Air Sample Results - Aluminum

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Aluminum			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	91	> LOQ 3.0	1956.99	> LOQ 64.52
97035	2	47.34	SS	1	630	> LOQ 3.0	13307.98	> LOQ 63.37
97029	3	44.33	SS	1	700	> LOQ 3.0	15791.37	> LOQ 67.68
97034	OBZ	47.60	SS	1	3300	> LOQ 6.0	69321.91	> LOQ 126.04
97022	1	47.66	SSDS	2	48	> LOQ 3.0	1007.05	> LOQ 62.94
97032	2	46.72	SSDS	2	140	> LOQ 3.0	2996.83	> LOQ 64.22
97025	3	49.14	SSDS	2	160	> LOQ 3.0	3256.00	> LOQ 61.05
97006	OBZ	48.95	SSDS	2	140	> LOQ 3.0	2860.18	> LOQ 61.29
97024	1	46.50	CS	3	630.00	> LOQ 3.0	13548.39	> LOQ 64.52
97020	2	47.34	CS	3	4300	> LOQ 6.0	90832.28	> LOQ 126.74
97015	3	44.33	CS	3	5300	> LOQ 10	119563.26	> LOQ 225.59
97037	OBZ	47.60	CS	3	4000	> LOQ 6.0	84026.55	> LOQ 126.04
97014	1	50.38	CP	4	560	> LOQ 3.0	11116.40	> LOQ 59.55
97011	2	47.98	CP	4	1300	> LOQ 3.0	27096.88	> LOQ 62.53
97031	3	47.92	CP	4	1300	> LOQ 3.0	27130.81	> LOQ 62.61
97019	OBZ	48.30	CP	4	1800	> LOQ 3.0	37267.08	> LOQ 62.11
97030	1	47.64	N	5	180	> LOQ 3.0	3778.34	> LOQ 62.97
97009	2	44.16	N	5	450	> LOQ 3.0	10190.22	> LOQ 67.93
97021	3	44.52	N	5	320	> LOQ 3.0	7187.78	> LOQ 67.39
97036	OBZ	54.48	N	5	420	> LOQ 3.0	7709.25	> LOQ 55.07
97018	1	48.17	G	6	2100	> LOQ 3.0	43597.41	> LOQ 62.28
97005	2	47.51	G	6	3200	> LOQ 6.0	67357.08	> LOQ 126.29
97017	3	47.11	G	6	4700	> LOQ 10.0	99762.27	> LOQ 212.26
97007	OBZ	48.76	G	6	400	> LOQ 6.0	8204.12	> LOQ 123.06
97008	1	47.92	S	7	210	> LOQ 3.0	4382.67	> LOQ 62.61
97023	2	48.40	S	7	410	> LOQ 3.0	8471.77	> LOQ 61.99
97013	3	48.89	S	7	430	> LOQ 3.0	8795.61	> LOQ 61.36
97016	OBZ	48.71	S	7	270	> LOQ 3.0	5543.24	> LOQ 61.59
97001	1	47.89	SG	8	9.5	> LOQ 3.0	198.36	> LOQ 62.64
97003	2	48.29	SG	8	32	> LOQ 3.0	662.69	> LOQ 62.13
97028	3	48.32	SG	8	40	> LOQ 3.0	827.75	> LOQ 62.08
97038	OBZ	48.97	SG	8	150	> LOQ 10.0	3062.97	> LOQ 204.20

LOD = Limit of Detection
LOQ = Limit of Quantification
ND = Nondetectable

Bulk Elemental Analysis - Aluminum

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Aluminum		Sample		
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	1200.00	>LOQ 10.0	J97119P203 PB	1600.00	>LOQ 10.0
N	J97119P205 VB	860.00	>LOQ 10.0	J97119P205 PB	970.00	>LOQ 10.0
S	J97119P207 VB	260.00	>LOQ 10.0	J97119P207 PB	390.00	>LOQ 10.0
SS	J97119P201 VB	1000.00	>LOQ 10.0	J97119P201 PB	870.00	>LOQ 10.0
SSDS	J97119P202 VB	50.00	>LOQ 10.0	J97119P202 PB	57.00	>LOQ 10.0
CP	J97119P204 VB	21000.00	>LOQ 50.0	J97119P204 PB	27000.00	>LOQ 50.0
G	J97119P206 VB	1400.00	>LOQ 10.0	J97119P206 PB	940.00	>LOQ 10.0
SG	J97119P208 VB	380.00	>LOQ 10.0	J97119P208 PB	430.00	>LOQ 10.0

Comparison of Airborne Concentrations to Bulk Concentrations - Aluminum

NIOSH REL 10000 micrograms/cubic meter
OSHA PEL 15000 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Aluminum**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	13548.39	90832.28	119563.26	84026.55	1200.00	>LOQ 10.0
N	3778.34	10190.22	7187.78	7709.25	860.00	>LOQ 10.0
S	4382.67	8471.77	8795.61	5543.24	260.00	>LOQ 10.0
SS	1956.99	13307.98	15791.37	69321.91	1000.00	>LOQ 10.0
SSDS	1007.05	2996.83	3256.00	2860.18	50.00	>LOQ 10.0
CP	11116.40	27096.88	27130.81	37267.08	21000.00	>LOQ 50.0
G	43597.41	67357.08	99762.27	8204.12	1400.00	>LOQ 10.0
SG	198.36	662.69	827.75	3062.97	380.00	>LOQ 10.0

Air Sample Results - Arsenic

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Arsenic			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 0.06	ND	< LOD 1.29
97035	2	47.34	SS	1	0.47	> LOQ 0.2	9.928	> LOQ 4.22
97029	3	44.33	SS	1	0.5	> LOQ 0.2	11.280	> LOQ 4.51
97034	OBZ	47.60	SS	1	0.21	> LOQ 0.2	4.411	> LOQ 4.20
97022	1	47.66	SSDS	2	0.2	< LOQ 0.2	4.196	< LOQ 4.20
97032	2	46.72	SSDS	2	0.28	> LOQ 0.2	5.994	> LOQ 4.28
97025	3	49.14	SSDS	2	0.39	> LOQ 0.2	7.937	> LOQ 4.07
97006	OBZ	48.95	SSDS	2	0.36	> LOQ 0.2	7.355	> LOQ 4.09
97024	1	46.50	CS	3	0.49	> LOQ 0.2	10.538	> LOQ 4.30
97020	2	47.34	CS	3	0.34	> LOQ 0.2	7.182	> LOQ 4.22
97015	3	44.33	CS	3	0.41	> LOQ 0.2	9.249	> LOQ 4.51
97037	OBZ	47.60	CS	3	0.37	> LOQ 0.2	7.772	> LOQ 4.20
97014	1	50.38	CP	4	0.55	> LOQ 0.2	10.918	> LOQ 3.97
97011	2	47.98	CP	4	1.2	> LOQ 0.2	25.013	> LOQ 4.17
97031	3	47.92	CP	4	1.2	> LOQ 0.2	25.044	> LOQ 4.17
97019	OBZ	48.30	CP	4	1.6	> LOQ 0.2	33.126	> LOQ 4.14
97030	1	47.64	N	5	0.1	< LOQ 0.2	2.099	< LOQ 4.20
97009	2	44.16	N	5	0.27	> LOQ 0.2	6.114	> LOQ 4.53
97021	3	44.52	N	5	0.25	> LOQ 0.2	5.615	> LOQ 4.49
97036	OBZ	54.48	N	5	0.26	> LOQ 0.2	4.772	> LOQ 3.67
97018	1	48.17	G	6	0.27	> LOQ 0.2	5.605	> LOQ 4.15
97005	2	47.51	G	6	0.48	> LOQ 0.2	10.104	> LOQ 4.21
97017	3	47.11	G	6	0.56	> LOQ 0.2	11.887	> LOQ 4.25
97007	OBZ	48.76	G	6	0.54	> LOQ 0.2	11.076	> LOQ 4.10
97008	1	47.92	S	7	ND	< LOD 0.2	ND	< LOD 4.17
97023	2	48.40	S	7	0.07	< LOQ 0.2	1.446	< LOQ 4.13
97013	3	48.89	S	7	0.07	< LOQ 0.2	1.432	< LOQ 4.09
97016	OBZ	48.71	S	7	ND	< LOD 0.06	ND	< LOD 1.23
97001	1	47.89	SG	8	0.4	> LOQ 0.2	8.352	> LOQ 4.18
97003	2	48.29	SG	8	0.33	> LOQ 0.2	6.834	> LOQ 4.14
97028	3	48.32	SG	8	1.2	> LOQ 0.2	24.832	> LOQ 4.14
97038	OBZ	48.97	SG	8	9.1	> LOQ 1.0	185.820	> LOQ 20.42

Bulk Elemental Analysis - Arsenic

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Arsenic		Sample	Arsenic	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	<LOD 0.9	J97119P203 PB	0.60	< LOQ 2.0
N	J97119P205 VB	ND	<LOD 0.9	J97119P205 PB	ND	< LOD 0.3
S	J97119P207 VB	ND	<LOD 0.9	J97119P207 PB	ND	< LOD 0.3
SS	J97119P201 VB	ND	<LOD 0.9	J97119P201 PB	0.80	< LOQ 0.9
SSDS	J97119P202 VB	ND	<LOD 0.9	J97119P202 PB	0.50	< LOQ 0.9
CP	J97119P204 VB	24.00	>LOQ 9.0	J97119P204 PB	23.00	>LOQ 9.0
G	J97119P206 VB	ND	<LOD 0.9	J97119P206 PB	ND	< LOD 0.5
SG	J97119P208 VB	48.00	>LOQ 9.0	J97119P208 PB	48.00	>LOQ 9.0

Comparison of Airborne Concentrations to Bulk Concentrations - Arsenic

NIOSH REL 2.0 micrograms/cubic meter Ceiling Limit
OSHA PEL 10.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Arsenic**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	10.54	7.18	9.25	7.77	ND	<LOD 0.9
N	2.10	6.11	5.62	4.77	ND	<LOD 0.9
S	ND	1.45	1.43	ND	ND	<LOD 0.9
SS	ND	9.93	11.28	4.41	ND	<LOD 0.9
SSDS	4.20	5.99	7.94	7.36	ND	<LOD 0.9
CP	10.92	25.01	25.04	33.13	24.00	>LOQ 9.0
G	5.61	10.10	11.89	11.08	ND	<LOD 0.9
SG	8.35	6.83	24.83	185.82	48.00	>LOQ 9.0

Air Sample Results - Barium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Barium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	0.790	> LOQ 0.2	16.99	> LOQ 4.30
97035	2	47.34	SS	1	3.600	> LOQ 0.2	76.05	> LOQ 4.22
97029	3	44.33	SS	1	4.000	> LOQ 0.2	90.24	> LOQ 4.51
97034	OBZ	47.60	SS	1	12.000	> LOQ 0.2	252.08	> LOQ 4.20
97022	1	47.66	SSDS	2	0.300	> LOQ 0.2	6.29	> LOQ 4.20
97032	2	46.72	SSDS	2	0.620	> LOQ 0.2	13.27	> LOQ 4.28
97025	3	49.14	SSDS	2	0.760	> LOQ 0.2	15.47	> LOQ 4.07
97006	OBZ	48.95	SSDS	2	0.790	> LOQ 0.2	16.14	> LOQ 4.09
97024	1	46.50	CS	3	3.5	> LOQ 0.2	75.27	> LOQ 4.30
97020	2	47.34	CS	3	15.000	> LOQ 0.2	316.86	> LOQ 4.22
97015	3	44.33	CS	3	18.000	> LOQ 0.2	406.06	> LOQ 4.51
97037	OBZ	47.60	CS	3	14.000	> LOQ 0.2	294.09	> LOQ 4.20
97014	1	50.38	CP	4	5.700	> LOQ 0.2	113.15	> LOQ 3.97
97011	2	47.98	CP	4	13.000	> LOQ 0.2	270.97	> LOQ4.17
97031	3	47.92	CP	4	13.000	> LOQ 0.2	271.31	> LOQ4.17
97019	OBZ	48.30	CP	4	18.000	> LOQ 0.2	372.67	> LOQ 4.14
97030	1	47.64	N	5	1.100	> LOQ 0.2	23.09	> LOQ 4.20
97009	2	44.16	N	5	2.300	> LOQ 0.2	52.08	> LOQ 4.53
97021	3	44.52	N	5	1.900	> LOQ 0.2	42.68	> LOQ 4.49
97036	OBZ	54.48	N	5	2.200	> LOQ 0.2	40.38	> LOQ 3.67
97018	1	48.17	G	6	0.560	> LOQ 0.2	11.63	> LOQ 4.15
97005	2	47.51	G	6	1.000	> LOQ 0.2	21.05	> LOQ 4.21
97017	3	47.11	G	6	1.300	> LOQ 0.2	27.59	> LOQ 4.25
97007	OBZ	48.76	G	6	1.200	> LOQ 0.2	24.61	> LOQ 4.10
97008	1	47.92	S	7	1.400	> LOQ 0.2	29.22	> LOQ 4.17
97023	2	48.40	S	7	2.600	> LOQ 0.2	53.72	> LOQ 4.13
97013	3	48.89	S	7	2.700	> LOQ 0.2	55.23	> LOQ 4.09
97016	OBZ	48.71	S	7	1.800	> LOQ 0.2	36.95	> LOQ 4.11
97001	1	47.89	SG	8	0.100	< LOQ 0.2	2.09	< LOQ 4.18
97003	2	48.29	SG	8	0.410	> LOQ 0.2	8.49	> LOQ 4.14
97028	3	48.32	SG	8	0.460	> LOQ 0.2	9.52	> LOQ 4.14
97038	OBZ	48.97	SG	8	1.200	> LOQ 0.2	24.50	> LOQ 4.08

Bulk Elemental Analysis - Barium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Barium		Sample	Barium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	4.50	>LOQ 0.7	J97119P203 PB	6.10	>LOQ 0.7
N	J97119P205 VB	4.20	>LOQ 0.7	J97119P205 PB	4.80	>LOQ 0.7
S	J97119P207 VB	3.00	>LOQ 0.7	J97119P207 PB	3.40	>LOQ 0.7
SS	J97119P201 VB	5.30	>LOQ 0.7	J97119P201 PB	5.60	>LOQ 0.7
SSDS	J97119P202 VB	ND	<LOD 0.2	J97119P202 PB	1.10	>LOQ 0.7
CP	J97119P204 VB	190.00	>LOQ 0.7	J97119P204 PB	230.00	>LOQ 0.7
G	J97119P206 VB	0.50	<LOQ 0.7	J97119P206 PB	0.72	>LOQ 0.7
SG	J97119P208 VB	2.80	>LOQ 0.7	J97119P208 PB	3.40	>LOQ 0.7

Comparison of Airborne Concentrations to Bulk Concentrations - Barium

NIOSH REL 500.0 micrograms/cubic meter
OSHA PEL 500.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Barium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	75.27	316.86	406.06	294.09	4.50	>LOQ 0.7
N	23.09	52.08	42.68	40.38	4.20	>LOQ 0.7
S	29.22	53.72	55.23	36.95	3.00	>LOQ 0.7
SS	16.99	76.05	90.24	252.08	5.30	>LOQ 0.7
SSDS	6.29	13.27	15.47	16.14	ND	<LOD 0.2
CP	113.15	270.97	271.31	372.67	190.00	>LOQ 0.7
G	11.63	21.05	27.59	24.61	0.50	<LOQ 0.7
SG	2.09	8.49	9.52	24.50	2.80	>LOQ 0.7

Air Sample Results - Beryllium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Beryllium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 0.01	ND	< LOD 0.215
97035	2	47.34	SS	1	0.04	< LOQ 0.04	0.84	< LOQ 0.845
97029	3	44.33	SS	1	0.04	< LOQ 0.04	0.90	< LOQ 0.902
97034	OBZ	47.60	SS	1	0.23	> LOQ 0.01	4.83	> LOQ .210
97022	1	47.66	SSDS	2	ND	< LOD 0.004	ND	< LOD 0.084
97032	2	46.72	SSDS	2	0.005	< LOQ 0.01	0.11	< LOQ 0.214
97025	3	49.14	SSDS	2	0.006	< LOQ 0.01	0.12	< LOQ 0.204
97006	OBZ	48.95	SSDS	2	0.007	< LOQ 0.01	0.14	< LOQ 0.204
97024	1	46.50	CS	3	0.04	< LOQ 0.04	0.86	< LOQ 0.860
97020	2	47.34	CS	3	0.24	> LOQ 0.08	5.07	> LOQ 1.690
97015	3	44.33	CS	3	0.26	> LOQ 0.2	5.87	> LOQ 4.512
97037	OBZ	47.60	CS	3	0.23	> LOQ 0.08	4.83	> LOQ 1.681
97014	1	50.38	CP	4	0.019	> LOQ 0.01	0.38	> LOQ 0.199
97011	2	47.98	CP	4	0.042	> LOQ 0.01	0.88	> LOQ 0.208
97031	3	47.92	CP	4	0.04	> LOQ 0.01	0.83	> LOQ 0.209
97019	OBZ	48.30	CP	4	0.06	> LOQ 0.01	1.24	> LOQ 0.207
97030	1	47.64	N	5	0.004	< LOQ 0.01	0.08	< LOQ 0.210
97009	2	44.16	N	5	0.01	< LOQ 0.01	0.23	< LOQ 0.226
97021	3	44.52	N	5	0.007	< LOQ 0.01	0.16	< LOQ 0.225
97036	OBZ	54.48	N	5	0.009	< LOQ 0.01	0.17	< LOQ 0.184
97018	1	48.17	G	6	0.019	> LOQ 0.01	0.39	> LOQ 0.208
97005	2	47.51	G	6	0.02	< LOQ 0.04	0.42	< LOQ 0.842
97017	3	47.11	G	6	0.03	< LOQ 0.04	0.64	< LOQ 0.849
97007	OBZ	48.76	G	6	0.03	< LOQ 0.04	0.62	< LOQ 0.820
97008	1	47.92	S	7	0.016	> LOQ 0.01	0.33	> LOQ 0.209
97023	2	48.40	S	7	0.038	> LOQ 0.01	0.79	> LOQ 0.207
97013	3	48.89	S	7	0.039	> LOQ 0.01	0.80	> LOQ 0.205
97016	OBZ	48.71	S	7	0.026	> LOQ 0.01	0.53	> LOQ 0.205
97001	1	47.89	SG	8	ND	< LOD 0.04	ND	< LOD 0.084
97003	2	48.29	SG	8	ND	< LOD 0.04	ND	< LOD 0.083
97028	3	48.32	SG	8	ND	< LOD 0.04	ND	< LOD 0.083
97038	OBZ	48.97	SG	8	ND	< LOD 0.04	ND	< LOD 0.082

