

TECHNICAL SUPPORT DOCUMENT

TECHNICAL INFORMATION PRESENTED IN REVIEW OF AN APPLICATION FOR A MINOR REVISION TO THE PART 70 OPERATING PERMIT

SUBMITTED BY:

United States Air Force, 99th ABW
4430 Grissom Avenue, Suite 101
Nellis AFB, Nevada 89191-6520

FOR:

United States Air Force – 99th ABW – Creech Air Force Base

LOCATION:

East Highway 95 North
Indian Springs, Nevada 89018

Part 70 Operating Permit Number: 473

SIC Code: 9711 – National Security
NAICS Code: 92811 – National Security



Clark County Department of Air Quality
Permitting Section

January 3, 2017

Source Information

Permittee	United States Air Force, Nellis AFB 99 th ABW
Source	Creech Air Force Base
Mailing Address	4430 Grissom Avenue, Suite 101, Nellis AFB, NV 89191-6520
Responsible Official	Paul Murray, Commander
Contact	Michelle Kramer, Air Quality Program Manager
Phone Number	(702) 652-9900
Fax Number	(702) 652-7909
Source Location	East Highway 95 North, Indian Springs, NV 89018
Hydrographic Area	161
Township, Range, Section	T16S, R56E, Multiple Sections
SIC Code	9711 – National Security
NAICS Code	928110 – National Security

Executive Summary

Creech Air Force Base is a federally-owned military installation located within the city limits of Indian Springs, Nevada. The base is divided into two geographic areas: the Main Base and the Nellis Testing and Training Range (NTTR). The main base, located adjacent to the township of Indian Springs, Nevada, within the Indian Springs Valley Hydrographic Area, consists of the flight line and an associated industrial infrastructure that directly supports flying operations along with a wide variety of commercial and industrial uses which support of the base's mission.

The NTTR, located to the south of the main base, encompassing Hydrographic Areas 160, 161, 168, 211, and 212, consists of approximately 2.9 million acres of BLM land, a portion of which is situated in Clark County, that has been withdrawn from public domain for military use as an armament and high hazard testing area. Activities include, but are not limited to, aerial gunnery training, rocketry, electronic warfare, tactical maneuvering and air support, and equipment and tactics development and testing. The NTTR is also referred to as the Southern Ranges and includes the Point Bravo facilities and Range 63C (Silver Flag Alpha Ground Combat Training Area).

Both Creech AFB and the NTTR operate under the authority of the 99th Air Base Wing Commander, located at Nellis AFB. The source falls under SIC Code 9711: National Security and NAICS Code 928110: National Security

The Indian Springs Valley Hydrographic Area is designated as an attainment area for all criteria pollutants. The major source threshold for each criteria pollutant in an attainment area is 250 tons/year. Creech AFB is a Major Part 70 source for NO_x and a minor source of PM₁₀, CO, SO₂, VOC, and HAP pollutants.

Permitting Action

This is a minor revision to an existing major source in Clark County. The Permittee submitted an application for a minor revision on July 25, 2016 and a supplemental application on October 19, 2016 as follows:

- Addition of one new emergency generator, identified as G162.
- Reinstatement of two generators that were permitted in previous permitting actions, but subsequently removed (EUs: G066 and G141). These units retain the original emission unit identifiers.
- Removal of two emergency generators previously identified as EUs: G063 and G161.
- Increase in the combined annual consumption of propane for the two spray booth heaters (EUs: C003 and C004), from 133,304 gallons to 279,171 gallons.
- Update PTE for external combustion units that were permitted on, or prior to, May 31, 2013 (EUs: W003 through W008, W010 and W011). The emission factors for the external combustion spreadsheet have been updated since the original PTE was calculated for these units.
- Removal of one 10,000 AST gasoline tank, previously identified as EU: J018, and one loading arm previously identified as EU: J011.
- Reclassification of one 10,000 gallon AST, previously identified as J019, and two loading arms, previously identified as EU: J016 to insignificant activities. These two emission units were previously identified as nonbillable emission units, so billing is unaffected.
- Consolidate the mineral processing emission units (EUs: A002 through A014) into one emission unit identified as EU: A003. The Ultra Max 1200-25CC is a portable self-contained mineral processing unit. The PTE for the Mineral Processing Operation is unaffected by this revision. (supplemental dated October 19, 2016)
- Increase the round-trip haul road mileage, for the aggregate plant, from two to eight miles (EU: A016). The existing limitation for annual haul road mileage is retained.
- Removed requirements for annual EPA Method 9 testing for the Mineral Processing Operation. (supplemental dated October 19, 2016)
- Increase the number of miscellaneous woodworking tools from three to four.
- The source has acquired new MQ-1 aircraft and has requested a modification to the fuel cell maintenance requirements to allow for 50 additional purgings per year.

