

## TECHNICAL SUPPORT DOCUMENT

### I. GENERAL COMMENTS:

The Honeywell International Inc. (Honeywell) facility is an aerospace part(s) manufacturing facility located at 11100 North Oracle Road, Oro Valley, Arizona.

#### A. Company Information

1. Source Name: Honeywell International, Inc. (Honeywell)
2. Source Address: 11100 North Oracle Road, Oro Valley, Arizona 85737
3. Mailing Address: (Same as source address)

#### B. Background

The Honeywell facility - previously known as “Honeywell Aerospace” then “Allied-Signal Aerospace” and prior to that “Garret Air Research” – has operated under a one-year air quality permit first issued in Sept 1996. The March 12, 2013 issued air quality operating permit is the facilities first five year operating permit issued to regulate air pollutants generated primarily from the use of fossil fuel fired equipment.

#### C. Attainment Classification

The Honeywell facility is located within an area that is in attainment for all pollutants.

### II. SOURCE DESCRIPTION

The Honeywell facility manufactures and tests a variety of parts and equipment related to the aerospace industry. The majority of the manufacturing and testing at the facility occurs in two primary manufacturing buildings. The permitted operations at the facility include two diesel fired emergency generators to provide emergency backup power and two natural gas fired boilers to supply steam and hot water. Chemical usage at the facility is generally associated with grinding, degreasing and coating operations. Several spray booths are used for paint mixing, paint/coating spraying, and spot painting and touch-up operations

The facility also has installed and operates certain equipment which is designated as de minimis or insignificant activities by Pima County Code; that equipment includes various electric curing ovens, fire pump fuel tanks, five cooling towers, a wave solder machine and three chillers.

The affected sources at the facility to which this air quality operating permit #1480 applies are identified in the following categories of the permit:

- Section A** National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines (40 CFR Part 63 Subpart ZZZZ).
- Section B** New and Existing Stationary Source Performance Standards for Fossil-Fuel Fired Industrial and Commercial Equipment
- Section C** New and Existing Stationary Source Performance Standards for Surface Coating and Solvent Handling Activities
- Section D** General Facility-Wide Specific Conditions.

### III. REGULATORY HISTORY

#### A. Testing and Inspections

A full compliance evaluation conducted on June 7, 2012 found the facility in compliance with all permit regulations.

#### B. Excess Emissions

No reports of excess air emissions.

### IV. EMISSIONS ESTIMATES

The Honeywell facility is located in an area that is considered in attainment for all criteria air pollutants. The following emission rates are for reference purposes only and are not intended to be enforced by direct measurement unless otherwise noted in the Specific Conditions of the permit. The emissions are based on the design capacity processing level for each process, operating for 8760 hours per year.

Pollutant	Potential Emissions (Tons per Year)
Nitrogen Oxides (NO <sub>x</sub> )	7.36
Carbon Monoxide (CO)	4.39
Volatile Organic Compounds (VOC)	7.83
Particulate Matter (as PM <sub>10</sub> )	4.67
Sulfur Oxides (SO <sub>x</sub> )	0.22
Hazardous Air Pollutants (HAPs – total)	5.47

The emissions from the Honeywell facility do not exceed the significant source threshold in Pima County Code (PCC) and thus it is classified as an 'Area Source'.

### V. APPLICABLE REQUIREMENTS

#### Code of Federal Regulations (CFR):

40 CFR Part 63 Subpart ZZZZ National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines - applicable to the existing stationary engines  $\leq 500$ HP located at Area Sources of HAP emissions constructed before 6/12/2006.

A negative applicability determination for Title 40 of the Code of Federal Regulations (40 CFR) Part 63, Subpart HHHHHH (National Emission Standards for Hazardous Air Pollutants: Paint Stripping and Miscellaneous Surface Coating Operations at Area Sources) was approved by PDEQ on February 9, 2012.

**Pima County Code (PCC)**

This is not meant to be an exhaustive list of every applicable requirement to which the Permittee is subject, but represents those performance standards cited in the permit. It is the responsibility of the Permittee to comply with all applicable regulations.

- PCC 17.16.040 Visible Emission Standards – Standards and Applicability (includes NESHAP)
- PCC 17.16.165 Standards of Performance for Fossil Fuel Fired Industrial and Commercial Equipment.
- PCC 17.16.340 Standards of Performance for Stationary Rotating Machinery.
- PCC 17.20.010 Emission Source Testing and Monitoring.