Bulk Elemental Analysis - Beryllium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Beryllium		Sample	Beryllium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	0.11	>LOQ 0.05	J97119P203 PB	0.34	>LOQ 0.05
N	J97119P205 VB	0.04	<LOQ 0.05	J97119P205 PB	0.04	<LOQ 0.05
S	J97119P207 VB	ND	<LOD 0.01	J97119P207 PB	0.03	<LOQ 0.05
SS	J97119P201 VB	0.05	<LOQ 0.05	J97119P201 PB	0.08	>LOQ 0.05
SSDS	J97119P202 VB	ND	<LOD 0.01	J97119P202 PB	ND	<LOD 0.01
CP	J97119P204 VB	0.90	>LOQ 0.1	J97119P204 PB	0.92	>LOQ 0.05
G	J97119P206 VB	0.02	<LOQ 0.05	J97119P206 PB	0.01	<LOQ 0.05
SG	J97119P208 VB	ND	<LOD 0.01	J97119P208 PB	ND	<LOD 0.01

Comparison of Airborne Concentrations to Bulk Concentrations - Beryllium

NIOSH REL 0.50 micrograms/cubic meter
OSHA PEL 2.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Beryllium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	0.86	5.07	5.87	4.83	0.11	>LOQ 0.05
N	0.08	0.23	0.16	0.17	0.04	<LOQ 0.05
S	0.33	0.79	0.80	0.53	ND	<LOD 0.01
SS	ND	0.84	0.90	4.83	0.05	<LOQ 0.05
SSDS	ND	0.11	0.12	0.14	ND	<LOD 0.01
CP	0.38	0.88	0.83	1.24	0.90	>LOQ 0.1
G	0.39	0.42	0.64	0.62	0.02	<LOQ 0.05
SG	ND	ND	ND	ND	ND	<LOD 0.01

Air Sample Results - Cadmium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Cadium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	0.003	< LOQ 0.008	0.065	< LOQ 0.172
97035	2	47.34	SS	1	0.014	> LOQ 0.008	0.296	> LOQ 0.169
97029	3	44.33	SS	1	0.014	> LOQ 0.008	0.316	> LOQ 0.180
97034	OBZ	47.60	SS	1	0.0091	> LOQ 0.008	0.191	> LOQ 0.168
97022	1	47.66	SSDS	2	0.005	< LOQ 0.008	0.105	< LOQ 0.168
97032	2	46.72	SSDS	2	0.0084	> LOQ 0.008	0.180	> LOQ 0.171
97025	3	49.14	SSDS	2	0.011	> LOQ 0.008	0.224	> LOQ 0.163
97006	OBZ	48.95	SSDS	2	0.025	> LOQ 0.008	0.511	> LOQ 0.163
97024	1	46.50	CS	3	0.048	> LOQ 0.008	1.032	> LOQ 0.172
97020	2	47.34	CS	3	0.013	> LOQ 0.008	0.275	> LOQ 0.169
97015	3	44.33	CS	3	0.018	> LOQ 0.008	0.406	> LOQ 0.180
97037	OBZ	47.60	CS	3	0.025	> LOQ 0.008	0.525	> LOQ 0.168
97014	1	50.38	CP	4	0.006	< LOQ 0.008	0.119	< LOQ 0.159
97011	2	47.98	CP	4	0.013	> LOQ 0.008	0.271	> LOQ 0.167
97031	3	47.92	CP	4	0.016	> LOQ 0.008	0.334	> LOQ 0.167
97019	OBZ	48.30	CP	4	0.18	> LOQ 0.2	3.727	> LOQ 4.141
97030	1	47.64	N	5	0.011	> LOQ 0.008	0.231	> LOQ 0.168
97009	2	44.16	N	5	0.015	> LOQ 0.008	0.340	> LOQ 0.181
97021	3	44.52	N	5	0.014	> LOQ 0.008	0.314	> LOQ 0.180
97036	OBZ	54.48	N	5	0.031	> LOQ 0.008	0.569	> LOQ 0.147
97018	1	48.17	G	6	0.033	> LOQ 0.008	0.685	> LOQ 0.166
97005	2	47.51	G	6	0.053	> LOQ 0.02	1.116	> LOQ 0.421
97017	3	47.11	G	6	0.071	> LOQ 0.02	1.507	> LOQ 0.425
97007	OBZ	48.76	G	6	0.063	> LOQ 0.02	1.292	> LOQ 0.410
97008	1	47.92	S	7	0.01	> LOQ 0.008	0.209	> LOQ 0.167
97023	2	48.40	S	7	0.014	> LOQ 0.008	0.289	> LOQ 0.165
97013	3	48.89	S	7	0.015	> LOQ 0.008	0.307	> LOQ 0.164
97016	OBZ	48.71	S	7	0.01	> LOQ 0.008	0.205	> LOQ 0.164
97001	1	47.89	SG	8	0.004	< LOQ 0.008	0.084	< LOQ 0.167
97003	2	48.29	SG	8	0.0093	> LOQ 0.008	0.193	> LOQ 0.166
97028	3	48.32	SG	8	0.008	< LOQ 0.008	0.166	< LOQ 0.166
97038	OBZ	48.97	SG	8	0.6	> LOQ 0.2	12.252	> LOQ 4.084

Bulk Elemental Analysis - Cadmium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Cadmium		Sample	Cadmium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	0.03	<LOQ 0.7	J97119P203 PB	ND	<LOD 0.02
N	J97119P205 VB	ND	<LOD 0.02	J97119P205 PB	0.03	<LOQ 0.03
S	J97119P207 VB	ND	<LOD 0.02	J97119P207 PB	0.02	<LOQ 0.7
SS	J97119P201 VB	0.03	<LOQ 0.7	J97119P201 PB	0.03	<LOQ 0.7
SSDS	J97119P202 VB	ND	<LOD 0.02	J97119P202 PB	0.02	<LOQ 0.7
CP	J97119P204 VB	0.03	<LOQ 0.7	J97119P204 PB	0.03	<LOQ 0.7
G	J97119P206 VB	0.05	<LOQ 0.7	J97119P206 PB	0.03	<LOQ 0.7
SG	J97119P208 VB	ND	<LOD 0.02	J97119P208 PB	ND	<LOD 0.02

Comparison of Airborne Concentrations to Bulk Concentrations - Cadmium

NIOSH REL - Limit of Quantification (Lowest Feasible Concentration)
OSHA PEL 5.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Cadmium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	1.03	0.28	0.41	0.53	0.03	<LOQ 0.7
N	0.23	0.34	0.31	0.57	ND	<LOD 0.02
S	0.21	0.29	0.31	0.21	ND	<LOD 0.02
SS	0.07	0.30	0.32	0.19	0.03	<LOQ 0.7
SSDS	0.11	0.18	0.22	0.51	ND	<LOD 0.02
CP	0.12	0.27	0.33	3.73	0.03	<LOQ 0.7
G	0.69	1.12	1.51	1.29	0.05	<LOQ 0.7
SG	0.08	0.19	0.17	12.25	ND	<LOD 0.02

Air Sample Results - Calcium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Calcium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	390	> LOQ 7.0	8172.04	> LOQ 150.54
97035	2	47.34	SS	1	4800	> LOQ 10.0	101394.17	> LOQ 211.24
97029	3	44.33	SS	1	4900	> LOQ 30.0	110539.61	> LOQ 676.77
97034	OBZ	47.60	SS	1	790	> LOQ 7.0	16595.24	> LOQ 147.05
97022	1	47.66	SSDS	2	32	> LOQ 7.0	671.37	> LOQ 146.86
97032	2	46.72	SSDS	2	53	> LOQ 7.0	1134.51	> LOQ 149.84
97025	3	49.14	SSDS	2	71	> LOQ 7.0	1444.85	> LOQ 142.45
97006	OBZ	48.95	SSDS	2	80	> LOQ 7.0	1634.39	> LOQ 143.01
97024	1	46.50	CS	3	5700.00	> LOQ 30	122580.65	> LOQ 645.16
97020	2	47.34	CS	3	990	> LOQ 7.0	20912.55	> LOQ 147.87
97015	3	44.33	CS	3	1200	> LOQ 7.0	27070.93	> LOQ 157.91
97037	OBZ	47.60	CS	3	950	> LOQ 7.0	19956.31	> LOQ 147.05
97014	1	50.38	CP	4	2600	> LOQ 30.0	51611.88	> LOQ 595.52
97011	2	47.98	CP	4	5600	> LOQ 70.0	116725.03	> LOQ 1459.06
97031	3	47.92	CP	4	5600	> LOQ 7.0	116871.19	> LOQ 146.09
97019	OBZ	48.30	CP	4	8500	> LOQ 30.0	175983.44	> LOQ 621.12
97030	1	47.64	N	5	160	> LOQ 7.0	3358.52	> LOQ 146.94
97009	2	44.16	N	5	360	> LOQ 7.0	8152.17	> LOQ 158.51
97021	3	44.52	N	5	280	> LOQ 7.0	6289.31	> LOQ 157.23
97036	OBZ	54.48	N	5	350	> LOQ 7.0	6424.38	> LOQ 128.49
97018	1	48.17	G	6	220	> LOQ 7.0	4567.35	> LOQ 145.32
97005	2	47.51	G	6	350	> LOQ 7.0	7367.18	> LOQ 147.34
97017	3	47.11	G	6	490	> LOQ 7.0	10400.75	> LOQ 148.58
97007	OBZ	48.76	G	6	440	> LOQ 7.0	9024.53	> LOQ 143.57
97008	1	47.92	S	7	50	> LOQ 7.0	1043.49	> LOQ 146.09
97023	2	48.40	S	7	89	> LOQ 7.0	1838.99	> LOQ 144.64
97013	3	48.89	S	7	95	> LOQ 7.0	1943.22	> LOQ 143.18
97016	OBZ	48.71	S	7	65	> LOQ 7.0	1334.48	> LOQ 143.71
97001	1	47.89	SG	8	7.7	> LOQ 7.0	160.78	> LOQ 146.16
97003	2	48.29	SG	8	35	> LOQ 7.0	724.82	> LOQ 144.96
97028	3	48.32	SG	8	31	> LOQ 7.0	641.50	> LOQ 144.86
97038	OBZ	48.97	SG	8	74	> LOQ 30.0	1511.07	> LOQ 612.59

Bulk Elemental Analysis - Calcium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Calcium		Sample	Calcium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	280.00	>LOQ 30.0	J97119P203 PB	370.00	>LOQ 30.0
N	J97119P205 VB	610.00	>LOQ 30.0	J97119P205 PB	770.00	>LOQ 30.0
S	J97119P207 VB	20.00	<LOQ 30.0	J97119P207 PB	500.00	>LOQ 30.0
SS	J97119P201 VB	28000.00	>LOQ 100	J97119P201 PB	8300.00	>LOQ 30.0
SSDS	J97119P202 VB	10.00	<LOQ 30.0	J97119P202 PB	140.00	>LOQ 30.0
CP	J97119P204 VB	110000.00	>LOQ 600	J97119P204 PB	110000.00	>LOQ 600
G	J97119P206 VB	310.00	>LOQ 30.0	J97119P206 PB	460.00	>LOQ 30.0
SG	J97119P208 VB	ND	<LOD 9.0	J97119P208 PB	ND	<LOD 9.0

Comparison of Airborne Concentrations to Bulk Concentrations - Calcium

NIOSH REL 10000.0 micrograms/cubic meter
OSHA PEL 15000.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Calcium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	122580.65	20912.55	27070.93	19956.31	280.00	>LOQ 30.0
N	3358.52	8152.17	6289.31	6424.38	610.00	>LOQ 30.0
S	1043.49	1838.99	1943.22	1334.48	20.00	<LOQ 30.0
SS	8172.04	101394.17	110539.61	16595.24	28000.00	>LOQ 100
SSDS	671.37	1134.51	1444.85	1634.39	10.00	<LOQ 30.0
CP	51611.88	116725.03	116871.19	175983.44	110000.00	>LOQ 600
G	4567.35	7367.18	10400.75	9024.53	310.00	>LOQ 30.0
SG	160.78	724.82	641.50	1511.07	ND	<LOD 9.0

Air Sample Results - Chromium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Chromium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 0.5	ND	< LOD 10.75
97035	2	47.34	SS	1	2.50	> LOQ 2.0	52.81	> LOQ 42.25
97029	3	44.33	SS	1	2.80	> LOQ 2.0	63.17	> LOQ 45.12
97034	OBZ	47.60	SS	1	4.50	> LOQ 2.0	94.53	> LOQ 42.01
97022	1	47.66	SSDS	2	0.70	< LOQ 2.0	14.69	< LOQ 41.96
97032	2	46.72	SSDS	2	2.00	< LOQ 2.0	42.81	< LOQ 42.81
97025	3	49.14	SSDS	2	2.30	> LOQ 2.0	46.81	> LOQ 40.70
97006	OBZ	48.95	SSDS	2	2.10	> LOQ 2.0	42.90	> LOQ 40.86
97024	1	46.50	CS	3	2.9	> LOQ 2.0	62.37	> LOQ 43.01
97020	2	47.34	CS	3	5.90	> LOQ 2.0	124.63	> LOQ 42.25
97015	3	44.33	CS	3	7.20	> LOQ 2.0	162.43	> LOQ 45.12
97037	OBZ	47.60	CS	3	5.80	> LOQ 2.0	121.84	> LOQ 42.01
97014	1	50.38	CP	4	2.00	< LOQ 2.0	39.70	< LOQ 39.70
97011	2	47.98	CP	4	4.10	> LOQ 2.0	85.46	> LOQ 41.69
97031	3	47.92	CP	4	4.10	> LOQ 2.0	85.57	> LOQ 41.74
97019	OBZ	48.30	CP	4	4.90	> LOQ 2.0	101.45	> LOQ 41.41
97030	1	47.64	N	5	92.00	> LOQ 2.0	1931.15	> LOQ 41.98
97009	2	44.16	N	5	240.00	> LOQ 2.0	5434.78	> LOQ 45.29
97021	3	44.52	N	5	160.00	> LOQ 2.0	3593.89	> LOQ 44.92
97036	OBZ	54.48	N	5	220.00	> LOQ 2.0	4038.18	> LOQ 36.71
97018	1	48.17	G	6	2.70	> LOQ 2.0	56.05	> LOQ 41.52
97005	2	47.51	G	6	4.70	> LOQ 2.0	98.93	> LOQ 42.10
97017	3	47.11	G	6	6.20	> LOQ 2.0	131.60	> LOQ 42.45
97007	OBZ	48.76	G	6	5.30	> LOQ 2.0	108.70	> LOQ 41.02
97008	1	47.92	S	7	2.60	> LOQ 2.0	54.26	> LOQ 41.74
97023	2	48.40	S	7	4.30	> LOQ 2.0	88.85	> LOQ 41.33
97013	3	48.89	S	7	4.80	> LOQ 2.0	98.18	> LOQ 40.91
97016	OBZ	48.71	S	7	3.10	> LOQ 2.0	63.64	> LOQ 41.06
97001	1	47.89	SG	8	16.00	> LOQ 2.0	334.09	> LOQ 41.76
97003	2	48.29	SG	8	15.00	> LOQ 2.0	310.64	> LOQ 41.42
97028	3	48.32	SG	8	60.00	> LOQ 2.0	1241.62	> LOQ 41.39
97038	OBZ	48.97	SG	8	420.00	> LOQ 10.0	8576.33	> LOQ 204.20

Bulk Elemental Analysis - Chromium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Chromium		Sample	Chromium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	<LOD 2.0	J97119P203 PB	3.00	<LOQ 7.0
N	J97119P205 VB	350.00	>LOQ 7.0	J97119P205 PB	450.00	>LOQ 7.0
S	J97119P207 VB	ND	<LOD 2.0	J97119P207 PB	4.00	<LOQ 7.0
SS	J97119P201 VB	3.00	<LOQ 7.0	J97119P201 PB	5.00	<LOQ 7.0
SSDS	J97119P202 VB	ND	<LOD 2.0	J97119P202 PB	2.00	<LOQ 7.0
CP	J97119P204 VB	33.00	>LOQ 7.0	J97119P204 PB	45.00	>LOQ 7.0
G	J97119P206 VB	3.00	<LOQ 7.0	J97119P206 PB	7.00	<LOQ 7.0
SG	J97119P208 VB	1300.00	>LOQ 7.0	J97119P208 PB	1400.00	>LOQ 7.0

Comparison of Airborne Concentrations to Bulk Concentrations - Chromium

NIOSH REL 500.0 micrograms/cubic meter
OSHA PEL 500.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Chromium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	62.37	124.63	162.43	121.84	ND	<LOD 2.0
N	1931.15	5434.78	3593.89	4038.18	350.00	>LOQ 7.0
S	54.26	88.85	98.18	63.64	ND	<LOD 2.0
SS	ND	52.81	63.17	94.53	3.00	<LOQ 7.0
SSDS	14.69	42.81	46.81	42.90	ND	<LOD 2.0
CP	39.70	85.46	85.57	101.45	33.00	>LOQ 7.0
G	56.05	98.93	131.60	108.70	3.00	<LOQ 7.0
SG	334.09	310.64	1241.62	8576.33	1300.00	>LOQ 7.0

