09E-05	1.98E+00	NCA	NCA	NCA	NCA	**1.09E+01**
	Methane	NCA	NCA	2.60E-05	6.91E+00	2.60E-05	1.26E+00	NCA	NCA	NCA	NCA	**6.91E+00**
	Nitrous Oxide	NCA	NCA	1.32E-05	3.52E+00	1.32E-05	6.40E-01	NCA	NCA	NCA	NCA	**3.52E+00**
	Polycyclic Organic Matter (POM)	NCA	NCA	3.97E-07	1.06E-01	3.97E-07	1.92E-02	NCA	NCA	NCA	NCA	**1.06E-01**
Volatile Organics	Benzene	1.37E-05	1.65E+00	2.53E-08	6.72E-03	2.53E-08	6.72E-03	NCA	NCA	NCA	NCA	**1.66E+00**
	Ethylbenzene	NCA	NCA	7.65E-09	2.04E-03	7.65E-09	2.04E-03	NCA	NCA	NCA	NCA	**2.04E-03**
	Xylenes	4.17E-06	5.05E-01	NCA	3.49E-03	1.31E-08	3.49E-03	NCA	NCA	NCA	NCA	**5.08E-01**
	Toluene	5.99E-06	7.24E-01	7.46E-07	1.98E-01	7.46E-07	1.98E-01	NCA	NCA	NCA	NCA	**9.23E-01**
	1,1,1-Trichloroethane	NCA	NCA	2.84E-08	7.55E-03	2.84E-08	7.55E-03	NCA	NCA	NCA	NCA	**7.55E-03**
	Propylene	3.78E-05	4.57E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**4.57E+00**
	Formaldehyde	1.73E-05	2.09E+00	3.97E-06	1.06E+00	3.97E-06	1.06E+00	NCA	NCA	NCA	NCA	**3.15E+00**
Semi-Volatile Organics	Acetaldehyde	1.12E-05	1.36E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**1.36E+00**
	Naphthalene	1.24E-06	1.50E-01	1.36E-07	3.62E-02	1.36E-07	3.62E-02	NCA	NCA	NCA	NCA	**1.86E-01**
	Acenaphthene	NCA	NCA	2.54E-09	6.75E-04	2.54E-09	6.75E-04	NCA	NCA	NCA	NCA	**6.75E-04**
	Acenaphthylene	NCA	NCA	3.04E-11	8.10E-06	3.04E-11	8.10E-06	NCA	NCA	NCA	NCA	**8.10E-06**
	Anthracene	2.74E-08	3.31E-03	1.47E-10	3.90E-05	1.47E-10	3.90E-05	NCA	NCA	NCA	NCA	**3.35E-03**
	Benz(a)anthracene	2.46E-08	2.97E-03	4.82E-10	1.28E-04	4.82E-10	1.28E-04	NCA	NCA	NCA	NCA	**3.10E-03**
	Benzo(b,k)fluoranthene	NCA	NCA	1.78E-10	4.74E-05	1.78E-10	4.74E-05	NCA	NCA	NCA	NCA	**4.74E-05**
	Benzo(g,h,I)perylene	NCA	NCA	2.72E-10	7.23E-05	2.72E-10	7.23E-05	NCA	NCA	NCA	NCA	**7.23E-05**
	Chrysene	5.17E-09	6.25E-04	2.86E-10	7.62E-05	2.86E-10	7.62E-05	NCA	NCA	NCA	NCA	**7.01E-04**
	Dibenzo(a,h)anthracene	NCA	NCA	2.01E-10	5.34E-05	2.01E-10	5.34E-05	NCA	NCA	NCA	NCA	**5.34E-05**
	Fluoranthene	1.11E-07	1.35E-02	5.82E-10	1.55E-04	5.82E-10	1.55E-04	NCA	NCA	NCA	NCA	**1.36E-02**
	Fluorene	4.27E-07	5.17E-02	5.38E-10	1.43E-04	5.38E-10	1.43E-04	NCA	NCA	NCA	NCA	**5.18E-02**
	Indo(1,2,3-cd)pyrene	NCA	NCA	2.57E-10	6.85E-05	2.57E-10	6.85E-05	NCA	NCA	NCA	NCA	**6.85E-05**
	Octochloro-dibenzo-dioxin	NCA	NCA	3.73E-13	9.92E-08	3.73E-13	9.92E-08	NCA	NCA	NCA	NCA	**9.92E-08**
	Phenanthrene	4.30E-07	5.21E-02	1.26E-09	3.36E-04	1.26E-09	3.36E-04	NCA	NCA	NCA	NCA	**5.24E-02**
	Pyrene	7.00E-08	8.46E-03	5.11E-10	1.36E-04	5.11E-10	1.36E-04	NCA	NCA	NCA	NCA	**8.60E-03**
Metals	Arsenic	NCA	NCA	6.15E-08	1.64E-02	6.15E-08	1.64E-02	NCA	NCA	NCA	NCA	**1.64E-02**
	Beryllium	NCA	NCA	3.66E-08	9.74E-03	3.66E-08	9.74E-03	NCA	NCA	NCA	NCA	**9.74E-03**
	Cadmium	NCA	NCA	1.61E-07	4.28E-02	1.61E-07	4.28E-02	NCA	NCA	NCA	NCA	**4.28E-02**
	Chromium	NCA	NCA	8.42E-07	2.24E-01	8.42E-07	2.24E-01	NCA	NCA	NCA	NCA	**2.24E-01**
	Mercury	NCA	NCA	4.39E-08	1.17E-02	4.39E-08	1.17E-02	NCA	NCA	NCA	NCA	**1.17E-02**
	Manganese	NCA	NCA	2.05E-07	5.45E-02	2.05E-07	5.45E-02	NCA	NCA	NCA	NCA	**5.45E-02**
	Nickel	NCA	NCA	2.63E-07	7.01E-02	2.63E-07	7.01E-02	NCA	NCA	NCA	NCA	**7.01E-02**
	Lead	NCA	NCA	1.30E-07	3.47E-02	1.30E-07	3.47E-02	NCA	NCA	NCA	NCA	**3.47E-02**

NOTES: NCA = No characterization data available.
[1] Emissions Factors for Nitrogen Oxides, Carbon Monoxide, Particulate Matter and Carbon Dioxide based on stacktesting data for Model 75 Water Heaters; emission factors for all other parameters derived from U.S. EPA Office of Air and Radiation, *Compilation of Air Pollutant Emission Factors. AP-42* , Volume II, Mobile Sources, Fourth Edition. September 1985.

