INTERNAL CORRESPONDENCE

h29

FEB 2 5 1980

METALS DIVISION •

P. O. BOX 579 · 4625 ROYAL AVE., NIAGARA FALLS, NEW YORK 1430

To (Name) Mr. J. L. Myers
Division UCC - Metals
Location Niagara Falls, NY

Date February 19, 1980
Originating Dept. "Calidria" Asbestos
Answering letter date
Subject Review of King City Plant Monitoring and Medical Records

Copy to Messrs.
T. W. Carmody
W. B. DeAtley
K. S. Lane
P. W. McDaniel
O. J. Malacarne
[redacted]
J. J. Sibley/R. F. X. Fusaro

This letter summarizes the status of the above-noted project following meetings at King City and with Dr. Lane and Mr. McDaniel in New York City.

The monitoring data files at King City have been assembled in one place. We have exposure information going back to 1963. The early data are by midget impinger and are sporadic in today's terms, but at least a modest number of facts seem to be available. Personal sampling started in 1970 and sampling detail, frequency and scope has increased substantially since that time. Examples of this type of data available at various points in time are attached for reference.

It also appears that Dick Marsden has good chronological records of changes that have been made in the plant equipment. These include changes affecting the levels of asbestos dust so we should be able to relate the changes to the observed levels of airborne asbestos dust.

The information available to relate workers to job locations is very extensive. Weekly time cards which show the hours spent in each plant department appear to be available for everyone who has ever worked in the plant. Examples of these cards are attached for reference. Medical records are also available for all past and present employees.

Based on this information two projects can be defined:

1. Summarize the exposure data and relate it to the corresponding changes made in plant equipment to reduce dust levels.

2. Put the exposure and work location information in a form where exposure histories and cumulative exposure can be obtained readily for each individual employee. This is obviously a computer program and storage task. Medical records would also be coded for prompt recall.

Regarding the first of these tasks, there are about 16 plant locations that are now monitored with some regularity. A substantial proportion of these have been tested to some extent back to 1963. Since monitoring seldom occurred more than once a month and often only once or twice a year, it is a substantial but still manageable task to prepare a graphical summary by month of all of the daily TWA data.

Bill DeAtley is now preparing such a summary. The mechanical changes relating to dust levels from Dick Marsden will also be shown. When completed, we will have a good historical picture of our efforts to control exposure and the results achieved. It will also show clearly the amount and kind of exposure data available.

The second task relating to individual exposure and medical histories is much more substantial. For epidemiology it would be most desirable to relate the time spent by each employee in each location to the corresponding exposure records to give a cumulative exposure. It appears that our ability to relate time-in-location far exceeds our ability to estimate exposure. Nevertheless, it appears that the total amount of information available substantially exceeds that used in most asbestos epidemiological studies published in the past.

It is well recognized that asbestos related diseases generally take a minimum of twenty years to develop and the latency period can be much longer than this for low exposures. Also, out of approximately 200 past and present employees at King City, only five have as much as 16 years exposure.

The medical records show no evidence of asbestos related disease. It can be concluded that the cohort here is too small and the exposure period has been too brief to make an epidemiological study worthwhile at this time.

On the other hand, however, there are several good reasons to put the data in "epidemiology" form now and store future data in the same form. These include:

1. In order to protect our employees it is very desirable to know their exposure history and cumulative exposure. Recent literature is providing estimates of risk based on cumulative exposure. We need to be sure that our employees are not being exposed to excessive risk.

2. The total records involved include only about 200 employees for a maximum time of employment of only about 16 years. It appears to be a reasonable sized effort to code this quantity of information now. Entry of future data annually would be quite simple.

3. We are faced with demands from EPA and other regulatory agencies for increasingly detailed exposure information. There is little doubt that such information will be required in the future. We are in the best position to interpret our data accurately. The alternative is likely to be the supplying of the "raw" data to NIOSH or EPA for their analysis.

The obvious question is how much time and effort would be required to write the programs and code the available information into the computer. I am pursuing this matter actively and hope to have definite information in the next several weeks.

H. B. Rhodes

Harrison B. Rhodes

/rmm
Attachments

UC 149-2

UNION CARBIDE

INTERNAL CORRESPONDENCE

RECEIVED
OCT 2 1963
UNION CARBIDE NUCLEAR CO.
KING CITY, CALIF.

UNION CARBIDE CORPORATION • 270 PARK AVENUE, NEW YORK, NEW YORK

To (Name) Mr. Kenneth Lentz
Company Union Carbide Corporation
Location Nuclear Division
P. O. Box 613
King City, California

Date September 27, 1963

Originating Dept.