**VI. PERMIT CONTENTS**

**SECTION A**

**National Emissions Standards for Hazardous Air Pollutants (NESHAP) for Stationary Reciprocating Internal Combustion Engines (RICE) 40 CFR Part 63 Subpart ZZZZ.**

RICE use pistons that alternatively move back and forth to convert pressure into rotating motion. They're commonly used at power and manufacturing plants to generate electricity and to power pumps and compressors. RICE are also used in emergencies to produce electricity and pump water for flood and fire control. The U.S. Environmental Protection Agency (EPA) has recently finalized new air quality regulations that place requirements on owners and operators of a wide variety of stationary RICE.

The air toxics emitted from RICE include formaldehyde, acrolein, acetaldehyde and methanol. RICE engines also emit the conventional air pollutants created when fuel is burned including carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), and particulate matter (PM).

Subpart ZZZZ establishes national emission limitations and operating limitations for hazardous air pollutants (HAP) emitted from stationary reciprocating internal combustion engines (RICE) located at major and area sources of HAP emissions. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and operating limitations.

A summary of the applicable conditions are presented in the table on the following page:

Applicable RICE	RICE Compliance Requirements
<p>For Emergency Compression Ignition Engines.</p> <p>Existing Stationary Engine ≤500HP Located at Area Source of HAP constructed before 06/12/2006.</p>	<p>Numerical emission limitations: <b>No Requirements</b> Operating Limitations: <b>No Requirements</b> Performance Tests: <b>No Requirements</b></p> <p>Monitoring, Installation, Collection, Operation and Maintenance Requirements:</p> <ul style="list-style-type: none"> <li>• <b>Option 1:</b> Change oil/filter, inspect air cleaner or spark plugs, hoses/belts on prescribed schedule</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>• <b>Option 2:</b> May use oil analysis program instead of prescribed oil change frequency</li> </ul> <p><b>Must complete Option 1 or 2 above, AND:</b></p> <ul style="list-style-type: none"> <li>• Operate/maintain engine &amp; control device per manufacturer's instructions or owner-developed maintenance plan</li> <li>• Emergency engines must have a non-resettable hour meter and record hours of operation and document hours spent in emergency or non-emergency operation. If engines used for demand response, keep record of notification of emergency situation and time operated.</li> <li>• Keep records of maintenance</li> </ul> <p>Initial Compliance: <b>No Requirements</b> Notification Requirements: <b>No Requirements</b> Reporting Requirements: <b>No Requirements</b></p>

**SECTION B**

**New and Existing Stationary Source Performance Standards for Fossil-Fuel Fired Industrial and Commercial Equipment**

**(Locally Enforceable Conditions, unless otherwise stated)**

**Applicability**

Fossil fuel fired equipment located at a source which is required to obtain an air quality operating permit pursuant to Title 17 of the Pima County Code (PCC) 17.12.140.B.3.c.

Condition in Permit	Discussion	Authority
I.A	Prohibition from emitting smoke from the boilers in excess of 20% opacity.	PCC 17.16.040
I.B	Prohibition from firing fuels other than natural gas. This is a Synthetic Emission Limitation as firing alternate fuels may result in an increase in emissions above major source thresholds.	PCC 17.12.190.B

Condition in Permit	Discussion	Authority
II.A	Monitoring - A demonstration to show compliance with the opacity limitation is not required since the percent of opacity of visible emissions whilst combusting natural gas is inherently low. The Permittee has reported that the applicable boilers are fired exclusively by Natural Gas.	PCC 17.12.185.A.3
II.B	Monitoring - Fuel Prohibition from firing fuels other than those allowed by the permit. This is a synthetic emission limitation as firing alternate fuels may result in an increase in emissions above major source thresholds. There is also a prohibition from firing high sulfur fuel. This requirement is the basis for not requiring measures to show compliance with PCC 17.16.340.F and H.	PCC 17.12.185.A.3
III	Requirement to maintain records of any emissions in excess of the limits established by this permit. All records shall be maintained for five years.	PCC 17.12.185.A.4
IV	Reporting Requirements to report all excess emissions to the Control Officer.	PCC 17.12.185.A.5 and PCC 17.12.040
V	Testing Requirements - to conduct testing to demonstrate compliance with the applicable standards. Various conversion formulae are provided to determine the mass per unit output emissions.	PCC 17.20.010
V.A	Opacity Testing Requirements - provision for the Control Officer to request that a Method 9 test be conducted by the Permittee.	PCC 17.12.050 & PCC 17.20.010 PCC 17.12.040.B
V.B	Fuel Testing - guidance for the Permittee to demonstrate compliance that pipeline quality natural gas was fired exclusively in the boiler.	PCC 17.12.185.A.3 and PCC 17.20.010
V.C	Provision to allow the Permittee to submit an alternate and equivalent test method(s) that is listed in 40 CFR Subpart 60, Appendix A, to the Control Officer in a test plan, for approval by the Control Officer.	PCC 17.12.045.D
VI	Provision for the Permittee to submit the proper notification and follow the required permit revision procedures for facility changes.	PCC 17.12.240, PCC 17.12.255, and PCC 17.12.260

**SECTION C**

**New and Existing Stationary Source Performance Standards for the Surface Coating and Solvent Handling Activities**

**(Locally Enforceable Conditions, unless otherwise stated)**

**Applicability**

Paint spray operations located at a source which are required to obtain an air quality operating permit pursuant to Title 17 of the Pima County Code (PCC) 17.12.140.B.3.c.

