



WASHINGTON FOUNDRY SURVEY

May, 1971

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Results of the Washington Foundry Survey (SIC-3325) conducted in May 1971, are reported. Respirable dust counts in the various facilities varied from 0.5 to 8.5 milligrams per cubic meter (mg/cu m). The percentage of free silica (7631869) in settled dust varied from 0.2 to 31. Air concentrations of trace metals in milligrams per cubic meter are tabulated for manganese (7439965), zinc (7440666), chromium (7440473), nickel (7440020), lead (7439921), and iron-oxide (1309371).				
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TABLE I

WASHINGTON FOUNDRY SURVEY - 1971

Evaluation of Free Silica Exposures

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	% Free Silica	TLV in Mg/M ³	Sample Results in Mg/M ³	Comments
5/5/71	<u>Western Steel Casting</u>								
5/5/71	Area Sample - Sand Preparation for Mold Making	548	0917-1150	10	1530	5.3	1.4	6.9	≈ 4' from operation.
5/5/71	Area Sample - Sand Preparation for Core and Mold Making	549	0926-1157	10	1510	9.2	0.9	0.6	≈ 15' from mixer.
5/4/71	Sand Mill Operator	534	0930-0300	1.7	561	5.3	1.4	3.1	Uses respirator part of the time (ref. 548).
5/4/71	Molder	566	1025-0304	1.7	474	5.3	1.4	1.6	Sand quite damp (ref. 548).
5/4/71	Area Sample - Center of Cleaning Room	563	0955-1203	10	1230	9.6-	1.0	0.7	Cyclone not used.
5/4/71	Core Maker	544	0913-1200	1.7	284	9.2	0.9	0.7	(ref. 549).
5/4/71	Facing Mill Operator	520	0922-1152	1.7	255	9.2	0.9	1.7	(ref. 549).
5/5/71	<u>Rogers Olympic</u>								
5/5/71	Molder	533	1024-0109	1.7	281	7.8	1.0	1.0	(ref. 561).
5/5/71	Sand Mill Operator	560	1028-0106	1.7	269	7.8	1.0	2.4	(ref. 561).
5/5/71	Area Sample - Sand Mixing Mill	561	0121-0257	10	960	7.8	1.0	1.1	
5/5/71	Area Sample - ≈ 20' from Shakeout and Sand Putter	562	0125-0258	10	930	5.7	1.3	2.2	Shake-out operated very little during sampling.

TABLE I - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	% Free Silica	TLV in Mg/M ³	Sample Results in Mg/M ³	Comments
5/7/71	<u>Rogers Olympic - Continued</u>								
5/7/71	Area Sample Between Muller and Sand Mill	587	0612-0843	10	1510	3.1	2.0	0.5	
5/7/71	Mill and Muller Operator	584	0617-0845	1.7	252	3.1	2.0	0.9	(ref. 587).
5/7/71	Area Sample - Sand Cutter	580	0829-0957	10	1280	18.5	0.5	0.8	(ref. 580).
5/7/71	Clean-up Crew Around Sand Cutter	578	0828-0958	1.7	153	18.5	0.5	6.1	(ref. 580).
5/11/71	<u>Bendix Skagit</u>								
5/11/71	Area Sample - Sandmill	479	1052-0146	10	1740	2.4	2.3	4.2	
5/11/71	Sandmill Operator	491	1057-1158 1227-0145	1.7	236	2.4	2.3	2.6	(ref. 479).
5/11/71	Grinder	457	1106-1210 1228-0151	1.7	250	4.7	1.5	4.0	Former work station of Henry Whiznant. (Silicosis Claim) (ref. 504).
5/11/71	Area Sample - Grinder Work Station	504	1101-0151	10	1700	4.7	1.5	5.6	Former work station of Henry Whiznant. (Silicosis Claim).
5/11/71	Shakeout and Pouring Helpers -	492	1116-1155 1227-0200	1.7	224	2.4	2.3	2.0	(ref. 479) One filter, same work area for both employees. 1st employee unavailable 2nd ½ of shift, work "snap" mostly.
5/11/71	Core Maker	480	1132-1202 0105-0225	1.7	187	7.8	1.0	2.7	
5/11/71	Molder	522	1239-0221	1.7	173	6.8	0.9	8.5	
5/12/71	<u>Black Clawson</u>								
5/12/71	Mini-Max Operator	474	1027-1156 1231-0205	1.7	311	3.7	1.8	0.5	Complains of odor which irritates nasal passages and upper resp. tract. (ref. 507).

