PLAINTIFF'S
EXHIBIT
ASA-340

Environmental Survey

CORPUS CHRISTI PLANT

June 23-July 3, 1975

ASARCO, Incorporated
Department of Environmental Sciences
Salt Lake City, Utah

Plant: CORPUS CHRISTI Survey Date: June 23-July 3, 1975

Field Work by: John B. Richardson Report Date: August 29, 1975

ENVIRONMENTAL SURVEY

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1. OPERATING CONDITIONS

At 5:50 a.m. on 6/23/75 calcine build up on the walls of the Lurgi Roaster sloughed off, forcing the roaster down for the duration of the survey. The acid plant immediately ceased operating at this time. As a result of roaster shut-down both oxide and sulfide cell houses went on 48-hour stripping cycles. During normal operation the aluminum cathodes are usually stripped every 24 hours.

On 6/24/75 Raymond L. Skinner and Karl G. Ammersbach from the Occupational Safety and Health Administration (OSHA) arrived unannounced in response to a five-page union grievance alleging unsafe health and safety conditions throughout the plant. From 6/24-7/2/75 OSHA and ASARCO collected concurrent air samples and noise measurements.

Construction of the new Dross Mill precluded operation of the existing Dross Mill on day shift.

Number 1 Zinc Dust unit in Sulfide Casting was down during the survey.

The Sulfide Leach Department was not casting cadmium sticks the week of 6/30/75. Otherwise, operations were normal.

II. SAMPLING

A. A.I.S.I. tape samplers were used to collect one-hour sequential samples of airborne dust, fume and/or acid mist at the following locations:

Department	Date	Location
Sulfide Cell House	6/23/75	East side of cells (upwind)
Oxide Cell House	6/23/75	West side of cells (downwind)
Sulfide Zinc Casting	6/25/75	5' south of casting area
Oxide Crushing	6/25/75	5' west of automatic feed manganese hopper, at charge end of crushing cycle
Oxide Electric Furnace	6/26/75	Charge deck, north of charging port
Sulfide Leach - Cadmium Casting	6/27/75	5' northwest of melting pot
Sulfide Reverb Furnace	7/1/75	5' north of charge port

The above samples were analyzed for lead, zinc, manganese and cadmium by atomic absorption. The titrametric method outlined in the NIOSH Criteria Document for acid mist was utilized for cell house samples.

B. M.S.A. personal monitors equipped with closed-face Millipore filters were used to collect individual dust, fume and/or acid mist samples.

One personal monitor equipped with a closed-face preweighed Millipore filter was used as a fixed location sampler inside the Lurgi Roaster during clean out.

These samples were analyzed for lead, cadmium, zinc and manganese by atomic absorption spectrophotometry. Arsenic analyses were performed using an arsine generation, colorimetric method. Acid mist samples were titrated according to the NIOSH method cited above. In some instances preweighed Millipore filters were used to collect total dust samples.

C. Ventilation was measured in the laboratory using an Alnor Type 8500 thermo-anemometer.

D. Noise measurements were taken in the Sulfide Zinc Dust Manufacturing area with a General Radio Type 1558-A octave band analyzer. Internal calibration preceded each set of measurements. A B&K Calibrator Type 4230 was used to calibrate the analyzer (94 dB-1000 Hertz) after the survey in Salt Lake.

E. Individual noise exposure data were collected using DuPont audio dosimeters, Models D-100 (measures exposure in terms of the present 90 dBA OSHA standard) and D-285 (records noise exposures according to the 85 dBA limit proposed by EPA, et al).*

A DuPont readout unit was used to decode each dosimeter memory cell and produce a reading as a percentage of either the 90 dBA or the 85 dBA standard.

III. SAMPLING RESULTS

A. A.I.S.I Tape Samplers:

Department	Location	Element	Concentration (mg/m^3) Mean	Max.	Min.	No. of Hourly Samples	Percent Exceeding OSHA Limit	Graph No.
Sulfide Cell House	East side of cells (upwind)	H_2SO_4 Mist	<.09	<.09	<.09	45	0	---
Oxide Cell House	West wall (downwind)	H_2SO_4 Mist	<.35	1.83	<.07	42	5	1
Sulfide Zinc Casting	Casting area	Pb	<.01	.01	<.01	29	0	---
		Zn	.08	.19	.05	--	0	---
Oxide Crushing	Charge end	Pb	.07	.41	<.01	27	7	2
		Zn	1.96	8.96	.11	----	0	---
		Mn	<.07	.54	<.01	----	0	---
Oxide Electric Furnace	Charge deck	Pb	<.01	.01	<.01	25	0	---
		ZnO Fume	1.20	6.77	.03	----	8	3
Sulfide Leach Cadmium Casting	Near melting pot	Cd	<.01	.02	<.01	7	0	---
Sulfide Reverb	Charge deck	Pb	<.01	.01	<.01	23	0	---
		ZnO Fume	1.40	5.90	.33	----	4	---