Answering letter date

Subject

Copy to Mr. C. E. Brown
Mr. L. B. Emlet

DISTRIBUTION
K. W. Lentz ☐
J. A. Biddle ☐
E. W. Haskins ☒
L. F. Crow ☒
G. C. Brice ☒
D. S. Kamens ☐
Foreman ☒
File ☒

I am attaching two copies of Mr. McDaniel's report on the mine and plant operation during his visit September 10 through September 13. I think the report is self-explanatory, and we would concur with Mr. McDaniel's recommendations. I hope it will be possible to obtain equipment for the plant site for dust counts, etc., since it is very difficult to transport equipment every time a visit is made.

Mr. McDaniel reports that he did meet with the medical group in King City and was able to present to them some picture of what we are trying to do in industrial hygiene. I believe this was of educational value to the group.

Thank you very much for the courtesies shown Mr. McDaniel on his visit.

Very truly yours,

Medical Director

Thomas W. Nale, M.D.
vm
enclosures

Report of Investigation
Nuclear Division
Union Carbide Corp.
King City, California
Sept. 10-13, 1963

This was the first formal evaluation of the working environment for conditions that might be hazardous to health at the new plant and mine. It was concerned primarily with airborne dust.

Air samples were collected at both the mine and mill by a technique in which the dust was retained by impingement in liquid. Particle concentration was then determined by count using light-field microscopy and a magnification of 100 diameters. This is in accord with the standard procedures of the U. S. Public Health Service. Results are given in the accompanying table.

For safety, all particles were considered to be fibrous. While it is recognized that other materials may be present, studies of airborne material at Sterling Forrest by electron microscopy have shown that the fiber-bearing particles do not always have the familiar fiber shape, and positive distinction is possible only through elaborate and expensive techniques that are impractical for a dust control program. Further, in view of the very limited information available on the toxicity of short fiber asbestos, a conservative approach is indicated.

Nuclear Division
Union Carbide Corp.
King City, California
Sept. 10-13, 1963

Recommendations

Mine:

1. Require that caterpillar operators engaged in cleaning and scraping mine site wear respirators approved by the U. S. Bureau of Mines for toxic dusts. A relatively inexpensive respirator that resembles the non-approved mask now available, but which has been found adequate, is American Optical Co., Sure-Guard, No. R9100T.
2. The recommended maximum allowable dust concentration for long-term exposure at the mine is 5 million particles per cubic foot of air. Evaluate environment periodically to determine if exposures are controlled.

Mill:

1. The recommended maximum allowable dust concentration for mill work areas is 5 million particles (total) per cubic foot of air. Plan dust control to meet that limit.
2. Initiate a program for routine evaluation of dust concentrations at various operations at the mill site. The actual number of samples that must be collected for reliable evaluation and other details

of the program will be defined as experience is gained in developing mill operations. For the early stages of operation, sampling should be conducted at monthly intervals until a good background of information is obtained and until experience shows that a longer interval is justified.

3. Obtain laboratory equipment necessary for routine dust evaluation. A list of equipment is shown below.

a.) Microscope. Bausch and Lomb model FBR-3(No. 31200423) with mechanical stage and Abbe condenser (N.A. 1.25) This is a monocular microscope that can be readily converted to a binocular type and is supplied with 10X, 43X, and 97X achromatic objectives, and 5X and 10X Huygenian eyepieces. Cost--approximately $430. Source--laboratory supply house or directly from Bausch and Lomb.

A similar microscope of Japanese make that has been found acceptable at Grand Junction is obtainable from Unitron Instrument Co., 66 Needham Street, Newton Highlands 61, Massachusetts. The model number is MLU. It is equipped with essentially the same accessories as the B&L model (including

10X, 40X, and 100X objectives, and 5X, 10X and 15X eyepieces). In addition, it has a built-in light. Cost--approximately $270. I have asked that a catalog be sent to King City.

b.) Microscope Light (if B&L microscope is purchased). B&L Optilume for monocular microscopes. Price--approximately$8.50. Source--laboratory supply house.

c.) Whipple Micrometer Disc. For use in microscope eyepiece. Price--approximately $7.50. Source--laboratory supply houses.

d.) 6 Sedgwick-Rafter (A.P.H.A.) Counting Cells. Price--$9.00 each. Source--Laboratory supply houses.

e.) Isopropyl alchol as discussed during the visit.

4. Obtain air sampling equipment. Literature on available equipment will be forwarded as soon as received. Probable cost--$250.

Detailed Findings

Mine

No mining was being performed during this visit but operations involved with the transportation of ore to the mill and general cleaning of the mine site were in progress.

Nuclear Division
Union Carbide Corp.
King City, California
Sept. 10-13, 1963

Dust counts were not found to be excessive except on the caterpillars dressing the mine site. Concentrations alongside the operators were about twice the recommended maximum of 5 million particles per cubic foot of air and indicated a need for improved protection of personnel. It was recommended that these people be supplied with respirators approved by the U. S. Bureau of Mines.