Air Sample Results - Cobalt

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Cobalt			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 0.2	ND	< LOD 4.30
97035	2	47.34	SS	1	0.44	> LOQ 0.4	9.29	> LOQ 8.45
97029	3	44.33	SS	1	0.59	> LOQ 0.4	13.31	> LOQ 9.02
97034	OBZ	47.60	SS	1	0.73	> LOQ 0.4	15.33	> LOQ 8.40
97022	1	47.66	SSDS	2	ND	< LOD 0.2	ND	< LOD 4.20
97032	2	46.72	SSDS	2	ND	< LOD 0.2	ND	< LOD 4.28
97025	3	49.14	SSDS	2	0.40	< LOQ 0.4	8.14	< LOQ 8.14
97006	OBZ	48.95	SSDS	2	ND	< LOD 0.2	ND	< LOD 4.09
97024	1	46.50	CS	3	0.7	> LOQ 0.4	15.05	> LOQ 8.60
97020	2	47.34	CS	3	1.20	> LOQ 0.4	25.35	> LOQ 8.45
97015	3	44.33	CS	3	1.50	> LOQ 0.4	33.84	> LOQ 9.02
97037	OBZ	47.60	CS	3	1.30	> LOQ 0.4	27.31	> LOQ 8.40
97014	1	50.38	CP	4	0.79	> LOQ 0.4	15.68	> LOQ 7.94
97011	2	47.98	CP	4	1.40	> LOQ 0.4	29.18	> LOQ 8.34
97031	3	47.92	CP	4	1.50	> LOQ 0.4	31.30	> LOQ 8.35
97019	OBZ	48.30	CP	4	2.20	> LOQ 0.4	45.55	> LOQ 8.28
97030	1	47.64	N	5	1.30	> LOQ 0.4	27.29	> LOQ 8.40
97009	2	44.16	N	5	3.30	> LOQ 0.4	74.73	> LOQ 9.06
97021	3	44.52	N	5	2.00	> LOQ 0.4	44.92	> LOQ 8.98
97036	OBZ	54.48	N	5	2.70	> LOQ 0.4	49.56	> LOQ 7.34
97018	1	48.17	G	6	0.20	< LOQ 0.4	4.15	< LOQ 8.30
97005	2	47.51	G	6	0.77	> LOQ 0.4	16.21	> LOQ 8.42
97017	3	47.11	G	6	0.99	> LOQ 0.4	21.01	> LOQ 8.49
97007	OBZ	48.76	G	6	0.74	> LOQ 0.4	15.18	> LOQ 8.20
97008	1	47.92	S	7	ND	< LOD 0.2	ND	<LOD 4.17
97023	2	48.40	S	7	0.41	> LOQ 0.4	8.47	> LOQ 8.27
97013	3	48.89	S	7	0.40	> LOQ 0.4	8.18	> LOQ 8.18
97016	OBZ	48.71	S	7	0.42	> LOQ 0.4	8.62	> LOQ 8.21
97001	1	47.89	SG	8	0.30	< LOQ 0.4	6.26	< LOQ 8.35
97003	2	48.29	SG	8	ND	< LOD 0.2	ND	< LOD 4.14
97028	3	48.32	SG	8	2.10	> LOQ 0.4	43.46	> LOQ 8.28
97038	OBZ	48.97	SG	8	13.00	> LOQ 2.0	265.46	> LOQ 40.84

Bulk Elemental Analysis - Cobalt

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Cobalt		Sample	Cobalt	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	1.00	<LOQ 2.0	J97119P203 PB	0.70	<LOQ 2.0
N	J97119P205 VB	8.10	>LOQ 2.0	J97119P205 PB	17.00	>LOQ 2.0
S	J97119P207 VB	1.00	<LOQ 2.0	J97119P207 PB	ND	<LOD 0.5
SS	J97119P201 VB	2.00	<LOQ 2.0	J97119P201 PB	1.00	<LOQ 2.0
SSDS	J97119P202 VB	0.60	<LOQ 2.0	J97119P202 PB	0.50	<LOQ 2.0
CP	J97119P204 VB	26.00	>LOQ 2.0	J97119P204 PB	30.00	>LOQ 2.0
G	J97119P206 VB	0.80	<LOQ 2.0	J97119P206 PB	2.10	>LOQ 2.0
SG	J97119P208 VB	44.00	>LOQ 2.0	J97119P208 PB	46.00	>LOQ 2.0

Comparison of Airborne Concentrations to Bulk Concentrations - Cobalt

NIOSH REL 50.0 micrograms/cubic meter
OSHA PEL 100.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Cobalt**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	15.05	25.35	33.84	27.31	1.00	<LOQ 2.0
N	27.29	74.73	44.92	49.56	8.10	>LOQ 2.0
S	ND	8.47	8.18	8.62	1.00	<LOQ 2.0
SS	ND	9.29	13.31	15.33	2.00	<LOQ 2.0
SSDS	ND	ND	8.14	ND	0.60	<LOQ 2.0
CP	15.68	29.18	31.30	45.55	26.00	>LOQ 2.0
G	4.15	16.21	21.01	15.18	0.80	<LOQ 2.0
SG	6.26	ND	43.46	265.46	44.00	>LOQ 2.0

Air Sample Results - Copper

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Copper			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	0.33	> LOQ 0.2	7.10	> LOQ 4.30
97035	2	47.34	SS	1	4.40	> LOQ 0.2	92.94	> LOQ 4.22
97029	3	44.33	SS	1	4.80	> LOQ 0.2	108.28	> LOQ 4.51
97034	OBZ	47.60	SS	1	5.90	> LOQ 0.2	123.94	> LOQ 4.20
97022	1	47.66	SSDS	2	1.20	> LOQ 0.2	25.18	> LOQ 4.20
97032	2	46.72	SSDS	2	2.60	> LOQ 0.2	55.66	> LOQ 4.28
97025	3	49.14	SSDS	2	3.50	> LOQ 0.2	71.23	> LOQ 4.07
97006	OBZ	48.95	SSDS	2	3.50	> LOQ 0.2	71.50	> LOQ 4.09
97024	1	46.50	CS	3	5.00	> LOQ 0.2	107.53	> LOQ 4.30
97020	2	47.34	CS	3	8.90	> LOQ 0.2	188.00	> LOQ 4.22
97015	3	44.33	CS	3	11.00	> LOQ 0.2	248.15	> LOQ 4.51
97037	OBZ	47.60	CS	3	9.10	> LOQ 0.2	191.16	> LOQ 4.20
97014	1	50.38	CP	4	35.00	> LOQ 0.2	694.78	> LOQ 3.97
97011	2	47.98	CP	4	80.00	> LOQ 0.2	1667.50	> LOQ 4.17
97031	3	47.92	CP	4	84.00	> LOQ 0.2	1753.07	> LOQ 4.17
97019	OBZ	48.30	CP	4	130.00	> LOQ 0.2	2691.51	> LOQ 4.14
97030	1	47.64	N	5	2.50	> LOQ 0.2	52.48	> LOQ 4.20
97009	2	44.16	N	5	5.30	> LOQ 0.2	120.02	> LOQ 4.53
97021	3	44.52	N	5	4.60	> LOQ 0.2	103.32	> LOQ 4.49
97036	OBZ	54.48	N	5	5.10	> LOQ 0.2	93.61	> LOQ 3.67
97018	1	48.17	G	6	1.50	> LOQ 0.2	31.14	> LOQ 4.15
97005	2	47.51	G	6	2.90	> LOQ 0.2	61.04	> LOQ 4.21
97017	3	47.11	G	6	3.50	> LOQ 0.2	74.29	> LOQ 4.25
97007	OBZ	48.76	G	6	3.10	> LOQ 0.2	63.58	> LOQ 4.10
97008	1	47.92	S	7	2.80	> LOQ 0.2	58.44	> LOQ 4.17
97023	2	48.40	S	7	4.90	> LOQ 0.2	101.25	> LOQ 4.13
97013	3	48.89	S	7	5.50	> LOQ 0.2	112.50	> LOQ 4.09
97016	OBZ	48.71	S	7	3.50	> LOQ 0.2	71.86	> LOQ 4.11
97001	1	47.89	SG	8	11.00	> LOQ 0.2	229.68	> LOQ 4.18
97003	2	48.29	SG	8	9.00	> LOQ 0.2	186.38	> LOQ 4.14
97028	3	48.32	SG	8	41.00	> LOQ 0.2	848.44	> LOQ 4.14
97038	OBZ	48.97	SG	8	280.00	> LOQ 1.0	5717.55	> LOQ 20.42

Bulk Elemental Analysis - Copper

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Copper		Sample	Copper	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	0.80	<LOQ 1.0	J97119P203 PB	7.30	>LOQ 1.0
N	J97119P205 VB	3.70	>LOQ 1.0	J97119P205 PB	9.10	>LOQ 1.0
S	J97119P207 VB	0.40	<LOQ 1.0	J97119P207 PB	3.40	>LOQ 1.0
SS	J97119P201 VB	7.50	>LOQ 1.0	J97119P201 PB	6.60	>LOQ 1.0
SSDS	J97119P202 VB	ND	<LOD 0.3	J97119P202 PB	3.60	>LOQ 1.0
CP	J97119P204 VB	1300.00	>LOQ 1.0	J97119P204 PB	1500.00	>LOQ 1.0
G	J97119P206 VB	0.50	<LOQ 1.0	J97119P206 PB	3.90	>LOQ 1.0
SG	J97119P208 VB	1100.00	>LOQ 1.0	J97119P208 PB	1200.00	>LOQ 1.0

Comparison of Airborne Concentrations to Bulk Concentrations - Copper

NIOSH REL 1000.0 micrograms/cubic meter
OSHA PEL 1000.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Copper**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	107.53	188.00	248.15	191.16	0.80	<LOQ 1.0
N	52.48	120.02	103.32	93.61	3.70	>LOQ 1.0
S	58.44	101.25	112.50	71.86	0.40	<LOQ 1.0
SS	7.10	92.94	108.28	123.94	7.50	>LOQ 1.0
SSDS	25.18	55.66	71.23	71.50	ND	<LOD 0.3
CP	694.78	1667.50	1753.07	2691.51	1300.00	>LOQ 1.0
G	31.14	61.04	74.29	63.58	0.50	<LOQ 1.0
SG	229.68	186.38	848.44	5717.55	1100.00	>LOQ 1.0

Air Sample Results - Iron

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Iron			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	350	> LOQ 2.0	7526.88	> LOQ 43.01
97035	2	47.34	SS	1	4700	> LOQ 10.0	99281.79	> LOQ 211.24
97029	3	44.33	SS	1	5000	> LOQ 10.0	112795.52	> LOQ 225.59
97034	OBZ	47.60	SS	1	7400	> LOQ 20.0	155449.12	> LOQ 420.13
97022	1	47.66	SSDS	2	1300	> LOQ 40.0	27274.25	> LOQ 839.21
97032	2	46.72	SSDS	2	3000	> LOQ 10.0	64217.83	> LOQ 214.06
97025	3	49.14	SSDS	2	4400	> LOQ 10.0	89540.09	> LOQ 203.50
97006	OBZ	48.95	SSDS	2	4200	> LOQ 10.0	85805.34	> LOQ 204.30
97024	1	46.50	CS	3	5800	> LOQ 10.0	124731.18	> LOQ 215.05
97020	2	47.34	CS	3	11000	> LOQ 20.0	232361.64	> LOQ 422.48
97015	3	44.33	CS	3	14000	> LOQ 40.0	315827.47	> LOQ 902.36
97037	OBZ	47.60	CS	3	11000	> LOQ 20.0	231073.02	> LOQ 420.13
97014	1	50.38	CP	4	3600	> LOQ 10.0	71462.60	> LOQ 198.51
97011	2	47.98	CP	4	8300	> LOQ 20.0	173003.17	> LOQ 416.88
97031	3	47.92	CP	4	8400	> LOQ 20.0	175306.79	> LOQ 417.40
97019	OBZ	48.30	CP	4	11000	> LOQ 20.0	227743.27	> LOQ 414.08
97030	1	47.64	N	5	4100	> LOQ 10.0	86062.13	> LOQ 209.91
97009	2	44.16	N	5	3100	> LOQ 20.0	70199.28	> LOQ 452.90
97021	3	44.52	N	5	8100	> LOQ 20.0	181940.70	> LOQ 449.24
97036	OBZ	54.48	N	5	9300	> LOQ 20.0	170704.85	> LOQ 367.11
97018	1	48.17	G	6	8500	> LOQ 20.0	176465.70	> LOQ 415.21
97005	2	47.51	G	6	13000	> LOQ 40.0	273638.12	> LOQ 841.96
97017	3	47.11	G	6	18000	> LOQ 40.0	382068.26	> LOQ 849.04
97007	OBZ	48.76	G	6	16000	> LOQ 40.0	328164.74	> LOQ 820.41
97008	1	47.92	S	7	4300	> LOQ 10.0	89740.38	> LOQ 208.70
97023	2	48.40	S	7	7400	> LOQ 20.0	152905.20	> LOQ 413.26
97013	3	48.89	S	7	8100	> LOQ 20.0	165684.83	> LOQ 409.10
97016	OBZ	48.71	S	7	5000	> LOQ 10.0	102652.54	> LOQ 205.31
97001	1	47.89	SG	8	7700	> LOQ 20.0	160778.42	> LOQ 417.61
97003	2	48.29	SG	8	7900	> LOQ 20.0	163601.72	> LOQ 414.18
97028	3	48.32	SG	8	28000	> LOQ 80.0	579422.23	> LOQ 1655.49
97038	OBZ	48.97	SG	8	210000	> LOQ 400.0	4288164.67	> LOQ 8167.93

Bulk Elemental Analysis - Iron

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Iron		Sample	Iron	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	1600.00	>LOQ 10.0	J97119P203 PB	5000.00	>LOQ 20.0
N	J97119P205 VB	8800.00	>LOQ 50.0	J97119P205 PB	17000.00	>LOQ 50.0
S	J97119P207 VB	83.00	>LOQ 10.0	J97119P207 PB	5600.00	>LOQ 20.0
SS	J97119P201 VB	3600.00	>LOQ 10.0	J97119P201 PB	6900.00	>LOQ 20.0
SSDS	J97119P202 VB	69.00	>LOQ 10.0	J97119P202 PB	5200.00	>LOQ 20.0
CP	J97119P204 VB	96000.00	>LOQ 200	J97119P204 PB	110000.00	>LOQ 400.0
G	J97119P206 VB	4100.00	>LOQ 10.0	J97119P206 PB	15000.00	>LOQ 50.0
SG	J97119P208 VB	660000.00	>LOQ 2000	J97119P208 PB	780000.00	>LOQ 2000

Comparison of Airborne Concentrations to Bulk Concentrations - Iron

NIOSH REL 5000.0 micrograms/cubic meter
OSHA PEL 10000.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Iron**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	124731.18	#REF!	315827.47	231073.02	1600.00	>LOQ 10.0
N	86062.13	70199.28	181940.70	170704.85	8800.00	>LOQ 50.0
S	89740.38	152905.20	165684.83	102652.54	83.00	>LOQ 10.0
SS	7526.88	99281.79	112795.52	155449.12	3600.00	>LOQ 10.0
SSDS	27274.25	64217.83	89540.09	85805.34	69.00	>LOQ 10.0
CP	71462.60	173003.17	175306.79	227743.27	96000.00	>LOQ 200
G	176465.70	273638.12	382068.26	328164.74	4100.00	>LOQ 10.0
SG	160778.42	163601.72	579422.23	4288164.67	660000.00	>LOQ 2000

Air Sample Results - Lead

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Lead			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOQ 0.4	ND	< LOD 2.15
97035	2	47.34	SS	1	0.55	> LOQ 0.4	11.62	> LOQ 8.45
97029	3	44.33	SS	1	0.63	> LOQ 0.04	14.21	> LOQ 0.90
97034	OBZ	47.60	SS	1	0.36	> LOQ 0.04	7.56	> LOQ 0.84
97022	1	47.66	SSDS	2	0.22	> LOQ 0.04	4.62	> LOQ 0.84
97032	2	46.72	SSDS	2	0.44	> LOQ 0.04	9.42	> LOQ 0.86
97025	3	49.14	SSDS	2	0.54	> LOQ 0.04	10.99	> LOQ 0.81
97006	OBZ	48.95	SSDS	2	0.55	> LOQ 0.04	11.24	> LOQ 0.82
97024	1	46.50	CS	3	0.56	> LOQ 0.4	12.04	> LOQ 8.60
97020	2	47.34	CS	3	0.47	> LOQ 0.4	9.93	> LOQ 8.45
97015	3	44.33	CS	3	0.52	> LOQ 0.4	11.73	> LOQ 9.02
97037	OBZ	47.60	CS	3	0.56	> LOQ 0.4	11.76	> LOQ 8.40
97014	1	50.38	CP	4	0.16	> LOQ 0.04	3.18	> LOQ0.79
97011	2	47.98	CP	4	0.42	> LOQ 0.04	8.75	> LOQ0.83
97031	3	47.92	CP	4	0.36	> LOQ 0.04	7.51	> LOQ 0.83
97019	OBZ	48.30	CP	4	0.49	> LOQ 0.04	10.14	> LOQ 0.83
97030	1	47.64	N	5	0.24	> LOQ 0.04	5.04	> LOQ 0.84
97009	2	44.16	N	5	0.37	> LOQ 0.04	8.38	> LOQ 0.91
97021	3	44.52	N	5	0.33	> LOQ 0.04	7.41	> LOQ 0.90
97036	OBZ	54.48	N	5	0.39	> LOQ 0.04	7.16	> LOQ 0.73
97018	1	48.17	G	6	0.25	> LOQ 0.04	5.19	> LOQ 0.83
97005	2	47.51	G	6	0.41	> LOQ 0.04	8.63	> LOQ 0.84
97017	3	47.11	G	6	0.55	> LOQ 0.04	11.67	> LOQ 0.85
97007	OBZ	48.76	G	6	0.5	> LOQ 0.04	10.26	> LOQ 0.82
97008	1	47.92	S	7	1.5	> LOQ 0.04	31.30	> LOQ 0.83
97023	2	48.40	S	7	2.8	> LOQ 0.2	57.86	> LOQ 4.13
97013	3	48.89	S	7	2.6	> LOQ 0.2	53.18	> LOQ 4.09
97016	OBZ	48.71	S	7	1.7	> LOQ 0.04	34.90	> LOQ 0.82
97001	1	47.89	SG	8	0.092	> LOQ 0.04	1.92	> LOQ 0.84
97003	2	48.29	SG	8	0.23	> LOQ 0.04	4.76	> LOQ 0.83
97028	3	48.32	SG	8	0.56	> LOQ 0.04	11.59	> LOQ 0.83
97038	OBZ	48.97	SG	8	1.2	> LOQ 0.04	24.50	> LOQ.0.82

Bulk Elemental Analysis - Lead

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Lead		Sample	Lead	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	<LOD 0.7	J97119P203 PB	ND	<LOD 0.7
N	J97119P205 VB	ND	<LOD 0.7	J97119P205 PB	ND	<LOD 0.7
S	J97119P207 VB	2.50	>LOQ 2.0	J97119P207 PB	2.50	>LOQ 2.0
SS	J97119P201 VB	ND	<LOD 0.7	J97119P201 PB	ND	<LOD 0.7
SSDS	J97119P202 VB	ND	<LOD 0.7	J97119P202 PB	ND	<LOD 0.7
CP	J97119P204 VB	3.20	>LOQ 2.0	J97119P204 PB	2.80	>LOQ 2.0
G	J97119P206 VB	ND	<LOD 0.7	J97119P206 PB	ND	<LOD 0.7
SG	J97119P208 VB	4.70	>LOQ 2.0	J97119P208 PB	4.40	>LOQ 2.0

