

1112. AIR, TOXICS

106.41



DEPARTMENT OF THE NAVY

MARE ISLAND NAVAL SHIPYARD
VALLEJO, CALIFORNIA 94592-5100

IN REPLY REFER TO:

5090
Ser 106.415/203

MAY 12 1989

Patricia A. Holmes
Bay Area Air Quality
Management District
939 Ellis Street
San Francisco, CA 94109

Dear Ms. Holmes:

Enclosure (1) is submitted as requested in your letter of January 27, 1989.

Please direct questions or comments concerning the enclosure to Code 106.415, Mr. Brad Beeman, Telephone (707) 646-3375 or 553-2191.

Sincerely,

STEVEN P. BRIXEY
Head, Environmental Management Division
By direction of the Shipyard Commander

Enclosure:

(1) Markup of Toxic Inventory Preview dated 31 Jan 89

BAY AREA
AIR QUALITY MANAGEMENT DISTRICT

TOXIC INVENTORY PREVIEW

MARF ISLAND NAVAL SHIPYARD (plant # 44)

JAN 31, 1989

S#	Source & Material	Toxic Pollutant	Emissions (lbs/yr)
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1	BOILER #1 BLDG 121 (C1130189) Natural gas 358706 therms [*] therms/yr	Benzene Formaldehyde	.79 33.25
2	BOILER #2 BLDG 121 (C1130189) Natural gas 358706 therms [*] therms/yr	Benzene Formaldehyde	.79 33.25
17	Spray Painting Dry Dock No.1 (SG700307) Xylene 438 gal/yr	Xylene	3172.75
18	Spray Painting, Dry Dock No. 2 (SG700307) Xylene 109 gal/yr	Xylene	789.57
19	Spray Painting Dry Dock No.3 (SG700307) Xylene 180 gal/yr	Xylene	1303.87
20	Spray Painting Dry Dock No.4 (SG700307) Xylene 233 gal/yr	Xylene	1687.79
22	DEGREASER (RDB) (SD03A294) Trichloroethane, 1,1 0 gal/yr	Dioxane (1,4-) Trichloroethane (1,1)	.00 .00
	Trichloroethylene 0 gal/yr	Trichloroethylene	.00
35	Cold Cleaner, Bldg 750 (SF03A307) Xylene 72 gal/yr	Xylene	525.60
36	Open Air Spray Painting, Area 900 (SG700307) Xylene 36 gal/yr	Xylene	260.77
46	DRYING AND CURTING OVEN, STEAM AND GAS HEATED (C64) Natural gas 133 therms [*] therms/yr	Benzene	.00

* 1000ft³/yr

S#	Source & Material	Toxic Pollutant	Emissions (lbs/yr)
56	COATING SPRAYBOOTH (SG700307) Xylene	6 gal/yr Xylene	43.46
81	PAINT AND FIBERGLASS FORMULATION BOOTH (KYH) (SJO) Trichloroethylene	5 gal/yr Trichloroethylene	61.00
121	PAINT SPRAY BOOTH - SIDEDRAFT, WATER WASH (SG7003) Xylene	36 gal/yr Xylene	260.77
123	PAINT SPRAY BOOTH - SIDEDRAFT, WATER WASH (SG7003) Xylene	22 gal/yr Xylene	159.36
124	PAINT SPRAY BOOTH - SIDEDRAFT, WATER WASH (SG7003) Xylene	22 gal/yr Xylene	159.36
126	PAINT SPRAY BOOTH - DOWNDRAFT, WATER WASH (SG7003) Xylene	10 gal/yr Xylene	72.44
127	PAINT SPRAY BOOTH - DOWNDRAFT, WATER WASH (SG7003) Xylene	10 gal/yr Xylene Xylene	72.44 72.44
128	PAINT SPRAY BOOTH - DOWNDRAFT, WATER WASH (SG7003) Xylene	10 gal/yr Xylene Xylene	72.44 72.44
129	PAINT SPRAY BOOTH - DOWNDRAFT, WATER WASH (SG7003) Xylene	10 gal/yr Xylene Xylene	72.44 72.44
130	PAINT SPRAY BOOTH - DOWNDRAFT, WATER WASH (SG7003) Xylene	10 gal/yr Xylene Xylene	72.44 72.44
131	PAINT SPRAY BOOTH - DOWNDRAFT, WATER WASH (SG7003) Xylene	10 gal/yr Xylene Xylene	72.44 72.44