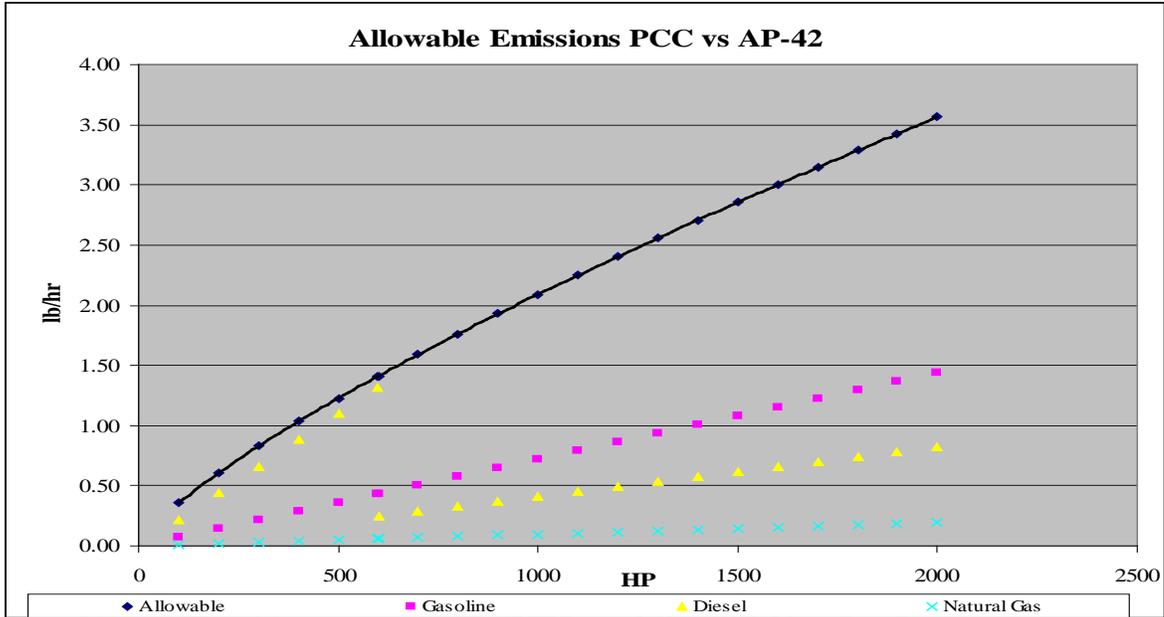
<b>Condition in Permit</b>	<b>Discussion</b>	<b>Authority</b>
I.A	Locally enforceable control measure provided to reduce the emissions from spray-coating overspray operations.	PCC 17.16.400.C.1
I.B	Local enforceable control measure to reduce and control the potential gaseous or odorous emissions from the spray coating operation.	PCC 17.16.430.D & PCC 17.16.430.F
II.A	Requirement for the Permittee to keep documentation verifying compliance with the spray coating overspray requirement.	PCC 17.12.185.A.3
II.B	Practical exclusion from odor monitoring as the application of good modern practices is sufficient to control the emissions of odors beyond the property boundary.	PCC 17.12.185.A.4
III	Generic excess emission reporting requirement ensuring the Permittee reports all instances when the emissions are in excess of the applicable standard.	PCC 17.12.040
IV	No testing applicable requirements identified in Pima County Code.	PCC 17.12.040

**VII. Miscellaneous Comments**

- A. Pima County Code PCC 17.16.340.H references a condition prohibiting the use of high sulfur oil by the Permittee. It has been accepted that compliance with this sulfur limitation ensures compliance with the Sulfur Dioxide Standard of PCC 17.16.340.F which limits the emission of SO<sub>2</sub> to 1.0 pound per million BTU heat input, when burning low sulfur fuel. It is not necessary to include either sulfur limitation in the permit as the applicable stationary rotating machinery (generator) is exclusively fired by natural gas. The Federal Energy Regulatory Commission (FERC) approved Tariff agreement, limits transmission of pipeline quality natural gas to a sulfur content less than 0.8 percent by weight.
- B. The requirement in PCC 17.16.340.J to report daily periods when the fuel sulfur content of the fuel being fired exceeds 0.8% by weight has not been included in the permit as all fuel that is delivered to Pima County has an enforceable limit of 0.9% by weight. Any fuel over 0.8% but below 0.9% would not be an exceedance of any standard or limitation and so it would be burdensome for sources to report every time the fuel had a sulfur content above 0.8%. Moreover, even though the sulfur content limit is 0.9% by weight, natural gas delivered to Pima County consistently shows sulfur levels below this limit as shown in past records of fuel supplier specifications which verify sulfur content of the fuel fired.