TABLE I - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	% Free Silica	TLV in Mg/M ³	Sample Results in Mg/M ³	Comments
5/12/71	<u>Black Clawson - Continued</u>								
5/12/71	Molding Machine Operator	510	1031-1155 1235-0200	1.7	298	3.7	1.8	1.1	Wet sand area - heat sand (ref. 507).
5/12/71	Swing Grinder	469	1228-0307	1.7	270	2.5	2.2	0.4	No exhaust and ventilation for grinder. (ref. 537)
5/12/71	Grinder and Chipper	537	1044-1204 1234-0210	1.7	299	2.5	2.2	2.4	Cleaning room.
5/12/71	Area Sample - Cleaning Room	498	1113-0212	10	1790	28*	0.3	0.4	No. of W. door, opposite lockers.
5/12/71	Muller Operator	505	0535-0731	1.7	197	3.7	1.8	1.1	(ref. 507).
5/12/71	Area Sample - Beside Shakeout and Muller	507	0529-0732	10	1230	3.7	1.8	0.3	Good exhaust on shakeout.
5/6/71	<u>Peterson Pattern</u>								
5/6/71	Area Sample - Near Mold Making	542	0921-1246	10	2050	12.3	0.7	0.3	
5/6/71	Molder	564	0932-1146	1.7	224	12.3	0.7	0.7	
5/6/71	Foreman	581	0930-1119	1.7	185	12.3	0.7	0.8	Made Molds and Helped pour - ½ hour.
5/10/71	<u>Washington Iron Works</u>								
5/10/71	No. Sand Mill Operator	586	0943-1142 1233-0233	1.7	398	9.4	0.9	1.2	
5/10/71	Iron Molder	583	1057-1145	1.7	82	0.9	3.5	0.8	Iron side floor (ref. 585).

*Suspect sample may have been contaminated.

TABLE I - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	% Free Silica	TLV in Mg/M ³	Sample Results in Mg/M ³	Comments
5/10/71	<u>Washington Iron Works - Continued</u>								
5/10/71	Sand Slinger Operator	579	1008-1144	1.7	163	0.9	3.5	0.8	Wears dustfoe respiratory (ref. 585).
5/10/71	So. Sandmill and Shakeout	585	1010-0246	10	2760	0.9	3.5	0.8	
5/10/71	So. Sandmill Operator	553	0943-1139	1.7	197	0.9	3.5	1.3	(ref. 585).
5/12/71	<u>Sather Manufacturing</u>								
5/12/71	Floor Molder	523	0945-1200 1230-0220	1.7	417	1.4	2.9	0.8	Operates sand slinger.
5/12/71	Grinder (Stationary and Hand)	531	0950-1200 1230-0203	1.7	379	3.1	2.0	9.7	
5/12/71	Welder and Maintenance	496	0950-1200 0132-0233	1.7	325	0.5	4.0	12.5	Welds on cast iron.
5/12/71	Hand Grinder	526	0947-1200 1230-0204	1.7	386	3.1	2.0	0.9	
5/12/71	Machine Molder	559	0946-1200 1230-0204	1.7	388	1.4	2.9	0.6	
5/12/71	Floor Molder	546	0943-1200 1231-0204	1.7	391	1.4	2.9	lost	Also operates sandslinger.
5/12/71	Floor Molder	527	0942-1200 1230-0203	1.7	393	1.4	2.9	0.4	
5/12/71	Floor Molder	524	0945-1200 1230-0200	1.7	383	1.4	2.9	0.5	