Changes Made to Insignificant Activities

- Addition of four new aboveground storage tanks for diesel fuel and updates made to capacities for various storage tanks.
- Addition of one parts washer/degreaser.

Requested Changes that were not Implemented

The application requested some changes to model numbers and serial numbers for internal combustion units that were redundant. Each of these requests are addressed individually

Request:

1150	G158	Update Engine Serial Number from H13055578 to 73568652
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Response: The serial number identified as H13055578 is for the generator, not the engine. The engine serial number is already identified as 73568652.

Request:

2265	G153	Update Engine Serial Number from A090228444 to 46975118
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Response: The serial number identified as A090228444 is for the generator, not the engine. The engine serial number is already identified as 46975118.

Request:

1055	G156	Elect) Update Engine Model Number from 900RXC6DT2 to 16V2000G45TB
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Response: The serial number identified as 900RXC6DT2 is for the generator, not the engine. The engine model number is already identified as 16V2000G45TB.

Changes Implemented without a Request

During the review process, it became apparent that, beginning with the permit issued January, 2010, a redundant emission unit has been included with the mineral processing operation. The emission unit previously identified as A018, defined as “Hopper Feeding”, has been removed. This process is accounted for in EU: A001, defined as “Material Transfer: Loader to Hopper”.

Only units affected by this permitting action are included in this document.

Table 1: Acronyms and Abbreviations

Acronym	Term
AGE	Aerospace Ground Equipment
AQR	Clark County Air Quality Regulations
AST	Aboveground Storage Tank
BCC	Clark County Board of County Commissioners
CAO	Field Corrective Action Order
CARB	California Air Resources Board
CE	Control Efficiency
CF	Control Factor
CFR	United States Code of Federal Regulations
CO	Carbon Monoxide
CO ₂	Carbon Dioxide
CPI	Urban Consumer Price Index
DAQ	Clark County Department of Air Quality
EF	Emission Factor
EO	Executive Order
EPA	United States Environmental Protection Agency
EU	Emission Unit
EVR	Enhanced Vapor Recovery
GDO	Gasoline Dispensing Operation
GHG	Green House Gases
HAP	Hazardous Air Pollutant
HP	Horse Power
MMBtu	Millions of British Thermal Units
NAC	Nevada Administrative Code
NEI	Net Emission Increase
NO _x	Nitrogen Oxides
NOV	Notice of Violation
NRS	Nevada Revised Statutes
NSPS	New Source Performance Standards
NSR	New Source Review
PM ₁₀	Particulate Matter less than 10 microns
PM _{2.5}	Particulate Matter less than 2.5 microns
ppm	Parts per Million
PSD	Prevention of Significant Deterioration
PTE	Potential to Emit
RICE	Rotating Internal Combustion Engine
SIP	State Implementation Plan
SO ₂	Sulfur dioxide
TSD	Technical Support Document
UST	Underground Storage Tank
VOC	Volatile Organic Compound

Table 2: Source PTE

Activity	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	H ₂ S	Pb	CO ₂
Storage Tanks/Loading Arms/Fuel Dispensing	0	0	0	0	0	10.96	1.03	0	0	0
External Combustion	0.72	0.72	12.76	7.00	1.45	0.94	0.14	0	0	12,048.62
Internal Combustion	8.06	8.06	157.91	31.72	10.83	10.82	1.25	0	0	9,971.21
Mineral Processing	14.30	0.11	0	0	0	0	0	0	0	0
Surface Coating	0.02	0.00	0	0	0	6.60	4.62	0	0	0
Wood Working	0.37	0.00	0	0	0	0.00	0.00	0	0	0
Fuel Cell Maintenance	0.00	0.00	0	0	0	0.05	0.01	0	0	0
Total (Insignificant Units not Included)	23.47	8.89	170.67	38.72	12.28	29.37	7.05	0	0	22,019.83
Insignificant Activities¹										
External Combustion	1.69	1.69	22.04	12.18	2.93	1.98	0.13	0	0	21,126.58
Storage Tanks/Loading Racks/Fuel Dispensing	0	0	0	0	0	0.85	0.04	0	0	0
Abrasive Blasting	0.02	0	0	0	0	0	0	0	0	0
Degreasers	0	0	0	0	0	0.82	0	0	0	0
Total (Including Insignificant Units)	25.18	10.58	192.71	50.90	15.21	33.02	7.22	0	0	43,146.41

