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NATIONAL OCCUPATIONAL HEALTH SURVEY OF MINING

MAGNESITE REPORT

SEPTEMBER 29, 1987

COMMENTS SHOULD BE DIRECTED TO

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NATIONAL OCCUPATIONAL HEALTH SURVEY OF MINING  
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## INTRODUCTION

This is one of a series of reports on the National Occupational Health Survey of Mining (NOHSM), which is being carried out by the National Institute for Occupational Safety and Health (NIOSH). This particular report provides NOHSM data for the magnesite commodity, which was surveyed during September and November, 1984. Three magnesite mines were surveyed. The NOHSM began in May, 1984, as an effort by NIOSH to obtain representative data related to occupational health from the mining industry. The data collected were similar to the information previously obtained in non-mining studies. Specifically, NOHSM data include:

- a. Occupational health program and policy information;
- b. An inventory of all health-related substances found on mine property; and
- c. A series of worksite observations which detail potential exposure to chemical and physical agents.

These data are being collected by surveyors who travel to each mine site. The survey sites have been chosen so as to provide a statistically valid representation of each commodity. With this representative sample, NIOSH can project survey data to the entire mining industry.

The NOHSM is being carried out primarily as a service to the Mine Safety and Health Administration (MSHA), and secondarily as a source of information for NIOSH investigators and other interested parties. MSHA plans to use the data for three purposes:

1. To set regulatory priorities and write improved health standards;
2. To improve compliance with existing standards; and
3. To identify and determine research needs and priorities.

This transfer of information to MSHA is mandated by Section 201 of the 1977 Federal Mine Safety and Health Amendments Act.

This report identifies potential exposures and provides the associated numbers of workers, the occupations of those workers, and the locations on the mine property where the potential exposures were observed. This information is categorized into seven tables: four concerning chemical agents; one concerning musculoskeletal overload conditions; one physical exposure conditions; and one welding processes. Estimated annual usage information is provided for chemical substances, both generic and tradenames.



For the magnesite commodity, Table 1 contains 13 chemicals which were found on mine property that are regulated by MSHA. During the 3 surveys, no chemicals were encountered which would be displayed in Table 2 (chemicals found on mine property that have a NIOSH recommended exposure limit but are not regulated by MSHA). Twenty-three chemicals were found which have no NIOSH or MSHA exposure limit (Table 3). Table 4 lists 96 tradename products to which workers in the magnesite commodity were found to be potentially exposed. Table 5 describes potential exposures to noise, segmental vibration, whole-body vibration, and process-related temperature, the only physical agents observed by the surveyor. Table 6 lists potential exposures to the ten musculoskeletal conditions observed during the survey. Table 7 indicates the three welding processes: arc welding, oxyfuel gas cutting, and oxyacetylene welding, which were observed to be used in the magnesite commodity.

It is extremely important that the limitations of the reported data be recognized. The data do not in any way document exposures or exposure levels. The data only indicate potential exposures. The term "potential exposure" means the agent was observed to be present at one or more worksites in such a way that there was a possibility of workers being exposed to the agent.

Likewise, the usage data presented in some of the tables are only a guide to the projected magnitude of usage and should not be taken as precise information. The usage data are based on estimates provided by mine management. It is expected that these estimates have widely varying accuracy. Occasionally, an item may be represented as having an annual usage of zero with workers observed to be potentially exposed. This may occur because annual usage estimates are generally based on purchases of the 12 months immediately preceding a survey. Therefore, items purchased prior to that 12 month period may be represented as having a zero annual usage rate even though potential exposures were observed during the survey. Other zero annual usage occurrences could involve recyclable items such as some catalysts and desiccants, items such as paints and coatings which are applied prior to the 12 month period but which are present in the workplace in such a way as to present a potential exposure, and obsolete items which are no longer actively used on the property but to which employees could still be potentially exposed in the course of their work. Furthermore, all the estimates were rounded to the nearest whole number, with all quantities between 0 and 1 being reported as 1. Thus, extremely small usage levels may actually be lower than estimated. With this possible exception, NIOSH believes the relative magnitude to be appropriately represented.