The amount of dust found in the open cab of a pick-up truck during travel from the mine site to the public road was higher than at some points at the mine but not to a significant degree. With further improvement to the road, concentrations in moving trucks should drop.

Mill

Only the front end of the process (ore treatment up to filtration) was operated during this visit. The remainder of the process will be investigated later in the year when the installation is completed.

Dust concentrations at various points of operation are shown in the table. None exceeded 5 million particles per cubic foot of air, but it was apparent that very careful control of the dry material was necessary to prevent a significant increase in airborne particles. Thus as production

rises to mill capacity additional control measures may be indicated.

In view of the toxicity of asbestos and the low permissable air concentration, it was recommended that a program for routine periodic appraisal of the work environment be established, and that necessary equipment be obtained. While much of the program (sampling location, number of samples, and the number of investigations required per unit of time) cannot be defined until the mill is in normal operation, it was felt that initially plans should be made for monthly investigations. Information on sampling equipment needed for the program will be forwarded as soon as descriptive literature is received from the supplier.

The basic laboratory equipment for dust appraisal and its approximate cost is listed in the recommendations. The microscope selected need not be one of the makes listed but should have the same features and a complete line of available accessories. The question of imported or American-made is a matter for local decision which should consider in addition to cost the availability of parts and service. The other recommended laboratory supplies are more or less standard items in American dust control practice.

Paul W. McDaniel
Industrial Hygiene Engineer

PWM/en

Dust Concentrations
Nuclear Division
Union Carbide Corp.
King City, California
Sept. 10-13, 1963

Sampling Location and Operation	Date	MPPCF (1)	Remarks
Mine Site			
Alongside wobbler during loading trucks.	9/10/63	4.2 3.8 3.3 3.9	Variable wind direction and speed so that sampling location is upwind of dust part of time.
Riding caterpillars cleaning mine site.	9/10/63	9.6 10.9 11.3 11.8	Much large, non-respirable material noted.
Walking across ore pile	9/10/63	3.2 3.4	Light breeze (5 MPH) from west and south.
Riding pick-up with windows open on road from mine.	9/10/63	4.7 6.0	Deep dust on portions of road.
Mill Site			
Deck around Com-Bin feeder and screen 204	9/11/63	2.3 2.7	Wind from south (10-15 MPH). No ore moved from stockpile.
Same Location	9/11/63	3.1 3.7	Wind from north (10-15 MPH) and ore loaded on conveyor belt feedin Com-Bin feeder.
Walkways from screen 204 to shaking tables	9/11/63	1.7 1.9	
Deck around screen 204 and Com-Bin feeder	9/12/63	2.6 2.5	No ore moved from Stockpile. Very little wind.
Same Location	9/12/63	3.8 3.6	Ore loaded on conveyor belt feeding Com-Bin feeder.

Dust Concentrations
Nuclear Division
Union Carbide Corp.
King City, California
Sept. 10-13, 1963

Mill Site (cont'd)

Walking over ore pile as pile was dressed by front loader	9/12/63	1.7	Not visibly dusty.
In front loader cab while dressing ore pile.	9/12/63	2.5	Not visibly dusty.

(1) MPPCF--Millions of particles per cubic foot of air.

UC 14a 7

UNION CARBIDE INTERNAL CORRESPONDENCE

MINING AND METALS DIVISION • P. O. BOX K, KING CITY, CALIFORNIA 93930

To (Name) Mr. Paul A. McDaniel
Division Union Carbide Corporation
Location 270 Park Avenue
New York, New York

Date Feb. 1, 1967

Originating Dept.

Answering letter date

Subject

Copy to

Dear Mr. McDaniel:

Here are the latest series of dust counts. As you may notice, they have decreased from last time. This, I believe is due to high moisture in the product. Personnel were wearing respirators in the bagging room.

1-24-67	Location	PPM
	End of Bag Conveyor	2.6
	Same as above	2.2
	Bagging Room	3.8
	Same as above	4.2
	Rock Fiber Area	1.2
	Refiner Area	1.2
	General Mill	1.3
	Same as above	1.5
	Maintenance Bldg.	1.0
	Inside Michigan Loader	1.1
	Car Loading Operation	2.2
	Same as above	2.1
	Blank	5

Weather: Cloudy, light rain - High Purity Open - High moisture.

Very truly yours,

D. S. Kamens

DSK/jcb
cc: J. A. Riddle ✓
J. L. Myers

C 149-2

UNION CARBIDE

INTERNAL CORRESPONDENCE

MINING AND METALS DIVISION

P. O. BOX K, KING CITY, CALIFORNIA 93930

To (Name) P. W. McDaniel
Division HS & EA 22nd Floor
Location New York, NY

Date December 21, 1979

Originating Dept.