¹The PTE from insignificant activities are included for informational purposes, only. There are no regulatory requirements for these units.

Emission Units

Table 3: External Combustion Units (modified)

EU	Description	Manufacturer	Fuel	Rating (MMBtu/hr)	Model #	Serial #	Location	SCC
W003	Boiler	Bryan	Propane	2.00	AB200-W-FDG-LX	92135	Bldg. 1000	10301002
W004	Boiler	Bryan	Propane	2.00	AB200-W-FDG	96527	Bldg. 1003	10301002
W005	Boiler	Unilux	Propane	1.26	DZ 100W	5820	Bldg. 1005	10301002
W006	Boiler	Unilux	Propane	1.31	VZ 150W	3884	Bldg. 1004	10301002
W007	Boiler	Unilux	Propane	2.28	ZF 250W	A1417	Bldg. 719	10301002
W008	Boiler	Weil McClain	Propane	2.05	88		Bldg. 1009	10301002
W010	Boiler	Camus	Propane	1.50	DPNH-1501-MGI-HVS	121216648	Bldg. 1130	10301002
W011	Boiler	Camus	Propane	1.50	DPNH-1501-MGI-HVS	121216647	Bldg. 1130	10301002
C003	Spray Booth Heater	Weather-Rite	Propane	2.916	TOT221VT	53748-1	Bldg. 230	10500110
C004	Spray Booth Heater	Weather-Rite	Propane	2.916	TOT221VT	53748-2	Bldg. 230	10500110

Table 4: Emission Units, Woodworking (new)

EU	Description	Location	SCC
H001	One Additional Piece of Equipment	Bldg. 231	30703097

Table 5: Emission Units (new)

EU	Description	SCC	Aircraft Type	Fuel	Tank Volume per Aircraft
L001	Fuel Cell Maintenance	40400151	MQ-1	Aviation Gasoline	100 Gallons

Table 6: Revised Emission Units for Mineral Processing Operation

EU	Description	Model #	Serial #	SCC
A003	Hopper to Crusher	Ultra-Max 1200-25CC	22778X	30502006
	Crusher			30502001
	Transfer Point			30502006
	Double Deck Screen			30502006
	Double Deck Screen to Conveyor – Side Discharge			30502006
	Double Deck Screen to Conveyor – Front Discharge			30502006
	Double Deck Screen to Conveyor – Oversize			30502006
	Side Discharge – Conveyor to Stockpile			30502006
	Front Discharge – Conveyor to Stockpile			30502006
	Short Conveyor with Transfer of Oversize to Conveyor			30502006
	Oversize Conveyor with Transfer to Hopper			30502006
	Front Extend Conveyor to Stockpile			30502006
	Side Extend Conveyor to Reject Pile			30502006
	A016			Haul Road; Unpaved; Round Trip = 8.0 miles

Table 7: Internal Combustion Units (new and modified)