* In Noise Standard hearings in Washington, D.C., both the Environmental Protection Agency (EPA) and labor unions support an 85 dBA standard. The Occupational Safety and Health Administration (OSHA) has recommended that the present 90 dBA standard remain unchanged.

OSHA LIMITS: Pb = 0.2 mg/m^3

Zn = No standard

ZnO Fume = 5.0 mg/m^3

Mn = 5.0 mg/m^3

Cd Fume = 0.1 mg/m^3

H_2SO_4 Mist = 1.0 mg/m^3

B. Personal Monitors:

Department	Employee and Number	Job or Operation	Sampling 1975 Date	Sampling Time (Min.)	Element	Conc'n. (mg/m^3)
Oxide-Cell House	Jesus Salazar #322 (no respirator)	Stripper	6/24	85	H_2SO_4 Mist	.46
	J. Sauceda #338 (no respirator)	Stripper	6/24	82	H_2SO_4 Mist	<.19
	R. Villarreal #340 (no respirator)	Stripper	6/24	79	H_2SO_4 Mist	.67
	S.M. Garcia #1578 (no respirator)	Stripper	6/24	74	H_2SO_4 Mist	.43
	P. Bosquez # 1565[5] (no respirator)	Stripper	6/26	325	H_2SO_4 Mist	.31
	J. Lascano #344[5] (no respirator)	Stripper	6/26	309	H_2SO_4 Mist	.41
	A. Yanez #156[5] (no respirator)	Stripper	6/26	351	H_2SO_4 Mist	.20
	R. Flores #498[5] (no respirator)	Stripper	6/26	251	H_2SO_4 Mist	<.06
	A. Ramirez #414[5] (no respirator)	Stripper	6/26	331	H_2SO_4 Mist	.04
	A. Flores #175[5] (no respirator)	Stripper	6/26	256	H_2SO_4 Mist	.11
	E. Cano #704[5] (no respirator)	Stripper	6/26	364	H_2SO_4 Mist	.63

Department	Employee and Number	Job or Operation	Sampling 1975 Date	Sampling Time (Min.)	Element	Conc'n. (mg/m^3)
Sulfide - Cell House	M. Martinez #550 (no respirator)	Cell Inspector	6/23	104	H_2SO_4 Mist	.68
	R. Ramirez #414[5] (no respirator)	Stripper	7/1	310	H_2SO_4 Mist	1.38[1]
	F. Roldan #382 (no respirator)	Cell Inspector	6/23	102	H_2SO_4 Mist	.35
	S. Garcia #1578[5] (no respirator)	Stripper	7/1	387	H_2SO_4 Mist	.75
	R. Ovalle # 1665 (no respirator)	Stripper	6/25	250	$H2SO_4$ Mist	.57
	D. Deleon #372[5] (no respirator)	Stripper	7/1	354	H_2SO_4 Mist	.53
	G. Rodriquez #520 (no respirator)	Stripper	6/25	249	H_2SO_4 Mist	.66
	R. Ovalle #1665[5] (no respirator)	Stripper	7/1	360	H_2SO_4 Mist	.21
	C. Garcia #557 (no respirator)	Stripper	6/25	245	H_2SO_4 Mist	.19
	J. Lascano #344 (no respirator)	Stripper	6/25	244	H_2SO_4 Mist	.16
Oxide-Lead Pot	Martinez #1541[5] (no respirator)	Laborer	6/24	413	Pb	.05
	J. Alaniz #1533[5] (no respirator)	Laborer	6/24	416	Pb	.04
	J. Silva #599[5] (no respirator)	Laborer	6/24	336	Pb	.03