S#	Source & Material	Toxic Pollutant	Emissions (lbs/yr)
133	PAINT SPRAY BOOTH, WATER WASH W/PUMP Xylene	(SG700307) 1 gal/yr Xylene	7.24
140	HEATING PLANT, HOT WATER Natural gas	(C1360189) 122 therms /yr * Benzene Formaldehyde	.00 .01
141	QTRS 2,3,4,5, HEATING PLANT, HOT WATER Natural gas	(C1360189) 1490 therms /yr * Benzene Formaldehyde	.01 .14
142	HEATING PLANT, HOT WATER Natural gas	(C1300189) 150 therms /yr 2,176 * Benzene Formaldehyde	.00 .01
144	HEATING PLANT, HOT WATER Natural gas	(C1350189) 1716 therms /yr * Benzene Formaldehyde	.02 .16
145	HEATING PLANT, STEAM Natural gas	(C1350189) 1716 therms /yr * Benzene Formaldehyde	.02 .16
146	BLDG. 41, HEATING PLANT, HOT WATER Natural gas	(C1360189) 850 therms /yr * Benzene Formaldehyde	.01 .08
147	HEATING PLANT, HOT WATER Natural gas	(C1360189) 190 therms /yr * Benzene Formaldehyde	.00 .02
149	HEATING PLANT, HOT WATER Natural gas	(C1360189) 626 therms /yr * Benzene Formaldehyde	.00 .06
150	HEATING PLANT, HOT WATER Natural gas	(C1360189) 279 therms /yr * Benzene Formaldehyde	.00 .03

* 1000 ft³/yr

S#	Source & Material	Toxic Pollutant	Emissions (lbs/yr)
151	HEATING PLANT, HOT WATER (C1360189) Natural gas	163 therms /yr * Benzene Formaldehyde	.00 .02
152	HEATING PLANT, STEAM, 1,004,000 BTU/HR OUTPUT (C1 Natural gas	1438 therms /yr * Benzene Formaldehyde	.01 .13
153	HEATING PLANT, HOT WATER (C1300189) Natural gas	382 therms /yr * Benzene Formaldehyde	.00 .04
154	HEATING PLANT, HOT WATER (C1360189) Natural gas	382 therms /yr * Benzene Formaldehyde	.00 .04
155	HEATING PLANT, STEAM (C1350189) Natural gas	9744 therms /yr * Benzene Formaldehyde	.09 .90
156	HEATING PLANT, HOT WATER (C1360189) Natural gas	342 therms /yr * Benzene Formaldehyde	.00 .03
161	HEATING PLANT, HOT WATER (C1360189) Natural gas	929 therms /yr * Benzene Formaldehyde	.01 .09
162	HEATING PLANT, HOT WATER (C1360189) Natural gas	929 therms /yr * Benzene Formaldehyde	.01 .09
163	HEATING PLANT, STEAM, NATURAL GAS (C1350189) Natural gas	5477 therms /yr * Benzene Formaldehyde	.05 .51
165	HEATING PLANT, HOT WATER, (C1360189) Natural gas	1 therms /yr * Benzene Formaldehyde	.00 .00

* 1000 ft³/yr

S#	Source & Material	Toxic Pollutant	Emissions (lbs/yr)
166	HEATING PLANT, HOT WATER (C1360189) Natural gas	369 therms /yr * Benzene Formaldehyde	.00 .03
167	HEATING PLANT, STEAM (C1350189) Natural gas	2048 therms /yr * Benzene Formaldehyde	.02 .19
168	HEATING PLANT, HOT WATER (C1350189) Natural gas	88 therms /yr * Benzene Formaldehyde	.00 .01
169	HEATING PLANT, HOT WATER (C1350189) Natural gas	88 therms /yr * Benzene Formaldehyde	.00 .01
170	HEATING PLANT, HOT WATER (C1350189) Natural gas	1313 therms /yr * Benzene Formaldehyde	.01 .12
171	HEATING PLANT, HOT WATER (C1350189) Natural gas	1313 therms /yr * Benzene Formaldehyde	.01 .12
173	BLDG. 764, HEATING PLANT, HOT WATER (C1360189) Natural gas	368 therms /yr * Benzene Formaldehyde	.00 .03
174	HEATING PLANT, HOT WATER (C1350189) Natural gas	310 therms /yr * Benzene Formaldehyde	.00 .03
175	BLDG 767, HEATING PLANT, HOT WATER (C1350189) Natural gas	310 therms /yr * Benzene Formaldehyde	.00 .03
176	HEATING PLANT, HOT WATER (C1350189) Natural gas	3426 therms /yr * Benzene Formaldehyde	.03 .32