TABLE B-5 . ESTIMATED ANNUAL AIR EMISSIONS FROM FUEL COMBUSTION SOURCES OPERATED BY PROJECT ICE CUBE DURING YEAR 3 (12 holes drilled)

Air Pollutant		Power & Water Production Fuel Usage: 90,720 L		Water Heating Fuel Usage: 199,584 L		Space Heating Fuel Usage: 36,288 L/yr		Diesel-Powered Equipment Fuel Usage: 36,288 L		Gasoline -Powered Equipment Fuel Usage: 2,000 L		
Type	**Constituent**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L) [1]**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Total Emissions (kg/yr)**
Characteristic Air Pollutants	Sulfur Oxides	4.25E-03	3.85E+02	6.93E-03	1.38E+03	6.93E-03	2.51E+02	3.74E-03	1.36E+02	6.35E-04	1.27E+00	**1.90E+03**
	Nitrogen Oxides	6.46E-02	5.86E+03	7.08E-04	1.41E+02	2.41E-03	8.73E+01	4.43E-02	1.61E+03	1.15E-02	2.30E+01	**7.63E+03**
	Carbon Monoxide	1.39E-02	1.26E+03	5.37E-04	1.07E+02	6.01E-04	2.18E+01	1.85E-02	6.70E+02	4.76E-01	9.52E+02	**2.99E+03**
	Exhaust Hydrocarbons	NCA	NCA	NCA	NCA	NCA	NCA	4.05E-03	1.47E+02	1.56E-02	3.13E+01	**1.78E+02**
	Particulate Matter	4.54E-03	4.12E+02	1.15E-04	2.29E+01	2.41E-04	8.73E+00	3.62E-03	1.31E+02	7.29E-04	1.46E+00	**5.67E+02**
	Carbon Dioxide	2.40E+00	2.18E+05	2.66E+00	5.31E+05	2.66E+00	9.66E+04	NCA	NCA	NCA	NCA	**7.49E+05**
	Aldehydes	1.02E-03	9.30E+01	NCA	NCA	NCA	NCA	8.15E-04	2.96E+01	5.34E-04	1.07E+00	**1.24E+02**
	Total Organic Carbon (TOC)	5.27E-03	4.78E+02	6.69E-05	1.33E+01	6.69E-05	2.43E+00	NCA	NCA	NCA	NCA	**4.91E+02**
	Non-methane TOC	NCA	NCA	4.09E-05	8.16E+00	4.09E-05	1.48E+00	NCA	NCA	NCA	NCA	**8.16E+00**
	Methane	NCA	NCA	2.60E-05	5.18E+00	2.60E-05	9.43E-01	NCA	NCA	NCA	NCA	**5.18E+00**
	Nitrous Oxide	NCA	NCA	1.32E-05	2.64E+00	1.32E-05	4.80E-01	NCA	NCA	NCA	NCA	**2.64E+00**
	Polycyclic Organic Matter (POM)	NCA	NCA	3.97E-07	7.92E-02	3.97E-07	1.44E-02	NCA	NCA	NCA	NCA	**7.92E-02**
Volatile Organics	Benzene	1.37E-05	1.24E+00	2.53E-08	5.04E-03	2.53E-08	5.04E-03	NCA	NCA	NCA	NCA	**1.24E+00**
	Ethylbenzene	NCA	NCA	7.65E-09	1.53E-03	7.65E-09	1.53E-03	NCA	NCA	NCA	NCA	**1.53E-03**
	Xylenes	4.17E-06	3.78E-01	NCA	2.62E-03	1.31E-08	2.62E-03	NCA	NCA	NCA	NCA	**3.81E-01**
	Toluene	5.99E-06	5.43E-01	7.46E-07	1.49E-01	7.46E-07	1.49E-01	NCA	NCA	NCA	NCA	**6.92E-01**
	1,1,1-Trichloroethane	NCA	NCA	2.84E-08	5.66E-03	2.84E-08	5.66E-03	NCA	NCA	NCA	NCA	**5.66E-03**
	Propylene	3.78E-05	3.43E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**3.43E+00**
	Formaldehyde	1.73E-05	1.57E+00	3.97E-06	7.92E-01	3.97E-06	7.92E-01	NCA	NCA	NCA	NCA	**2.36E+00**
Semi-Volatile Organics	Acetaldehyde	1.12E-05	1.02E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**1.02E+00**
	Naphthalene	1.24E-06	1.13E-01	1.36E-07	2.71E-02	1.36E-07	2.71E-02	NCA	NCA	NCA	NCA	**1.40E-01**
	Acenaphthene	NCA	NCA	2.54E-09	5.06E-04	2.54E-09	5.06E-04	NCA	NCA	NCA	NCA	**5.06E-04**
	Acenaphthylene	NCA	NCA	3.04E-11	6.07E-06	3.04E-11	6.07E-06	NCA	NCA	NCA	NCA	**6.07E-06**
	Anthracene	2.74E-08	2.48E-03	1.47E-10	2.93E-05	1.47E-10	2.93E-05	NCA	NCA	NCA	NCA	**2.51E-03**
	Benz(a)anthracene	2.46E-08	2.23E-03	4.82E-10	9.62E-05	4.82E-10	9.62E-05	NCA	NCA	NCA	NCA	**2.33E-03**
	Benzo(b,k)fluoranthene	NCA	NCA	1.78E-10	3.55E-05	1.78E-10	3.55E-05	NCA	NCA	NCA	NCA	**3.55E-05**
	Benzo(g,h,I)perylene	NCA	NCA	2.72E-10	5.42E-05	2.72E-10	5.42E-05	NCA	NCA	NCA	NCA	**5.42E-05**
	Chrysene	5.17E-09	4.69E-04	2.86E-10	5.71E-05	2.86E-10	5.71E-05	NCA	NCA	NCA	NCA	**5.26E-04**
	Dibenzo(a,h)anthracene	NCA	NCA	2.01E-10	4.01E-05	2.01E-10	4.01E-05	NCA	NCA	NCA	NCA	**4.01E-05**
	Fluoranthene	1.11E-07	1.01E-02	5.82E-10	1.16E-04	5.82E-10	1.16E-04	NCA	NCA	NCA	NCA	**1.02E-02**
	Fluorene	4.27E-07	3.88E-02	5.38E-10	1.07E-04	5.38E-10	1.07E-04	NCA	NCA	NCA	NCA	**3.89E-02**
	Indo(1,2,3-cd)pyrene	NCA	NCA	2.57E-10	5.14E-05	2.57E-10	5.14E-05	NCA	NCA	NCA	NCA	**5.14E-05**
	Octochloro-dibenzo-dioxin	NCA	NCA	3.73E-13	7.44E-08	3.73E-13	7.44E-08	NCA	NCA	NCA	NCA	**7.44E-08**
	Phenanthrene	4.30E-07	3.90E-02	1.26E-09	2.52E-04	1.26E-09	2.52E-04	NCA	NCA	NCA	NCA	**3.93E-02**
	Pyrene	7.00E-08	6.35E-03	5.11E-10	1.02E-04	5.11E-10	1.02E-04	NCA	NCA	NCA	NCA	**6.45E-03**
Metals	Arsenic	NCA	NCA	6.15E-08	1.23E-02	6.15E-08	1.23E-02	NCA	NCA	NCA	NCA	**1.23E-02**
	Beryllium	NCA	NCA	3.66E-08	7.30E-03	3.66E-08	7.30E-03	NCA	NCA	NCA	NCA	**7.30E-03**
	Cadmium	NCA	NCA	1.61E-07	3.21E-02	1.61E-07	3.21E-02	NCA	NCA	NCA	NCA	**3.21E-02**
	Chromium	NCA	NCA	8.42E-07	1.68E-01	8.42E-07	1.68E-01	NCA	NCA	NCA	NCA	**1.68E-01**
	Mercury	NCA	NCA	4.39E-08	8.76E-03	4.39E-08	8.76E-03	NCA	NCA	NCA	NCA	**8.76E-03**
	Manganese	NCA	NCA	2.05E-07	4.09E-02	2.05E-07	4.09E-02	NCA	NCA	NCA	NCA	**4.09E-02**
	Nickel	NCA	NCA	2.63E-07	5.26E-02	2.63E-07	5.26E-02	NCA	NCA	NCA	NCA	**5.26E-02**
	Lead	NCA	NCA	1.30E-07	2.60E-02	1.30E-07	2.60E-02	NCA	NCA	NCA	NCA	**2.60E-02**