TABLE I - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	% Free Silica	TLV in Mg/M ³	Sample Results in Mg/M ³	Comments
5/12/71	<u>Sather Manufacturing - Continued</u>								
5/12/71	Melter	512	1000-1200 1233-0223	1.7	391	1.4	2.9	2.2	Should wear respirator when working with fire clay and sand.
5/12/71	Mold Area	516	1015-0230	10	2570	1.4	2.9	1.7	
5/12/71	Grinding Area	530	1037-0230	10	2330	3.1	2.0	6.2	
5/10/71	<u>Zandt</u>								
5/10/71	Molder	503	0932-1155 1231-0150	1.7	377	8.9	0.9	0.6	Quite dusty when worker uses compressed air to clean molds.
5/10/71	Molder	499	0933-1155 1230-0150	1.7	377	8.9	0.9	0.7	
5/10/71	Sand Mixing	423	0937-1156 1230-0150	1.7	272	8.9	0.9	2.1	
5/10/71	Molder	536	0940-1156 1231-0150	1.7	366	8.9	0.9	0.9	
5/10/71	Core Making	518	0942-1156	1.7	228	8.9	0.9	0.7	Spends ≈ 5 minutes/day mixing sand.
5/10/71	Mold and Shakeout area	508	1004-0154	10	2300	8.9	0.9	0.6	
5/11/71	<u>Washington Stove Works</u>								
5/11/71	Muller Operator	431	1008-1157 1234-0244	1.7	406	3.4	1.8	1.0	Quite dusty.
5/11/71	Melter	502	1024-1157 1233-0133	1.7	260	3.4	1.8	1.3	
5/11/71	Bench Molder	535	1022-1157 1234-0240	1.7	376	3.4	1.8	0.9	
5/11/71	Mold and Shakeout Area	500	0950-0300	10	3100	3.4	1.8	0.5	Visible dust in air.

TABLE I - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	% Free Silica	TLV in Mg/M ³	Sample Results in Mg/M ³	Comments
3/11/71	<u>Washington Stove Works - Continued</u>								
3/11/71	Bench Molder	494	1005-1158 1233-0243	1.7	413	3.4	1.8	0.53	
3/11/71	Machine Molder	513	1005-1155 1234-0245	1.7	410	3.4	1.8	0.5	Quite dusty.
3/11/71	Machine Molder	493	0958-1158 1232-0240	1.7	422	3.4	1.8	0.5	Molding near open doorway.
3/11/71	Machine Molder	515	1000-1157 1234-0243	1.7	231	3.4	1.8	1.3	Center of Building, west side.
3/11/71	Wheelabrator Operator	495	1106-1157 1233-0225	1.7	277	4.8	1.5	1.5	Wheelabrator poorly ventilated.
3/11/71	Wheelabrator Area	511	1140-0225	10	1650	4.8	1.5	1.3	10' from wheelabrator and 10' from grinder.
3/6/71	<u>Meltco - Stainless</u>								
3/6/71	Pourer and Muller Operator	461	1102-1155 1227-0250	1.7	333	3.9	1.7	0.5	Shakeout mechanical, but no ventilation.
3/6/71	Foreman	G3	1112-1155 1230-0235	1.7	286	3.9	1.7	6.0	Helped pour.
3/6/71	Molder	487	1137-1155 1225-0305	1.7	303	3.9	1.7	0.4	Does not appear dusty.
3/6/71	Shakeout Near Muller Machine	G-9	1150-0320	10	2050	3.9	1.7	2.0	
3/6/71	Shakeout	G-8	0847-1129	1.7	275	3.55	1.8	1.2	No ventilation on mechanical shakeout.

TABLE I - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	% Free Silica	TLV in Mg/M ³	Sample Results in Mg/M ³	Comments
5/7/71	<u>Meltec - Carbon Steel</u>								
5/7/71	Core Molder	306	0900-1200	1.7	306	3.55	1.8	0.6	
5/7/71	Sand Mill Operator	308	0908-1155	1.7	284	3.55	1.8	0.7	
5/7/71	Core Maker	428	0907-1150	1.7	277	3.55	1.8	0.3	
5/7/71	Molder	486	0930-1150	1.7	284	3.55	1.8	0.4	
5/7/71	Shakeout and Pouring	433	0950-1150	1.7	281	3.55	1.8	0.8	Shakeout not operating during sampling period.
5/7/71	Pourer	429	0900-1150	1.7	289	3.55	1.8	0.4	Pouring not observed.
5/7/71	Top of Crane	G-1	0937-1155	1.7	235	3.55	1.8	0.8	No pouring or shakeout during sampling period.
5/7/71	Core Sand Preparation near Muller	490	0958-1200	10	1220	3.	2.0	3.72	Suspect worker may have purposely contaminated sample. Area not dusty.
5/7/71	Near Sand Mill Area	417	0910-1115	10	1250	4.1	1.6	0.4	
5/4/71	<u>Collidge Propeller, Inc.</u>								
5/4/71	Shakeout Operator	453	0958-1145 1254-0254	1.7	386	3.6	1.8	0.5	Wears dust respirator.
5/4/71	Area Sample - Knockout	489	1011-1150 0107-0325	10	990	3.6	1.8	2.0	
5/4/71	Muller Operator	473	1020-1200 1252-0315	1.7	413	3.6	1.8	0.3	
5/4/71	Molder	483	1055-1203 1256-0322	1.7	364	3.6	1.8	0.8	