Personal Monitors continued

Department	Employee and Number	Job or Operation	Sampling 1975 Date	Sampling Time (Min)	Element	Conc'n. (mg/m^3)
Sulfide-Zinc Dust	A. Villearreal #501[5] (no respirator)	No.2 Zinc Dust Unit Operator	6/30	217	Total Part.	2.91
					Zn	.81
	T. Morales #860 (no respirator)	No.2 Zinc Dust Operator	6/27	393	Total Part.	11.39
					Zn	8.98
	R. Quintero #794[5]	No.2 Zinc Dust Unit Helper	6/30	220	Total Part.	6.47
					Zn	3.65
	A. Villearreal #501[5] (no respirator)	No.2 Zinc Dust Unit Operator	7/1	327	Total Part.	4.24
					Zn	1.87
	R. Quintero #794[5] (no respirator)	No.2 Zinc Dust Unit Helper	7/1	316	Total Part.	4.78
					Zn.	2.08
Sulfide Leach Cadmium Casting	J. Ramirez #423 (no respirator)	Casting Operator	6/23	384	Cd	.01
	J. Casas #361 (no respirator)	Cuts, weighs Cd sticks	6/27	309	Cd	.03
	P. C. Perez #1529 (no respirator)	Leadman	6/27	344	Cd	.01
	J. Ramirez #423 (no respirator)	Helper	6/27	309	Cd	.02
Oxide-Purification	D. Aleman #267 (no respirator)	Operator	6/27	357	As	.011[2]
Oxide-Leach	C. Valdez #357 (no respirator)	Relief Leadman	6/27	342	As	.078[2]
Sulfide-Zinc Casting	G. Martinez #1148 (no respirator)	Operator	6/25	258	Zn	6.35
Oxide-Crushing	C. Benavidez #437 (no respirator)	Loader Oper.	6/27	362	Zn	5.84
					Mn	.08

Personal Monitors continued

Department	Employee and Number	Job or Operation	Sampling 1975 Date	Sampling Time (Min)	Element	Conc'n. (mg/m^3)
Sulfide-Reverb	G. Morin #515 (no respirator)	Chargeman	7/2	400	Zn Total Part.	.74 3.65
Oxide-Electric Furnace	M. Resio #113 (no respirator)	Chargeman	7/2	385	Zn Total Part.	.05 2.63
Maintenance	O. Garcia #823 (no respirator)	Lead Burner	7/2	104	Pb	.13

B. Personal Monitor -- Stationary:

Department	Location	Sampling 1975 Date	Sampling Time (Min)	Element	Conc'n. (mg/m^3)
Lurgi Roaster	Sampler attached to pole and placed inside roaster through northwest overhead port during clean out. Breathing zone level.	6/28	498	Pb	.25[3]
				Zn	6.25
				Cd	.05
				As	.009[2]
				Total Particulate	16.74[4]

1 Exceeds OSHA 8-hour, time weighted average (TWA) sulfuric acid mist (H_2SO_4)

2 Exceeds proposed OSHA 8-hour, TWA for inorganic arsenic.

3 Exceeds OSHA 8-hour, TWA for lead.

4 Exceeds OSHA 8-hour, TWA for nuisance dust (total particulate)

5 Concurrent sample (OSHA AND ASARCO)

OSHA Limits:

Pb	=	0.2 mg/m^3
Cd Fume	=	0.1 mg/m^3
Cd Dust	=	0.2 mg/m^3
Zn	=	No standard
ZnO Fume	=	5.0 mg/m^3
Total Particulate	=	15.0 mg/m^3
H_2SO_4 Mist	=	1.0 mg/m^3
Mn	=	5.0 mg/m^3
As	=	0.5 mg/m^3 (present)
As	=	0.004 mg/m^3 (proposed)

C. Ventilation Measurements:

Department	Location	Operating Conditions	Average Face Velocity (FPM)
Laboratory	Hoods-northeast corner	Normal	50
	Hoods-southeast corner H_2SO_4 fuming hood (west side)	Normal	70
	Muffle furnace hood (east side)	Normal	80
	Hoods-northwest corner		
	Hot plate hood (east side)	Normal	55
	Perchloric hood	Normal	80
	(Recommended average face velocity for laboratory hoods: 100 fpm; 100-150 fpm for perchloric hoods)		
	Atomic Absorption Hood	Flame on; air conditioner off	75
		Flame off; air conditioner off	95