NOTES: NCA = No characterization data available.
[1] Emissions Factors for Nitrogen Oxides, Carbon Monoxide, Particulate Matter and Carbon Dioxide based on stacktesting data for Model 75 Water Heaters; emission factors for all other parameters derived from U.S. EPA Office of Air and Radiation, *Compilation of Air Pollutant Emission Factors. AP-42* , Volume II, Mobile Sources, Fourth Edition. September 1985.

TABLE B-4. ESTIMATED ANNUAL AIR EMISSIONS FROM FUEL COMBUSTION SOURCES OPERATED BY PROJECT ICE CUBE DURING YEAR 2 (4 holes drilled)

Air Pollutant		Power & Water Production Fuel Usage: 30,240 L/yr		Water Heating Fuel Usage: 66,528 L/yr		Space Heating Fuel Usage: 12,096 L/yr		Diesel-Powered Equipment Fuel Usage: 12,096 L/yr		Gasoline -Powered Equipment Fuel Usage: 2,000 L/yr		
Type	**Constituent**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L) [1]**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Total Emissions (kg/yr)**
Characteristic Air Pollutants	Sulfur Oxides	4.25E-03	1.28E+02	6.93E-03	4.61E+02	6.93E-03	8.38E+01	3.74E-03	4.52E+01	6.35E-04	1.27E+00	**6.36E+02**
	Nitrogen Oxides	6.46E-02	1.95E+03	7.08E-04	4.71E+01	2.41E-03	2.91E+01	4.43E-02	5.35E+02	1.15E-02	2.30E+01	**2.56E+03**
	Carbon Monoxide	1.39E-02	4.21E+02	5.37E-04	3.57E+01	6.01E-04	7.27E+00	1.85E-02	2.23E+02	4.76E-01	9.52E+02	**1.63E+03**
	Exhaust Hydrocarbons	NCA	NCA	NCA	NCA	NCA	NCA	4.05E-03	4.90E+01	1.56E-02	3.13E+01	**8.03E+01**
	Particulate Matter	4.54E-03	1.37E+02	1.15E-04	7.63E+00	2.41E-04	2.91E+00	3.62E-03	4.38E+01	7.29E-04	1.46E+00	**1.90E+02**
	Carbon Dioxide	2.40E+00	7.26E+04	2.66E+00	1.77E+05	2.66E+00	3.22E+04	NCA	NCA	NCA	NCA	**2.50E+05**
	Aldehydes	1.02E-03	3.10E+01	NCA	NCA	NCA	NCA	8.15E-04	9.86E+00	5.34E-04	1.07E+00	**4.19E+01**
	Total Organic Carbon (TOC)	5.27E-03	1.59E+02	6.69E-05	4.45E+00	6.69E-05	8.09E-01	NCA	NCA	NCA	NCA	**1.64E+02**
	Non-methane TOC	NCA	NCA	4.09E-05	2.72E+00	4.09E-05	4.95E-01	NCA	NCA	NCA	NCA	**2.72E+00**
	Methane	NCA	NCA	2.60E-05	1.73E+00	2.60E-05	3.14E-01	NCA	NCA	NCA	NCA	**1.73E+00**
	Nitrous Oxide	NCA	NCA	1.32E-05	8.80E-01	1.32E-05	1.60E-01	NCA	NCA	NCA	NCA	**8.80E-01**
	Polycyclic Organic Matter (POM)	NCA	NCA	3.97E-07	2.64E-02	3.97E-07	4.80E-03	NCA	NCA	NCA	NCA	**2.64E-02**
Volatile Organics	Benzene	1.37E-05	4.13E-01	2.53E-08	1.68E-03	2.53E-08	1.68E-03	NCA	NCA	NCA	NCA	**4.15E-01**
	Ethylbenzene	NCA	NCA	7.65E-09	5.09E-04	7.65E-09	5.09E-04	NCA	NCA	NCA	NCA	**5.09E-04**
	Xylenes	4.17E-06	1.26E-01	1.31E-08	8.72E-04	1.31E-08	8.72E-04	NCA	NCA	NCA	NCA	**1.27E-01**
	Toluene	5.99E-06	1.81E-01	7.46E-07	4.96E-02	7.46E-07	4.96E-02	NCA	NCA	NCA	NCA	**2.31E-01**
	1,1,1-Trichloroethane	NCA	NCA	2.84E-08	1.89E-03	2.84E-08	1.89E-03	NCA	NCA	NCA	NCA	**1.89E-03**
	Propylene	3.78E-05	1.14E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**1.14E+00**