* 1000 ft³/yr

S#	Source & Material	Toxic Pollutant	Emissions (lbs/yr)
177	HEATING PLANT, HOT WATER (C1250189) Natural gas 2758 therms/yr	* Benzene Formaldehyde	.02 .26
178	HEATING PLANT, HOT WATER (C1360189) Natural gas 238 therms/yr	* Benzene Formaldehyde	.00 .02
179	HEATING PLANT, HOT WATER (C1360189) Natural gas 57 therms/yr	* Benzene Formaldehyde	.00 .01
180	GARBAGE COOKER, WET GARBAGE FROM SHIPS, LPF-FIRED LPG 1015 gal/yr	Benzene	.00
182	HEATING PLANT, HOT WATER, OIL-FIRED (C1360315) Distillate oil 3465 gal/yr	Arsenic (all) Benzene Beryllium (all) Cadmium Chromium (hexavalent) Formaldehyde Lead (all) Manganese Mercury (all) Nickel Polycyclic aromatic	.00 .03 .00 .01 .00 .19 .00 .01 .00 .08 .01
183	HEATING PLANT, HOT WATER, OIL FIRED (C1360315) Distillate oil 1393 gal/yr	Arsenic (all) Benzene Beryllium (all) Cadmium Chromium (hexavalent) Formaldehyde Lead (all) Manganese Mercury (all) Nickel Polycyclic aromatic	.00 .01 .00 .00 .00 .08 .00 .00 .00 .03 .00
184	HEATING PLANT, HOT WATER, OIL-FIRED (C1360315) Distillate oil 9114 gal/yr	Arsenic (all)	.01

* 1000 FT³/yr

S#	Source & Material	Toxic Pollutant	Emissions (lbs/yr)
		Benzene	.09
		Beryllium (all)	.00
		Cadmium	.01
		Chromium (hexavalent)	.00
		Formaldehyde	.51
		Lead (all)	.01
		Manganese	.02
		Mercury (all)	.00
		Nickel	.21
		Polycyclic aromatic	.03
185	HEATING PLANT, HOT WATER, OIL-FIRED (C1360315) Distillate oil 9114 gal/yr	Arsenic (all)	.01
		Benzene	.09
		Beryllium (all)	.00
		Cadmium	.01
		Chromium (hexavalent)	.00
		Formaldehyde	.51
		Lead (all)	.01
		Manganese	.02
		Mercury (all)	.00
		Nickel	.21
		Polycyclic aromatic	.03
186	BLDG A-246, HEATING PLANT, HOT WATER, OIL FIRED () Distillate oil 14126 gal/yr	Arsenic (all)	.01
		Benzene	.14
		Beryllium (all)	.00
		Cadmium	.02
		Chromium (hexavalent)	.00
		Formaldehyde	.79
		Lead (all)	.02
		Manganese	.03
		Mercury (all)	.01
		Nickel	.33
		Polycyclic aromatic	.04
187	HEATING PLANT, STEAM OIL-FIRED (C1360315) Distillate oil 38416 gal/yr	Arsenic (all)	.02
		Benzene	.38
		Beryllium (all)	.01
		Cadmium	.06
		Chromium (hexavalent)	.00
		Formaldehyde	2.15
		Lead (all)	.05
		Manganese	.07
		Mercury (all)	.02
		Nickel	.90

S#	Source & Material	Toxic Pollutant	Emissions (lbs/yr)
		Polycyclic aromatic	.12
188	HEATING PLANT, HOT WATER, OIL-FIRED (C13?0315) Distillate oil 1114 gal/yr	Arsenic (all) Benzene Beryllium (all) Cadmium Chromium (hexavalent) Formaldehyde Lead (all) Manganese Mercury (all) Nickel Polycyclic aromatic	.00 .01 .00 .00 .00 .06 .00 .00 .00 .03 .00
263	GASOLINE NOZZLES (TC000000) 500 thou gal/yr	Benzene Ethylene dibromide Ethylene dichloride	15.50 .01 .26
407	TEFLON CLEANING BENCH (SF03A128) Gasoline 1 gal/yr	Benzene Ethylene dibromide Ethylene dichloride	.56 .00 .01
420	Pipe & Boiler Shop; Strip Tank (SF03A062) Cellosolve 133 gal/yr	Cellosolve	498.75
422	Predry Oven Equip #PDO-1 (C4150189) Natural gas 143 therms /yr * Benzene	Benzene	.00
423	Paint Spray Booth - Downdraft, Waterwash (SG52B06) Cellosolve acetate 956 gal/yr Xylene 144 gal/yr	Cellosolve acetate Xylene	1035.92 1043.10
424	Paint Drying Oven #DO-2 (C6450189) Natural gas 557 therms /yr * Benzene Cellosolve acetate	Benzene Cellosolve acetate	.00 258.98
431	Paint Spray Booth - Water Wash (SG700307) Xylene 1 gal/yr	Xylene	7.24