**C. Particulate Matter:**

PCC 17.16.340.C.1 limits the emissions of particulate matter from stationary rotating machinery. This rule has not been included in the permit as allowable emissions are well above potential emissions. The following Chart illustrates this fact:



AP-42 estimated natural gas emissions are demonstrably less than allowable emissions; therefore, it is not necessary to include the standard in the permit explicitly but, by reference in Attachment 1.

**VIII. IMPACTS TO AMBIENT AIR QUALITY**

Not a major source so no impact studies are required.

**IV. CONTROL TECHNOLOGY DETERMINATION**

No control technologies needed to be determined; source is not subject to BACT or LAER.

**X. PREVIOUS PERMIT CONDITIONS**

The initial March 13, 2013 five year permit incorrectly specified applicable NESHAP RICE reporting requirements. These conditions have been removed in the July, 2013 issued revised permit because the source does not operate an applicable unit that meets the conditions in Table 7 of 40 CFR 63 Subpart ZZZZ. According to the aforementioned Table 7, the only emergency engines subject to reporting requirements are those which operate for the purposes specified in:

- 63.6640(f)(2)(ii), emergency demand response (more than 15 hours per year)
- 63.6640(f)(2)(iii) periods where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage or frequency (more than 15 hours per year)
- 63.6640(f)(4)(ii) to supply power as part of a financial arrangement with another entity

Neither of the engines located at the Honeywell facility are specified for these purposes. PDEQ has thus removed these requirements from the air operating permit.

**APPENDIX 1**

**POTENTIAL TO EMIT**



**Chemical Usage (6/1/12-6/1/13)**

Chemical	Weight per Gallon (lb/gal)	VOC / HAP Content (Weight %)	Annual Usage (gal/yr) <sup>1</sup>	Annual Usage (lb/yr)	Amount Shipped as Waste (lb/yr) <sup>2</sup>
IPA	6.65	100% VOC	2970	19751	23,577
MEK	6.72	100% VOC	385	2587	
Thinner 64 Humiseal	7.75	100% VOC / 30% HAP	109	845	
2A64 Part A Humiseal	8.58	48% VOC / 18% HAP	153	1313	
2A64 Part B Humiseal		44% VOC / 16% HAP			
Type 1B31 Humiseal	7.33	68% VOC / 50% HAP	15	110	
2110 Saponifier	8.3	95% VOC / 1% HAP	660	5478	N/A
Various Paints	11.16	100% VOC / 100% HAP	60	670	399
Methanol	6.55	100% VOC / 100% HAP	4	26	N/A

HAP = Hazardous Air Pollutant

VOC = Volatile Organic Compound

lb/gal - pound per gallon

gal/yr = gallon per year

lb/yr = pound per year

N/A = not applicable

<sup>1</sup> Annual Usage (gal/yr) obtained from purchasing records for the stated time period.

<sup>2</sup> Amount Shipped as Waste based on waste shipping records for the stated time period. Chemicals are combined in waste streams "Lacquer Wash Thinner" and "Flux Thinner".

\*\*Paint usage is a conservative estimate based on best available records/process knowledge