Answering letter date

Subject

Copy to W. B. DeAtley
R. J. Kronkhyte
O. J. Malacarne
E. A. Piersall
J. C. Settlemoir

PERSONAL AIR SAMPLES TAKEN FOR THE MONTH OF DECEMBER 1979

Subject	Job Classification	Sampling Time min.	Average + 5m/ml
Harry Roof	038 Bagger Operator	21-69	1.46
Thomas Moore	RG-244 Bagger Operator	60-71	0.74
Clyde Bailey	Press-Dryer Circuit Operator	56-87	0.21
Isabel Flores, Sr.	Outside Operator	53-78	0.78
Andy Anderson	Shift Supervisor	59-74	0.33
Adene Andrade	Labor Operator	21-64	1.69

James C. Settlemoir
Quality Control Technician

/dm

12/20/79

Subject: Harry Roof - 038 Bagger Operator

Area: Main Bagging Room

Conditions:

1) Full bagging, shrink wrapping, palletizing operation on Super Visbestos.

2) Light forklift traffic.

3) 5 - 10 mph wind from the south all day.

4) Clear to cloudly day, west door open.

5) Upper bagger enclosure partly filled with product from an inspection door being loose.

6) Circuit down due to maintenance repairs.

Time	Work Performed	Average + 5m/ml
8:57 A.M. - 9:35 A.M.	Circuit down, moved pallets of SVC around bagging room for double wrapping.	0.98
9:36 A.M. - 10:13 A.M.	Started circuit; worked around bagging room; took a break.	3.39
10:14 A.M. - 10:54 A.M.	Circuit down; vacuumed inside the upper bagger enclosure.	1.70
10:55 A.M. - 11:35 A.M.	Same as above until 11:15.	2.07
11:36 A.M. - 11:57 A.M.	Checked around bagging room.	1.12
12:33 P.M. - 1:40 P.M.	Put plastic bags into drums; moved pallets from the east door to the palletizer area.	0.40
1:41 P.M. - 2:50 P.M.	Placed SSG press cake in sample drums. Total 6 Drums.	0.54
	Average	1.46

12/18/79

Subject: Thomas Moore - RG-244 Bagger Operator.

Area: RG-244 Bagging Room

Conditions:

1) Full bagging, shrink wrappping, palletizing operation on RG-244.
2) North door open, fair day.
3) 5 - 10 mph wind from south all day.
4) New product return system to Raymond mill.
5) Moved pallets from RG-bagging room to storage area and took samples to the laboratory.
6) He was wearing a respirator.
7) Bulk car fill pipe plugged up at 1:50 P.M.

Time	Work Performed	Average + 5m/ml
9:25 A.M. - 10:25 A.M.	Normal conditions.	0.64
10:26 A.M. - 11:28 A.M.	" "	0.44
11:29 A.M. - 12:40 P.M.	" "	0.67
1:00 P.M. - 2:03 P.M.	" "	1.09
2:03 P.M. - 3:03 P.M.	" " , took break.	0.88
	Average	0.74

12/18/79

Subject: Clyde Bailey - Press-Dryer Circuit Operator

Area: Press-Dryer Circuit

Conditions: 1) Usual mill operating conditions.

2) East/south door closed; 5 - 10 mph wind from the south all day.

Time	Work Performed	Average + 5m/ml
9:15 A.M. - 10:20 A.M.	Normal conditions.	0.18
10:21 A.M. - 11:17 A.M.	" "	0.26
11:18 A.M. - 12:45 P.M.	" " , lunch for 30 min.	0.14
12:46 P.M. - 2:09 P.M.	" "	0.16
2:10 P.M. - 3:10 P.M.	" "	0.37
	Average	0.21

12/18/79

Subject: Isabel Flores, SR. - Outside Operator

Area: Mill, Mill Ore Loading System

Conditions:

1) Usual mill operating conditions.

2) Loaded ore into feed hopper.

3) Worked in RG-244 bagging room and took a bulk car sample to laboratory every hour.

4) Bulk car fill pipe plugged causing a pellet dust spill - 5 - 7 mph wind from south.

5) He was wearing a respirator.

Time	Work Performed	Average + 5m/ml
9:42 A.M. - 10:35 A.M.	Normal conditions.	0.84
10:36 A.M. - 11:39 A.M.	" "	0.61
11:40 A.M. - 12:46 P.M.	" " , changed bulk car.	1.08
12:47 P.M. - 2:05 P.M.	" "	0.71
2:06 P.M. - 3:07 P.M.	" "	0.67
	Average	0.78

12/18/79

Subject: Andy Anderson - Shift Supervisor

Area: Mill and Office

Conditions:

1) Usual mill operating conditions.

2) He was wearing a respirator as needed.

3) Main circuit down all day.