Comparison of Airborne Concentrations to Bulk Concentrations - Lead

NIOSH REL 100.0 micrograms/cubic meter
OSHA PEL 50.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Lead**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	12.04	9.93	11.73	11.76	ND	<LOD 0.7
N	5.04	8.38	7.41	7.16	ND	<LOD 0.7
S	31.30	57.86	53.18	34.90	2.50	>LOQ 2.0
SS	ND	11.62	14.21	7.56	ND	<LOD 0.7
SSDS	4.62	9.42	10.99	11.24	ND	<LOD 0.7
CP	3.18	8.75	7.51	10.14	3.20	>LOQ 2.0
G	5.19	8.63	11.67	10.26	ND	<LOD 0.7
SG	1.92	4.76	11.59	24.50	4.70	>LOQ 2.0

Air Sample Results - Lithium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Lithium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	0.060	< LOQ 0.07	1.29	< LOQ 1.505
97035	2	47.34	SS	1	0.540	> LOQ 0.07	11.41	> LOQ 1.479
97029	3	44.33	SS	1	0.630	> LOQ 0.07	14.21	> LOQ 1.579
97034	OBZ	47.60	SS	1	2.400	> LOQ 0.07	50.42	> LOQ 1.470
97022	1	47.66	SSDS	2	0.090	> LOQ 0.07	1.89	> LOQ 1.469
97032	2	46.72	SSDS	2	0.190	> LOQ 0.07	4.07	> LOQ 1.498
97025	3	49.14	SSDS	2	0.200	> LOQ 0.07	4.07	> LOQ 1.425
97006	OBZ	48.95	SSDS	2	0.170	> LOQ 0.07	3.47	> LOQ 1.430
97024	1	46.50	CS	3	0.57	> LOQ 0.07	12.26	> LOQ 1.505
97020	2	47.34	CS	3	2.900	> LOQ 0.07	61.26	> LOQ 1.479
97015	3	44.33	CS	3	3.500	> LOQ 0.07	78.96	> LOQ 1.579
97037	OBZ	47.60	CS	3	2.800	> LOQ 0.07	58.82	> LOQ 1.470
97014	1	50.38	CP	4	0.420	> LOQ 0.07	8.34	> LOQ 1.390
97011	2	47.98	CP	4	0.850	> LOQ 0.07	17.72	> LOQ 1.459
97031	3	47.92	CP	4	0.910	> LOQ 0.07	18.99	> LOQ 1.461
97019	OBZ	48.30	CP	4	1.300	> LOQ 0.07	26.92	> LOQ 1.449
97030	1	47.64	N	5	0.092	> LOQ 0.07	1.93	> LOQ 1.469
97009	2	44.16	N	5	0.170	> LOQ 0.07	3.85	> LOQ 1.585
97021	3	44.52	N	5	0.140	> LOQ 0.07	3.14	> LOQ 1.572
97036	OBZ	54.48	N	5	0.160	> LOQ 0.07	2.94	> LOQ 1.285
97018	1	48.17	G	6	0.450	> LOQ 0.07	9.34	> LOQ 1.453
97005	2	47.51	G	6	0.680	> LOQ 0.07	14.31	> LOQ 1.473
97017	3	47.11	G	6	0.910	> LOQ 0.07	19.32	> LOQ 1.486
97007	OBZ	48.76	G	6	0.790	> LOQ 0.07	16.20	> LOQ 1.436
97008	1	47.92	S	7	0.450	> LOQ 0.07	9.39	> LOQ 1.461
97023	2	48.40	S	7	0.970	> LOQ 0.07	20.04	> LOQ 1.446
97013	3	48.89	S	7	1.000	> LOQ 0.07	20.45	> LOQ 1.432
97016	OBZ	48.71	S	7	0.630	> LOQ 0.07	12.93	> LOQ 1.437
97001	1	47.89	SG	8	0.040	< LOQ 0.07	0.84	< LOQ 1.462
97003	2	48.29	SG	8	0.050	< LOQ 0.07	1.04	< LOQ 1.450
97028	3	48.32	SG	8	0.050	< LOQ 0.07	1.03	< LOQ 1.449
97038	OBZ	48.97	SG	8	0.200	< LOQ 0.3	4.08	< LOQ 6.126

Bulk Elemental Analysis - Lithium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Lithium		Sample	Lithium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	0.95	>LOQ 0.3	J97119P203 PB	1.30	>LOQ 0.3
N	J97119P205 VB	0.39	>LOQ 0.3	J97119P205 PB	0.48	>LOQ 0.3
S	J97119P207 VB	0.30	<LOQ 0.3	J97119P207 PB	0.62	>LOQ 0.3
SS	J97119P201 VB	1.30	>LOQ 0.3	J97119P201 PB	1.20	>LOQ 0.3
SSDS	J97119P202 VB	0.10	<LOQ 0.3	J97119P202 PB	ND	<LOD 0.09
CP	J97119P204 VB	14.00	>LOQ 0.3	J97119P204 PB	17.00	>LOQ 0.3
G	J97119P206 VB	0.48	>LOQ 0.3	J97119P206 PB	0.30	<LOQ 0.3
SG	J97119P208 VB	ND	<LOD 0.09	J97119P208 PB	ND	<LOD 0.09

Comparison of Airborne Concentrations to Bulk Concentrations - Lithium

NIOSH REL 25.0 micrograms/cubic meter
OSHA PEL 25.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Lithium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	12.26	61.26	78.96	58.82	0.95	>LOQ 0.3
N	1.93	3.85	3.14	2.94	0.39	>LOQ 0.3
S	9.39	20.04	20.45	12.93	0.30	<LOQ 0.3
SS	1.29	11.41	14.21	50.42	1.30	>LOQ 0.3
SSDS	1.89	4.07	4.07	3.47	0.10	<LOQ 0.3
CP	8.34	17.72	18.99	26.92	14.00	>LOQ 0.3
G	9.34	14.31	19.32	16.20	0.48	>LOQ 0.3
SG	0.84	1.04	1.03	4.08	ND	<LOD 0.09

Air Sample Results - Magnesium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Magnesium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	200.00	> LOQ 2.0	4301.08	> LOQ 43.01
97035	2	47.34	SS	1	2400.00	> LOQ 4.0	50697.08	> LOQ 84.50
97029	3	44.33	SS	1	2500.00	> LOQ 10.0	56397.76	> LOQ 225.59
97034	OBZ	47.60	SS	1	140.00	> LOQ 2.0	2940.93	> LOQ 42.01
97022	1	47.66	SSDS	2	10.00	> LOQ 2.0	209.80	> LOQ 41.96
97032	2	46.72	SSDS	2	17.00	> LOQ 2.0	363.90	> LOQ 42.81
97025	3	49.14	SSDS	2	22.00	> LOQ 2.0	447.70	> LOQ 40.70
97006	OBZ	48.95	SSDS	2	27.00	> LOQ 2.0	551.61	> LOQ 40.86
97024	1	46.50	CS	3	2900	> LOQ 10.0	62365.59	> LOQ 215.05
97020	2	47.34	CS	3	170.00	> LOQ 2.0	3591.04	> LOQ 42.25
97015	3	44.33	CS	3	210.00	> LOQ 2.0	4737.41	> LOQ 45.12
97037	OBZ	47.60	CS	3	160.00	> LOQ 2.0	3361.06	> LOQ 42.01
97014	1	50.38	CP	4	350.00	> LOQ 2.0	6947.75	> LOQ 39.70
97011	2	47.98	CP	4	770.00	> LOQ 2.0	16049.69	> LOQ 41.69
97031	3	47.92	CP	4	800.00	> LOQ 2.0	16695.88	> LOQ 41.74
97013	OBZ	48.30	CP	4	1100.00	> LOQ 2.0	22774.33	> LOQ 41.41
97030	1	47.64	N	5	7900.00	> LOQ 10.0	165827.04	> LOQ 209.91
97009	2	44.16	N	5	8800.00	> LOQ 20.0	199275.36	> LOQ 452.90
97021	3	44.52	N	5	5800.00	> LOQ 20.0	130278.53	> LOQ 449.24
97036	OBZ	54.48	N	5	7900.00	> LOQ 20.0	145007.34	> LOQ 367.11
97018	1	48.17	G	6	290.00	> LOQ 2.0	6020.59	> LOQ 41.52
97005	2	47.51	G	6	450.00	> LOQ 2.0	9472.09	> LOQ 42.10
97017	3	47.11	G	6	640.00	> LOQ 2.0	13584.65	> LOQ 42.45
97007	OBZ	48.76	G	6	570.00	> LOQ 2.0	11690.87	> LOQ 41.02
97008	1	47.92	S	7	14.00	> LOQ 2.0	292.18	> LOQ 41.74
97023	2	48.40	S	7	27.00	> LOQ 2.0	557.90	> LOQ 41.33
97013	3	48.89	S	7	29.00	> LOQ 2.0	593.19	> LOQ 40.91
97016	OBZ	48.71	S	7	20.00	> LOQ 2.0	410.61	> LOQ 41.06
97001	1	47.89	SG	8	11.00	> LOQ 2.0	229.68	> LOQ 41.76
97003	2	48.29	SG	8	30.00	> LOQ 2.0	621.27	> LOQ 41.42
97028	3	48.32	SG	8	32.00	> LOQ 2.0	662.20	> LOQ 41.39
97038	OBZ	48.97	SG	8	54.00	> LOQ 10.0	1102.67	> LOQ.204.20

Bulk Elemental Analysis - Magnesium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Magnesium		Sample	Magnesium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	52.00	>LOQ 7.0	J97119P203 PB	70.00	>LOQ 7.0
N	J97119P205 VB	17000.00	>LOQ 30.0	J97119P205 PB	25000.00	>LOQ 30.0
S	J97119P207 VB	8.40	>LOQ 7.0	J97119P207 PB	260.00	>LOQ 7.0
SS	J97119P201 VB	15000.00	>LOQ 30.0	J97119P201 PB	4100.00	>LOQ 7.0
SSDS	J97119P202 VB	6.00	<LOQ 7.0	J97119P202 PB	26.00	>LOQ 7.0
CP	J97119P204 VB	13000.00	>LOQ 30.0	J97119P204 PB	17000.00	>LOQ 30.0
G	J97119P206 VB	230.00	>LOQ 7.0	J97119P206 PB	160.00	>LOQ 7.0
SG	J97119P208 VB	68.00	>LOQ 7.0	J97119P208 PB	87.00	>LOQ 7.0

Comparison of Airborne Concentrations to Bulk Concentrations - Magnesium

NIOSH REL 10000.0 micrograms/cubic meter (nuisance)
OSHA PEL 15000.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Magnesium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	62365.59	3591.04	4737.41	3361.06	52.00	>LOQ 7.0
N	165827.04	199275.36	130278.53	145007.34	17000.00	>LOQ 30.0
S	292.18	557.90	593.19	410.61	8.40	>LOQ 7.0
SS	4301.08	50697.08	56397.76	2940.93	15000.00	>LOQ 30.0
SSDS	209.80	363.90	447.70	551.61	6.00	<LOQ 7.0
CP	6947.75	16049.69	16695.88	22774.33	13000.00	>LOQ 30.0
G	6020.59	9472.09	13584.65	11690.87	230.00	>LOQ 7.0
SG	229.68	621.27	662.20	1102.67	68.00	>LOQ 7.0

Air Sample Results - Manganese

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Manganese			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	3.00	> LOQ 0.03	64.52	> LOQ 0.645
97035	2	47.34	SS	1	38.00	> LOQ 0.03	802.70	> LOQ 0.634
97029	3	44.33	SS	1	42.00	> LOQ 0.03	947.48	> LOQ 0.677
97034	OBZ	47.60	SS	1	21.00	> LOQ 0.03	441.14	> LOQ 0.630
97022	1	47.66	SSDS	2	4.90	> LOQ 0.03	102.80	> LOQ 0.629
97032	2	46.72	SSDS	2	12.00	> LOQ 0.03	256.87	> LOQ 0.642
97025	3	49.14	SSDS	2	16.00	> LOQ 0.03	325.60	> LOQ 0.611
97006	OBZ	48.95	SSDS	2	15.00	> LOQ 0.03	306.45	> LOQ 0.613
97024	1	46.50	CS	3	42.00	> LOQ 0.03	903.23	> LOQ 0.645
97020	2	47.34	CS	3	30.00	> LOQ 0.03	633.71	> LOQ 0.634
97015	3	44.33	CS	3	37.00	> LOQ 0.03	834.69	> LOQ 0.677
97037	OBZ	47.60	CS	3	31.00	> LOQ 0.03	651.21	> LOQ 0.630
97014	1	50.38	CP	4	55.00	> LOQ 0.03	1091.79	> LOQ 0.596
97011	2	47.98	CP	4	120.00	> LOQ 0.03	2501.25	> LOQ 0.625
97031	3	47.92	CP	4	120.00	> LOQ 0.03	2504.38	> LOQ 0.626
97019	OBZ	48.30	CP	4	160.00	> LOQ 0.03	3312.63	> LOQ 0.621
97030	1	47.64	N	5	42.00	> LOQ 0.03	881.61	> LOQ 0.630
97009	2	44.16	N	5	100.00	> LOQ 0.03	2264.49	> LOQ 0.679
97021	3	44.52	N	5	78.00	> LOQ 0.03	1752.02	> LOQ 0.674
97036	OBZ	54.48	N	5	96.00	> LOQ 0.03	1762.11	> LOQ 0.551
97018	1	48.17	G	6	280.00	> LOQ 0.03	5812.99	> LOQ 0.623
97005	2	47.51	G	6	440.00	> LOQ 0.03	9261.60	> LOQ 0.631
97017	3	47.11	G	6	640.00	> LOQ 0.1	13584.65	> LOQ 2.123
97007	OBZ	48.76	G	6	540.00	> LOQ 0.06	11075.56	> LOQ 1.231
97008	1	47.92	S	7	23.00	> LOQ 0.03	480.01	> LOQ 0.626
97023	2	48.40	S	7	37.00	> LOQ 0.03	764.53	> LOQ 0.620
97013	3	48.89	S	7	40.00	> LOQ 0.03	818.20	> LOQ 0.614
97016	OBZ	48.71	S	7	27.00	> LOQ 0.03	554.32	> LOQ 0.616
97001	1	47.89	SG	8	77.00	> LOQ 0.03	1607.78	> LOQ 0.626
97003	2	48.29	SG	8	77.00	> LOQ 0.03	1594.60	> LOQ 0.621
97028	3	48.32	SG	8	290.00	> LOQ 0.03	6001.16	> LOQ 0.621
97038	OBZ	48.97	SG	8	1900.00	> LOQ 0.1	38797.68	>LOQ 2.042

Bulk Elemental Analysis -Manganese

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Manganese		Sample	Manganese	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	2.80	> LOQ 0.1	J97119P203 PB	24.00	> LOQ 0.1
N	J97119P205 VB	130.00	> LOQ 0.1	J97119P205 PB	190.00	> LOQ 0.1
S	J97119P207 VB	5.30	> LOQ 0.1	J97119P207 PB	26.00	> LOQ 0.1
SS	J97119P201 VB	110.00	> LOQ 0.1	J97119P201 PB	65.00	> LOQ 0.1
SSDS	J97119P202 VB	0.17	> LOQ 0.1	J97119P202 PB	26.00	> LOQ 0.1
CP	J97119P204 VB	1600.00	> LOQ 0.1	J97119P204 PB	2000.00	> LOQ 0.1
G	J97119P206 VB	170.00	> LOQ 0.1	J97119P206 PB	170.00	> LOQ 0.1
SG	J97119P208 VB	7000.00	> LOQ 0.5	J97119P208 PB	7600.00	> LOQ 0.5

Comparison of Airborne Concentrations to Bulk Concentrations - Manganese

NIOSH REL 1000.0 micrograms/cubic meter
OSHA PEL 5000.0 micrograms/cubic meter Ceiling Limit

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Manganese**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	903.23	633.71	834.69	651.21	2.80	> LOQ 0.1
N	881.61	2264.49	1752.02	1762.11	130.00	> LOQ 0.1
S	480.01	764.53	818.20	554.32	5.30	> LOQ 0.1
SS	64.52	802.70	947.48	441.14	110.00	> LOQ 0.1
SSDS	102.80	256.87	325.60	306.45	0.17	> LOQ 0.1
CP	1091.79	2501.25	2504.38	3312.63	1600.00	> LOQ 0.1
G	5812.99	9261.60	13584.65	11075.56	170.00	> LOQ 0.1
SG	1607.78	1594.60	6001.16	38797.68	7000.00	> LOQ 0.5

Air Sample Results - Molybdenum

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Molybdenum			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 0.3	ND	< LOD 6.45
97035	2	47.34	SS	1	ND	< LOD 0.3	ND	< LOD 6.34
97029	3	44.33	SS	1	ND	< LOD 0.3	ND	< LOD 6.77
97034	OBZ	47.60	SS	1	ND	< LOD 0.3	ND	< LOD 6.30
97022	1	47.66	SSDS	2	0.40	< LOQ 0.8	8.39	< LOQ 16.78
97032	2	46.72	SSDS	2	ND	< LOD 0.3	ND	< LOD 6.42
97025	3	49.14	SSDS	2	ND	< LOD 0.3	ND	< LOD 6.11
97006	OBZ	48.95	SSDS	2	ND	< LOD 0.3	ND	< LOD 6.13
97024	1	46.50	CS	3	ND	< LOD 0.3	ND	< LOD 17.20
97020	2	47.34	CS	3	ND	< LOD 0.3	ND	< LOD 6.34
97015	3	44.33	CS	3	ND	< LOD 0.3	ND	< LOD 6.77
97037	OBZ	47.60	CS	3	ND	< LOD 0.3	ND	< LOD 6.30
97014	1	50.38	CP	4	ND	< LOD 0.3	ND	< LOD 5.96
97011	2	47.98	CP	4	ND	< LOD 0.3	ND	< LOD 6.25
97031	3	47.92	CP	4	ND	< LOD 0.3	ND	< LOD 6.26
97019	OBZ	48.30	CP	4	ND	< LOD 0.3	ND	< LOD 6.21
97030	1	47.64	N	5	ND	< LOD 0.3	ND	< LOD 6.30
97009	2	44.16	N	5	ND	< LOD 0.3	ND	< LOD 6.79
97021	3	44.52	N	5	ND	< LOD 0.3	ND	< LOD 6.74
97036	OBZ	54.48	N	5	ND	< LOD 0.3	ND	< LOD 5.51
97018	1	48.17	G	6	ND	< LOD 0.3	ND	< LOD 6.23
97005	2	47.51	G	6	0.30	< LOQ 0.8	6.31	< LOQ 16.84
97017	3	47.11	G	6	0.81	> LOQ 0.8	17.19	> LOQ 16.98
97007	OBZ	48.76	G	6	ND	< LOD 0.3	ND	< LOD 6.15
97008	1	47.92	S	7	ND	< LOD 0.3	ND	< LOD 6.26
97023	2	48.40	S	7	ND	< LOD 0.3	ND	< LOD 6.20
97013	3	48.89	S	7	ND	< LOD 0.3	ND	< LOD 6.14
97016	OBZ	48.71	S	7	ND	< LOD 0.3	ND	< LOD 6.16
97001	1	47.89	SG	8	2.40	> LOQ 0.8	50.11	> LOQ 16.70
97003	2	48.29	SG	8	2.40	> LOQ 0.8	49.70	> LOQ 16.57
97028	3	48.32	SG	8	14.00	> LOQ 0.8	289.71	> LOQ 16.55
97038	OBZ	48.97	SG	8	95.00	> LOQ 4.0	1939.88	> LOQ 81.68