D. Octave Band Sound Level Measurements:

Department	Frequency Range (Hertz)	Inside Booth 1,4	Outside Booth 2,4	Outside Booth 3	Near Instrument Panel 2
Sulfide-Zinc Dust		84 dBA	93 dBA	93 dBA	97 dBA
	18.75-37.5	81 dB	77 dB	76 dB	84 dB
	37.5-75	71 dB	80 dB	77 dB	86 dB
	75-150	70 dB	80 dB	78 dB	85 dB
	150-300	69 dB	84 dB	84 dB	86 dB
	300-600	68 dB	82 dB	83 dB	84 dB
	600-1200	64 dB	83 dB	86 dB	85 dB
	1200-2400	60 dB	82 dB	85 dB	86 dB
	2400-4800	61 dB	82 dB	82 dB	87 dB
	4800-9600	64 dB	87 dB	87 dB	89 dB
	9600-19200	57 dB	83 dB	82 dB	82 dB

[1] No. 2 Zinc Dust Unit operating; air conditioner in booth on.

[2] No. 2 Zinc Dust Unit operating; measurements taken between zinc slabs falling from moulds.

[3] No. 2 Zinc Dust Unit down; no zinc slabs falling.

[4] Graph number 4 compares inside vs. outside measurements.

E. DuPont Audio Dosimeters:

Department	Employee and No.	Dosimeter No.[1]	Job or Operation	Sampling 1975 Date	Sampling Time (Min.)	Percent Readout Based on Sampling Time(Min)	Percent Readout Adjusted to 8 hrs.	>115 dBA?[3]
Sulfide-Zinc Dust	T. Morales #860	8	Operator	6/25	363	145	192[2]	Yes
	A. Villarreal[6] #501	8	Operator	6/30	213	41	92	No
	R. Quintero[6] #794	2	Helper	6/30	220	31	68	No
	A. Villarreal[6] #501	8	Operator	7/1	317	77	117[2]	No
	R. Quintero[6] #794	2	Helper	7/1	316	55	84	No
	A. Villarreal[7] #501	7	Operator	7/22	349	80	110[2]	No
	R. Quintero[7] #794	6	Helper	7/22	349	85	117[2]	Yes
	A. Gomez[7,8] #753	6	Helper	7/29	346	75	104[2]	No
	H. Williams[7,8] #366	7	Operator	7/29	344	63	88	Yes
Oxide-Unloading	N. Nunez #159 (Muffs worn)	A	Car Shaker	6/25	367	81	106[9]	Yes
	H. Delgado #919	B	Helper	6/25	365	63	83	No
Sulfide-Cell House	J. Garcia #1544	C	Stripper	6/25	345	67	93	No
	P. Bosquez #1565	2	Stripper	6/25	342	53	74	No

DuPont Audio Dosimeters continued

Department	Employee and Number	Dosimeter No.[1]	Job or Operation	Sampling 1975 Date	Sampling Time (Min)	Percent Readout Based on Sampling Time(Min)	Percent Readout Adjusted to 8 hrs.	>115 dBA?[3]
Paint Shop	B. Orrick #260	1	Sandblaster	6/25	349	No Reading	No Reading	Yes
	B. Orrick #260	1[4]	Sandblaster	6/27	289	No Reading	No Reading	----
		8[5]		6/27	289	33	55	Yes

1 Numbered dosimeters record noise in terms of the present 90 dBA OSHA standard. Lettered dosimeters integrate noise according to an 85 dBA, 8-hour limit.

2 Exposures exceeding 100% may violate the OSHA 90 dBA standard, assuming the adjusted percent readout correctly reflects sound levels that would be received in an 8-hour period. OSHA usually does not cite unless the exposure exceeds 120%.

3 The dosimeter records any level over 115 dBA during the sampling period. Under OSHA exposure to steady state noise in excess of 115 dBA for any length of time is not allowed.

4 Dosimeter located outside sandblaster's hood.

5 Dosimeter located inside sandblaster's hood.

6 Concurrent sample (OSHA and ASARCO)

7 Samples collected by plant personnel.

8 Both zinc dust units operating.

9 Exposure exceeds the 85 dBA standard proposed by EPA.

IV. COMMENTS

A. Sulfide Department:

Tape and personal monitoring results for airborne cadmium in Cadmium Casting were acceptably low. No respiratory protection was worn and the results indicate none was necessary.