Honeywell International, Inc.  
Air Quality Operating Permit #1480

Air Quality Permit Revision, No. 1480  
Honeywell Aerospace

July 2010  
Project No. 603090001

**Table 4 - VOC and HAP Potential to Emit**

Product	Specific Gravity	CAS Number	Components	Weight %	VOC/HAP	VOC Content	HAP Content	Annual Usage <sup>1,2</sup>		Projected Annual Usage <sup>3</sup>	Annual Amount Shipped as Waste <sup>4</sup>	Annual VOC Emission	Annual HAP Emission
	(g/cm <sup>3</sup> )			(%)		(%)	(%)	(gal/yr)	(lbs)	(lb/yr)	(lb/yr)	(lb/yr)	(lb/yr)
Isopropyl Alcohol	0.786	67-63-0	Isopropyl Alcohol	100	VOC	100%	0%	2,970	19,751	24,689			
Methyl Ethyl Ketone	0.805	78-93-3	Methyl Ethyl Ketone	100	VOC	100%	0%	385	2,587	3,234			
Thinner 64 Humiseal	0.93	108-65-6	Propylene Glycol Methyl ether Acetate	70	VOC	100%	30%	109	845	1,056	23,577		
		108-88-3	Toluene	30	VOC/HAP								
2A64 Part A Humiseal	1.03	108-65-6	Propylene Glycol Methyl ether Acetate	27	VOC	48%	18%	153	1,313	679			
		108-88-3	Toluene	18	VOC/HAP								
		141-78-6	Ethyl Acetate	1	VOC								
		proprietary	Polyesters	proprietary	-								
2A64 Part B Humiseal	1.11	108-65-6	Propylene Glycol Methyl ether Acetate	29	VOC	44%	16%	15	110	138			
		108-88-3	Toluene	2	VOC/HAP								
		1330-20-7	Xylene	14	VOC/HAP								
		26471-62-5	Toluene Diisocyanate	0.28	VOC/HAP								
		proprietary	Prepolymer Resin	proprietary	-								
		108-88-3	Toluene	50	VOC/HAP								
Type 1B31 Humiseal	0.88	78-93-3	Methyl Ethyl Ketone	15	VOC	68%	50%	15	110	138			
		proprietary	Acrylic Polymer	proprietary	-								
		proprietary	Optical Brightener	proprietary	-								
		proprietary	Optical Brightener	proprietary	-								
<b>Subtotal</b>									<b>29,795</b>	<b>23,577</b>	<b>4,788</b>	<b>1,181</b>	
2110 Saponifier	0.997	141-43-5	2-aminoethanol	50-60	VOC	95%	1%	660	5,478	6,848	6,163	342	7
		112-34-5	2-(2-butoxyethoxy)ethanol	30-40	VOC								
		872-50-4	N-methyl-2-pyrrolidone	1-5	VOC								
		68987-81-5	alcohols	1-5	VOC								
		107-21-1	ethanol	0.1-1	VOC/HAP								
Various Paints (see below)	1.34	-	Various VOC/HAP	100	VOC/HAP	100%	100%	4	26	33	N/A	9,565	9,565
Methanol	0.79	67-56-1	Methanol	100	VOC/HAP	100%	100%	4	26	33	N/A	33	33
<b>TOTAL</b>											<b>14,695</b>	<b>10,753</b>	

<sup>1</sup> Total Quantity Purchased based on purchasing records for the stated time period.

<sup>2</sup> The Total Quantity of "Various Parts" was based on purchasing records. Honeywell Aerospace uses approximately 75 different paint part numbers. To be conservative VOC/HAP emissions were estimated assuming a VOC/HAP content of 100%.

<sup>3</sup> Project Annual Usage estimated by multiplying total quantity purchased by a growth factor of 25%. Since hazardous VOC/HAP materials are mixed in various waste streams, the Projected Annual Usage less the Annual Amount Shipped as Waste was considered 100% VOC (worst case potential) and 100% HAP content (worst case potential).

<sup>4</sup> Annual Amount Shipped as Waste is based on waste Honeywell Aerospace shipping records for the stated time period.

Product	Specific Gravity	CAS Number	Components	Weight %	VOC/HAP	VOC Content	HAP Content	Paint Gun Fluid Output	Maximum Spray Time	Number of Booths	Annual Amount Shipped as Waste <sup>4</sup>	Annual VOC Emission	Annual HAP Emission
	(g/cm <sup>3</sup> )			(%)		(%)	(%)	(%)	(lb/yr)		(lb/yr)	(lb/yr)	
Various Paints	1.34	-	Various VOC/HAP	100	VOC/HAP	100%	100%	25	4	2	399	9,565	9,565

Assumes manual spray gun used for paint operations: LPH-50 0620 (max fluid output 25 ml/min)

Operational limits based on paint booths operated during first and second shifts only and preparation, drying and gun cleaning time required for each operation (max spray time based on process = 12 min/hr).

(25 ml/min \* 12 min spray/hr (operational limitation) \* 332 days/year \* 1 gal/0.75 ml \* 11.6 lb/gal \* 16 hrs/day \* 2 booths) = 399 lbs of waste/yr

**Table 5 - Kohler Emergency Generator Potential to Emit**

<b>Assumption:</b>			<b>Description:</b>	
Hours per year/unit operated:	500	Kohler Emergency Generator		
Weight % of sulfur:	0.0015			
Rated Maximum Capacity Emergency Generator (kW):		100	Nominal BHP	134
		mmBtu/hr	0.94	