Bulk Elemental Analysis -Molybdenum

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Molybdenum		Sample	Molybdenum	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	< LOD 1.0	J97119P203 PB	1.00	< LOQ 3.0
N	J97119P205 VB	6.60	> LOQ 3.0	J97119P205 PB	2.00	< LOQ 3.0
S	J97119P207 VB	1.00	< LOQ 3.0	J97119P207 PB	3.00	< LOQ 3.0
SS	J97119P201 VB	ND	< LOD 1.0	J97119P201 PB	ND	< LOD 1.0
SSDS	J97119P202 VB	ND	< LOD 1.0	J97119P202 PB	ND	< LOD 1.0
CP	J97119P204 VB	ND	< LOD 1.0	J97119P204 PB	7.20	> LOQ 3.0
G	J97119P206 VB	4.60	> LOQ 3.0	J97119P206 PB	ND	< LOD 1.0
SG	J97119P208 VB	290.00	> LOQ 3.0	J97119P208 PB	310.00	> LOQ 3.0

Comparison of Airborne Concentrations to Bulk Concentrations - Molybdenum

NIOSH REL 10000.0 micrograms/cubic meter (nuisance)
OSHA PEL 15000.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Molybdenum**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	ND	ND	ND	ND	ND	< LOD 1.0
N	ND	ND	ND	ND	6.60	> LOQ 3.0
S	ND	ND	ND	ND	1.00	< LOQ 3.0
SS	ND	ND	ND	ND	ND	< LOD 1.0
SSDS	8.39	ND	ND	ND	ND	< LOD 1.0
CP	ND	ND	ND	ND	ND	< LOD 1.0
G	ND	6.31	17.19	ND	4.60	> LOQ 3.0
SG	50.11	49.70	289.71	1939.88	290.00	> LOQ 3.0

Air Sample Results - Nickel

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Nickel			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	0.50	< LOQ 1.0	10.75	< LOQ 21.51
97035	2	47.34	SS	1	1.70	> LOQ 1.0	35.91	> LOQ 21.12
97029	3	44.33	SS	1	1.60	> LOQ 1.0	36.09	> LOQ 22.56
97034	OBZ	47.60	SS	1	2.20	> LOQ 1.0	46.21	> LOQ 21.01
97022	1	47.66	SSDS	2	ND	< LOD 0.5	ND	< LOD 10.49
97032	2	46.72	SSDS	2	1.10	> LOQ 1.0	23.55	> LOQ 21.41
97025	3	49.14	SSDS	2	1.10	> LOQ 1.0	22.39	> LOQ 20.35
97006	OBZ	48.95	SSDS	2	0.80	< LOQ 1.0	16.34	< LOQ 20.43
97024	1	46.50	CS	3	1.7	> LOQ 1.0	36.56	> LOQ 21.51
97020	2	47.34	CS	3	3.50	> LOQ 1.0	73.93	> LOQ 21.12
97015	3	44.33	CS	3	4.50	> LOQ 1.0	101.52	> LOQ 22.56
97037	OBZ	47.60	CS	3	4.30	> LOQ 1.0	90.33	> LOQ 21.01
97014	1	50.38	CP	4	0.80	< LOQ 1.0	15.88	< LOQ 19.85
97011	2	47.98	CP	4	1.80	> LOQ 1.0	37.52	> LOQ 20.84
97031	3	47.92	CP	4	2.10	> LOQ 1.0	43.83	> LOQ 20.87
97019	OBZ	48.30	CP	4	2.30	< LOQ 1.0	47.62	< LOQ 20.70
97030	1	47.64	N	5	23.00	> LOQ 1.0	482.79	> LOQ 20.99
97009	2	44.16	N	5	68.00	> LOQ 1.0	1539.86	> LOQ 22.64
97021	3	44.52	N	5	44.00	> LOQ 1.0	988.32	> LOQ 22.46
97036	OBZ	54.48	N	5	60.00	> LOQ 1.0	1101.32	> LOQ 18.36
97018	1	48.17	G	6	ND	< LOD 0.5	ND	< LOD 10.38
97005	2	47.51	G	6	1.20	> LOQ 1.0	25.26	> LOQ 21.05
97017	3	47.11	G	6	1.40	> LOQ 1.0	29.72	> LOQ 21.23
97007	OBZ	48.76	G	6	0.90	< LOQ 1.0	18.46	< LOQ 20.51
97008	1	47.92	S	7	0.80	< LOQ 1.0	16.70	< LOQ 20.87
97023	2	48.40	S	7	1.80	> LOQ 1.0	37.19	> LOQ 20.66
97013	3	48.89	S	7	2.10	> LOQ 1.0	42.96	> LOQ 20.45
97016	OBZ	48.71	S	7	0.60	< LOQ 1.0	12.32	< LOQ 20.53
97001	1	47.89	SG	8	8.60	> LOQ 1.0	179.57	> LOQ 20.88
97003	2	48.29	SG	8	6.30	> LOQ 1.0	130.47	> LOQ 20.71
97028	3	48.32	SG	8	33.00	> LOQ 1.0	682.89	> LOQ 20.69
97038	OBZ	48.97	SG	8	230.00	> LOQ 5.0	4696.56	> LOQ 102.10

Bulk Elemental Analysis -Nickel

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Nickel		Sample	Nickel	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	< LOD 2.0	J97119P203 PB	ND	< LOD 2.0
N	J97119P205 VB	400.00	> LOQ 4.0	J97119P205 PB	1300.00	> LOQ 4.0
S	J97119P207 VB	ND	< LOD 2.0	J97119P207 PB	ND	< LOD 2.0
SS	J97119P201 VB	ND	< LOD 2.0	J97119P201 PB	2.00	< LOQ 4.0
SSDS	J97119P202 VB	ND	< LOD 2.0	J97119P202 PB	ND	< LOD 2.0
CP	J97119P204 VB	19.00	> LOQ 4.0	J97119P204 PB	24.00	> LOQ 4.0
G	J97119P206 VB	ND	< LOD 2.0	J97119P206 PB	ND	< LOD 2.0
SG	J97119P208 VB	680.00	> LOQ 4.0	J97119P208 PB	770.00	> LOQ 4.0

Comparison of Airborne Concentrations to Bulk Concentrations - Nickel

NIOSH REL 15.0 micrograms/cubic meter
OSHA PEL 1000.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Nickel**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	36.56	73.93	101.52	90.33	ND	< LOD 2.0
N	482.79	1539.86	988.32	1101.32	400.00	> LOQ 4.0
S	16.70	37.19	42.96	12.32	ND	< LOD 2.0
SS	10.75	35.91	36.09	46.21	ND	< LOD 2.0
SSDS	ND	23.55	22.39	16.34	ND	< LOD 2.0
CP	15.88	37.52	43.83	47.62	19.00	> LOQ 4.0
G	ND	25.26	29.72	18.46	ND	< LOD 2.0
SG	179.57	130.47	682.89	4696.56	680.00	> LOQ 4.0

Air Sample Results - Phosphorus

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Phosphorus			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 2.0	ND	< LOD 43.01
97035	2	47.34	SS	1	20.00	> LOQ 4.0	422.48	> LOQ 84.50
97029	3	44.33	SS	1	19.00	> LOQ 4.0	428.62	> LOQ 90.24
97034	OBZ	47.60	SS	1	11.00	> LOQ 4.0	231.07	> LOQ 84.03
97022	1	47.66	SSDS	2	2.00	< LOQ 4.0	41.96	< LOQ 83.92
97032	2	46.72	SSDS	2	ND	< LOD 2.0	ND	< LOD 42.81
97025	3	49.14	SSDS	2	2.00	< LOQ 4.0	40.70	< LOQ 81.40
97006	OBZ	48.95	SSDS	2	3.00	< LOQ 4.0	61.29	< LOQ 81.72
97024	1	46.50	CS	3	20	> LOQ 4.0	430.11	> LOQ 86.02
97020	2	47.34	CS	3	12.00	> LOQ 4.0	253.49	> LOQ 84.50
97015	3	44.33	CS	3	20.00	> LOQ 4.0	451.18	> LOQ 90.24
97037	OBZ	47.60	CS	3	8.10	> LOQ 4.0	170.15	> LOQ 84.03
97014	1	50.38	CP	4	20.00	> LOQ 4.0	397.01	> LOQ 79.40
97011	2	47.98	CP	4	46.00	> LOQ 4.0	958.81	> LOQ 83.38
97031	3	47.92	CP	4	47.00	> LOQ 4.0	980.88	> LOQ 83.48
97019	OBZ	48.30	CP	4	67.00	> LOQ 4.0	1387.16	> LOQ 82.82
97030	1	47.64	N	5	ND	< LOD 2.0	ND	< LOD 41.98
97009	2	44.16	N	5	ND	< LOD 2.0	ND	< LOD 45.29
97021	3	44.52	N	5	2.00	< LOQ 4.0	44.92	< LOQ 89.85
97036	OBZ	54.48	N	5	ND	< LOD 2.0	ND	< LOD 36.71
97018	1	48.17	G	6	22.00	> LOQ 4.0	456.73	> LOQ 83.04
97005	2	47.51	G	6	41.00	> LOQ 4.0	863.01	> LOQ 84.20
97017	3	47.11	G	6	50.00	> LOQ 4.0	1061.30	> LOQ 84.90
97007	OBZ	48.76	G	6	45.00	> LOQ 4.0	922.96	> LOQ 82.04
97008	1	47.92	S	7	20.00	> LOQ 4.0	417.40	> LOQ 83.48
97023	2	48.40	S	7	32.00	> LOQ 4.0	661.21	> LOQ 82.65
97013	3	48.89	S	7	34.00	> LOQ 4.0	695.47	> LOQ 81.82
97016	OBZ	48.71	S	7	17.00	> LOQ 4.0	349.02	> LOQ 82.12
97001	1	47.89	SG	8	ND	< LOD 2.0	ND	< LOD 41.76
97003	2	48.29	SG	8	ND	< LOD 2.0	ND	< LOD 41.42
97028	3	48.32	SG	8	3.00	< LOQ 4.0	62.08	< LOQ 82.77
97038	OBZ	48.97	SG	8	29.00	> LOQ 20.0	592.18	> LOQ 408.40

Bulk Elemental Analysis - Phosphorus

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Phosphorus		Sample	Phosphorus	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	10.00	< LOQ 20.0	J97119P203 PB	ND	< LOD 5.0
N	J97119P205 VB	6.00	< LOQ 20.0	J97119P205 PB	20.00	< LOQ 20.0
S	J97119P207 VB	23.00	> LOQ 20.0	J97119P207 PB	40.00	> LOQ 20.0
SS	J97119P201 VB	100.00	> LOQ 20.0	J97119P201 PB	51.00	> LOQ 20.0
SSDS	J97119P202 VB	ND	< LOD 5.0	J97119P202 PB	6.00	< LOQ 20.0
CP	J97119P204 VB	860.00	> LOQ 20.0	J97119P204 PB	1100.00	> LOQ 20.0
G	J97119P206 VB	110.00	> LOQ 20.0	J97119P206 PB	130.00	> LOQ 20.0
SG	J97119P208 VB	300.00	> LOQ 20.0	J97119P208 PB	350.00	> LOQ 20.0

Comparison of Airborne Concentrations to Bulk Concentrations - Phosphorus

NIOSH REL 100.0 micrograms/cubic meter
OSHA PEL 100.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Phosphorus**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	430.11	253.49	451.18	170.15	10.00	< LOQ 20.0
N	ND	ND	44.92	ND	6.00	< LOQ 20.0
S	417.40	661.21	695.47	349.02	23.00	> LOQ 20.0
SS	ND	422.48	428.62	231.07	100.00	> LOQ 20.0
SSDS	41.96	ND	40.70	61.29	ND	< LOD 5.0
CP	397.01	958.81	980.88	1387.16	860.00	> LOQ 20.0
G	456.73	863.01	1061.30	922.96	110.00	> LOQ 20.0
SG	ND	ND	62.08	592.18	300.00	> LOQ 20.0

Air Sample Results - Platinum

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Platinum			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 3.0	ND	< LOD 64.52
97035	2	47.34	SS	1	ND	< LOD 3.0	ND	< LOD 63.37
97029	3	44.33	SS	1	5.00	< LOQ 7.0	112.80	< LOQ 157.91
97034	OBZ	47.60	SS	1	ND	< LOD 3.0	ND	< LOD 63.02
97022	1	47.66	SSDS	2	ND	< LOD 3.0	ND	< LOD 62.94
97032	2	46.72	SSDS	2	ND	< LOD 3.0	ND	< LOD 64.22
97025	3	49.14	SSDS	2	ND	< LOD 3.0	ND	< LOD 61.05
97006	OBZ	48.95	SSDS	2	ND	< LOD 3.0	ND	< LOD 61.29
97024	1	46.50	CS	3	ND	< LOD 3.0	ND	< LOD 64.52
97020	2	47.34	CS	3	ND	< LOD 3.0	ND	< LOD 63.37
97015	3	44.33	CS	3	9.50	> LOQ 7.0	214.31	> LOQ 157.91
97037	OBZ	47.60	CS	3	3.00	< LOQ 7.0	63.02	< LOQ 147.05
97014	1	50.38	CP	4	ND	< LOD 3.0	ND	< LOD 59.55
97011	2	47.98	CP	4	ND	< LOD 3.0	ND	< LOD 62.53
97031	3	47.92	CP	4	ND	< LOD 3.0	ND	< LOD 62.61
97019	OBZ	48.30	CP	4	3.00	< LOQ 7.0	62.11	< LOQ 144.93
97030	1	47.64	N	5	3.00	< LOQ 7.0	62.97	< LOQ 146.94
97009	2	44.16	N	5	ND	< LOD 3.0	ND	< LOD 67.93
97021	3	44.52	N	5	6.00	< LOQ 7.0	134.77	< LOQ 157.23
97036	OBZ	54.48	N	5	4.00	< LOQ 7.0	73.42	< LOQ 128.49
97018	1	48.17	G	6	ND	< LOD 3.0	ND	< LOD 62.28
97005	2	47.51	G	6	12.00	> LOQ 7.0	252.59	> LOQ 147.34
97017	3	47.11	G	6	18.00	> LOQ 7.0	382.07	> LOQ 148.58
97007	OBZ	48.76	G	6	17.00	> LOQ 7.0	348.68	> LOQ 143.57
97008	1	47.92	S	7	ND	< LOD 3.0	ND	< LOD 62.61
97023	2	48.40	S	7	ND	< LOD 3.0	ND	< LOD 61.99
97013	3	48.89	S	7	6.00	< LOQ 7.0	122.73	< LOQ 143.18
97016	OBZ	48.71	S	7	ND	< LOD 3.0	ND	< LOD 61.59
97001	1	47.89	SG	8	4.00	< LOQ 7.0	83.52	< LOQ 146.16
97003	2	48.29	SG	8	ND	< LOD 3.0	ND	< LOD 62.13
97028	3	48.32	SG	8	34.00	> LOQ 7.0	703.58	> LOQ 144.86
97038	OBZ	48.97	SG	8	330.00	> LOQ 30.0	6738.54	> LOQ 612.59

Bulk Elemental Analysis - Platinum

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Platinum		Sample	Platinum	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	< LOD 9.0	J97119P203 PB	20.00	< LOQ 30.0
N	J97119P205 VB	20.00	< LOQ 30.0	J97119P205 PB	35.00	> LOQ 30.0
S	J97119P207 VB	ND	< LOD 9.0	J97119P207 PB	ND	< LOD 9.0
SS	J97119P201 VB	ND	< LOD 9.0	J97119P201 PB	ND	< LOD 9.0
SSDS	J97119P202 VB	ND	< LOD 9.0	J97119P202 PB	9.00	< LOQ 30.0
CP	J97119P204 VB	160.00	> LOQ 30.0	J97119P204 PB	260.00	> LOQ 30.0
G	J97119P206 VB	ND	< LOD 9.0	J97119P206 PB	30.00	< LOQ 30.0
SG	J97119P208 VB	2900.00	> LOQ 30.0	J97119P208 PB	3300.00	> LOQ 30.0

Comparison of Airborne Concentrations to Bulk Concentrations - Platinum

NIOSH REL 1000.0 micrograms/cubic meter
OSHA PEL 1000.0 micrograms/cubic meter (Proposed)

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Platinum**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	ND	ND	214.31	63.02	ND	< LOD 9.0
N	62.97	ND	134.77	73.42	20.00	< LOQ 30.0
S	ND	ND	122.73	ND	ND	< LOD 9.0
SS	ND	ND	112.80	ND	ND	< LOD 9.0
SSDS	ND	ND	ND	ND	ND	< LOD 9.0
CP	ND	ND	ND	62.11	160.00	> LOQ 30.0
G	ND	252.59	382.07	348.68	ND	< LOD 9.0
SG	83.52	ND	703.58	6738.54	2900.00	> LOQ 30.0