TABLE I - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	% Free Silica	TLV in Mg/M ³	Sample Results in Mg/M ³	Comments
5/5/71	<u>Collidge Propeller, Inc. - Continued</u>								
5/5/71	Sand Reclaimer	432	0555-0824	1.7	253	6.8	1.2	1.5	Sample does not appear to represent conditions - dusty area.
5/5/71	Sand Reclaim Area	424	0614-0855	10	1600	6.8	1.2	3.4	
5/5/71	Area Sample - Swing Grinder	477	1155-0325	10	2100	0.9	3.4	1.3	
5/5/71	<u>Morel Foundry</u>								
5/5/71	Area Sample - CO ₂ Core Area	484	0915-0233	10	3180	7.6	1.0	0.3	
5/5/71	Molder	466	0924-1135 0138-0231	1.7	313	7.6	1.0	0.9	
5/5/71	CO ₂ Core Maker	452	0929-1135 0150-0232	1.7	286	7.6	1.0	0.5	
5/5/71	Molding and Shakeout Line -	458	0937-1127 0138-0238	1.7	289	7.6	1.0	0.7	
5/5/71	Mold Operator	482	0942-1132 0138-0228	1.7	272	7.6	1.0	0.4	
5/5/71	Molding and Shakeout Line -	471	0950-1138 0135-0227	1.7	272	7.6	1.0	1.1	Worker may have been trying to contaminate sample.
5/5/71	Core Knockout	462	1002-1135 0136-0237	1.7	262	7.6	1.0	0.5	
5/5/71	Grinder	475	1020-1132 0147-0230	1.7	179	9.0	0.9	0.6	Cleaning Al Casts
5/14/71	<u>Olympic Foundry</u>								
5/14/71	Cyclone Pour Area	70	?	?	?	11.5	0.7		Dept. of Labor and Ind. filter.

TABLE I - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	% Free Silica	TLV in Mg/M ³	Sample Results in Mg/M ³	Comments
5/14/71	<u>Olympic Foundry - Continued</u>								
5/14/71	Cyclone - Core Department	126	?	?	?	13.6	0.6		Dept. of Labor and Ind. filter.
5/14/71	Machine Molder	532	1012-1207 1230-0151	1.7	333	11.5	0.7	1.4	(ref. No. 70 used instead of No. 69).
5/14/71	Shakeout Helper	464	1023-1203 1230-0152	1.7	309	13.6	0.6	0.5	(ref. No. 126 used instead of No. 66).
5/14/71	Sandmill Operator	547	1032-1205 1230-0153	1.7	299	13.6	0.6	0.8	
5/14/71	Sandlinger	478	1017-1206 1231-0200	1.7	337	13.6	0.6	0.5	
5/14/71	Coremaker	529	1026-1204 1230-0155	1.7	311	13.6	0.6	0.6	
5/14/71	Pourer	525	1015-1200 1235-0205	1.7	332	13.6	0.6	0.9	
5/14/71	Melter	519	1002-0157	1.7	400	13.6	0.6	1.3	
5/14/71	Chipper and Grinder	568	1006-1204 1230-0210	1.7	370	9.9	0.8	0.6	
5/14/71	Grinding Loom - Area Sample	552	1045-0212	10	2070	9.9	0.8	1.9	