	Formaldehyde	1.73E-05	5.22E-01	3.97E-06	2.64E-01	3.97E-06	2.64E-01	NCA	NCA	NCA	NCA	**7.86E-01**
Semi-Volatile Organics	Acetaldehyde	1.12E-05	3.40E-01	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**3.40E-01**
	Naphthalene	1.24E-06	3.75E-02	1.36E-07	9.04E-03	1.36E-07	9.04E-03	NCA	NCA	NCA	NCA	**4.66E-02**
	Acenaphthene	NCA	NCA	2.54E-09	1.69E-04	2.54E-09	1.69E-04	NCA	NCA	NCA	NCA	**1.69E-04**
	Acenaphthylene	NCA	NCA	3.04E-11	2.02E-06	3.04E-11	2.02E-06	NCA	NCA	NCA	NCA	**2.02E-06**
	Anthracene	2.74E-08	8.28E-04	1.47E-10	9.76E-06	1.47E-10	9.76E-06	NCA	NCA	NCA	NCA	**8.38E-04**
	Benz(a)anthracene	2.46E-08	7.44E-04	4.82E-10	3.21E-05	4.82E-10	3.21E-05	NCA	NCA	NCA	NCA	**7.76E-04**
	Benzo(b,k)fluoranthene	NCA	NCA	1.78E-10	1.18E-05	1.78E-10	1.18E-05	NCA	NCA	NCA	NCA	**1.18E-05**
	Benzo(g,h,I)perylene	NCA	NCA	2.72E-10	1.81E-05	2.72E-10	1.81E-05	NCA	NCA	NCA	NCA	**1.81E-05**
	Chrysene	5.17E-09	1.56E-04	2.86E-10	1.90E-05	2.86E-10	1.90E-05	NCA	NCA	NCA	NCA	**1.75E-04**
	Dibenzo(a,h)anthracene	NCA	NCA	2.01E-10	1.34E-05	2.01E-10	1.34E-05	NCA	NCA	NCA	NCA	**1.34E-05**
	Fluoranthene	1.11E-07	3.37E-03	5.82E-10	3.87E-05	5.82E-10	3.87E-05	NCA	NCA	NCA	NCA	**3.41E-03**
	Fluorene	4.27E-07	1.29E-02	5.38E-10	3.58E-05	5.38E-10	3.58E-05	NCA	NCA	NCA	NCA	**1.30E-02**
	Indo(1,2,3-cd)pyrene	NCA	NCA	2.57E-10	1.71E-05	2.57E-10	1.71E-05	NCA	NCA	NCA	NCA	**1.71E-05**
	Octochloro-dibenzo-dioxin	NCA	NCA	3.73E-13	2.48E-08	3.73E-13	2.48E-08	NCA	NCA	NCA	NCA	**2.48E-08**
	Phenanthrene	4.30E-07	1.30E-02	1.26E-09	8.40E-05	1.26E-09	8.40E-05	NCA	NCA	NCA	NCA	**1.31E-02**
	Pyrene	7.00E-08	2.12E-03	5.11E-10	3.40E-05	5.11E-10	3.40E-05	NCA	NCA	NCA	NCA	**2.15E-03**
Metals	Arsenic	NCA	NCA	6.15E-08	4.09E-03	6.15E-08	4.09E-03	NCA	NCA	NCA	NCA	**4.09E-03**
	Beryllium	NCA	NCA	3.66E-08	2.43E-03	3.66E-08	2.43E-03	NCA	NCA	NCA	NCA	**2.43E-03**
	Cadmium	NCA	NCA	1.61E-07	1.07E-02	1.61E-07	1.07E-02	NCA	NCA	NCA	NCA	**1.07E-02**
	Chromium	NCA	NCA	8.42E-07	5.60E-02	8.42E-07	5.60E-02	NCA	NCA	NCA	NCA	**5.60E-02**
	Mercury	NCA	NCA	4.39E-08	2.92E-03	4.39E-08	2.92E-03	NCA	NCA	NCA	NCA	**2.92E-03**
	Manganese	NCA	NCA	2.05E-07	1.36E-02	2.05E-07	1.36E-02	NCA	NCA	NCA	NCA	**1.36E-02**
	Nickel	NCA	NCA	2.63E-07	1.75E-02	2.63E-07	1.75E-02	NCA	NCA	NCA	NCA	**1.75E-02**
	Lead	NCA	NCA	1.30E-07	8.67E-03	1.30E-07	8.67E-03	NCA	NCA	NCA	NCA	**8.67E-03**

NOTES: NCA = No characterization data available.
[1] Emissions Factors for Nitrogen Oxides, Carbon Monoxide, Particulate Matter and Carbon Dioxide based on stacktesting data for Model 75 Water Heaters; emission factors for all other parameters derived from U.S. EPA Office of Air and Radiation, *Compilation of Air Pollutant Emission Factors. AP-42* , Volume II, Mobile Sources, Fourth Edition. September 1985.