Another limitation to be observed is the terminology associated with the commodity, occupation, and location. These terms were adapted directly from MSHA information and applied by NIOSH. NIOSH recognizes that other parties may prefer other commodity, occupation, or location terminology. The MSHA terms were used because of MSHA's close interest in the data.

A separate report will be prepared for each commodity surveyed as a part of the NOHSM. During each year of the NOHSM, approximately 150 mining operations are surveyed as the sample from a number of selected commodities. A different set of commodities is surveyed during each year.

NIOSH plans for use of these data in the future include:

- a. Encourage MSHA use of the data, as outlined above;
- b. Determine the ranges of exposure to various agents, as required by Section 201 of the 1977 Federal Mine Safety and Health Amendments Act;
- c. Assist in setting priorities for mine-related occupational health research; and
- d. Respond to questions from other parties regarding occupational health aspects of the mining industry.

Information beyond that presented in this report has been collected during the NOHSM. All of the information not protected by trade secret claims is available to the public upon detailed written request. Other categories of available information include:

- a. Management policies related to occupational health;
- b. Duration of potential exposures;
- c. Operations associated with potential exposures;
- d. Controls employed with potential exposures; and
- e. Results of bulk dust analyses.

Interested parties should direct their requests to:

Project Officer  
National Occupational Health Survey of Mining  
NIOSH  
Division of Respiratory Disease Studies  
944 Chestnut Ridge Road, Room 140  
Morgantown, W 26505-2888

TABLE DEFINITIONS

<u>AGENT NAME</u>	(1) # WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) # WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) % WORKERS POTENTIALLY (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(5) OCCUPATIONS	(6) LOCATIONS
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Column (1) represents the total number of workers in occupations within this commodity in which a potential exposure to an agent was observed or identified through questioning of mine management or workers. This number only includes workers from the NOHSM sample sites. A "potential exposure" means the agent was observed to be present at the worksite in such a way that there was a possibility of workers being exposed to the agent. The potential exposures do not imply any exposure level, nor do they imply the absence or presence of controls.

Column (2) represents the number of workers within this commodity predicted to be potentially exposed to each agent. This number reflects a projection to this entire commodity, based on data obtained at NOHSM sample sites.

Column (3) represents the percentage of workers within this commodity predicted to be potentially exposed to each agent. Column (3) is obtained by dividing column (2) by the projected total population of workers in the commodity.

Column (4) represents the number of gallons (GAL) or the number of pounds (LBS) of each chemical that NIOSH has estimated to be used per year. This number is obtained from projections based on estimates of usage provided by mine management, and should only be used in determining the order of magnitude of usage. It should not be used as a precise figure. This number reflects a projection to this entire commodity, based on data obtained at NOHSM sample sites. In some cases, where usage data was unavailable, a "\*" appears in this column.

Column (5) contains the occupations observed to have a potential for exposure to this agent. In each occupation, the percentage of workers with a potential for exposure to the agent is given in parentheses. This number only includes data obtained at NOHSM sample sites.

Column (6) contains the locations where workers were observed to have a potential for exposure to this agent at the NOHSM sample sites. The percentage of workers in each listed location with a potential exposure to the agent is given in parentheses. This number only includes data obtained at NOHSM sample sites.