EU	Description	Manufacturer	Rating	Model #	Serial #	Location	SCC
G003	Genset –Emergency	Onan	80 kW	DGDA5627785	G030520964	Bldg. 83 ¹	20300101
	Engine – Diesel; DOM: 2003	Cummins	170 hp	6BT5.9-G6	46320778		
G025	Genset –Emergency	Clark	51 hp	4045DFR120 ²	PE4045D660770	Bldg. 2417	20300101
	Engine – Diesel; DOM: 06/2007	John Deere					
G026	Fire Pump ³	Cummins	130 hp	6BTA5.9F2	4476910	Bldg. 3922	20300101
	Engine – Diesel; DOM: 1992						
G066 ^N	Genset	Onan	15 kW	DKAC5774803	I060971876	62UOC	20300101
	Engine – Diesel; DOM: 09/2006	Kubota	27 hp	D1703	06N3765		
G118	Genset –Emergency	Cummins	1,500 kW	DQGAB4902071	33181757 ²	Bldg. 1009	20300101
	Engine – Diesel; DOM: 06/2010		2,220 hp	QSK50-G4	75702799		
G125	Genset –Emergency	Onan	7.5 kW	DNAC5664666	B048601622	Bldg. 279 ¹	20300101
	Engine – Diesel; DOM: 2005	Cummins	14 hp	LPW2	03014117		
G126	Genset –Emergency	Onan	7.5 kW	DNAC5664666	B048601621	Bldg. 279 ¹	20300101
	Engine – Diesel; DOM: 2006	Cummins	14 hp	LPW2	03021410		
G135	Genset –Emergency	Detroit Diesel	40 kW	40DSEJB	2136904	Bldg. 279 ¹	20300101
	Engine – Diesel; DOM: 2006	John Deere	54 hp	3029TF270D	PE3029633300		
G141 ^N	Genset –Emergency	Caterpillar	13 kW	D13-4	CAT00000CGBD00299	Southwest Barrier Pit	20300101
	Engine – Diesel; DOM: 2010		20 hp	C1.5	E4F00295		
G142 ²	Genset –Emergency	Cummins	200 kW	DSHAC5770629	H060964339	Bldg. 1210	20300101
	Engine – Diesel; DOM: 07/2006		364 hp				
G159	Genset –Emergency	Cummins	1,250 kW	DQGAA1217643	25383751 ²	Bldg. 1130	20300101
	Engine – Diesel; DOM: 2013		2,220 hp	QSK50-G4NR2	50264		
G162 ^N	Genset –Emergency	Cummins	300 kW	300DQHAB	K150889886	Bldg. 703	20300101

EU	Description	Manufacturer	Rating	Model #	Serial #	Location	SCC
	Engine – Diesel; DOM: 2015		470 hp	QSM11-G4	35335608		

The 'N' superscript refers to new units for this permitting action.

¹Update to location of emission unit.

²Update to model number or serial number

³Update emission unit description (emergency generator to fire pump).

Calculation of PTE

Table 8: PTE for New and Modified Units (tons per year)

EU	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	CO ₂
W003	0.07	0.07	1.24	0.72	0.14	0.10	0.01	1,196.70
W004	0.07	0.07	1.24	0.72	0.14	0.10	0.01	1,196.70
W005	0.04	0.04	0.78	0.45	0.09	0.06	0.01	753.92
W006	0.04	0.04	0.82	0.47	0.09	0.06	0.01	783.84
W007	0.08	0.08	1.42	0.82	0.16	0.11	0.01	1,364.24
W008	0.07	0.07	1.28	0.74	0.14	0.10	0.01	1,226.62
W010	0.05	0.05	0.93	0.54	0.11	0.07	0.01	897.46
W011	0.05	0.05	0.93	0.54	0.11	0.07	0.01	897.46
C003	0.10	0.10	1.81	1.05	0.21	0.14	0.01	1,744.82
C004								
G066	0.03	0.03	0.12	0.08	0.01	0.01	0.01	31.05
G141	0.01	0.01	0.07	0.02	0.01	0.01	0.01	5.75
G162	0.01	0.01	0.67	0.02	0.01	0.02	0.01	135.13
H001	0.37	0	0	0	0	0	0	0
L001	0	0	0	0	0	0.05	0.01	0

Calculation of NEI

Table 9: NEI for Storage Tanks and Fuel Dispensing (tons per year)

Description	VOC	HAP
PTE for Removed (EUs: J011 & J018) and Reclassified Units (EUs: J016 & J019)	2.88	0.55
Change to PTE	-2.88	-0.55
NEI	0	0

Table 10: NEI for Internal Combustion Units (tons per year)

Description	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	CO ₂
PTE for New Units	0.05	0.05	0.86	0.12	0.03	0.04	0.03	171.93
PTE for Removed Units (EUs: G063 and G161)	0.04	0.04	7.22	0.59	0.13	0.13	0.02	562.06
Change to PTE	0.01	0.01	- 6.36	- 0.47	- 0.10	- 0.09	0.01	- 390.13
NEI	0.01	0.01	0	0	0	0	0.01	0