TABLE 2

WASHINGTON FOUNDRY SURVEY - 1971

Analysis of Settled Dust Samples for Percent Free Silica

Location	Field Number	Type of Sample	Analysis % Free Silica
Peterson Pattern-Mold Area	1	Settled Dust	7.6
Meltec (C Steel Side) Mold Prep. Side	2	Settled Dust	31.0
Meltec Grinder's Sample	3	Settled Dust	1.0
Meltec (Mn Side) Near Shakeout Muller	4	Settled Dust	5.4
Meltec (C Steel Side) Near Air Grinder Operator	5	Settled Dust	7.5
Coolidge Propeller	6	Settled Dust	0.4
Coolidge Propeller Hot Topping Sand ("Ferror")	7	Settled Dust	1.0
8 Coolidge Propeller Bull Machine ("Swing Grinder")	8	Settled Dust	2.0
Coolidge Propeller Sand Muller Operation	9	Settled Dust	9.0
Coolidge Propeller Shake-Out	10	Settled Dust	10.0
Morel Foundry - Molding Sand	11	Settled Dust	7.0
Morel Foundry - Grinding Area	12	Settled Dust	3.0
Rogers Olympic - Shake-Out Area	13	Settled Dust	20.0
Rogers Olympic - Sand Mixing Mill	14	Settled Dust	19.0
Sather Manufacturing - Grinding Area	15	Settled Dust	1.0
Sather Manufacturing - Mold Area	16	Settled Dust	6.0
Wash Stove - Top of Wheelabrator	17	Settled Dust	4.6
Wash Stove Furnace Area	18	Settled Dust	37.

TABLE 2 - Continued

Location	Field Number	Type of Sample	Analysis % Free Silica
Wash Stove - Swing Grinder	19	Settled Dust	0.2
Wash Stove - Mold Area	20	Settled Dust	21.5
Western Steel Casting - Cleaning Room	21	Settled Dust	1.4
Western Steel Casting - Sand Mix Area	22	Settled Dust	26.7
Western Steel Casting - Facing Mill	23	Settled Dust	21.0
Olympic Foundry - Core Mold Area	24	Settled Dust	21.0
Olympic Foundry - Grinding Area	25	Settled Dust	9.0
Olympic Foundry - Mold Area	26	Settled Dust	28.0
Zandt - Core Area	27	Settled Dust	15.0
Zandt - Mold Area	28	Settled Dust	11.0
Zandt - Near Hood Grinder	29	Settled Dust	13.0
Roemer - Shakout Area No. Wall 15' from Grinding	30	Settled Dust	16.6
Roemer - Bench Molding	31	Settled Dust	15.7
Roemer - Core Shelves, Facing Pouring Area	32	Settled Dust	15.
Roemer - Sand Reclaim Mixer Bin over New Mold Sand Prep.	33	Settled Dust	27.
Fick - Floor Molding, Near Old Cleaning Area	34	Settled Dust	6.
Fick - Snap Molding Area	35	Settled Dust	11.
Fick - Mech. Shake-Out Area	36	Settled Dust	24

TABLE 2 - Continued

Location	Field Number	Type of Sample	Analysis % Free Silica
Fick - Mold Sand Prep.	37	Settled Dust	27
Griffin Wheel - Shake-Out Area	38	Settled Dust	26.
Vancouver - Storage Shelves Adj. to Machine Molting, Core Making Area	39	Settled Dust	10.
Vancouver - Sand Prep. 20' Off Ground	40	Settled Dust	21
Vancouver - Machine Molding Area	41	Settled Dust	12

12
X indicates no analysis for this particular metal.

TABLE 3

WASHINGTON FOUNDRY SURVEY - 1971

Air Concentrations of Trace Metals

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	Gross Dust	Mg/M ³						Comments
							Mn	Zn	Cr	Ni	Pb	Fe ₂ O ₃	
5/5/71	<u>Western Steel Casting</u>												
5/5/71	Swing Grinder	554	0840-1205	1.7	349	1.2	X	0.006	X	X	0.002	1.28	
5/4/71	Melter	497	0925-1217	1.7	292	0.6	X	0.004	X	X	0.003	.094	Door open during sampling period. Fume exposure quite noticeable; 1 pour - 15 minutes.
5/4/71	Craneman	539	0934-1150	1.7	231	1.2	X	0.24	X	X	.010	.3143	
5/4/71	Air Arc Operator	556	0947-0208	1.7	444	8.2	X	.007	X	X	.005	10.8	
5/4/71	Forman	551	0935-1157	1.7	241	.8	X	.016	X	X	.003	.143	Operates ladle during pour.
5/4/71	Swing Grinder	543	0223-0310	1.7	80	2.8	X	X	X	X	X	3.11	Same grinder as filter number 554.
5/5/71	<u>Rogers Olympic</u>												
5/5/71	Grinder	541	1015-0103	1.7	286	1.8	0.3	X	X	X	X	1.51	
5/5/71	Crane Operator	571	1143-0255	1.7	326	6.5	.22	X	X	X	X	3.37	Sampling period - furnace charge, pour, ½ hour lunch, and 1 hour equipment moving.
5/5/71	Air Arc Operator	572	1020-0103	1.7	277	19.4	.82	X	X	X	X	20.0	Wears dust respirator, no local exhaust.
5/5/71	Furnaceman	555	1145-0230	1.7	281	2.0	.06	X	X	X	X	.117	Sample collected during charge and pour and ½ hour lunch.