TABLE B-3 . ESTIMATED ANNUAL AIR EMISSIONS FROM FUEL COMBUSTION SOURCES OPERATED BY PROJECT ICE CUBE DURING YEAR 1 (0 holes drilled)

Air Pollutant		Power & Water Production Fuel Usage: 0 L/yr		Water Heating Fuel Usage: 0 L/yr		Space Heating Fuel Usage: 0 L/yr		Diesel-Powered Equipment Fuel Usage: 16,632 L/yr		Gasoline -Powered Equipment Fuel Usage: 1,000 L/yr		Total Emissions
Type	**Constituent**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L) [1]**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**(kg/yr)**
Characteristic Air Pollutants	Sulfur Oxides	4.25E-03	0.00E+00	6.93E-03	0.00E+00	6.93E-03	0.00E+00	3.74E-03	6.22E+01	6.35E-04	6.35E-01	**6.28E+01**
	Nitrogen Oxides	6.46E-02	0.00E+00	7.08E-04	0.00E+00	2.41E-03	0.00E+00	4.43E-02	7.36E+02	1.15E-02	1.15E+01	**7.48E+02**
	Carbon Monoxide	1.39E-02	0.00E+00	5.37E-04	0.00E+00	6.01E-04	0.00E+00	1.85E-02	3.07E+02	4.76E-01	4.76E+02	**7.83E+02**
	Exhaust Hydrocarbons	NCA	NCA	NCA	NCA	NCA	NCA	4.05E-03	6.74E+01	1.56E-02	1.56E+01	**8.30E+01**
	Particulate Matter	4.54E-03	0.00E+00	1.15E-04	0.00E+00	2.41E-04	0.00E+00	3.62E-03	6.02E+01	7.29E-04	7.29E-01	**6.09E+01**
	Carbon Dioxide	2.40E+00	0.00E+00	2.66E+00	0.00E+00	2.66E+00	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Aldehydes	1.02E-03	0.00E+00	NCA	NCA	NCA	NCA	8.15E-04	1.36E+01	5.34E-04	5.34E-01	**1.41E+01**
	Total Organic Carbon (TOC)	5.27E-03	0.00E+00	6.69E-05	0.00E+00	6.69E-05	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Non-methane TOC	NCA	NCA	4.09E-05	0.00E+00	4.09E-05	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Methane	NCA	NCA	2.60E-05	0.00E+00	2.60E-05	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Nitrous Oxide	NCA	NCA	1.32E-05	0.00E+00	1.32E-05	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Polycyclic Organic Matter (POM)	NCA	NCA	3.97E-07	0.00E+00	3.97E-07	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
Volatile Organics	Benzene	1.37E-05	0.00E+00	2.53E-08	0.00E+00	2.53E-08	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Ethylbenzene	NCA	NCA	7.65E-09	0.00E+00	7.65E-09	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Xylenes	4.17E-06	0.00E+00	NCA	NCA	1.31E-08	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Toluene	5.99E-06	0.00E+00	7.46E-07	0.00E+00	7.46E-07	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	1,1,1-Trichloroethane	NCA	NCA	2.84E-08	0.00E+00	2.84E-08	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Propylene	3.78E-05	0.00E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**0.00E+00**
	Formaldehyde	1.73E-05	0.00E+00	3.97E-06	0.00E+00	3.97E-06	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
Semi-Volatile Organics	Acetaldehyde	1.12E-05	0.00E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**0.00E+00**
	Naphthalene	1.24E-06	0.00E+00	1.36E-07	0.00E+00	1.36E-07	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Acenaphthene	NCA	NCA	2.54E-09	0.00E+00	2.54E-09	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Acenaphthylene	NCA	NCA	3.04E-11	0.00E+00	3.04E-11	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Anthracene	2.74E-08	0.00E+00	1.47E-10	0.00E+00	1.47E-10	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Benz(a)anthracene	2.46E-08	0.00E+00	4.82E-10	0.00E+00	4.82E-10	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Benzo(b,k)fluoranthene	NCA	NCA	1.78E-10	0.00E+00	1.78E-10	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Benzo(g,h,I)perylene	NCA	NCA	2.72E-10	0.00E+00	2.72E-10	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Chrysene	5.17E-09	0.00E+00	2.86E-10	0.00E+00	2.86E-10	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Dibenzo(a,h)anthracene	NCA	NCA	2.01E-10	0.00E+00	2.01E-10	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Fluoranthene	1.11E-07	0.00E+00	5.82E-10	0.00E+00	5.82E-10	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Fluorene	4.27E-07	0.00E+00	5.38E-10	0.00E+00	5.38E-10	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Indo(1,2,3-cd)pyrene	NCA	NCA	2.57E-10	0.00E+00	2.57E-10	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Octochloro-dibenzo-dioxin	NCA	NCA	3.73E-13	0.00E+00	3.73E-13	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Phenanthrene	4.30E-07	0.00E+00	1.26E-09	0.00E+00	1.26E-09	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Pyrene	7.00E-08	0.00E+00	5.11E-10	0.00E+00	5.11E-10	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
Metals	Arsenic	NCA	NCA	6.15E-08	0.00E+00	6.15E-08	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Beryllium	NCA	NCA	3.66E-08	0.00E+00	3.66E-08	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Cadmium	NCA	NCA	1.61E-07	0.00E+00	1.61E-07	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Chromium	NCA	NCA	8.42E-07	0.00E+00	8.42E-07	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Mercury	NCA	NCA	4.39E-08	0.00E+00	4.39E-08	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Manganese	NCA	NCA	2.05E-07	0.00E+00	2.05E-07	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Nickel	NCA	NCA	2.63E-07	0.00E+00	2.63E-07	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**
	Lead	NCA	NCA	1.30E-07	0.00E+00	1.30E-07	0.00E+00	NCA	NCA	NCA	NCA	**0.00E+00**