Table 11: NEI for External Combustion Units (tons per year)

Description	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	CO ₂
Excluded Emission Units (change in emission factors only)¹								
Boiler PTE – Previous Permitting Actions (includes only units modified for this permitting action)	0.27	0.27	8.67	1.28	0.99	0.34	0.08	8,316.94
Boiler PTE Revised Emission Factors (includes only units modified for this permitting action)	0.47	0.47	8.64	5.0	0.98	0.66	0.08	8,316.94
Difference (excluded emissions)¹	0.20	0.20	-0.03	3.72	-0.01	0.32	0	0
Spray Booth Heaters – Previous PTE	0.05	0.05	0.87	0.50	0.10	0.07	0.01	833.15
Spray Booth Heaters – New PTE	0.10	0.10	1.81	1.05	0.21	0.14	0.01	1744.82
NEI (Spray Booth Heaters Only)	0.05	0.05	0.94	0.55	0.11	0.07	0	911.67

¹This is for informational purposes only. Changes in PTE resulting from updated emission factors are not included with NEI calculations

Table 12: NEI for Mineral Processing Operation (tons per year)

Description	PTE (PM _{2.5})	PTE (PM ₁₀)
Removal of EU: A018	0.01	0.29
Change to PTE	-0.01	-0.29
NEI	0	0

Table 13: NEI for Woodworking and Fuel Cell Operations (tons per year)

Description	PM ₁₀	VOC	HAP
PTE for New Units (Woodworking Operation)	0.04	0	0
PTE for Increased Fuel Cell Purgings	0	0.03	0.01
NEI	0.04	0.03	0.01

Table 14: NEI for Insignificant Activities¹ (tons per year)

Description	VOC	HAP
PTE for New Aboveground Storage Tanks and Nozzles	0.46	0.01
PTE for Emission Units Reclassified as Insignificant Activities (EUs: J016 & J019)	0.09	0.02
PTE for New Degreaser	0.08	0
Emissions Increase	0.63	0.03

¹This is for informational purposes only. Insignificant activities are not included with NEI.

Table 15: Total Source NEI (tons per year)

Description	PM ₁₀	PM _{2.5}	NO _x	CO	SO ₂	VOC	HAP	CO ₂
PTE for Current Permitting Action	23.47	8.89	170.67	38.72	12.28	29.37	7.05	22,019.83
PTE for Title V – Issued 05/21/2015	23.46	8.64	176.12	34.93	12.28	31.92	7.57	21,671.36
Excluded Emissions (from Table 10)	0.20	0.20	0	3.72	0	0.32	0	0
Change to PTE	0.01	0.05	- 5.45	0.07	0.01	- 2.55	- 0.52	348.47
NEI	0.01	0.05	0	0.07	0.01	0	0	348.47
Significance Thresholds AQR 12.2.2(uu)	15	10	40	100	40	40		

Operational Limits

1. The Permittee shall limit operation of each emergency generator to 100 hours per year on for testing and maintenance. The Permittee may operate each emergency generator up to 50 hours per year for nonemergency situations, but those hours count towards the 100 hours provided for testing and maintenance. The 50 hours per year for nonemergency situations cannot be used for peak shavings or to generate income for the facility (EUs: G141 and G162).
2. The Permittee shall limit the operation of the Urban Operations Complex (UOC) continuous duty generator to 2,000 hours per any consecutive twelve month period (EU: G066)
3. The Permittee shall limit fuel consumption for the two propane-fired spray booth heaters (EUs: C003 and C004) to a combined maximum of 279,171 gallons in any consecutive twelve month period.

Review of Applicable Regulations

This permitting action does not trigger any additional local or federal regulations. All regulations established in previous permitting actions remain enforceable.

Control Technology

The source NEI does not exceed the significant thresholds for any criteria pollutant. Therefore, a RACT analysis is not required. All RACT and BACT requirements established with previous permitting actions remain enforceable.

Monitoring

This permitting action does not trigger any additional monitoring requirements. All monitoring requirement established in previous permitting actions remain enforceable.

Testing

No Performance testing requirements have been identified for the emission units associated with this permitting action.