Air Sample Results - Selenium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Selenium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 2.0	ND	< LOD 43.01
97035	2	47.34	SS	1	3.00	< LOQ 4.0	63.37	< LOQ 84.50
97029	3	44.33	SS	1	ND	< LOD 2.0	ND	< LOD 45.12
97034	OBZ	47.60	SS	1	ND	< LOD 2.0	ND	< LOD 42.01
97022	1	47.66	SSDS	2	ND	< LOD 2.0	ND	< LOD 41.96
97032	2	46.72	SSDS	2	ND	< LOD 2.0	ND	< LOD 42.81
97025	3	49.14	SSDS	2	ND	< LOD 2.0	ND	< LOD 40.70
97006	OBZ	48.95	SSDS	2	ND	< LOD 2.0	ND	< LOD 40.86
97024	1	46.50	CS	3	ND	< LOD 2.0	ND	< LOD 43.01
97020	2	47.34	CS	3	ND	< LOD 2.0	ND	< LOD 42.25
97015	3	44.33	CS	3	ND	< LOD 2.0	ND	< LOD 45.12
97037	OBZ	47.60	CS	3	ND	< LOD 2.0	ND	< LOD 42.01
97014	1	50.38	CP	4	ND	< LOD 2.0	ND	< LOD 39.70
97011	2	47.98	CP	4	ND	< LOD 2.0	ND	< LOD 41.69
97031	3	47.92	CP	4	ND	< LOD 2.0	ND	< LOD 41.74
97019	OBZ	48.30	cp	4	ND	< LOD 2.0	ND	< LOD 41.41
97030	1	47.64	N	5	ND	< LOD 2.0	ND	< LOD 41.98
97009	2	44.16	N	5	ND	< LOD 2.0	ND	< LOD 45.29
97021	3	44.52	N	5	ND	< LOD 2.0	ND	< LOD 44.92
97036	OBZ	54.48	N	5	ND	< LOD 2.0	ND	< LOD 36.71
97018	1	48.17	G	6	ND	< LOD 2.0	ND	< LOD 41.52
97005	2	47.51	G	6	ND	< LOD 2.0	ND	< LOD 42.10
97017	3	47.11	G	6	ND	< LOD 2.0	ND	< LOD 42.45
97007	OBZ	48.76	G	6	ND	< LOD 2.0	ND	< LOD 41.02
97008	1	47.92	S	7	ND	< LOD 2.0	ND	< LOD 41.74
97023	2	48.40	S	7	ND	< LOD 2.0	ND	< LOD 41.33
97013	3	48.89	S	7	ND	< LOD 2.0	ND	< LOD 40.91
97016	OBZ	48.71	S	7	ND	< LOD 2.0	ND	< LOD 41.06
97001	1	47.89	SG	8	2.00	< LOQ 4.0	41.76	< LOQ 83.52
97003	2	48.29	SG	8	ND	< LOD 2.0	ND	< LOD 41.42
97028	3	48.32	SG	8	ND	< LOD 2.0	ND	< LOD 41.39
97038	OBZ	48.97	SG	8	ND	< LOD 20.0	ND	< LOD 408.40

Bulk Elemental Analysis - Selenium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Selenium		Sample	Selenium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	< LOD 5.0	J97119P203 PB	ND	< LOD 5.0
N	J97119P205 VB	ND	< LOD 5.0	J97119P205 PB	ND	< LOD 5.0
S	J97119P207 VB	ND	< LOD 5.0	J97119P207 PB	ND	< LOD 5.0
SS	J97119P201 VB	ND	< LOD 5.0	J97119P201 PB	ND	< LOD 5.0
SSDS	J97119P202 VB	ND	< LOD 5.0	J97119P202 PB	ND	< LOD 5.0
CP	J97119P204 VB	9.00	< LOQ 20.0	J97119P204 PB	ND	< LOD 5.0
G	J97119P206 VB	ND	< LOD 5.0	J97119P206 PB	ND	< LOD 5.0
SG	J97119P208 VB	ND	< LOD 10.0	J97119P208 PB	70.00	< LOQ 100.0

Comparison of Airborne Concentrations to Bulk Concentrations - Selenium

NIOSH REL 200.0 micrograms/cubic meter
OSHA PEL 200.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Selenium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	ND	ND	ND	ND	ND	< LOD 5.0
N	ND	ND	ND	ND	ND	< LOD 5.0
S	ND	ND	ND	ND	ND	< LOD 5.0
SS	ND	63.37	ND	ND	ND	< LOD 5.0
SSDS	ND	ND	ND	ND	ND	< LOD 5.0
CP	ND	ND	ND	ND	9.00	< LOQ 20.0
G	ND	ND	ND	ND	ND	< LOD 5.0
SG	41.76	ND	ND	ND	ND	< LOD 10.0

Air Sample Results - Silver

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Silver			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 0.08	ND	< LOD 1.72
97035	2	47.34	SS	1	ND	< LOD 0.08	ND	< LOD 1.69
97029	3	44.33	SS	1	ND	< LOD 0.08	ND	< LOD 1.80
97034	OBZ	47.60	SS	1	ND	< LOD 0.08	ND	< LOD 1.68
97022	1	47.66	SSDS	2	ND	< LOD 0.08	ND	< LOD 1.68
97032	2	46.72	SSDS	2	ND	< LOD 0.08	ND	< LOD 1.71
97025	3	49.14	SSDS	2	0.100	< LOQ 0.2	2.04	< LOQ 4.07
97006	OBZ	48.95	SSDS	2	ND	< LOD 0.08	ND	< LOD 1.63
97024	1	46.50	CS	3	ND	< LOD 0.08	ND	< LOD 1.72
97020	2	47.34	CS	3	ND	< LOD 0.08	ND	< LOD 1.69
97015	3	44.33	CS	3	ND	< LOD 0.08	ND	< LOD 1.80
97037	OBZ	47.60	CS	3	ND	< LOD 0.08	ND	< LOD 1.68
97014	1	50.38	CP	4	ND	< LOD 0.08	ND	< LOD 1.59
97011	2	47.98	CP	4	ND	< LOD 0.08	ND	< LOD 1.67
97031	3	47.92	CP	4	ND	< LOD 0.08	ND	< LOD 1.67
97019	OBZ	48.30	CP	4	ND	< LOD 0.08	ND	< LOD 1.66
97030	1	47.64	N	5	ND	< LOD 0.08	ND	< LOD 1.68
97009	2	44.16	N	5	ND	< LOD 0.08	ND	< LOD 1.81
97021	3	44.52	N	5	ND	< LOD 0.08	ND	< LOD 1.80
97036	OBZ	54.48	N	5	ND	< LOD 0.08	ND	< LOD 1.47
97018	1	48.17	G	6	ND	< LOD 0.08	ND	< LOD 1.66
97005	2	47.51	G	6	ND	< LOD 0.08	ND	< LOD 1.68
97017	3	47.11	G	6	ND	< LOD 0.08	ND	< LOD 1.70
97007	OBZ	48.76	G	6	ND	< LOD 0.08	ND	< LOD 1.64
97008	1	47.92	S	7	ND	< LOD 0.08	ND	< LOD 1.67
97023	2	48.40	S	7	ND	< LOD 0.08	ND	< LOD 1.65
97013	3	48.89	S	7	ND	< LOD 0.08	ND	< LOD 1.64
97016	OBZ	48.71	S	7	ND	< LOD 0.08	ND	< LOD 1.64
97001	1	47.89	SG	8	ND	< LOD 0.08	ND	< LOD 1.67
97003	2	48.29	SG	8	ND	< LOD 0.08	ND	< LOD 1.66
97028	3	48.32	SG	8	ND	< LOD 0.08	ND	< LOD 1.66
97038	OBZ	48.97	SG	8	ND	< LOD 0.08	ND	< LOD 1.63

Bulk Elemental Analysis - Silver

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Silver		Sample	Silver	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	< LOD 0.3	J97119P203 PB	ND	< LOD 0.3
N	J97119P205 VB	ND	< LOD 0.3	J97119P205 PB	ND	< LOD 0.3
S	J97119P207 VB	0.40	< LOQ 1.0	J97119P207 PB	ND	< LOD 0.3
SS	J97119P201 VB	ND	< LOD 0.3	J97119P201 PB	ND	< LOD 0.3
SSDS	J97119P202 VB	ND	< LOD 0.3	J97119P202 PB	ND	< LOD 0.3
CP	J97119P204 VB	1.00	< LOQ 1.0	J97119P204 PB	1.10	> LOQ 1.0
G	J97119P206 VB	ND	< LOD 0.3	J97119P206 PB	ND	< LOD 0.3
SG	J97119P208 VB	ND	< LOD 3.0	J97119P208 PB	ND	< LOD 1.0

Comparison of Airborne Concentrations to Bulk Concentrations - Silver

NIOSH REL 10.0 micrograms/cubic meter
OSHA PEL 10.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Silver**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	ND	ND	ND	ND	ND	< LOD 0.3
N	ND	ND	ND	ND	ND	< LOD 0.3
S	ND	ND	ND	ND	0.40	< LOQ 1.0
SS	ND	ND	ND	ND	ND	< LOD 0.3
SSDS	ND	ND	2.04	ND	ND	< LOD 0.3
CP	ND	ND	ND	ND	1.00	< LOQ 1.0
G	ND	ND	ND	ND	ND	< LOD 0.3
SG	ND	ND	ND	ND	ND	< LOD 3.0

Air Sample Results - Sodium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Sodium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	24	> LOQ 7.0	516.13	> LOQ 150.54
97035	2	47.34	SS	1	51	> LOQ 7.0	1077.31	> LOQ 147.87
97029	3	44.33	SS	1	53	> LOQ 7.0	1195.63	> LOQ 157.91
97034	OBZ	47.60	SS	1	100	> LOQ 7.0	2100.66	> LOQ 147.05
97022	1	47.66	SSDS	2	13	> LOQ 7.0	272.74	> LOQ 146.86
97032	2	46.72	SSDS	2	12	> LOQ 7.0	256.87	> LOQ 149.84
97025	3	49.14	SSDS	2	14	> LOQ 7.0	284.90	> LOQ 142.45
97006	OBZ	48.95	SSDS	2	14	> LOQ 7.0	286.02	> LOQ 143.01
97024	1	46.50	CS	3	48.00	> LOQ 7.0	1032.26	> LOQ 150.54
97020	2	47.34	CS	3	120.00	> LOQ 7.0	2534.85	> LOQ 147.87
97015	3	44.33	CS	3	150.00	> LOQ 7.0	3383.87	> LOQ 157.91
97037	OBZ	47.60	CS	3	120.00	> LOQ 7.0	2520.80	> LOQ 147.05
97014	1	50.38	CP	4	21	> LOQ 7.0	416.87	> LOQ 138.96
97011	2	47.98	CP	4	30	> LOQ 7.0	625.31	> LOQ 145.91
97031	3	47.92	CP	4	33	> LOQ 7.0	688.71	> LOQ 146.09
97019	OBZ	48.30	CP	4	43	> LOQ 7.0	890.27	> LOQ 144.93
97030	1	47.64	N	5	14	> LOQ 7.0	293.87	> LOQ 146.94
97009	2	44.16	N	5	27	> LOQ 7.0	611.41	> LOQ 158.51
97021	3	44.52	N	5	20	> LOQ 7.0	449.24	> LOQ 157.23
97036	OBZ	54.48	N	5	21	> LOQ 7.0	385.46	> LOQ 128.49
97018	1	48.17	G	6	9.5	> LOQ 7.0	197.23	> LOQ 145.32
97005	2	47.51	G	6	8.2	> LOQ 7.0	172.60	> LOQ 147.34
97017	3	47.11	G	6	9.1	> LOQ 7.0	193.16	> LOQ 148.58
97007	OBZ	48.76	G	6	9.1	> LOQ 7.0	186.64	> LOQ 143.57
97008	1	47.92	S	7	15	> LOQ 7.0	313.05	> LOQ 146.09
97023	2	48.40	S	7	21	> LOQ 7.0	433.92	> LOQ 144.64
97013	3	48.89	S	7	21	> LOQ 7.0	429.55	> LOQ 143.18
97016	OBZ	48.71	S	7	15	> LOQ 7.0	307.96	> LOQ 143.71
97001	1	47.89	SG	8	8.2	> LOQ 7.0	171.22	> LOQ 146.16
97003	2	48.29	SG	8	12	> LOQ 7.0	248.51	> LOQ 144.96
97028	3	48.32	SG	8	18	> LOQ 7.0	372.49	> LOQ 144.86
97038	OBZ	48.97	SG	8	ND	< LOD 10.0	ND	< LOD 204.20

Bulk Elemental Analysis - Sodium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Sodium		Sample	Sodium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	44.00	> LOQ 30.0	J97119P203 PB	54.00	> LOQ 30.0
N	J97119P205 VB	50.00	> LOQ 30.0	J97119P205 PB	64.00	> LOQ 30.0
S	J97119P207 VB	20.00	< LOQ 30.0	J97119P207 PB	20.00	< LOQ 30.0
SS	J97119P201 VB	61.00	> LOQ 30.0	J97119P201 PB	30.00	> LOQ 30.0
SSDS	J97119P202 VB	ND	< LOD 30.0	J97119P202 PB	9.00	< LOQ 30.0
CP	J97119P204 VB	390.00	> LOQ 30.0	J97119P204 PB	490.00	> LOQ 30.0
G	J97119P206 VB	10.00	< LOQ 30.0	J97119P206 PB	10.00	< LOD 30.0
SG	J97119P208 VB	ND	< LOD 60.0	J97119P208 PB	ND	< LOD 100.0

Comparison of Airborne Concentrations to Bulk Concentrations - Sodium

NIOSH REL 10000.0 micrograms/cubic meter (nuisance)
OSHA PEL 15000.0 micrograms/cubic meter (nuisance)

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Sodium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	1032.26	2534.85	3383.87	2520.80	44.00	> LOQ 30.0
N	293.87	611.41	449.24	385.46	50.00	> LOQ 30.0
S	313.05	433.92	429.55	307.96	20.00	< LOQ 30.0
SS	516.13	1077.31	1195.63	2100.66	61.00	> LOQ 30.0
SSDS	272.74	256.87	284.90	286.02	ND	< LOD 30.0
CP	416.87	625.31	688.71	890.27	390.00	> LOQ 30.0
G	197.23	172.60	193.16	186.64	10.00	< LOQ 30.0
SG	171.22	248.51	372.49	ND	ND	< LOD 60.0

Air Sample Results - Tellurium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Tellurium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 0.8	ND	< LOD 17.20
97035	2	47.34	SS	1	ND	< LOD 0.8	ND	< LOD 16.90
97029	3	44.33	SS	1	ND	< LOD 0.8	ND	< LOD 18.05
97034	OBZ	47.60	SS	1	ND	< LOD 0.8	ND	< LOD 16.81
97022	1	47.66	SSDS	2	ND	< LOD 0.8	ND	< LOD 16.78
97032	2	46.72	SSDS	2	ND	< LOD 0.8	ND	< LOD 17.12
97025	3	49.14	SSDS	2	ND	< LOD 0.8	ND	< LOD 16.28
97006	OBZ	48.95	SSDS	2	ND	< LOD 0.8	ND	< LOD 16.34
97024	1	46.50	CS	3	ND	< LOD 0.8	ND	< LOD 17.20
97020	2	47.34	CS	3	ND	< LOD 0.8	ND	< LOD 16.90
97015	3	44.33	CS	3	ND	< LOD 0.8	ND	< LOD 18.05
97037	OBZ	47.60	CS	3	ND	< LOD 0.8	ND	< LOD 16.81
97014	1	50.38	CP	4	ND	< LOD 0.8	ND	< LOD 15.88
97011	2	47.98	CP	4	ND	< LOD 0.8	ND	< LOD 16.68
97031	3	47.92	CP	4	ND	< LOD 0.8	ND	< LOD 16.70
97019	OBZ	48.30	CP	4	ND	< LOD 0.8	ND	< LOD 16.56
97030	1	47.64	N	5	ND	< LOD 0.8	ND	< LOD 16.79
97009	2	44.16	N	5	ND	< LOD 0.8	ND	< LOD 18.12
97021	3	44.52	N	5	ND	< LOD 0.8	ND	< LOD 17.97
97036	OBZ	54.48	N	5	ND	< LOD 0.8	ND	< LOD 14.68
97018	1	48.17	G	6	ND	< LOD 0.8	ND	< LOD 16.61
97005	2	47.51	G	6	ND	< LOD 0.8	ND	< LOD 16.84
97017	3	47.11	G	6	ND	< LOD 0.8	ND	< LOD 16.98
97007	OBZ	48.76	G	6	ND	< LOD 0.8	ND	< LOD 16.41
97008	1	47.92	S	7	ND	< LOD 0.8	ND	< LOD 16.70
97023	2	48.40	S	7	ND	< LOD 0.8	ND	< LOD 16.53
97013	3	48.89	S	7	ND	< LOD 0.8	ND	< LOD 16.36
97016	OBZ	48.71	S	7	ND	< LOD 0.8	ND	< LOD 16.42
97001	1	47.89	SG	8	ND	< LOD 0.8	ND	< LOD 16.70
97003	2	48.29	SG	8	ND	< LOD 0.8	ND	< LOD 16.57
97028	3	48.32	SG	8	ND	< LOD 0.8	ND	< LOD 16.55
97038	OBZ	48.97	SG	8	ND	< LOD 4.0	ND	< LOD 81.68

Bulk Elemental Analysis - Tellurium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Tellurium		Sample	Tellurium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	< LOD 3.0	J97119P203 PB	ND	< LOD 3.0
N	J97119P205 VB	ND	< LOD 3.0	J97119P205 PB	ND	< LOD 3.0
S	J97119P207 VB	ND	< LOD 3.0	J97119P207 PB	ND	< LOD 3.0
SS	J97119P201 VB	ND	< LOD 3.0	J97119P201 PB	ND	< LOD 3.0
SSDS	J97119P202 VB	ND	< LOD 3.0	J97119P202 PB	ND	< LOD 3.0
CP	J97119P204 VB	9.00	< LOQ 10.0	J97119P204 PB	ND	< LOD 3.0
G	J97119P206 VB	ND	< LOD 3.0	J97119P206 PB	ND	< LOD 3.0
SG	J97119P208 VB	49.00	> LOQ 10.0	J97119P208 PB	62.00	> LOQ 10.0

Comparison of Airborne Concentrations to Bulk Concentrations - Tellurium

NIOSH REL 100.0 micrograms/cubic meter
OSHA PEL 100.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Tellurium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	ND	ND	ND	ND	ND	< LOD 3.0
N	ND	ND	ND	ND	ND	< LOD 3.0
S	ND	ND	ND	ND	ND	< LOD 3.0
SS	ND	ND	ND	ND	ND	< LOD 3.0
SSDS	ND	ND	ND	ND	ND	< LOD 3.0
CP	ND	ND	ND	ND	9.00	< LOQ 10.0
G	ND	ND	ND	ND	ND	< LOD 3.0
SG	ND	ND	ND	ND	49.00	> LOQ 10.0