NOTES: NCA = No characterization data available.
[1] Emissions Factors for Nitrogen Oxides, Carbon Monoxide, Particulate Matter and Carbon Dioxide based on stacktesting data for Model 75 Water Heaters; emission factors for all other parameters derived from U.S. EPA Office of Air and Radiation, *Compilation of Air Pollutant Emission Factors. AP-42* , Volume II, Mobile Sources, Fourth Edition. September 1985.

TABLE B-2. ESTIMATED ANNUAL AIR EMISSIONS FROM FUEL COMBUSTION SOURCES AT THE AMUNDSEN-SCOTT STATION DURING YEAR 2 AND BEYOND OF PROJECT ICE CUBE

Air Pollutant		Power & Water Production Fuel Usage: 1,360,800 L/yr		Heating Fuel Usage: 170,100 L/yr		Diesel-Powered Equipment Fuel Usage: 170,100 L/yr		Gasoline -Powered Equipment Fuel Usage: 15,000 L/yr		Total Emissions
Type	**Constituent**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**(kg/yr)**
Characteristic Air Pollutants	Sulfur Oxides	4.05E-04	5.51E+02	6.93E-03	1.18E+03	3.74E-03	6.36E+02	6.35E-04	9.52E+00	**2.37E+03**
	Nitrogen Oxides	4.65E-02	6.33E+04	2.41E-03	4.09E+02	4.43E-02	7.53E+03	1.15E-02	1.73E+02	**7.14E+04**
	Carbon Monoxide	1.72E-02	2.34E+04	6.01E-04	1.02E+02	1.85E-02	3.14E+03	4.76E-01	7.14E+03	**3.38E+04**
	Exhaust Hydrocarbons	5.05E-04	NCA	NCA	NCA	4.05E-03	6.89E+02	1.56E-02	2.34E+02	**9.24E+02**
	Particulate Matter	2.75E-04	3.75E+02	2.41E-04	4.09E+01	3.62E-03	6.16E+02	7.29E-04	1.09E+01	**1.04E+03**
	Carbon Dioxide	2.36E+00	3.22E+06	2.66E+00	4.53E+05	NCA	NCA	NCA	NCA	**3.67E+06**
	Aldehydes	1.02E-03	1.39E+03	NCA	NCA	8.15E-04	1.39E+02	5.34E-04	8.01E+00	**1.54E+03**
	Total Organic Carbon (TOC)	5.27E-03	7.17E+03	6.69E-05	1.14E+01	NCA	NCA	NCA	NCA	**7.18E+03**
	Non-methane TOC	NCA	NCA	4.09E-05	6.95E+00	NCA	NCA	NCA	NCA	**6.95E+00**
	Methane	NCA	NCA	2.60E-05	4.42E+00	NCA	NCA	NCA	NCA	**4.42E+00**
	Nitrous Oxide	NCA	NCA	1.32E-05	2.25E+00	NCA	NCA	NCA	NCA	**2.25E+00**
	Polycyclic Organic Matter (POM)	NCA	NCA	3.97E-07	6.75E-02	NCA	NCA	NCA	NCA	**6.75E-02**
Volatile Organics	Benzene	1.37E-05	1.86E+01	2.53E-08	4.30E-03	NCA	NCA	NCA	NCA	**1.86E+01**
	Ethylbenzene	NCA	NCA	7.65E-09	1.30E-03	NCA	NCA	NCA	NCA	**1.30E-03**
	Xylenes	4.17E-06	5.68E+00	NCA	2.23E-03	NCA	NCA	NCA	NCA	**5.68E+00**
	Toluene	5.99E-06	8.15E+00	7.46E-07	1.27E-01	NCA	NCA	NCA	NCA	**8.27E+00**
	1,1,1-Trichloroethane	NCA	NCA	2.84E-08	4.83E-03	NCA	NCA	NCA	NCA	**4.83E-03**
	Propylene	3.78E-05	5.14E+01	NCA	NCA	NCA	NCA	NCA	NCA	**5.14E+01**
	Formaldehyde	1.73E-05	2.35E+01	3.97E-06	6.75E-01	NCA	NCA	NCA	NCA	**2.42E+01**
Semi-Volatile Organics	Acetaldehyde	1.12E-05	1.53E+01	NCA	NCA	NCA	NCA	NCA	NCA	**1.53E+01**
	Naphthalene	1.24E-06	1.69E+00	1.36E-07	2.31E-02	NCA	NCA	NCA	NCA	**1.71E+00**
	Acenaphthene	NCA	NCA	2.54E-09	4.32E-04	NCA	NCA	NCA	NCA	**4.32E-04**
	Acenaphthylene	NCA	NCA	3.04E-11	5.18E-06	NCA	NCA	NCA	NCA	**5.18E-06**
	Anthracene	2.74E-08	3.72E-02	1.47E-10	2.50E-05	NCA	NCA	NCA	NCA	**3.73E-02**
	Benz(a)anthracene	2.46E-08	3.35E-02	4.82E-10	8.20E-05	NCA	NCA	NCA	NCA	**3.35E-02**
	Benzo(b,k)fluoranthene	NCA	NCA	1.78E-10	3.03E-05	NCA	NCA	NCA	NCA	**3.03E-05**
	Benzo(g,h,I)perylene	NCA	NCA	2.72E-10	4.62E-05	NCA	NCA	NCA	NCA	**4.62E-05**
	Chrysene	5.17E-09	7.03E-03	2.86E-10	4.87E-05	NCA	NCA	NCA	NCA	**7.08E-03**
	Dibenzo(a,h)anthracene	NCA	NCA	2.01E-10	3.42E-05	NCA	NCA	NCA	NCA	**3.42E-05**
	Fluoranthene	1.11E-07	1.52E-01	5.82E-10	9.90E-05	NCA	NCA	NCA	NCA	**1.52E-01**
	Fluorene	4.27E-07	5.82E-01	5.38E-10	9.14E-05	NCA	NCA	NCA	NCA	**5.82E-01**
	Indo(1,2,3-cd)pyrene	NCA	NCA	2.57E-10	4.38E-05	NCA	NCA	NCA	NCA	**4.38E-05**
	Octochloro-dibenzo-dioxin	NCA	NCA	3.73E-13	6.34E-08	NCA	NCA	NCA	NCA	**6.34E-08**
	Phenanthrene	4.30E-07	5.86E-01	1.26E-09	2.15E-04	NCA	NCA	NCA	NCA	**5.86E-01**
	Pyrene	7.00E-08	9.52E-02	5.11E-10	8.69E-05	NCA	NCA	NCA	NCA	**9.53E-02**
Metals	Arsenic	NCA	NCA	6.15E-08	1.05E-02	NCA	NCA	NCA	NCA	**1.05E-02**
	Beryllium	NCA	NCA	3.66E-08	6.22E-03	NCA	NCA	NCA	NCA	**6.22E-03**
	Cadmium	NCA	NCA	1.61E-07	2.74E-02	NCA	NCA	NCA	NCA	**2.74E-02**
	Chromium	NCA	NCA	8.42E-07	1.43E-01	NCA	NCA	NCA	NCA	**1.43E-01**
	Cobalt	NCA				NCA		NCA		**0.00E+00**
	Mercury	NCA	NCA	4.39E-08	7.47E-03	NCA	NCA	NCA	NCA	**7.47E-03**
	Manganese	NCA	NCA	2.05E-07	3.49E-02	NCA	NCA	NCA	NCA	**3.49E-02**
	Nickel	NCA	NCA	2.63E-07	4.48E-02	NCA	NCA	NCA	NCA	**4.48E-02**
	Lead	NCA	NCA	1.30E-07	2.22E-02	NCA	NCA	NCA	NCA	**2.22E-02**