Increment

Creech Air Force Base is a major source for NO₂ under Part 70 rules, but a minor source with respect to Prevention of Significant Deterioration (PSD) regulations. The source is located in Hydrographic Areas 160, 161, 168, 211 and 212. Permitted emission units include boilers, generators, fire pumps, arrestors, mineral processing, surface coating, wood working and fuel dispensing.

Air Quality modeled the source using AERMOD to track the increment consumption in Hydrographic Area 212. Stack data submitted by the applicant were supplemented with information available for similar emission units. Five years (1999 to 2003) of meteorological data from the McCarran Station and Desert Rock Station were used in the model. United States Geological Survey (USGS) National Elevation Dataset (NED) terrain data was used to calculate elevations. Table 16 shows the location of the maximum impact and the potential PSD increment consumed by the source at that location. The impacts are below the PSD increment limits.

Table 16: PSD Increment Consumption

Pollutant	Averaging Period	PSD Increment Consumption by the Source ($\mu\text{g}/\text{m}^3$)	Location of Maximum Impact	
			UTM X (m)	UTM Y (m)
SO ₂	3-hour	1.02 ¹	635797	4039601
SO ₂	24-hour	0.14 ¹	635797	4039601
SO ₂	Annual	0.01	638680	4037248
NO _x	Annual	0.01	641251	4040478

¹ Second High Concentration

Public Notice

Public notice requirements have not been triggered.

Permitting History

1. The last permit was issued on May 21, 2015.
2. An application was received on July 25, 2016.
3. The application was assigned to the Permit Writer on August 17, 2016
4. The application was deemed complete on October 7, 2016.
5. The draft permit and TSD were sent for internal review on October 7, 2016.

Attachments

Table 17: PTE from Propane-Fired Boilers

EU#	W003 and W004	Pollutants	Emission Factor (lb/MMBtu) ¹	PTE (per unit)	
				lb/hr	ton/yr
Make:	Bryan				
Model:	See Table 3	PM ₁₀	0.0077	0.02	0.07
S/N:	See Table 3	PM _{2.5}	0.0077	0.02	0.07
MMBtu/hr (each unit):	2.0	NO _x	0.1421	0.28	1.24
Hours/Day (each unit):	24	CO	0.0820	0.16	0.72
Hours/Year (each unit):	8,760	SO ₂	0.0161	0.03	0.14
		VOC	0.0109	0.02	0.10
		HAP	3.016E-05	0.01	0.01
		CO ₂	136.61	273.22	1196.70

¹Emission factors from AP-42.

Table 18: PTE from Propane-Fired Boiler

EU#	W005	Pollutants	Emission Factor (lb/MMBtu) ¹	PTE	
				lb/hr	ton/yr
Make:	Unilux				
Model:	DZ100W	PM ₁₀	0.0077	0.01	0.04
S/N:	5820	PM _{2.5}	0.0077	0.01	0.04
MMBtu/hr:	1.26	NO _x	0.1421	0.18	0.78
Hours/Day:	24	CO	0.0820	0.10	0.45
Hours/Year:	8,760	SO ₂	0.0161	0.02	0.09
		VOC	0.0109	0.01	0.06
		HAP	3.016E-05	0.01	0.01
		CO ₂	136.61	172.13	753.92

¹Emission factors from AP-42.

Table 19: PTE from Propane-Fired Boiler

EU#	W006	Pollutants	Emission Factor (lb/MMBtu) ¹	PTE	
				lb/hr	ton/yr
Make:	Unilux				
Model:	VZ150W	PM ₁₀	0.0077	0.01	0.03
S/N:	3884	PM _{2.5}	0.0077	0.01	0.04
MMBtu/hr:	1.31	NO _x	0.1421	0.19	0.82
Hours/Day:	24	CO	0.0820	0.11	0.47
Hours/Year:	8,760	SO ₂	0.0161	0.02	0.09
		VOC	0.0109	0.01	0.06
		HAP	3.016E-05	0.01	0.01
		CO ₂	136.61	178.96	783.84

¹Emission factors from AP-42.

Table 20: PTE from Propane-Fired Boiler

EU#	W007	Pollutants	Emission Factor (lb/MMBtu) ¹	PTE	
				lb/hr	ton/yr
Make:	Unilux				
Model:	ZF250W	PM ₁₀	0.0077	0.02	0.08
S/N:	A1417	PM _{2.5}	0.0077	0.02	0.08
MMBtu/hr:	2.28	NO _x	0.1421	0.32	1.42
Hours/Day:	24	CO	0.0820	0.19	0.82
Hours/Year:	8,760	SO ₂	0.0161	0.04	0.16
		VOC	0.0109	0.02	0.11
		HAP	3.016E-05	0.01	0.01
		CO ₂	136.61	311.47	1364.24

¹Emission factors from AP-42.