* 1000 ft³/yr

S#	Source & Material	Toxic Pollutant	Emissions (lbs/yr)
432	Paint Spray Booth (JNR) (SG700307) Xylene	54 gal/yr 21 Xylene	391.16
435	(TC000000)	144 thou gal/yr Benzene Ethylene dibromide Ethylene dichloride	4.46 .00 .08
436	T-4 Chrome Plating Tank (1R) (G3051477) Chrome (plating curr 1250000 amp-hours/yr)	Chromium (hexavalent)	4.29
437	T-3, Chrome Plating Tank (2R) (G3051477) Chrome (plating curr 1300000 amp-hours/yr)	Chromium (hexavalent)	4.47
438	Vapor Degreaser (SD03A294) Trichloroethane, 1,1	50 gal/yr Dioxane (1,4-) Trichloroethane (1,1)	16.50 533.50
439	T-6, Chrome Plating Tank (5R) (G3051477) Chrome (plating curr 700000 amp-hours/yr)	Chromium (hexavalent)	.09
441	T-5, Chrome Plating Tank (9R) (G3051477) Chrome (plating curr 2600000 amp-hours/yr)	Chromium (hexavalent)	2.98
443	Cold Cleaner (SF03A396) Methylene chloride	25 gal/yr Methylene chloride	275.00
444	Vapor Degreaser (SD03A294) Trichloroethane, 1,1	50 gal/yr Dioxane (1,4-) Trichloroethane (1,1)	16.50 533.50
445	Cold Cleaner (SF03A396) Methylene chloride	50 gal/yr Methylene chloride	550.00
450	Vapor Degreaser (SD03A294) Trichloroethane, 1,1	50 gal/yr Dioxane (1,4-) Trichloroethane (1,1)	16.50 533.50

+ Chrome plating shop inactive since Sept 1988

S#	Source & Material	Toxic Pollutant	Emissions (lbs/yr)
453	Insulating and Varnishing Dip Tank (SG700307) Xylene	10 gal/yr	
		Xylene	72.44
		Xylene	4.48
454	Insulating and Varnish Dip Tank (SG700307) Xylene	5 gal/yr	
		Xylene	36.22
		Xylene	4.48
456 455	Vapor Degreaser (SD03A294) Trichloroethane, 1,1	100 15 gal/yr	
		Dioxane (1,4-)	33.00
		Trichloroethane (1,1)	1067.00

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TABLE 1: Typical Toxic Emissions Calculations Formulas

SOURCE TYPE:	TOXIC EMISSIONS CALCULATION:
C - Combustion	Fuel Usage/YR * Toxic Emission Factor = Emissions
G - General	Throughput/YR * Toxic Emission Factor = Emissions
S - Coating Ops.	(Solvent + Cleanup Usage/YR) * Solvent Density = Emissions
F - SemiCond. Fab.	Usage/YR * Fraction Evaporated * Solvent Density = Emissions
T - Tanks	Throughput/YR * API Tank Emission Equations = Emissions

NOTE: * All Toxic Emissions are reported in lbs/Yr.

* API Tank Emission Equations are described in Section 4.3 of AP-42.

NOTE: Some Typical Responses To Toxic Emissions Questions

- # Combustion of natural gas and fuel oil generates small amounts of Benzene, Formaldehyde, Polycyclic Aromatic Hydrocarbon (PAH), and heavy metals (from combustion of fuel oil only)
- # Use of Trichloroethane (TCA) for degreasing generates TCA and small amounts of 1,4 - Dioxane emissions.
- # Many trade-name products or solvents contain several types of compounds of which could be toxic. The MSDS for these products should help identify the origin of the listed toxic contaminants for your facility.