NOTES: NCA = No characterization data available.

TABLE B-10. ESTIMATED ANNUAL AIR EMISSIONS FROM FUEL COMBUSTION SOURCES OPERATED BY PROJECT ICE CUBE DURING YEAR 8 AND BEYOND

Air Pollutant		Power & Water Production Fuel Usage: 0 L/yr		Water Heating Fuel Usage: 0 L/yr		Space Heating Fuel Usage: 11,340 L/yr		Diesel-Powered Equipment Fuel Usage: 1,134 L/yr		Gasoline -Powered Equipment Fuel Usage: 200 L/yr		
Type	**Constituent**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L) [1]**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Emissions Factor (kg/L)**	**Emissions (kg/yr)**	**Total Emissions (kg/yr)**
Characteristic Air Pollutants	Sulfur Oxides	4.25E-03	0.00E+00	6.93E-03	0.00E+00	6.93E-03	7.85E+01	3.74E-03	4.24E+00	6.35E-04	1.27E-01	**4.37E+00**
	Nitrogen Oxides	6.46E-02	0.00E+00	7.08E-04	0.00E+00	2.41E-03	2.73E+01	4.43E-02	5.02E+01	1.15E-02	2.30E+00	**5.25E+01**
	Carbon Monoxide	1.39E-02	0.00E+00	5.37E-04	0.00E+00	6.01E-04	6.82E+00	1.85E-02	2.09E+01	4.76E-01	9.52E+01	**1.16E+02**
	Exhaust Hydrocarbons	NCA	NCA	NCA	NCA	NCA	NCA	4.05E-03	4.60E+00	1.56E-02	3.13E+00	**7.72E+00**
	Particulate Matter	4.54E-03	0.00E+00	1.15E-04	0.00E+00	2.41E-04	2.73E+00	3.62E-03	4.10E+00	7.29E-04	1.46E-01	**4.25E+00**
	Carbon Dioxide	2.40E+00	0.00E+00	2.66E+00	0.00E+00	2.66E+00	3.02E+04	NCA	NCA	NCA	NCA	**0.00E+00**
	Aldehydes	1.02E-03	0.00E+00	NCA	NCA	NCA	NCA	8.15E-04	9.25E-01	5.34E-04	1.07E-01	**1.03E+00**
	Total Organic Carbon (TOC)	5.27E-03	0.00E+00	6.69E-05	0.00E+00	6.69E-05	7.58E-01	NCA	NCA	NCA	NCA	**0.00E+00**
	Non-methane TOC	NCA	NCA	4.09E-05	0.00E+00	4.09E-05	4.64E-01	NCA	NCA	NCA	NCA	**0.00E+00**
	Methane	NCA	NCA	2.60E-05	0.00E+00	2.60E-05	2.95E-01	NCA	NCA	NCA	NCA	**0.00E+00**
	Nitrous Oxide	NCA	NCA	1.32E-05	0.00E+00	1.32E-05	1.50E-01	NCA	NCA	NCA	NCA	**0.00E+00**
	Polycyclic Organic Matter (POM)	NCA	NCA	3.97E-07	0.00E+00	3.97E-07	4.50E-03	NCA	NCA	NCA	NCA	**0.00E+00**
Volatile Organics	Benzene	1.37E-05	0.00E+00	2.53E-08	0.00E+00	2.53E-08	2.86E-04	NCA	NCA	NCA	NCA	**0.00E+00**
	Ethylbenzene	NCA	NCA	7.65E-09	0.00E+00	7.65E-09	8.67E-05	NCA	NCA	NCA	NCA	**0.00E+00**
	Xylenes	4.17E-06	0.00E+00	NCA	0.00E+00	1.31E-08	1.49E-04	NCA	NCA	NCA	NCA	**0.00E+00**
	Toluene	5.99E-06	0.00E+00	7.46E-07	0.00E+00	7.46E-07	8.45E-03	NCA	NCA	NCA	NCA	**0.00E+00**
	1,1,1-Trichloroethane	NCA	NCA	2.84E-08	0.00E+00	2.84E-08	3.22E-04	NCA	NCA	NCA	NCA	**0.00E+00**
	Propylene	3.78E-05	0.00E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**0.00E+00**
	Formaldehyde	1.73E-05	0.00E+00	3.97E-06	0.00E+00	3.97E-06	4.50E-02	NCA	NCA	NCA	NCA	**0.00E+00**