TABLE 3 - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	Gross Dust	Mg/M ³					Fe ₂ O ₃	Comments
							Mn	Zn	Cr	Ni	Pb		
5/11/71	<u>Bendix Skagit</u>												
5/11/71	Air Arc Operator	481	1244-0200	1.7	129	16.7	.32	.023	X	X	.007	28.1	Cyclone Used.
5/11/71	Burner and Air Arc Operator -	501	1251-0219	1.7	150	11.7	.025	.022	X	X	.008	17.7	Cyclone Used.
5/12/71	<u>Black Clawson</u>												
5/12/71	Air Arc Operator	509	1025-1115	1.7	85	64.6	X	X	X	X	X	110.8	No ventilation; no respirator.
5/12/71	Brass Molder	450	1015-1149 1237-0157	1.7	296	3.9	X	1.27	X	X	.111	X	Natural ventilation from open window; no exhaust; Brass section of foundry.
5/12/71	Ladleman	459	0955-1153 1235-0206	1.7	355	3.7		X				.714	Poured steel and snapped molds.
5/12/71	Furnaceman	460	1040-1200 1233-0100	1.7	199	3.3	X	X	X	X	X	2.71	
5/12/71	Crane Operator	454	1049-1159 1234-0310	1.7	384	.7	X	X	X	X	X	.400	Furnace charged during sampling period, handled pour and worked above air arc.
5/6/71	<u>Peterson Pattern</u>												
5/6/71	Melter	576	0929-1141	1.7	224	2.3	X	.20	N.D.	X	.63	X	Helped pour - Total ½ hour.
5/6/71	Grinder and Chipper	560	0927-1146	1.7	236	.6	X	X	X	X	.024	X	Helped pour - Total ½ hour.
5/6/71	15' from Melting Pot	Esp 7	0921-1201	7.3cfm	1175 ft ³		X	.02	.0004	X	.038	X	

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TABLE 3 - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	Gross Dust	mg/m ³					Fe ₂ O ₃	Comments
							Mn	Zn	Cr	Ni	Pb		
5/10/71	<u>Washington Iron Works</u>												
5/10/71	Grinder	538	1239-0241	1.7	207	1.6							
5/10/71	Air Arc Operator	577	1036-1135	1.7	100	12.1	X	X	X	X	X	18.0	No exhaust.
5/10/71	Welder and Air Arc -	574	1243-0243	1.7	204	12.4	X	X	X	X	X	13.4	3" exhaust hose positioned on knee in gen. Pouring area.
5/10/71	Lead man	575	0938-1146	1.7	218	3.1							
5/10/71	Pouring and Shadeout Crew	582	1001-1141	1.7	170	1.1	X	X	X	X	X	.514	
5/10/71	Grinder and Chipper	569	1021-1138 1237-0242	1.7	345	0.9							Rough cleaning area.
5/10/71	Core Maker	570	1055- ?	1.7	? *	? *							Possibly 1 hour sample.
5/10/71	Crane Operator	557	1004-1159	1.7	196	.7	X	X	X	X	X	.229	Wears dustfree respirator
5/12/71	<u>Sather Manufacturing</u>												
5/12/71	Grinder (Stationary and Hand)	531	0950-1200 1230-0203	1.7	379	9.7	X	X	X	X	.009	X	
	Hand Grinder	526	0947-1200 1230-0204	1.7	386	.9	X	X	X	X	.001	X	

*Pump Stopped.