Time	Work Performed	Average + 5/ml
9:32 A.M. - 10:32 A.M.	Normal conditions.	0.28
10:33 A.M. - 11:32 A.M.	" "	0.24
11:33 A.M. - 12:37 P.M.	" "	0.28
12:38 P.M. - 1:52 P.M.	" "	0.36
1:53 P.M. - 3:04 P.M.	Checked bulk car for plugged up, normal conditions.	0.47
	Average	0.33

12/19/79

Subject: Adene Andrade - Labor Operator

Area: Storage and Shipping Area.

Conditions:

1) Usual loading trucks operating conditions.

2) 10 - 15 mph wind from the south in the morning and 0 - 7 mph wind from the south in the afternoon.

3) Cloudy day.

4) She was wearing a respirator as needed.

Time	Work Performed	Filter	Average + 5m/ml
9:37 A.M. - 10:30 A.M.	Hand loading containers of HPPEX with wrapped bags.	(25mm)	Too much dirt.
10:47 A.M. - 11:08 A.M.	Same as above.	(35mm)	4.19
11:09 A.M. - 11:30 A.M.	Same as above until 11:20.	(35mm)	2.06
11:32 A.M. - 11:59 A.M.	Cleaned up around storage area.	(35mm)	2.06
12:33 P.M. - 1:25 P.M.	Moved bulk car to a pick up area.	(35mm)	0.52
1:26 P.M. - 2:30 P.M.	Cleaned up around storage area.	(35mm)	0.94
3:00 P.M. - 3:57 P.M.	Same as above; took all empty paraplex drums to treasure island.	(35mm)	1.11
		Average	1.69

started this head down

JAN – Sept on Location
October – Dec on personal

LOCATION → PERSONAL

OPERATOR	1963	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79
039 Bagger													3.63	3.03	1.67	2.50	1.67
Rotary Bagger													1.52	1.12	0.82	1.26	1.17
Rock. Fiber													1.02	0.88	0.39	1.03	0.63
Shipping Forklift													0.62	0.42	0.61	0.64	0.83
Maintenance													1.24	1.02	0.81	0.65	0.40
Press Dryer													0.77	0.67	0.70	0.74	0.43
Outside													2.49	1.45	0.99	1.20	0.62
Rotary wet													0.52	0.55	0.64	0.70	0.46
LABOR													—	—	—	—	1.56
mine site													—	—	0.42	0.91	0.14
Ore Trucks													—	—	0.49	0.22	0.07
LABOR PAY													0.39	—	0.64	0.42	0.36
K.C. millcheck pile															2.03	0.70	—
Maint. supervisor officer															0.37	0.51	0.18
Shift supervisor															0.46	1.12	0.46
Main office															—	0.20	0.13

UCC 025096

PERSONAL AIR SAMPLE - YEAR

	1974	1975	1976	1977	1978	1979
MAIN Bagger. PALLETIZER OPERATOR	3.08	3.64	3.03	1.67	2.50	1.67
RG-744 Bagger Operator	1.65	1.52	1.12	0.82	1.26	1.17
Rock. Fiber Circuit OPERATOR	0.69	1.02	0.88	0.39	1.03	0.63
shipping Forklift OPERATOR	0.87	0.62	0.44	0.61	0.64	0.83
Maintenance	1.12	1.24	1.02	0.81	0.65	0.40
Press. Dryer Operator	0.80	0.77	0.61	0.70	0.74	0.43
outside Operator	2.18	2.49	1.45	0.99	1.20	0.92
RG-744 wet Circuit operator	0.86	0.52	0.55	0.64	0.70	0.46
office (downstairs & upstairs)	-	-	-	-	0.30	0.13
shifter foreman	-	-	-	0.44	1.12	0.40
LABORATORY	-	0.39	-	0.64	0.50	0.38
Mine site	-	-	-	0.42	0.91	0.14
KC bulldoze on top of stockpile				2.03	-	-
ORE TRUCKER				0.49	0.22	0.07

UCC 025097

OCTOBER - DECEMBER (personal air sample)
(*) JANUARY - September (Breathing zone)

(1974) (AVERAGE +5 microns per mL)