Tape and personal monitor sampling showed low airborne lead and zinc levels in the Reverb and slab casting areas.

With the exception of the R. Ramirez sample on 7/1/75, all Cell House tape and personal monitor results were below the OSHA 8-hour time-weighted average (TWA) for sulfuric acid mist. Many of these samples were taken concurrently with OSHA, as noted.

Noise dosimeter readings were below the OSHA 8-hour TWA of 90 dBA.

The Zinc Dust Unit personal monitor showed acceptable levels of airborne zinc dust and total particulate.

The Zinc Dust area was the subject of extensive concurrent (OSHA and ASARCO) and independent (both ASARCO D.O.E.S. and Corpus Christi plant personnel) sampling with noise dosimeters between June 25 and July 29, 1975. Several conclusions may be tentatively drawn. First, results indicate that the 115 dBA level is periodically exceeded. Under OSHA no excursion above the 115 dBA limit for steady state noise is allowed at any time during an 8-hour shift. Second, results suggest that the newly-constructed sound booth, built as an engineering control to reduce individual noise exposures, is not being sufficiently used. Third, dosimeter data show that with only one dust unit operating, operator and/or helper tend to receive noise exposures which exceed the 90 dBA limit as an 8-hour TWA. Fourth, operation of a zinc dust unit with operator only allows this worker minimal relief from areal noise. Relief would be afforded by his frequenting the sound booth or by leaving the premises temporarily (see T. Morales' result). An operator without helper must constantly tend the operation.

From the standpoint of efficiency, Universal Scheduling has recommended zinc dust manufacturing as a one-man operation per each dust unit. Individual noise data render this assessment untenable from the standpoint of good industrial hygiene practice. A possibly workable compromise proposed by plant safety personnel is employee rotation, a valid administrative control under OSHA. One employee would work four hours in the zinc dust area then

move to a low noise area for the remainder of the shift. However, the single result for Morales indicates that with just one dust unit operating, one worker could receive essentially all noise exposure allowable for 8 hours in about four hours. For the remainder of the shift the worker would have to be assured of noise exposure below the 90 dBA level.

With two dust units operating, individual noise exposure could be greater than that indicated for Morales. The question of whether employee rotation will keep exposure within allowable limits should be resolved by sampling with noise dosimeters.

One operator had earplugs in his pocket. Hearing protection was not observed to be worn at any time during several hours of observation of operator and helper. Respirators were worn during baghouse cleanout only.

Octave band analysis of noise in the zinc dust area shows the highest sound level at the 4800-9600 Hertz (cycles per second) range. The range where damage to hearing in the speech frequencies can occur is generally regarded as 2000-4000 Hertz. Decibel levels at these frequencies are higher on the zinc pot platform than near the door of the sound booth. An operator with no helper spends most of the time between platform and air jet. Damage to hearing can be averted by relieving the operator and allowing him either time in the sound booth or time away from noise. Until administrative or engineering controls can be affected, ear muffs or plugs should be mandatory whenever the dust units are operating.

Graph 4 shows sound attenuation characteristics of the sound booth. Attenuation at selected frequencies ranges from 9 to 26 decibels (dB). Overall, the booth decreases sound levels from 93 down to 84 dBA.

Presently plant personnel are designing a sound absorbing panel with built-in observation port to place over the openings to the high pressure air nozzles on the Zinc Dust Units. Since the air jets are the primary sources of areal noise, the panels should measurably decrease sound levels. Upon completion of the project an exhaustive noise survey should be undertaken to determine compliance.

B. Oxide Department:

Two hourly tape samples exceeded the 8-hour TWA for acid mist in the cell house. 8-hour averages of tape

sample results, however, show minimal acid mist levels. All personal monitor samples for acid mist were acceptably low.

Of the tape samples taken on the Electric Furnace charge deck, 8% exceeded the OSHA limit for zinc oxide fume, assuming all zinc is present as fume. 8-hour averages are comfortably below the OSHA standard. All lead results for tapes and personal monitors were minimal, as would be expected in an operation where elctrolytically refined zinc is melted and cast. Zinc and total particulate values for personal monitors were below permissible limits.

The Lead Pot area was sampled concurrently (OSHA and ASARCO) with personal monitoring devices. ASARCO data show minimal airborne lead levels. Respirators were not worn. Three fans were positioned such that they were bucking prevailing wind and thereby interfering with natural ventilation. The fans could be positioned to better advantage.