Pollutant	Emission Factor <sup>1</sup>	Emission Factor <sup>2</sup>	Potential Emissions <sup>3</sup>		
	(lb/hp-hr)	(lb/mmBtu)	(lb/hr)	(lb/yr)	(tons/year)
CO	6.68E-03	-	0.90	447.56	0.22
NO <sub>x</sub>	3.10E-02	-	4.15	2,077.00	1.04
SO <sub>x</sub>	2.05E-03	-	0.27	137.35	0.07
CO <sub>2</sub>	1.15	-	154.10	77,050.00	38.53
PM <sub>10</sub>	2.20E-03	-	0.29	147.40	0.07
VOC	2.47E-03	-	0.33	165.49	0.08
Acetaldehyde		7.67E-04	7.2E-04	0.36	1.80E-04
Benzene	-	9.33E-04	8.8E-04	0.44	2.19E-04
Formaldehyde	-	1.18E-03	1.1E-03	0.55	2.77E-04
Naphthalene	-	8.48E-05	8.0E-05	0.04	1.99E-05
PAHs ( minus naphthalene)	-	8.32E-05	7.8E-05	0.04	1.95E-05
Propylene	-	2.58E-03	2.4E-03	1.21	6.05E-04
Toluene	-	4.09E-04	3.8E-04	0.19	9.59E-05
Xylene	-	2.85E-04	2.7E-04	0.13	6.68E-05
Total HAPs					0.00148

<sup>1</sup> Emission factors for criteria pollutants are from AP-42 Chapter 3 Section 3 – Gasoline and Diesel Industrial Engines Table 3.3-1 Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engine.

<sup>2</sup> Emission factors for speciated organic compounds are from AP-42 Chapter 3 Section 3 – Gasoline and Diesel Industrial Engines Table 3.3-2 Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engine.

<sup>3</sup> Annual emissions are based on the assumed hours per year (500 cumulative hrs/yr).

**Table 6 - Caterpillar Fire Pump Engine Potential to Emit**

<b>Assumption:</b>			<b>Description:</b>	
Hours per year/unit operated:	500	Caterpillar Fire Pump Engine		
Weight % of sulfur:	0.0015			
Rated Maximum Capacity Emergency Fire Pump (kW):		175	Nominal BHP	235
		mmBtu/hr	1.65	

Pollutant	Emission Factor <sup>1</sup>	Emission Factor <sup>2</sup>	Potential Emissions <sup>4</sup>		
	(lb/hp-hr)	(lb/mmBtu)	(lb/hr)	(lb/yr)	(tons/year)
CO	6.68E-03	-	1.57	784.90	0.39
NO <sub>x</sub>	3.10E-02	-	7.29	3,642.50	1.82
SO <sub>x</sub>	2.05E-03	-	0.48	240.88	0.12
CO <sub>2</sub>	1.15	-	270.25	135,125.00	67.56
PM <sub>10</sub>	2.20E-03	-	0.52	258.50	0.13
VOC	2.47E-03	-	0.58	290.23	0.15
Acetaldehyde		7.67E-04	1.3E-03	0.63	3.15E-04
Benzene	-	9.33E-04	1.5E-03	0.77	3.84E-04
Formaldehyde	-	1.18E-03	1.9E-03	0.97	4.85E-04
Naphthalene	-	8.48E-05	1.4E-04	0.07	3.49E-05
PAHs (minus naphthalene)	-	8.32E-05	1.4E-04	0.07	3.42E-05
Propylene	-	2.58E-03	4.2E-03	2.12	1.06E-03
Toluene	-	4.09E-04	6.7E-04	0.34	1.68E-04
Xylene	-	2.85E-04	4.7E-04	0.23	1.17E-04
Total HAPs					0.00260

<sup>1</sup> Emission factors for criteria pollutants are from AP-42 Chapter 3 Section 3 – Gasoline and Diesel Industrial Engines Table 3.3-1 Emission Factors for Uncontrolled Gasoline and Diesel Industrial Engine.

<sup>2</sup> Emission factors for speciated organic compounds are from AP-42 Chapter 3 Section 3 – Gasoline and Diesel Industrial Engines Table 3.3-2 Speciated Organic Compound Emission Factors for Uncontrolled Diesel Engine.

<sup>3</sup> Annual emissions are based on the assumed hours per year (500 cumulative hrs/yr).

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**Table 7 - Sellers Boilers Potential to Emit**