SAMPLE	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	TOTAL AVE.
Main Production →	NO REPORT	SG-210	HPP	down	SG-210		SX-14		SX-14 SG-210 SG-210	SG-102	SG-102 SG-210	SVC	
038 Bagging Room	–	2.08	1.50	2.90	3.21	–	1.74	–	1.41	2.35	4.80	2.10	= 2.45
R6-244 Bagging Room		0.98	2.84	0.81	2.79		1.50		1.08	2.40	1.51	1.05	= 1.66
R6-244 wet Circuit											0.86		= 0.86
Payloader Dumper area to Com-bin		3.04											= 3.04
Product storage area.			1.00	2.19	0.30								= 1.16
Mill ore stockpile			1.68	0.71									= 1.20
on board operating dust sweeper			6.59										= 6.59
038 Hand stacking area				1.83									= 1.83
South fence line				0.51	1.69	0.17	0.19		0.31				= 0.57
A board bulldozer					16.93								= 16.93
Mine pit area, east side					1.70								= 1.70
mine pit area, west side					2.46								= 2.46
Screening area					0.90								= 0.90
Top of ore stockpile					0.90								= 0.90
Top of Future stockpile					1.60								= 1.60
Maintenance Mechanic									0.67		1.12		= 0.895
Coverall change room									0.60				= 0.60
street clothes change room									0.28				= 0.28
Upstain office											0.49		= 0.49
Downstain office													
Shipping operator										0.75		0.98	= 0.87
(Canteen) Empty at start of sampling						0.69							= 0.69
(Canteen) Men taking Lunch break						1.93							= 1.93
on board sweeper						2.53							= 2.53
LABORATORY						0.27						1.06	= 0.67
Change room location near room heater (men changing for shift change)						2.68							= 2.68
Same as above (Men changing, mostly Mechanics						0.93							= 0.93
Change room, near hand washing area						3.05							= 3.05
Same as above (mostly mechanics)						1.09							= 1.09
Outside operator										0.99		3.37	= 2.18
LABOR operator												9.62	= 9.62
Filter Press-dryer operator												0.80	= 0.80

UCC 025098

MONTHLY SUMMARY OF PERSONAL AIR SAMPLES

1979

MONTH	MAIN PRODUCT	MAIN BAGGER PALLETIZER OPER. *	RG-244 BAGGER OPER.	ROCK-FIBER CIRCUIT OPER.	SHIPPING FORKLIFT OPER.	MAINTENANCE	PRESS-DRYER CIRCUIT OPER.	OUTSIDE OPERATOR	RG-244 WET CIRCUIT OPER.	OTHERS (SPECIFY)
JAN	RG-110	Johnny Harris 3.65	David Vessels 1.13			Jimmy Stanford 0.30				David Urquidez 0.47
										Trini Cruz 0.18
FEB	SG-103	Thomas Moore 1.87	David Vessels 1.29	Brent Grab 1.27	Elmer Matasci 0.26					James Settlemyer 0.48
MAR	SG-130	William Cheek 2.51	[illegible] Garcia 2.08				Clyde R. Bailey 0.46	Isabel Flores 1.43		Brigitte Daniels 0.29
										George Vessels 0.11
APR	SG-100	Febin DelSilva 0.89	Roy Garica 1.97			Ed Sinclair 0.42			Jesse Diaz / Mike Usrey 0.47	Harry Smith 0.17
										Linda Grogan 0.097
MAY	HPP	Roy Garica 0.995	Hector Vengas 0.47	Paul Whitlock 0.40						Darrell Garica 0.14
JUN	HPO	Manuel Segobia 2.37	Jeff Harris 1.00		Jimmy Vasquez 0.37		Don Sowell 0.49			Bill Usrey 0.72
JUL	SG-130	Brent Pheco 1.20	Bertha Hernandez 0.76			Gerry Peggi 0.26				Kemper West 0.06
										Bob Kroukhyte 0.20
AUG	SG-103	Greg Valdez 1.08	Annie Gumez 1.02	Art Valdez 0.32				Gustavo Caballero 0.56		Adene Andrade 0.31
										Dick Masten 0.054
SEP	HPO	Harry Poof 1.87	Thomas Moore 0.69				Clyde Bailey 0.59		Jesse Diaz 0.44	William DeAltey 0.094
OCT	SG-130	Roy Garcia 1.26	David Vessels 2.04		Joe Pereira 0.42	George Larson 0.63				
					James Canfield 1.43 *					
NOV	RG-244 Wet Mary	Manuel Segobia 0.93	David Vessels 0.81	Paul Whitlock / Art Valdez 0.53						Steve Garica 0.20
										Carroll Grogan 0.33
DEC	SYC / Press cave	Harry Poof 1.46	Thomas Moore 0.74		Adene Andrade 1.69 *		Clyde Bailey 0.21	Isabel Flores, SR 0.78		Ann Anderson 0.33
										0.25 AVE
		1.67 AVE	1.17 AVE	0.63 AVE	LABOR OPERATING * 0.83 AVE	0.40 AVE	0.44 AVE	0.92 AVE	0.46 AVE AUG. 1979	Jack Potter 0.067
										Gary Jensen I 0.083
										Jack III McCormack 0.183
										Jerry Nitsch 0.193
										Roger Hopper 0.170
										0.139 AVE

UCC 025099

UCC IH-3-77-D

SUMMARY OF JOB EXPOSURES

Division METALS

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Facility KING CITY, CA. Bldg. No. — Report Period 1ST HALF 1979