Both personal samples collected in Leach and Purification were below the present OSHA 8-hour TWA for arsenic. However, both values exceed the proposed OSHA standard.

Oxide Crushing tape sampler values showed excursions above the OSHA limit for lead 7% of the time. All 8-hour averages for lead are acceptably low. Tape and personal results for zinc and manganese indicate minimal airborne levels of these elements throughout the sampling periods.

Of the two 85 dBA noise dosimeters placed in Oxide Unloading, one (N. Nunez, #159, car shaker) showed that the permissible 8-hour exposure was exceeded by 6%. Under the present 90 dBA OSHA standard the Nunez sample would be within acceptable limits. The Nunez dosimeter registered exposure to noise above 115 dBA, a level which should be exceeded at no time during the shift. Nunez wore ear muffs during car shaking.

C. Lurgi Roaster:

During cleanout a stationary personal sampling device was positioned inside the roaster at breathing zone level. Airborne levels of lead and total particulate exceeded their respective OSHA standards. Values for zinc, cadmium and arsenic were within acceptable limits. Respirator use is mandatory inside the roaster and is considered optional outside the roaster. The stationary

sample result indicates that respirators should be worn inside the roaster during maintenance operations at all times, i.e. a continuation of current practice.

D. Maintenance - Paint Shop:

The Obidio Garcia personal monitor sample was below the OSHA limit for lead. Garcia's lead burning project (repairing fitting on electrolyte recirculation pump) was short duration. No fans were used and no respirator was worn.

The dosimeter measurement for B. Orrick, #260 (Sandblaster), taken inside the hood shows low actual time-weighted exposure. However, both dosimeters (inside and outside hood) recorded noise peaks above 115 dBA. For OSHA compliance this level should be exceeded at no time during the work shift.

To combat heat stress a vortex tube has been placed in the sandblaster's air line. The tube cools the compressed air that would otherwise enter the hood at ambient (usually warm) temperature. Sandblaster Orrick enthusiastically endorsed use of the vortex tube, which was being used on a trial basis.

At one time transite was extensively used at the plant. As one example of former use, carpenters cut sheets into skimming paddles. All work involving transite and asbestos products has now been contracted out. Asbestos cloth is still occassionally used to line launders. No other inventories of asbestos products were noted.

E. Ventilation:

For the atomic absorption (AA) hood manufacturers recommend a ventilation rate of 400 cfm. The AA hood face is 0.5 ft^2 (1' x 0.5'). With flame on the volume is 38 cfm (0.5 x 75). With flame off the volume becomes 48 cfm (0.5 x 95). The ventilation rate in both instances is sub-standard.

All hoods have inadequate draft and should be upgraded. Lowering the sash to provide greater face velocity should serve only as an interim step in improving overall laboratory ventilation. With such low face velocities it is doubtful whether even extensive lowering of the sash would bring air velocities up to an acceptable level. Low sashes may also impede work in the hood areas.

Radial and rip saws in the Wood Shop need to be ventilated even though transite is no longer cut. Total particulate (wood dust) concentrations appearing in the 1974 survey report demonstrate that local exhaust ventilation is indicated. The system should conform to A.N.S.I. Standard 29.2-1971, Fundamentals Governing the Design and Operation of Local Exhaust Systems.

F. Respiratory Protection:

Air sampling through the years has shown that most production workers do not need the protection offered by a respirator. Specialty workers, such as welders, acid plant personnel, lead workers, sand blasters and roaster personnel usually wear respiratory protection. Types are noted, as follows:

1. Welders - Welsh Back Pack Dual cartridge respirator with dust pre-filter and Protex 7500-43 cartridges (remove dust, mists, fumes, organic vapors and acid gases).

2. Acid Plant - MSA Comfo II respirator equipped with GMB cartridges (protection against acid gases up to 50 ppm).

3. Lead Workers - MSA Comfo II respirator equipped with Type "S" filters (remove dust, fumes, mists and radon daughters - no gas or vapor protection).

4. Sand Blasters - Del-Monox Purifier filter cartridge (in line filter). Abrasive blasting hoods were recently purchased from MSA.