**Fuel: Natural Gas**

Pollutant	Rating	Emission Factor		Potential Emissions (individual unit) <sup>4</sup>			Potential Emissions (two units) <sup>4</sup>		
	MMBtu/hr	(lb/10 <sup>6</sup> scf)	(lb/MMBtu) <sup>5</sup>	(lb/hr)	(lb/yr)	(tons/year)	(lb/hr)	(lb/yr)	(tons/year)
NO <sub>x</sub> <sup>1,6</sup>	5.231	100	9.80E-02	0.51	4,492.51	2.25	1.03	8,985.01	4.49
CO <sup>1,6</sup>	5.231	84	8.24E-02	0.43	3,773.70	1.89	0.86	7,547.41	3.77
PM(total) <sup>2</sup>	5.231	7.6	7.45E-03	0.04	341.43	0.17	0.08	682.86	0.34
SO <sub>x</sub> <sup>2,7</sup>	5.231	0.6	5.88E-04	0.003	26.96	0.01	0.01	53.91	0.03
CH <sub>4</sub> <sup>2</sup>	5.231	2.3	2.25E-03	0.01	103.33	0.05	0.02	206.66	0.10
VOC <sup>2</sup>	5.231	5.5	5.39E-03	0.03	247.09	0.12	0.06	494.18	0.25
Pb <sup>2</sup>	5.231	5.00E-04	4.90E-07	2.56E-06	0.02	0.00	5.13E-06	4.49E-02	2.25E-05
Benzene <sup>3</sup>	5.231	2.10E-03	2.06E-06	1.08E-05	0.09	0.00	2.15E-05	1.89E-01	9.43E-05
Dichlorobenzene <sup>3</sup>	5.231	1.20E-03	1.18E-06	6.15E-06	0.05	0.00	1.23E-05	1.08E-01	5.39E-05
Formaldehyde <sup>3</sup>	5.231	7.50E-02	7.35E-05	3.85E-04	3.37	0.00	7.69E-04	6.74E+00	3.37E-03
Hexane <sup>3</sup>	5.231	1.80E+00	1.76E-03	9.23E-03	80.87	0.04	1.85E-02	1.62E+02	8.09E-02
Napthalene <sup>3</sup>	5.231	6.10E-04	5.98E-07	3.13E-06	0.03	0.00	6.26E-06	5.48E-02	2.74E-05
PAHs <sup>3</sup>	5.231	6.52E-04	6.39E-07	3.34E-06	0.03	0.00	6.69E-06	5.86E-02	2.93E-05
Toluene <sup>3</sup>	5.231	3.40E-03	3.33E-06	1.74E-05	0.15	0.00	3.49E-05	3.05E-01	1.53E-04
Total HAPs =						0.04	Total HAPs = 0.08		

<sup>1</sup> Emission factors for criteria pollutants are taken from AP-42 Chapter 1 Section 4 – Natural Gas Combustion Table 1.4-1 Emission Factors For Nitrogen Oxides (NO<sub>x</sub>) and Carbon Monoxide From Natural Gas Combustion.

<sup>2</sup> Emission factors for criteria pollutants are taken from AP-42 Chapter 1 Section 4 – Natural Gas Combustion Table 1.4-2 Emission Factors For Criteria Pollutants and Greenhouse Gases From Natural Gas Combustion.

<sup>3</sup> Emission factors for hazardous air pollutants are taken from AP-42 Chapter 1 Section 4 – Natural Gas Combustion Table 1.4-3 Emission Factors for Speciated Organic Compounds From Natural Gas Combustion.

<sup>4</sup> Annual emissions are based on an operating schedule of 24 hours/day, 365 days/year (i.e., 8,760 hours/year).

<sup>5</sup> Assume 1,020 Btu/scf for natural gas fuel.

<sup>6</sup> Emission factor based on 100ppm NO<sub>x</sub> and 200ppm for CO.

<sup>7</sup> Emission factor based on 0.0006 lb/mmBtu default pipeline natural gas defined in 40 CFR 72.2

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**Table 8 - Cooling Tower Potential to Emit**

Cooling Tower Unit	Water Circulation Rate	TDS <sup>1</sup>	Drift Loss <sup>2</sup>	Potential Emissions (single unit) <sup>3, 4</sup>		
	(gal/min)	(ppm)	(%)	(lb/hr)	(lb/yr)	(tons/year)
Baltimore Aircoil Company 8912	1,500	1,500	0.02	0.225	1,972.58	0.99
Baltimore Aircoil Company 8912	1,500	1,500	0.02	0.225	1,972.58	0.99
Baltimore Aircoil Company 8913	1,500	1,500	0.02	0.225	1,972.58	0.99
Baltimore Aircoil Company 8914	1,500	1,500	0.02	0.225	1,972.58	0.99
Marley 4852	240	1,500	0.02	0.036	315.61	0.16
Frigid Coil	112	1,500	0.002	0.002	14.73	0.01
Frigid Coil	112	1,500	0.002	0.002	14.73	0.01
Frigid Coil	112	1,500	0.002	0.002	14.73	0.01
<b>Total</b>				<b>0.94</b>	<b>8,250.11</b>	<b>4.13</b>

<sup>1</sup> Total Dissolved Solid (TDS) values obtained from Honeywell Aerospace personnel on June 25, 2010.

<sup>2</sup> Drift Loss (%) obtained from AP-42 Chapter 13 Section 4 – Wet Cooling Towers Table 13.4-1 Particulate Emissions Factors for Wet Cooling Towers.

<sup>3</sup> Annual emissions are based on an operating schedule of 24 hours/day, 365 days/year (i.e., 8,760 hours/year).