Job Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
BUILDING MAINT NO.I		MAINT.	ASBESTOS DUST	0	0.0 TO 2.0	--		2mf/mL	4	—	
MECHANIC NO.I		"	"	0	"	—		"	"	—	
ELECTRICIAN NO.I		"	"	0	"	—		"	"	—	
SHIFT LEADMAN		MILL	"	0	"	—		"	"	—	
MECHANIC NO.II		MAINT.	"	2	"	.35		"	"	0.36	0.36 0.42 0.36
BUILDING MAINT NO.II		"	"	0	"	—		"	"	—	
MINE EQUIP. OPERATOR NO.I		MINE	"	1	"	0.83		"	"	0.83	
ROCK FIBER OPERATOR		MILL	"	2	"	.71		"	"	0.83	1.17 0.49 0.825
PRESS DEVEL OPERATOR		"	"	2	"	.47		"	"	0.47	0.46 0.49 0.47
RG-24H A/E OPERATOR		"	"	2	"	.47		"	"	0.47	0.47 0.47 -0.47
MINE EQUIPMENT OPERATOR NO.II		MINE	"	1	"	0.18		"	"	0.18	
MAINTENANCE NO.II		MAINT.	"	1	"	0.26		"	"	0.26	
OUTSIDE OPERATOR		MILL	"	1	"	1.43		"	"	1.43	

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s_1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2 \ldots, y_n$ = log of each measurement

* - Source of Standards:
1 - OSHA
2 - ACGIH or NIOSH
3 - UCC-HSEA

UCC 025100

UCC IH-3-77-D

SUMMARY OF JOB EXPOSURES

Division METALS

Page 2 of 1

Facility KING CITY, CA.

Bldg. No. —

Report Period 1ST HALF 1979

Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
KAGING/PALLE-ER-OPERATOR		MILL	ASBESTOS DUST	6	0.0 TO 2.0	1.81		-2n/mL	4	2.05	3.65 0.89 36.96 1.87 0.995 2.047 2.51 2.37
IPPING NO. I		"	"	2	"	.310		"	"	0.31	0.26 0.37 0.315
ANT OILER		MAINT.	"	0	"	—		"	"	—	
GGER ERATOR (038)		MILL	"	6	"	1.81		"	"	2.05	SAME AS P/PALLETIZER -
GGER ERATOR (039)		"	"	6	"	1.19		"	"	1.32	1.13 1.97 2.820 1.19 0.47 1.301 2.08 1.10
IPPING NO. II		"	"	2	"	.310		"	"	0.31	SAME AS SHIPPING NO. I
NE UTILITY PERATOR		MINE		1	"	0.19		"	"	0.19	J. NITCH SUMMER HELP.
ILL BORER		MILL	"	0	"	—		"	"	—	
INE ABORER		MINE	"	1	"	0.19		"	"	0.19	SAME AS MINE UTILITY OPERATOR
HIFT PERVISOR		MILL	"	1	"	0.72		"	"	0.72	
HIPPING UPERVISOR		"	"	0	"	—		"	"	—	
AINT. PERVISOR		MAINT	"	0	"	—		"	"	—	
INE UPERVISOR		MINE	"	1	"	0.17		"	"	0.17	

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement

x_n = value of last measurement

n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s_1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2 \ldots y_n$ = log of each measurement

* - Source of Standards:
1 - OSHA
2 - ACGIH or NIOSH
3 - UCC-HSEA

UCC 025101

SUMMARY OF JOB EXPOSURES

UCC IH-3-77-D

Division METALS

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Facility KING CITY, CA Bldg. No. — Report Period 1ST HALF 1977

Description or Title	ID Code	Dept. a/o Operation	Air Contaminants and/or Physical Hazards	Number of Measurements	Range of Measurements (units)	Geometric Mean (GM)	Geometric Std. Dev. (GSD)	Current TLV (units)	*	Exposure as % of TLV	Comments or Notes
ALITY CONTROL HNICIAN		LAB	ASBESTOS DUST	1	0.0 TO 2.0	0.48		-2F/ML	4	0.48	
FFICE ANAGER		OFFICE	"	1	"	0.11		"	"	0.11	
RE HOUSEMAN		"	"	1	"	0.18		"	"	0.18	
B TECHNICIAN		LAB	"	3	"	.22		"	"	0.32	0.47 0.17 -3K 0.31
RCHASING GENT		OFFICE	"	1	"	0.06		"	"	0.06	
ECRETARY		"	"	2	"	.17		"	"	0.19	0.240 0.097 0.193
CCOUNTNG		"	"	1	"	0.14		"	"	0.14	
ANT MANAGER		"	"	1	"	0.09		"	"	0.09	
NE SUPERINTENDENT ANT ENGINEER		"	"	1	"	0.05		"	"	0.05	
IL FOREMAN FETY ENGINEER		"	"	1	"	0.20		"	"	0.20	

Geometric Mean(GM) = $\sqrt[n]{(x_1)(x_2)\ldots(x_n)}$

where: x_1 = value of first measurement
x_n = value of last measurement
n = the nth root of the product