Air Sample Results - Thallium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Thallium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	ND	< LOD 3.0	ND	< LOD 64.52
97035	2	47.34	SS	1	ND	< LOD 3.0	ND	< LOD 63.37
97029	3	44.33	SS	1	ND	< LOD 3.0	ND	< LOD 67.68
97034	OBZ	47.60	SS	1	ND	< LOD 3.0	ND	< LOD 63.02
97022	1	47.66	SSDS	2	ND	< LOD 3.0	ND	< LOD 62.94
97032	2	46.72	SSDS	2	ND	< LOD 3.0	ND	< LOD 64.22
97025	3	49.14	SSDS	2	ND	< LOD 3.0	ND	< LOD 61.05
97006	OBZ	48.95	SSDS	2	ND	< LOD 3.0	ND	< LOD 61.29
97024	1	46.50	CS	3	ND	< LOD 3.0	ND	< LOD 64.52
97020	2	47.34	CS	3	ND	< LOD 3.0	ND	< LOD 63.37
97015	3	44.33	CS	3	ND	< LOD 3.0	ND	< LOD 67.68
97037	OBZ	47.60	CS	3	ND	< LOD 3.0	ND	< LOD 63.02
97014	1	50.38	CP	4	ND	< LOD 3.0	ND	< LOD 59.55
97011	2	47.98	CP	4	ND	< LOD 3.0	ND	< LOD 62.53
97031	3	47.92	CP	4	ND	< LOD 3.0	ND	< LOD 62.61
97019	OBZ	48.30	CP	4	ND	< LOD 3.0	ND	< LOD 62.11
97030	1	47.64	N	5	ND	< LOD 3.0	ND	< LOD 62.97
97009	2	44.16	N	5	ND	< LOD 3.0	ND	< LOD 67.93
97021	3	44.52	N	5	ND	< LOD 3.0	ND	< LOD 67.39
97036	OBZ	54.48	N	5	ND	< LOD 3.0	ND	< LOD 55.07
97018	1	48.17	G	6	ND	< LOD 3.0	ND	< LOD 62.28
97005	2	47.51	G	6	ND	< LOD 3.0	ND	< LOD 63.15
97017	3	47.11	G	6	ND	< LOD 3.0	ND	< LOD 63.68
97007	OBZ	48.76	G	6	ND	< LOD 3.0	ND	< LOD 61.53
97008	1	47.92	S	7	ND	< LOD 3.0	ND	< LOD 62.61
97023	2	48.40	S	7	ND	< LOD 3.0	ND	< LOD 61.99
97013	3	48.89	S	7	ND	< LOD 3.0	ND	< LOD 61.36
97016	OBZ	48.71	S	7	ND	< LOD 3.0	ND	< LOD 61.59
97001	1	47.89	SG	8	ND	< LOD 3.0	ND	< LOD 62.64
97003	2	48.29	SG	8	ND	< LOD 3.0	ND	< LOD 62.13
97028	3	48.32	SG	8	ND	< LOD 3.0	ND	< LOD 62.08
97038	OBZ	48.97	SG	8	ND	< LOD 10.0	ND	< LOD 204.20

Bulk Elemental Analysis - Thallium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Thallium		Sample	Thallium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	< LOD 9.0	J97119P203 PB	ND	< LOD 9.0
N	J97119P205 VB	ND	< LOD 9.0	J97119P205 PB	ND	< LOD 9.0
S	J97119P207 VB	ND	< LOD 9.0	J97119P207 PB	ND	< LOD 9.0
SS	J97119P201 VB	ND	< LOD 9.0	J97119P201 PB	ND	< LOD 9.0
SSDS	J97119P202 VB	ND	< LOD 9.0	J97119P202 PB	ND	< LOD 9.0
CP	J97119P204 VB	ND	< LOD 9.0	J97119P204 PB	ND	< LOD 9.0
G	J97119P206 VB	ND	< LOD 9.0	J97119P206 PB	ND	< LOD 9.0
SG	J97119P208 VB	ND	< LOD 20.0	J97119P208 PB	ND	< LOD 40.0

Comparison of Airborne Concentrations to Bulk Concentrations - Thallium

NIOSH REL 100.0 micrograms/cubic meter
OSHA PEL 100.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Thallium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	ND	ND	ND	ND	ND	< LOD 9.0
N	ND	ND	ND	ND	ND	< LOD 9.0
S	ND	ND	ND	ND	ND	< LOD 9.0
SS	ND	ND	ND	ND	ND	< LOD 9.0
SSDS	ND	ND	ND	ND	ND	< LOD 9.0
CP	ND	ND	ND	ND	ND	< LOD 9.0
G	ND	ND	ND	ND	ND	< LOD 9.0
SG	ND	ND	ND	ND	ND	< LOD 20.0

Air Sample Results - Titanium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Titanium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	4.80	> LOQ 0.4	103.23	> LOQ 8.60
97035	2	47.34	SS	1	47.00	> LOQ 0.4	992.82	> LOQ 8.45
97029	3	44.33	SS	1	50.00	> LOQ 0.4	1127.96	> LOQ 9.02
97034	OBZ	47.60	SS	1	130.00	> LOQ 0.4	2730.86	> LOQ 8.40
97022	1	47.66	SSDS	2	0.75	> LOQ 0.4	15.74	> LOQ 8.39
97032	2	46.72	SSDS	2	1.40	> LOQ 0.4	29.97	> LOQ 8.56
97025	3	49.14	SSDS	2	1.60	> LOQ 0.4	32.56	> LOQ 8.14
97006	OBZ	48.95	SSDS	2	1.90	> LOQ 0.4	38.82	> LOQ 8.17
97024	1	46.50	CS	3	47	> LOQ 0.4	1010.75	> LOQ 8.60
97020	2	47.34	CS	3	90.00	> LOQ 0.4	1901.14	> LOQ 8.45
97015	3	44.33	CS	3	130.00	> LOQ 0.4	2932.68	> LOQ 9.02
97037	OBZ	47.60	CS	3	86.00	> LOQ 0.4	1806.57	> LOQ 8.40
97014	1	50.38	CP	4	32.00	> LOQ 0.4	635.22	> LOQ 7.94
97011	2	47.98	CP	4	69.00	> LOQ 0.4	1438.22	> LOQ 8.34
97031	3	47.92	CP	4	70.00	> LOQ 0.4	1460.89	> LOQ 8.35
97019	OBZ	48.30	CP	4	100.00	> LOQ 0.4	2070.39	> LOQ 8.28
97030	1	47.64	N	5	4.30	> LOQ 0.4	90.26	> LOQ 8.40
97009	2	44.16	N	5	9.60	> LOQ 0.4	217.39	> LOQ 9.06
97021	3	44.52	N	5	7.10	> LOQ 0.4	159.48	> LOQ 8.98
97036	OBZ	54.48	N	5	9.00	> LOQ 0.4	165.20	> LOQ 7.34
97018	1	48.17	G	6	11.00	> LOQ 0.4	228.37	> LOQ 8.30
97005	2	47.51	G	6	13.00	> LOQ 0.4	273.64	> LOQ 8.42
97017	3	47.11	G	6	16.00	> LOQ 0.4	339.62	> LOQ 8.49
97007	OBZ	48.76	G	6	15.00	> LOQ 0.4	307.65	> LOQ 8.20
97008	1	47.92	S	7	220.00	> LOQ 0.4	4591.37	> LOQ 8.35
97023	2	48.40	S	7	250.00	> LOQ 0.4	5165.72	> LOQ 8.27
97013	3	48.89	S	7	250.00	> LOQ 0.4	5113.73	> LOQ 8.18
97016	OBZ	48.71	S	7	230.00	> LOQ 0.4	4722.02	> LOQ 8.21
97001	1	47.89	SG	8	0.30	> LOQ 0.4	6.26	> LOQ 8.35
97003	2	48.29	SG	8	1.10	> LOQ 0.4	22.78	> LOQ 8.28
97028	3	48.32	SG	8	0.92	> LOQ 0.4	19.04	> LOQ 8.28
97038	OBZ	48.97	SG	8	4.00	> LOQ 2.0	81.68	> LOQ 40.84

Bulk Elemental Analysis - Titanium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Titanium		Sample	Titanium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	33.00	> LOQ 2.0	J97119P203 PB	35.00	> LOQ 2.0
N	J97119P205 VB	12.00	> LOQ 2.0	J97119P205 PB	15.00	> LOQ 2.0
S	J97119P207 VB	97.00	> LOQ 2.0	J97119P207 PB	120.00	> LOQ 2.0
SS	J97119P201 VB	67.00	> LOQ 2.0	J97119P201 PB	72.00	> LOQ 2.0
SSDS	J97119P202 VB	3.40	> LOQ 2.0	J97119P202 PB	1.00	> LOQ 2.0
CP	J97119P204 VB	790.00	> LOQ 2.0	J97119P204 PB	940.00	> LOQ 2.0
G	J97119P206 VB	7.90	> LOQ 2.0	J97119P206 PB	5.20	> LOQ 2.0
SG	J97119P208 VB	7.50	> LOQ 2.0	J97119P208 PB	7.50	> LOQ 2.0

Comparison of Airborne Concentrations to Bulk Concentrations - Titanium

NIOSH REL Limit of Quantification (Lowest Feasible Concentration)
OSHA PEL 15000.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Titanium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	1010.75	1901.14	2932.68	1806.57	33.00	> LOQ 2.0
N	90.26	217.39	159.48	165.20	12.00	> LOQ 2.0
S	4591.37	5165.72	5113.73	4722.02	97.00	> LOQ 2.0
SS	103.23	992.82	1127.96	2730.86	67.00	> LOQ 2.0
SSDS	15.74	29.97	32.56	38.82	3.40	> LOQ 2.0
CP	635.22	1438.22	1460.89	2070.39	790.00	> LOQ 2.0
G	228.37	273.64	339.62	307.65	7.90	> LOQ 2.0
SG	6.26	22.78	19.04	81.68	7.50	> LOQ 2.0

Air Sample Results - Vanadium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Vanadium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	0.200	< LOQ 0.2	4.30	< LOQ 4.30
97035	2	47.34	SS	1	2.200	> LOQ 0.2	46.47	> LOQ 4.22
97029	3	44.33	SS	1	2.300	> LOQ 0.2	51.89	> LOQ 4.51
97034	OBZ	47.60	SS	1	5.200	> LOQ 0.2	109.23	> LOQ 4.20
97022	1	47.66	SSDS	2	0.100	< LOQ 0.2	2.10	< LOQ 4.20
97032	2	46.72	SSDS	2	0.220	> LOQ 0.2	4.71	> LOQ 4.28
97025	3	49.14	SSDS	2	0.200	< LOQ 0.2	4.07	< LOQ 4.07
97006	OBZ	48.95	SSDS	2	0.100	< LOQ 0.2	2.04	< LOQ 4.09
97024	1	46.50	CS	3	2.1	> LOQ 0.2	45.16	> LOQ 43.01
97020	2	47.34	CS	3	6.300	> LOQ 0.2	133.08	> LOQ 4.22
97015	3	44.33	CS	3	7.600	> LOQ 0.2	171.45	> LOQ 4.51
97037	OBZ	47.60	CS	3	5.900	> LOQ 0.2	123.94	> LOQ 4.20
97014	1	50.38	CP	4	2.000	> LOQ 0.2	39.70	> LOQ 3.97
97011	2	47.98	CP	4	4.000	> LOQ 0.2	83.38	> LOQ 4.17
97031	3	47.92	CP	4	4.200	> LOQ 0.2	87.65	> LOQ 4.17
97019	OBZ	48.30	CP	4	5.900	> LOQ 0.2	122.15	> LOQ 4.14
97030	1	47.64	N	5	1.100	> LOQ 0.2	23.09	> LOQ 4.20
97009	2	44.16	N	5	2.600	> LOQ 0.2	58.88	> LOQ 4.53
97021	3	44.52	N	5	1.900	> LOQ 0.2	42.68	> LOQ 4.49
97036	OBZ	54.48	N	5	2.300	> LOQ 0.2	42.22	> LOQ 3.67
97018	1	48.17	G	6	0.700	> LOQ 0.2	14.53	> LOQ 4.15
97005	2	47.51	G	6	0.980	> LOQ 0.2	20.63	> LOQ 4.21
97017	3	47.11	G	6	1.200	> LOQ 0.2	25.47	> LOQ 4.25
97007	OBZ	48.76	G	6	1.100	> LOQ 0.2	22.56	> LOQ 4.10
97008	1	47.92	S	7	0.900	> LOQ 0.2	18.78	> LOQ 4.17
97023	2	48.40	S	7	1.400	> LOQ 0.2	28.93	> LOQ 4.13
97013	3	48.89	S	7	1.400	> LOQ 0.2	28.64	> LOQ 4.09
97016	OBZ	48.71	S	7	1.200	> LOQ 0.2	24.64	> LOQ 4.11
97001	1	47.89	SG	8	0.920	> LOQ 0.2	19.21	> LOQ 4.18
97003	2	48.29	SG	8	0.920	> LOQ 0.2	19.05	> LOQ 4.14
97028	3	48.32	SG	8	3.300	> LOQ 0.2	68.29	> LOQ 4.14
97038	OBZ	48.97	SG	8	24.000	> LOQ 1.0	490.08	> LOQ 20.42

Bulk Elemental Analysis - Vanadium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Vanadium		Sample	Vanadium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	1.80	> LOQ 1.0	J97119P203 PB	2.30	> LOQ 1.0
N	J97119P205 VB	2.90	> LOQ 1.0	J97119P205 PB	3.70	> LOQ 1.0
S	J97119P207 VB	0.90	< LOQ 1.0	J97119P207 PB	1.20	> LOQ 1.0
SS	J97119P201 VB	6.90	> LOQ 1.0	J97119P201 PB	3.60	> LOQ 1.0
SSDS	J97119P202 VB	ND	< LOD 0.3	J97119P202 PB	ND	< LOD 0.3
CP	J97119P204 VB	58.00	> LOQ 1.0	J97119P204 PB	71.00	> LOQ 1.0
G	J97119P206 VB	0.70	< LOQ 1.0	J97119P206 PB	0.40	< LOQ 1.0
SG	J97119P208 VB	67.00	> LOQ 1.0	J97119P208 PB	77.00	> LOQ 1.0

Comparison of Airborne Concentrations to Bulk Concentrations - Vanadium

NIOSH REL 50.0 micrograms/cubic meter Ceiling Limit
OSHA PEL 500.0 micrograms/cubic meter Ceiling Limit

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Vanadium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	45.16	133.08	171.45	123.94	1.80	> LOQ 1.0
N	23.09	58.88	42.68	42.22	2.90	> LOQ 1.0
S	18.78	28.93	28.64	24.64	0.90	< LOQ 1.0
SS	4.30	46.47	51.89	109.23	6.90	> LOQ 1.0
SSDS	2.10	4.71	4.07	2.04	ND	< LOD 0.3
CP	39.70	83.38	87.65	122.15	58.00	> LOQ 1.0
G	14.53	20.63	25.47	22.56	0.70	< LOQ 1.0
SG	19.21	19.05	68.29	490.08	67.00	> LOQ 1.0

Air Sample Results - Yttrium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Yttrium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	0.064	> LOQ 0.04	1.38	> LOQ 0.860
97035	2	47.34	SS	1	0.800	> LOQ 0.04	16.90	> LOQ 0.845
97029	3	44.33	SS	1	0.860	> LOQ 0.04	19.40	> LOQ 0.902
97034	OBZ	47.60	SS	1	1.400	> LOQ 0.04	29.41	> LOQ 0.840
97022	1	47.66	SSDS	2	0.075	> LOQ 0.04	1.57	> LOQ 0.839
97032	2	46.72	SSDS	2	0.170	> LOQ 0.04	3.64	> LOQ 0.856
97025	3	49.14	SSDS	2	0.230	> LOQ 0.04	4.68	> LOQ 0.814
97006	OBZ	48.95	SSDS	2	0.210	> LOQ 0.04	4.29	> LOQ 0.817
97024	1	46.50	CS	3	0.82	> LOQ 0.04	17.63	> LOQ 0.860
97020	2	47.34	CS	3	1.800	> LOQ 0.04	38.02	> LOQ 0.845
97015	3	44.33	CS	3	2.100	> LOQ 0.04	17.37	> LOQ 0.902
97037	OBZ	47.60	CS	3	1.700	> LOQ 0.04	35.71	> LOQ 0.840
97014	1	50.38	CP	4	0.280	> LOQ 0.04	5.56	> LOQ 0.794
97011	2	47.98	CP	4	0.590	> LOQ 0.04	12.30	> LOQ 0.834
97031	3	47.92	CP	4	0.590	> LOQ 0.04	12.31	> LOQ 0.835
97019	OBZ	48.30	CP	4	0.830	> LOQ 0.04	17.18	> LOQ 0.828
97030	1	47.64	N	5	0.053	> LOQ 0.04	1.11	> LOQ 0.840
97009	2	44.16	N	5	0.083	> LOQ 0.04	1.88	> LOQ 0.906
97021	3	44.52	N	5	0.083	> LOQ 0.04	1.86	> LOQ 0.898
97036	OBZ	54.48	N	5	0.083	> LOQ 0.04	1.52	> LOQ 0.734
97018	1	48.17	G	6	11.000	> LOQ 0.04	228.37	> LOQ 0.830
97005	2	47.51	G	6	17.000	> LOQ 0.04	357.83	> LOQ 0.842
97017	3	47.11	G	6	25.000	> LOQ 0.04	530.65	> LOQ .0.849
97007	OBZ	48.76	G	6	22.000	> LOQ 0.04	451.23	> LOQ .0.820
97008	1	47.92	S	7	1.800	> LOQ 0.04	37.57	> LOQ 0.835
97023	2	48.40	S	7	2.800	> LOQ 0.04	57.86	> LOQ 0.827
97013	3	48.89	S	7	2.800	> LOQ 0.04	57.27	> LOQ 0.818
97016	OBZ	48.71	S	7	1.700	> LOQ 0.04	34.90	> LOQ 0.821
97001	1	47.89	SG	8	ND	< LOD 0.02	ND	< LOQ 0.418
97003	2	48.29	SG	8	ND	< LOD 0.02	ND	< LOQ 0.414
97028	3	48.32	SG	8	0.040	< LOQ 0.04	0.83	<LOQ 0.828
97038	OBZ	48.97	SG	8	0.042	> LOQ 0.04	0.86	> LOQ 0.817