Semi-Volatile Organics	Acetaldehyde	1.12E-05	0.00E+00	NCA	NCA	NCA	NCA	NCA	NCA	NCA	NCA	**0.00E+00**
	Naphthalene	1.24E-06	0.00E+00	1.36E-07	0.00E+00	1.36E-07	1.54E-03	NCA	NCA	NCA	NCA	**0.00E+00**
	Acenaphthene	NCA	NCA	2.54E-09	0.00E+00	2.54E-09	2.88E-05	NCA	NCA	NCA	NCA	**0.00E+00**
	Acenaphthylene	NCA	NCA	3.04E-11	0.00E+00	3.04E-11	3.45E-07	NCA	NCA	NCA	NCA	**0.00E+00**
	Anthracene	2.74E-08	0.00E+00	1.47E-10	0.00E+00	1.47E-10	1.66E-06	NCA	NCA	NCA	NCA	**0.00E+00**
	Benz(a)anthracene	2.46E-08	0.00E+00	4.82E-10	0.00E+00	4.82E-10	5.47E-06	NCA	NCA	NCA	NCA	**0.00E+00**
	Benzo(b,k)fluoranthene	NCA	NCA	1.78E-10	0.00E+00	1.78E-10	2.02E-06	NCA	NCA	NCA	NCA	**0.00E+00**
	Benzo(g,h,I)perylene	NCA	NCA	2.72E-10	0.00E+00	2.72E-10	3.08E-06	NCA	NCA	NCA	NCA	**0.00E+00**
	Chrysene	5.17E-09	0.00E+00	2.86E-10	0.00E+00	2.86E-10	3.25E-06	NCA	NCA	NCA	NCA	**0.00E+00**
	Dibenzo(a,h)anthracene	NCA	NCA	2.01E-10	0.00E+00	2.01E-10	2.28E-06	NCA	NCA	NCA	NCA	**0.00E+00**
	Fluoranthene	1.11E-07	0.00E+00	5.82E-10	0.00E+00	5.82E-10	6.60E-06	NCA	NCA	NCA	NCA	**0.00E+00**
	Fluorene	4.27E-07	0.00E+00	5.38E-10	0.00E+00	5.38E-10	6.10E-06	NCA	NCA	NCA	NCA	**0.00E+00**
	Indo(1,2,3-cd)pyrene	NCA	NCA	2.57E-10	0.00E+00	2.57E-10	2.92E-06	NCA	NCA	NCA	NCA	**0.00E+00**
	Octochloro-dibenzo-dioxin	NCA	NCA	3.73E-13	0.00E+00	3.73E-13	4.23E-09	NCA	NCA	NCA	NCA	**0.00E+00**
	Phenanthrene	4.30E-07	0.00E+00	1.26E-09	0.00E+00	1.26E-09	1.43E-05	NCA	NCA	NCA	NCA	**0.00E+00**
	Pyrene	7.00E-08	0.00E+00	5.11E-10	0.00E+00	5.11E-10	5.80E-06	NCA	NCA	NCA	NCA	**0.00E+00**
Metals	Arsenic	NCA	NCA	6.15E-08	0.00E+00	6.15E-08	6.97E-04	NCA	NCA	NCA	NCA	**0.00E+00**
	Beryllium	NCA	NCA	3.66E-08	0.00E+00	3.66E-08	4.15E-04	NCA	NCA	NCA	NCA	**0.00E+00**
	Cadmium	NCA	NCA	1.61E-07	0.00E+00	1.61E-07	1.83E-03	NCA	NCA	NCA	NCA	**0.00E+00**
	Chromium	NCA	NCA	8.42E-07	0.00E+00	8.42E-07	9.54E-03	NCA	NCA	NCA	NCA	**0.00E+00**
	Mercury	NCA	NCA	4.39E-08	0.00E+00	4.39E-08	4.98E-04	NCA	NCA	NCA	NCA	**0.00E+00**
	Manganese	NCA	NCA	2.05E-07	0.00E+00	2.05E-07	2.32E-03	NCA	NCA	NCA	NCA	**0.00E+00**
	Nickel	NCA	NCA	2.63E-07	0.00E+00	2.63E-07	2.99E-03	NCA	NCA	NCA	NCA	**0.00E+00**
	Lead	NCA	NCA	1.30E-07	0.00E+00	1.30E-07	1.48E-03	NCA	NCA	NCA	NCA	**0.00E+00**

NOTES: NCA = No characterization data available.
[1] Emissions Factors for Nitrogen Oxides, Carbon Monoxide, Particulate Matter and Carbon Dioxide based on stacktesting data for Model 75 Water Heaters; emission factors for all other parameters derived from U.S. EPA Office of Air and Radiation, *Compilation of Air Pollutant Emission Factors. AP-42* , Volume II, Mobile Sources, Fourth Edition. September 1985.