Geometric Standard Deviation(GSD) = 10^{s_1}

$$s_1 = \sqrt{(1/n-1)\left[(y_1^2+y_2^2+\ldots+y_n^2) - n(\bar{y})^2\right]}$$

$y_1, y_2 \ldots y_n$ = log of each measurement

* - Source of Standards:
1 - OSHA
2 - ACGIH or NIOSH
3 - UCC-HSEA

UCC 025102

...ION Metals
...ITY King City Ca.
...T. Mill & Mine

DATE 2nd HALF 1979

BLDG. NO. —

...scription	# on Job	Dust - Fumes	Control Method	Gases	Vapors	Mists	Control Method	Noise	Control Method	Rad, Vib, I.R. UV, X-Ray, etc	Control
Bagger Oper. (038)	3	Asbestos Dust	Dust Respirator	NONE	NONE	NONE	—	<90dBA	PLUGGS & MUFFS	Fe^{65} ~ Cu (<2X10⁴) MICRO WAVE OVEN	SCINTILLATOR READINGS MONTHLY
Bagger Oper (039)	4	"	"	"	"	"	—	"	"	"	WIPE TEST every (2) mo
Shipping No 2	0	"	"	"	"	"	—	"	"	"	"
Mine Utility Oper.	0	"	"	"	"	"	—	"	"	"	"
Mill Laborer	6	"	"	"	"	"	—	"	"	"	"
Mine Laborer	0	"	"	"	"	"	—	"	"	"	"
Shift Super.	4	"	"	"	"	"	—	"	"	"	"
Maint Supervisor	1	"	"	"	"	"	—	"	"	"	"
Mine Supervisor	1	"	"	"	"	"	—	"	"	"	"
Quality Cont Technician	1	"	"	"	"	"	—	"	"	"	"
Office Manager	1	"	"	"	"	"	—	"	"	"	"
Warehouse Man	1	"	"	"	"	"	—	"	"	"	"
Lab Technician	4	"	"	"	"	"	—	"	"	"	"
Purchasing Agent	1	"	"	"	"	"	—	"	"	"	"
Secretary	2	"	"	"	"	"	—	"	"	"	"
Shipping											

UCC 025103

SION Metals

CITY King City Ca.

Mine & Mill

DATE 2ND HALF 77

BLDG. NO.

:::iption	# on Job	Dust - Fumes	Control Method	Gases	Vapors	Mists	Control Method	Noise	Control Method	Rad, Vib, I.R. UV, X-Ray, etc		Control
Building Maint No 1	0	Asbestos Dust	Dust Respirator	NONE	NONE	NONE	—	<90dBA	PLUGS MUFFS	FESS mCi (2x10⁴)	MICRO WAVE OVEN	SCINTILATOR READINGS monthly
Mechanic No. 1	4	"	"	"	"	"	—	"	"	"		WIPE TEST QUARTERLY (4) mo
Electrician No 1.	1	"	"	"	"	"	—	"	"	"		"
Shift Leadman	0	"	"	"	"	"	—	"	"	"		"
Mechanic No 2	3	"	"	"	"	"	—	"	"	"		"
Building Maint No 2	0	"	"	"	"	"	—	"	"	"		"
Mine Equip Oper No: 1	1	"	"	"	"	"	—	"	"	"		"
Rock Fiber Oper.	3	"	"	"	"	"	—	"	"	"		"
Press Dryer Oper	3	"	"	"	"	"	—	"	"	"		"
RG-244 W/E Oper.	4	"	"	"	"	"	—	"	"	"		"
Mine Equip Oper No. 2	1	"	"	"	"	"	—	"	"	"		"
Mechanic No. 3	2	"	"	"	"	"	—	"	"	"		"
Outside Oper.	3	"	"	"	"	"	—	"	"	"		"
Packaging Pall. Oper.	3	"	"	"	"	"	—	"	"	"		"
Shipping NO. 1	3	"	"	"	"	"	—	"	"	"		"
Plant												

...SION Metals
...ITY King City Ca.
... Mill & Mine

DATE 2nd HALF 1979

BLDG. NO.

...cription	# on Job	Dust - Fumes	Control Method	Gases	Vapors	Mists	Control Method	Noise	Control Method	Rad, Vib, I.R., UV, X-Ray, etc.		Control
Plant Manager	1	Asbestos Dust	Dust Respirator	NONE	NONE	NONE	—	<90dBA	PLUGGS & MUFFS	FREE Cu (C2X10⁴)	MIDCO WAVE OVEN	SCINTILLATOR READINGS MONTHLY
Mine Super. Plant Eng.	1	"	"	"				"	"	"		WIPE TEST EVERY 6 MO
Mill Foreman Safety Eng.	1	"	"	"				"	"	"		"
Accounting	1	"	"	"				"	"	"		"
Summer Help Labor Crew		"	"									

UCC 025105