Bulk Elemental Analysis - Yttrium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Yttrium		Sample	Yttrium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	0.50	> LOQ 0.2	J97119P203 PB	0.60	> LOQ 0.2
N	J97119P205 VB	0.10	< LOQ 0.2	J97119P205 PB	0.20	> LOQ 0.2
S	J97119P207 VB	0.56	> LOQ 0.2	J97119P207 PB	0.94	> LOQ 0.2
SS	J97119P201 VB	2.40	> LOQ 0.2	J97119P201 PB	1.40	> LOQ 0.2
SSDS	J97119P202 VB	0.08	< LOQ 0.2	J97119P202 PB	0.20	< LOQ 0.2
CP	J97119P204 VB	7.40	> LOQ 0.2	J97119P204 PB	9.50	> LOQ 0.2
G	J97119P206 VB	7.90	> LOQ 0.2	J97119P206 PB	5.50	> LOQ 0.2
SG	J97119P208 VB	0.07	< LOQ 0.2	J97119P208 PB	0.10	< LOQ 0.2

Comparison of Airborne Concentrations to Bulk Concentrations - Yttrium

NIOSH REL 1000.0 micrograms/cubic meter
OSHA PEL 1000.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Yttrium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	17.63	38.02	17.37	35.71	0.50	> LOQ 0.2
N	1.11	1.88	1.86	1.52	0.10	< LOQ 0.2
S	37.57	57.86	57.27	34.90	0.56	> LOQ 0.2
SS	1.38	16.90	19.40	29.41	2.40	> LOQ 0.2
SSDS	1.57	3.64	4.68	4.29	0.08	< LOQ 0.2
CP	5.56	12.30	12.31	17.18	7.40	> LOQ 0.2
G	228.37	357.83	530.65	451.23	7.90	> LOQ 0.2
SG	ND	ND	0.83	0.86	0.07	< LOQ 0.2

Air Sample Results - Zinc

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Zinc			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	1.00	< LOQ 2.0	21.51	< LOQ 43.01
97035	2	47.34	SS	1	4.20	> LOQ 2.0	88.72	> LOQ 42.25
97029	3	44.33	SS	1	4.80	> LOQ 2.0	108.28	> LOQ 45.12
97034	OBZ	47.60	SS	1	1.20	> LOQ 2.0	88.23	> LOQ 42.01
97022	1	47.66	SSDS	2	2.00	> LOQ 2.0	41.96	> LOQ 41.96
97032	2	46.72	SSDS	2	2.80	> LOQ 2.0	59.94	> LOQ 42.81
97025	3	49.14	SSDS	2	3.60	> LOQ 2.0	73.26	> LOQ 40.70
97006	OBZ	48.95	SSDS	2	3.50	> LOQ 2.0	71.50	> LOQ 40.86
97024	1	46.50	CS	3	5.2	> LOQ 2.0	111.83	> LOQ 43.01
97020	2	47.34	CS	3	5.20	> LOQ 2.0	109.84	> LOQ 42.25
97015	3	44.33	CS	3	5.70	> LOQ 2.0	128.59	> LOQ 45.12
97037	OBZ	47.60	CS	3	5.50	> LOQ 2.0	115.54	> LOQ 42.01
97014	1	50.38	CP	4	3.80	> LOQ 2.0	75.43	> LOQ 39.70
97011	2	47.98	CP	4	7.70	> LOQ 2.0	160.50	> LOQ 41.69
97031	3	47.92	CP	4	8.00	> LOQ 2.0	166.96	> LOQ 41.74
97019	OBZ	48.30	CP	4	11.00	> LOQ 2.0	227.74	> LOQ 41.41
97030	1	47.64	N	5	4.90	> LOQ 2.0	102.85	> LOQ 41.98
97009	2	44.16	N	5	9.70	> LOQ 2.0	219.66	> LOQ 45.29
97021	3	44.52	N	5	7.90	> LOQ 2.0	177.45	> LOQ 44.92
97036	OBZ	54.48	N	5	9.60	> LOQ 2.0	176.21	> LOQ 36.71
97018	1	48.17	G	6	3.80	> LOQ 2.0	78.89	> LOQ 41.52
97005	2	47.51	G	6	5.20	> LOQ 2.0	109.46	> LOQ 42.10
97017	3	47.11	G	6	6.90	> LOQ 2.0	146.46	> LOQ 42.45
97007	OBZ	48.76	G	6	6.80	> LOQ 2.0	139.47	> LOQ 41.02
97008	1	47.92	S	7	4.10	> LOQ 2.0	85.57	> LOQ 41.74
97023	2	48.40	S	7	6.50	> LOQ 2.0	134.31	> LOQ 41.33
97013	3	48.89	S	7	6.50	> LOQ 2.0	132.96	> LOQ 40.91
97016	OBZ	48.71	S	7	4.50	> LOQ 2.0	92.39	> LOQ 41.06
97001	1	47.89	SG	8	2.00	< LOQ 2.0	41.76	< LOQ 41.76
97003	2	48.29	SG	8	4.10	> LOQ 2.0	84.91	> LOQ 41.42
97028	3	48.32	SG	8	5.10	> LOQ 2.0	105.54	< LOQ 41.39
97038	OBZ	48.97	SG	8	10.00	< LOQ 10.0	204.20	< LOQ 204.20

Bulk Elemental Analysis - Zinc

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Zinc		Sample	Zinc	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	ND	< LOD 2.0	J97119P203 PB	ND	< LOD 2.0
N	J97119P205 VB	7.30	> LOQ 7.0	J97119P205 PB	10.00	> LOQ 7.0
S	J97119P207 VB	ND	< LOD 2.0	J97119P207 PB	2.00	< LOQ 7.0
SS	J97119P201 VB	4.00	< LOQ 7.0	J97119P201 PB	5.00	< LOQ 7.00
SSDS	J97119P202 VB	ND	< LOD 2.0	J97119P202 PB	ND	< LOD 2.0
CP	J97119P204 VB	92.00	> LOQ 7.0	J97119P204 PB	100.00	> LOQ 7.0
G	J97119P206 VB	ND	< LOD 2.0	J97119P206 PB	ND	< LOD 2.0
SG	J97119P208 VB	48.00	> LOQ 7.0	J97119P208 PB	57.00	> LOQ 7.0

Comparison of Airborne Concentrations to Bulk Concentrations - Zinc

NIOSH REL 5000.0 micrograms/cubic meter
OSHA PEL 15000.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Zinc**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	111.83	109.84	128.59	115.54	ND	< LOD 2.0
N	102.85	219.66	177.45	176.21	7.30	> LOQ 7.0
S	85.57	134.31	132.96	92.39	ND	< LOD 2.0
SS	21.51	88.72	108.28	88.23	4.00	< LOQ 7.0
SSDS	41.96	59.94	73.26	71.50	ND	< LOD 2.0
CP	75.43	160.50	166.96	227.74	92.00	> LOQ 7.0
G	78.89	109.46	146.46	139.47	ND	< LOD 2.0
SG	41.76	84.91	105.54	204.20	48.00	> LOQ 7.0

Air Sample Results - Zirconium

Sample No.	Station No.	Volume (l/filter)	Abrasive Type	Run	Zirconium			
					Mass (µg/filter)	Filter Notes µg/f	Result µg/m^3	Result Notes
97040	1	46.50	SS	1	0.200	< LOQ 0.2	4.30	< LOQ 4.30
97035	2	47.34	SS	1	1.500	> LOQ 0.2	31.69	> LOQ 4.22
97029	3	44.33	SS	1	1.800	> LOQ 0.2	40.61	> LOQ 4.51
97034	OBZ	47.60	SS	1	2.600	> LOQ 0.2	54.62	> LOQ 4.20
97022	1	47.66	SSDS	2	0.100	< LOQ 0.2	2.10	< LOQ 4.20
97032	2	46.72	SSDS	2	0.360	> LOQ 0.2	7.71	> LOQ 4.28
97025	3	49.14	SSDS	2	0.450	> LOQ 0.2	9.16	> LOQ 4.07
97006	OBZ	48.95	SSDS	2	0.410	> LOQ 0.2	8.38	> LOQ 4.09
97024	1	46.50	CS	3	1.3	> LOQ 0.2	27.96	> LOQ 4.30
97020	2	47.34	CS	3	1.800	> LOQ 0.2	38.02	> LOQ 4.22
97015	3	44.33	CS	3	2.300	> LOQ 0.2	51.89	> LOQ 4.51
97037	OBZ	47.60	CS	3	1.700	> LOQ 0.2	35.71	> LOQ 4.20
97014	1	50.38	CP	4	0.690	> LOQ 0.2	13.70	> LOQ 3.97
97011	2	47.98	CP	4	1.500	> LOQ 0.2	31.27	> LOQ 4.17
97031	3	47.92	CP	4	1.500	> LOQ 0.2	31.30	> LOQ 4.17
97019	OBZ	48.30	CP	4	2.200	> LOQ 0.2	45.55	> LOQ 4.14
97030	1	47.64	N	5	0.100	< LOQ 0.2	2.10	< LOQ 4.20
97009	2	44.16	N	5	0.230	> LOQ 0.2	5.21	> LOQ 4.53
97021	3	44.52	N	5	0.200	< LOQ 0.2	4.49	< LOQ 4.49
97036	OBZ	54.48	N	5	0.220	> LOQ 0.2	4.04	> LOQ 3.67
97018	1	48.17	G	6	0.390	> LOQ 0.2	8.10	> LOQ 4.15
97005	2	47.51	G	6	0.630	> LOQ 0.2	13.26	> LOQ 4.21
97017	3	47.11	G	6	0.920	> LOQ 0.2	19.53	> LOQ 4.25
97007	OBZ	48.76	G	6	0.840	> LOQ 0.2	17.23	> LOQ 4.10
97008	1	47.92	S	7	4.300	> LOQ 0.2	89.74	> LOQ 4.17
97023	2	48.40	S	7	7.300	> LOQ 0.2	150.84	> LOQ 4.13
97013	3	48.89	S	7	7.800	> LOQ 0.2	159.55	> LOQ 4.09
97016	OBZ	48.71	S	7	4.900	> LOQ 0.2	100.60	> LOQ 4.11
97001	1	47.89	SG	8	ND	< LOD 0.08	ND	< LOD 1.67
97003	2	48.29	SG	8	ND	< LOD 0.08	ND	< LOD 1.66
97028	3	48.32	SG	8	ND	< LOD 0.08	ND	< LOD 1.66
97038	OBZ	48.97	SG	8	ND	< LOD 0.08	ND	< LOD 1.63

Bulk Elemental Analysis - Zirconium

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Zirconium		Sample	Zirconium	
Type	No.	µg/g	Notes	No.	µg/g	Notes
CS	J97119P203 VB	0.90	< LOQ 1.0	J97119P203 PB	1.30	> LOQ 1.0
N	J97119P205 VB	0.60	LOQ 1.0	J97119P205 PB	0.80	< LOQ 1.0
S	J97119P207 VB	5.80	> LOQ 1.0	J97119P207 PB	6.20	> LOQ 1.0
SS	J97119P201 VB	2.30	> LOQ 1.0	J97119P201 PB	2.10	> LOQ 1.0
SSDS	J97119P202 VB	ND	< LOD 3.0	J97119P202 PB	ND	< LOD 3.0
CP	J97119P204 VB	27.00	> LOQ 1.0	J97119P204 PB	32.00	> LOQ 1.0
G	J97119P206 VB	0.40	< LOQ 1.0	J97119P206 PB	0.40	< LOQ 1.0
SG	J97119P208 VB	ND	< LOD 3.0	J97119P208 PB	ND	< LOD 3.0

Comparison of Airborne Concentrations to Bulk Concentrations - Zirconium

NIOSH REL 5000.0 micrograms/cubic meter
OSHA PEL 5000.0 micrograms/cubic meter

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Zirconium**	
Type	**mg/m^3**	**mg/m^3**	**mg/m^3**	**mg/m^3**	**µg/g**	**Notes**
CS	27.96	38.02	51.89	35.71	0.90	< LOQ 1.0
N	2.10	5.21	4.49	4.04	0.60	LOQ 1.0
S	89.74	150.84	159.55	100.60	5.80	> LOQ 1.0
SS	4.30	31.69	40.61	54.62	2.30	> LOQ 1.0
SSDS	2.10	7.71	9.16	8.38	ND	< LOD 3.0
CP	13.70	31.27	31.30	45.55	27.00	> LOQ 1.0
G	8.10	13.26	19.53	17.23	0.40	< LOQ 1.0
SG	ND	ND	ND	ND	ND	< LOD 3.0

Air Sample Results - Rerspirable Quartz

Sample	Station	Volume	Abrasive	Run	Gravemetric		Quartz Gravemetric			Calculations		
No.	No.	(l/filter)	Type		mg/filter	Filter Notes mg/f	mg/filter	Filter Notes mg/f	%	mg/m3	Notes	OSHA PEL
97-2022	1	40.37	SS	1	2.23	> LOD 0.02	0.40	> LOQ 0.03	17.94%	9.91	>LOQ 0.7432	0.502
97-2023	2	40.06	SS	1	7.73	> LOD 0.02	1.30	> LOQ 0.03	16.82%	32.46	>LOQ 0.7490	0.531
97-2058	3	40.42	SS	1	10.21	> LOD 0.02	0.00		20.00%	50.52	>LOQ 0.7423	0.455
97-2060	OBZ	40.96	SS	1	6.76	> LOD 0.02	1.54	> LOQ 0.03	22.78%	37.60	>LOQ 0.7325	0.404
97-2003	1	40.28	SSDS	2	0.93	> LOD 0.02	0.37	> LOQ 0.03	39.78%	9.18	>LOQ 0.7447	0.239
97-2024	2	40.92	SSDS	2	2.48	> LOD 0.02	0.87	> LOQ 0.03	35.08%	21.26	>LOQ 0.7331	0.27
97-2025	3	40.78	SSDS	2	2.93	> LOD 0.02	1.15	> LOQ 0.03	39.25%	28.20	>LOQ 0.7357	0.242
97-2056	OBZ	41.33	SSDS	2	2.19	> LOD 0.02	1.00	> LOQ 0.03	45.66%	24.20	>LOQ 0.7259	0.21
97-2012	1	40.36	CS	3	1.33	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2478	NA
97-2018	2	39.02	CS	3	0.27	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2563	NA
97-2004	3	40.02	CS	3	6.69	> LOD 0.02	0.01	< LOQ 0.03	0.15%	0.25	<LOQ 0.7496	4.651
97-2037	OBZ	41.12	CS	3	4.56	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2432	NA
97-2188	1	40.68	CP	4	1.19	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2458	NA
97-2182	2	40.32	CP	4	5.37	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2480	NA
97-2179	3	40.82	CP	4	3.68	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2450	NA
97-2173	OBZ	41.30	CP	4	2.41	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2421	NA
97-2175	1	40.52	N	5	2.16	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2468	NA
97-2195	2	40.06	N	5	6.67	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2497	NA
97-2196	3	40.27	N	5	8.23	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2483	NA
97-2189	OBZ	41.39	N	5	5.41	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2416	NA
97-2054	1	42.46	G	6	1.48	> LOD 0.02	0.037	> LOQ 0.03	2.50%	0.87	>LOQ 0.7066	2.222
97-2050	2	39.86	G	6	10.37	> LOD 0.02	0.00		2.80%	7.28	>LOQ 0.7526	2.083
97-2198	3	40.87	G	6	8.21	> LOD 0.02	0.16	> LOQ 0.03	1.95%	3.92	>LOQ 0.7340	2.532
97-2040	OBZ	41.33	G	6	5.1	> LOD 0.02	0.076	> LOQ 0.03	1.49%	1.84	>LOQ 0.7259	2.865
97-2049	1	40.43	S	7	2.56	> LOD 0.02	0.04	> LOQ 0.03	1.60%	1.01	>LOQ 0.7421	2.778
97-2033	2	40.90	S	7	7.55	> LOD 0.02	0.11	> LOQ 0.03	1.46%	2.70	>LOQ 0.7336	2.89
97-2047	3	40.58	S	7	8.16	> LOD 0.02	0.00		2.50%	5.03	>LOQ 0.7392	2.222
97-2029	OBZ	41.30	S	7	5.19	> LOD 0.02	0.085	> LOQ 0.03	1.64%	2.06	>LOQ 0.7263	2.747
97-2213	1	40.56	SG	8	0.41	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2465	NA
97-2200	2	40.51	SG	8	1.44	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2468	NA
97-2186	3	40.50	SG	8	1.57	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2469	NA
97-2207	OBZ	41.58	SG	8	0.97	> LOD 0.02	ND	< LOD 0.01	ND	ND	<LOD 0.2405	NA

Bulk Elemental Analysis, Percent by Weight - Quartz

	Virgin (Pre Blast) Bulk			Post (Blast) Bulk		
Abrasive	Sample	Quartz		Sample	Quartz	
Type	No.	%	Notes	No.	%	Notes
CS	J97119P203 VB	ND	< LOD 0.80	J97119P203 PB	ND	< LOD 0.80
N	J97119P205 VB	ND	< LOD 0.80	J97119P205 PB	ND	< LOD 0.80
S	J97119P207 VB	1.60	< LOQ 2.00	J97119P207 PB	1.40	< LOQ 2.00
SS	J97119P201 VB	51.00	> LOQ 2.0	J97119P201 PB	62.00	> LOQ 2.0
SSDS	J97119P202 VB	71.00	> LOQ 2.0	J97119P202 PB	86.00	> LOQ 2.0
CP	J97119P204 VB	ND	< LOD 0.80	J97119P204 PB	ND	< LOD 0.80
G	J97119P206 VB	1.90	< LOQ 2.00	J97119P206 PB	1.40	< LOQ 2.00
SG	J97119P208 VB	ND	< LOD 0.80	J97119P208 PB	ND	< LOD 0.80

Comparison of Airborne Concentrations to Bulk Concentrations - Respirable Quartz

NIOSH REL 0.05 milligrams/cubic meter
OSHA PEL As Calculated

	@ Make-up Air Area	**@ Operator Area**	**@ Exhaust Area**	**Operator 's Breathing Zone**	**Virgin (Pre Blast) Bulk**	
Abrasive	**Fixed Station #1**	**Fixed Station #2**	**Fixed Station #3**	**(OBZ)**	**Respirable Quartz**	
Type	**mg/m3**	**mg/m3**	**mg/m3**	**mg/m3**	**%**	**Notes**
CS	ND	ND	0.25	ND	ND	< LOD 0.80
N	ND	ND	ND	ND	ND	< LOD 0.80
S	1.01	2.70	5.03	2.06	1.60	< LOQ 2.00
SS	9.91	32.46	50.52	37.60	51.00	> LOQ 2.0
SSDS	9.18	21.26	28.20	24.20	71.00	> LOQ 2.0
CP	ND	ND	ND	ND	ND	< LOD 0.80
G	0.87	7.28	3.92	1.84	1.90	< LOQ 2.00
SG	ND	ND	ND	ND	ND	< LOD 0.80