TABLE 3 - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	Gross Dust	Mg/H ³					Pb	Fe ₂ O ₃	Comments
							Mn	Zn	Cr	Ni				
5/14/71	<u>Olympic Foundry</u>													
5/14/71	Stationary Grinder	455	1005-1202 1230-0210	1.7	369	1.2	X	X	X	X	.002	X		Ventilation provided.
5/14/71	Pourer	525	1015-1200 1235-0205	1.7	332	.9	.006	X	X	X	.002	X		
5/14/71	Melter	519	1002-0157	1.7	400	1.3	.02	X	X	X	.006	X		Worked through lunch.
5/14/71	Chipper and Grinder	568	1006-1204 1230-0210	1.7	370	.6	X	X	X	X	.003	X		Grinding in large open area.
5/10/71	<u>Zandt</u>													
5/10/71	Grinder (Hand)	514	0944-1157 1231-0147	1.7	355	1.0	X	X	X	X	.085	X		Did some grinding on brass.
5/10/71	Furnaceman	528	0952-1155	1.7	209	5.5	X	.24	X	X	.129	X		Pit furnace; no ventilation.
5/10/71	Between furnace and pouring area	425	1110-1140	10	300	1.6	X	.10	X	X	.162	X		10' from furnace, 15' from pouring.
5/11/71	<u>Washington Stove</u>													
5/11/71	Swing Grinder	506	1031-1157 1233-0223	1.7	333	1.1	X	X	X	X	.002	X		
	ESP Sample	No. 2	1043-0250	8 ft ³	1976 ft ³		.003	X	X	X	.023	.057		No ventilation for furnace.
5/6/71	<u>Meltec (Stainless)</u>													
5/6/71	Stationary Grinder	488	1055-1155 1230-0232	1.7	309	1.9	X	X	X	X	.002	X		No ventilation.

TABLE 3 - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	Gross Dust	Mg/M ³					Fe ₂ O ₃	Comments
							Mn	Zn	Cr	Ni	Pb		
5/6/71	<u>Meltac (Stainless) - Continued</u>												
5/6/71	Bench Grinder	468	1055-1155 1231-0231	1.7	306	1.7	X	X	X	X	.004	X	
5/6/71	Pourer	456	1100-1155 1225-0212	1.7	275	5.2	.06	X	.004	.022	X	X	Manganese
5/6/71	Burner	467	1111-1153 1229-0248	1.7	308	12.4	.69	X	.046	.058	X	21.14	
5/6/71	Welder	G-2	1116-1155 1228-0300	1.7	325	25.4	4.83	X	.345	X	X	31.14	
5/6/71	Melter	G-7	1127-0242	1.7	332	1.1	.16	X	.005	.0006	X	X	Worked through lunch, poured 2 heats of Mn. and 2 of St. Steel, furnace ventilation in- adequate during winter.
5/7/71	<u>Meltac (Carbon Steel)</u>												
5/7/71	Air Grinder	416	0911-1200	1.7	287	1.0	X	X	X	X	.002	X	Working in front of 20' by 20' open doorway.
5/7/71	Top of Crane	430	0937-1155	1.7	235	2.8	X	X	X	X	.002	X	No pouring or shakeout during sampling period.
5/4/71	<u>Collidge Propeller, Inc.</u>												
5/4/71	Melter	465	1042-1202 1258-0232	1.7	296	32.9	X	X	X	X	.091	X	Cleaning Furnaces.
5/4/71	Chipper	476	1116-1156	1.7	68	50.3	X	X	3.68	1.54	.022	30.28	During scarfing operati

TABLE 3 - Continued

Date	Location	Filter No.	Time	Flow lpm	Volume Liters	Gross Dust	Mg/M ³					Pb	Fe ₂ O ₃	Comments
							Mn	Zn	Cr	Ni				
5/4/71	Collidge Propeller, Inc. - Continued													
5/4/71	Bull Machine Grinder	470	1240-0350	1.7	323	1.7	X	X	X	X	.002	X		
5/4/71	Swing Grinder	463	1248-0350	1.7	309	.8	X	X	X	X	.003	X	Not much time spent grinding.	
5/4/71	Polisher	451	1242-0350	1.7	320	.7	X	X	.017	.021	.005	X		
5/4/71	Swing Grinder	472	1237-0350	1.7	328	.6	X	X	.014	X	.003	X		
5/4/71	Scarfer	G-6	0234-2046	1.7	20	111.5	X	35.1	X	X	2.80	3.28	Scarfig on bronze, clai- men have been ill from Zn poisoning; concerned about Cd.	

X indicates no analysis for this particular metal.

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