Table 21: PTE from Propane-Fired Boiler

EU#	W008	Pollutants	Emission Factor (lb/MMBtu) ¹	PTE	
				lb/hr	ton/yr
Make:	Weil McClain				
Model:	88	PM ₁₀	0.0077	0.02	0.07
S/N:	Not Provided	PM _{2.5}	0.0077	0.02	0.07
MMBtu/hr:	2.05	NO _x	0.1421	0.29	1.28
Hours/Day:	24	CO	0.0820	0.17	0.74
Hours/Year:	8,760	SO ₂	0.0161	0.03	0.14
		VOC	0.0109	0.02	0.10
		HAP	3.016E-05	0.01	0.01
		CO ₂	136.61	280.05	1226.62

¹Emission factors from AP-42.

Table 22: PTE from Propane-Fired Boilers

EU#	W010 & W011	Pollutants	Emission Factor (lb/MMBtu) ¹	PTE (per unit)	
				lb/hr	ton/yr
Make:	Camus				
Model:	DPNH-1501-MGI-HVS	PM ₁₀	0.0077	0.01	0.05
S/N:	See Table 3	PM _{2.5}	0.0077	0.01	0.05
MMBtu/hr (each unit):	2.05	NO _x	0.1421	0.21	0.93
Hours/Day (each unit):	24	CO	0.0820	0.12	0.54
Hours/Year (each unit):	8,760	SO ₂	0.0161	0.02	0.11
		VOC	0.0109	0.02	0.07
		HAP	3.016E-05	0.01	0.01
		CO ₂	136.61	204.92	897.46

¹Emission factors from AP-42.

Table 23: PTE from Propane-Fired Spray Booth Heaters

EU#	C003 & C004	Pollutants	Emission Factor (lb/gal) ¹	PTE (combined)	
				lb/hr	ton/yr
Make:	Weather-Rite				
Model:	TOT221VT	PM ₁₀	0.0007	0.02	0.10
S/N:	See Table 3	PM _{2.5}	0.0007	0.02	0.10
MMBtu/hr (each unit):	2.916	NO _x	0.013	0.41	1.81
Combined Fuel Consumption (gal/hour):	31	CO	0.0075	0.24	1.05
		SO ₂	0.0015	0.05	0.21
Combined Fuel Consumption (gal/year):	279,171	VOC	0.0010	0.03	0.14
		HAP	2.790E-06	0.01	0.01
		CO ₂	12.50	204.92	1744.82

¹Emission factors from AP-42.

Table 24: PTE from Diesel Engine

EU#	G066	Pollutants	Emission Factor (lb/hp-hr) ¹	PTE	
				lb/hr	ton/yr
Make:	Kubota				
Model:	D1703	PM ₁₀	1.28E-03	0.03	0.03
S/N:	06N3765	PM _{2.5}	1.28E-03	0.03	0.03
Horsepower:	27	NO _x	4.43E-03	0.12	0.12
Hours/Day:	24	CO	2.89E-03	0.08	0.08
Hours/Year	2,000	SO ₂	1.21E-05	0.01	0.01
		VOC	1.10E-04	0.01	0.01
		HAP	4.52E-05	0.01	0.01
		CO ₂	1.15	31.05	31.05

¹Emission factors from manufacturer's data and AP-42

Table 25: PTE from Diesel Engine

EU#	G141	Pollutants	Emission Factor (lb/hp-hr) ¹	PTE (each unit)	
				lb/hr	ton/yr
Make:	Caterpillar				
Model:	C1.5	PM ₁₀	4.34E-04	0.01	0.01
S/N:	E4F00295	PM _{2.5}	4.34E-04	0.01	0.01
Horsepower (each unit):	20	NO _x	1.40E-02	0.28	0.07
Hours/Day(each unit):	24	CO	3.28E-03	0.07	0.02
Hours/Year (each unit)	500	SO ₂	1.21E-05	0.01	0.01
		VOC	5.95E-04	0.01	0.01
		HAP	4.52E-05	0.01	0.01
		CO ₂	1.15	23.00	5.75

¹Emission factors from manufacturer's data and AP-42.