5. Lurgi Roaster - For cleanout either MSA Dustfoe or AO R-2000 respirators used.

In the Lead Shop Mr. Skinner (OSHA) found a case of improper respirator use. An AO R-33 cartridge (removes organic vapors and acid gases only) was being used on an AO R-2033 respirator. An MSA Comfo II respirator equipped with Type "S" filter, or equivalent competitor brand unit, should be worn by lead workers. Care should be taken that specialty workers use respiratory protection geared to their exposure.

Proponents of the bandana-type respirator referred to in the 1974 report are still to be found (Oxide Unloading, yard sweeper operator, Lurgi Roaster cleanout, outside roaster). Those indicating need of respiratory protection by wearing bandanas should be encouraged to wear an approved respirator.

G. Hearing Conservation:

Priority employees for annual audiograms are those whose time-weighted average exposure to noise is 85 dBA or greater. Based on audio dosimeter results sandblasters, Oxide Unloading workers and Zinc Dust personnel should be sampled without fail on an annual basis, before shift. It was generally observed that workers in high noise areas failed to wear hearing protection, with the exception of Mr. Nunez in Oxide Unloading.

H. Biological Monitoring:

A review of the biological monitoring records shows that between October 16, 1974 and August 20, 1975 there has been one repeat urine sample requested and no repeats for blood lead. There were no confirmed blood or urinary leads during this period. As of July, 1975, urine samples are no longer collected routinely as part of the Lead Hygiene Program. However, urine samples will still be collected on a regular basis from cadmium workers.

IV RECOMMENDATIONS

A. The concept of employee rotation in Sulfide Zinc Dust Manufacturing should be applied. Participating employees should be monitored with audio dosimeters to determine compliance with the OSHA noise standard. In the meantime engineering work should continue on sound absorbent panels to be placed over the air nozzle openings. When the panels are installed the Zinc Dust area should receive a comprehensive noise survey using noise dosimeters, sound level meter, and possibly an octave band analyzer to determine the success of engineering controls. The sound booth should continue to be used as frequently as possible by Zinc Dust personnel to lessen their noise exposure.

B. Specialty workers cited in the Comments section should wear NIOSH-approved respirators best suited to their exposures. Zinc Dust personnel, furnace chargemen and Wood Shop workers should be encouraged to wear NIOSH-approved respirators in visible dust and/or fume. Bandanas should be phased out and replaced where necessary with respirators. Roaster cleanout crew members may wish to use a barrier cream if skin irritation develops. The use of facelets ("socks") on respirators should be discouraged. NIOSH approval of a respirator is invalidated when equipped with a facelet.

C. Annual audiograms should be administered without fail to sandblasters, Zinc Dust personnel and the car shaker operator in Oxide Unloading. Hearing protection should be mandatory for Zinc Dust workers. Ear plugs should be worn by sandblasters to attenuate noise above 115 dBA.

D. Although all work with transite and asbestos is farmed out, any remaining applications of asbestos (such as lining launders with asbestos cloth) should be discontinued or a substitute material sought. Being free of the rigors of compliance with the OSHA asbestos standard should provide sufficient incentive to clear the plant of the last vestige of asbestos, where possible. Any future purchase of asbestos materials should be done only after all other possibilities for alternative products' use are exhausted. D.O.E.S. would appreciate receiving notification of any asbestos product still in stock or on order, now and at any time in the future.

E. All laboratory hoods should be upgraded. Present blowers and ducts should be inspected and cleaned of accretions if necessary. Special precautions should be taken when cleaning surfaces exposed to perchloric acid fumes because explosion hazard may exist. Corroded blowers may need replacing. Fan speed and/or blower size may need to be increased to provide adequate draft at the hood face.

Vertical ducts off the hoods offer less friction loss (resistance) to flowing air than the current duct arrangement. Since vertical ducts off the hoods are infeasible in the present building (office above), a new laboratory site, such as the old power plant, should be considered.

F. The afore-mentioned saws in the Wood Shop should be ventilated.

G. The new Dross Mill (completion date is September 30, 1975), the Sulfide Lead Pot (runs quarterly), and the lead burners working in lead-lined tanks should be sampled using personal monitors to determine compliance with the OSHA lead standard.

H. The plant should purchase vortex tubes for use by the sandblasters.

John B. Richardson

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Environmental Specialist

JBR/ms
Enclosures

cc: CBWhite
KDLoughridge
KWNelson
HLMontague
DHSoutar
AJGillespie/JPStetson
Dr. CHHine
EHHaug
RCBeckstead
MOVarner