<sup>4</sup> Potential PM emissions were estimated using Equation 2 from South Coast Air Quality Management District (SCAQMD) - Guidelines for Calculating Emissions from Cooling Towers dated June 2006. Available at [http://www.ecotek.com/daqm/2007/forms\\_and\\_instructions\\_pdf/0506\\_GuidelinesCalcEmissionsCoolingTow.pdf](http://www.ecotek.com/daqm/2007/forms_and_instructions_pdf/0506_GuidelinesCalcEmissionsCoolingTow.pdf)

$$\text{Equation 2: } E = V * \text{TDS} / 10^6 * n_{\text{drift}} / 100 * \rho_{\text{H}_2\text{O}} * 60 * \text{OH}$$

Where:

E = Annual Emissions in pounds per year (lb/yr)

V = Cooling tower circulation water rate (gal/min)

TDS = Concentration of total dissolved solids in circulation water (PPM by weight)

$n_{\text{drift}}$  = Drift loss of circulating water (%)

$\rho_{\text{H}_2\text{O}}$  = Density of water: 8.34 lb/gal

60 = Conversion from minutes to hours

OH = Annual operating hours (hours/year)

**Table 9 - Wave Soldering Machine Potential to Emit**

Wave Solder Machine Unit	Lead (Pb) Emission Factor <sup>1</sup>	Potential Emissions <sup>2</sup>		
	<i>(mg/hr)</i>	<i>(lb/hr)</i>	<i>(lb/yr)</i>	<i>(tons/year)</i>
ElectroVert	86.0	0.00019	1.66087	0.00083

<sup>1</sup>Emission factor (86 mg/hr) referenced from TRI Reporting Survey (<http://www.pwbr.org/wsg.cfm>)

<sup>2</sup>Annual emissions are based on an operating schedule of 24 hours/day, 365 days/year (i.e., 8,760 hours/year).

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**Table 10 - Facility Annual Potential-to-Emit Summary**

Pollutant	Chemical Usage Emissions		Emergency Generator Emissions		Fire Water Pump Emissions		Boiler Emissions		Cooling Tower Emissions		Wave Solder Machine Emissions		Total Emissions	
	(lb/yr)	(tpy)	(lb/yr)	(tpy)	(lb/yr)	(tpy)	(lb/yr)	(tpy)	(lb/yr)	(tpy)	(lb/yr)	(tpy)	(lb/yr)	(tons/year)
CO	-	-	447.56	0.22	784.90	0.39	7,547.41	3.77	-	-	-	-	8,784.26	4.39
NOx	-	-	2,077.00	1.04	3,642.50	1.82	8,985.01	4.49	-	-	-	-	14,711.86	7.36
SOx	-	-	137.35	0.07	240.88	0.12	53.91	0.03	-	-	-	-	432.35	0.22
PM <sub>10</sub>	-	-	147.40	0.07	258.50	0.13	682.86	0.34	8,250.11	4.13	-	-	9,343.54	4.67
VOC	14,695.28	7.35	165.49	0.08	290.23	0.15	494.18	0.25	-	-	-	-	15,653.00	7.83
Pb	-	-	-	-	-	-	0.04	-	-	-	1.66	0.00	1.71	0.00
Total HAPs	10,753.34	5.38	2.61	0.00	5.20	0.00	169.18	0.08	-	-	1.66	0.00	10,937.45	5.47
Acetaldehyde	-	-	0.36	0.00	0.63	0.00	-	-	-	-	-	-	0.99	0.00
Benzene	-	-	0.44	0.00	0.77	0.00	0.19	0.00	-	-	-	-	1.39	0.00
Dichlorobenzene	-	-	-	-	-	-	0.11	-	-	-	-	-	0.11	0.00
Formaldehyde	-	-	0.55	0.00	0.97	0.00	6.74	0.00	-	-	-	-	8.27	0.00
Hexane	-	-	-	-	-	-	161.73	-	-	-	-	-	161.73	0.08
Naphthalene	-	-	0.04	0.00	0.07	0.00	0.05	0.00	-	-	-	-	0.16	0.00
PAHs (minus naphthalene)	-	-	0.04	0.00	0.07	0.00	0.06	0.00	-	-	-	-	0.17	0.00
Propylene	-	-	1.21	0.00	2.12	0.00	-	-	-	-	-	-	3.33	0.00
Toluene	-	-	0.19	0.00	0.34	0.00	0.31	0.00	-	-	-	-	0.83	0.00
Xylene	-	-	0.13	0.00	0.23	0.00	-	-	-	-	-	-	0.37	0.00

Note: Emission values in bold indicate that the emission source will be installed at the site. Emission values in black indicate no change from the current permit  
NA = Not Applicable