Table 26: PTE from Diesel Engine

EU#	G162	Pollutants	Emission Factor (lb/hp-hr) ¹	PTE	
				lb/hr	ton/yr
Make:	Cummins				
Model:	QSM11-G4	PM ₁₀	8.82E-05	0.01	0.01
S/N:	35335608	PM _{2.5}	8.82E-05	0.01	0.01
Horsepower:	470	NO _x	5.71E-03	0.28	0.07
Hours/Day:	24	CO	1.76E-04	0.07	0.02
Hours/Year	500	SO ₂	1.21E-05	0.01	0.01
		VOC	1.76E-04	0.01	0.01
		HAP	4.52E-05	0.01	0.01
		CO ₂	1.15	23.00	5.75

¹Emission factors from manufacture's data and AP-42.

PTE Calculation for Woodworking Operation

PM₁₀ (tpy) = total pieces of equipment * emission factor * hours of operation * percentage of PM₁₀ * control efficiency ÷ 2,000 lbs/ton

PTE = (1 piece of equipment * 2.0 lbs/hr) * (8760 hours per year) * (0.473) * (0.01) ÷ (2,000 lbs/ton) = 0.04 tons/year

PTE Calculations for Fuel Cell Maintenance Operation

1. VOC (tpy) = (0.02355 * Volume of fuel cells * 0.134 * Number of Purges * number of aircraft) ÷ (2,000 lbs/ton);

where:

0.02355 = The saturation vapor density of Aviation Gasoline; and

0.134 = conversion between gallons and cubic feet (ft³)

PTE = (0.02355 * 100 gallons * 0.134 * 4 purges * 50 aircraft) ÷ (2,000 lbs/ton) = 0.03 tons/year VOC

2. HAP (tpy) = (lbs. VOC/year * percentage of HAP compounds) ÷ (2,000 lbs/ton)

where:

The percentage of HAP compounds in aviation gasoline = 10.5 (from Phillips 66 MSDS for 100LL aviation gasoline)

PTE = (63.11 lbs/year * 0.105) ÷ (2,000 lbs/ton) = 0.00007 tons/year = 0.003 tpy

Table 27: PTE for Insignificant Storage Tanks (new and modified)

Description	Location	Capacity (gallons)	Contents	Throughput (gal/year)	PTE (tpy)	
					VOC	HAP
AST	Bldg.64	1,500 ¹	Diesel	547,500	2.38E-03	7.15E-05
AST	Bldg. 85	1,700 ¹	Diesel	620,500	2.70E-03	8.11E-05
AST	Bldg. 255-2	5,000	Waste Fuels/ Mixed ²	1,825,000	9.71E-03	2.91E-04
Diesel Nozzles (4) ^N	Bldg. 661		Diesel	1,000,000	0.46	5.66E-06
AST ^N	Bldg. 707	20	Diesel	7,300	4.03E-05	1.21E-06
AST ^N	Bldg. 718	20	Diesel	7,300	4.03E-05	1.21E-06
AST	Bldg. 719	200 ¹	Diesel	73,000	3.18E-04	9.54E-06
AST ^N	Bldg. 792	20	Diesel	7,300	4.03E-05	1.21E-06
AST	Bldg. 820 ³	500	Diesel	182,500	7.44E-04	2.46E-06
AST ⁴	Bldg. 1011	10,000	Jet Fuel	3,650,000	1.94E-02	5.82E-04
Loading Arms (2); Loading and Unloading ⁵	Bldg. 1011 ³		Diesel	500,000	0.01	0.01
AST	Bldg. 1022	600 ¹	Diesel	219,000	9.53E-04	2.86E-05
AST ^N	Point Bravo	300	Diesel	109,500	4.77E-04	1.43E-05

^N 'N' superscript refers to new units

¹Modification to tank capacity

²Modification to tank contents

³Modification to location

⁴Previously identified as EU: J019

⁵Previously identified as EU: J016

Table 28: PTE from Degreasing (tons per year)

Number of new Units	Volume of Degreaser	Annual Consumption	EF (lbs/gal)	PTE
1	5 gallons	25 gallons	6.6	0.08