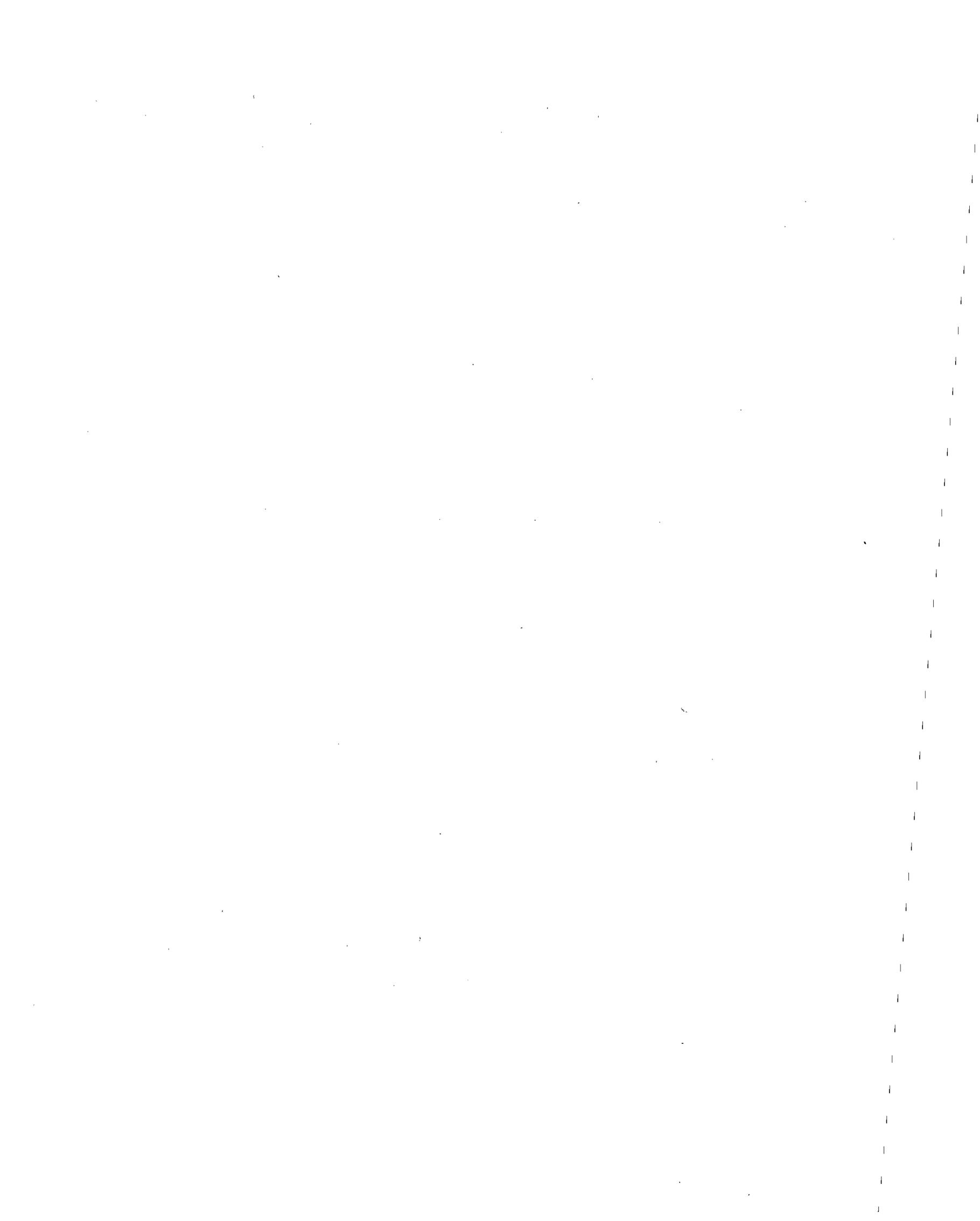


TABLE 1, PAGE 1 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

MSHA REGULATED CHEMICALS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
ACETIC ACID	3	3	2	2 GALS.	009 SURFACE MISC ( 21%)
<b>(5) OCCUPATIONS</b>					
514 LABORATORY TECHNICIAN ( 75%)					
ACETYLENE	2	2	1	496 LBS.	005 SURFACE SHOP ( 6%)
<b>(5) OCCUPATIONS</b>					
619 WELDER (100%)					
PROPANE	13	13	8	8,150 GALS.	009 SURFACE MISC ( 36%) 010 SURFACE MILL ( 14%)
<b>(5) OCCUPATIONS</b>					
514 LABORATORY TECHNICIAN ( 25%)			619 WELDER ( 50%)		
669 BIN PULLER; TRUCK LOADER (100%)			879 BAGGING OR PACKING WRKR (100%)		
HYDROGEN FLUORIDE	3	3	2	15 LBS.	009 SURFACE MISC ( 21%)
<b>(5) OCCUPATIONS</b>					
514 LABORATORY TECHNICIAN ( 75%)					
HYDROGEN CHLORIDE	3	3	2	180 LBS.	009 SURFACE MISC ( 21%)
<b>(5) OCCUPATIONS</b>					
514 LABORATORY TECHNICIAN ( 75%)					

MSHA REGULATED CHEMICALS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
METHANOL	3	3	2	10 GALS.	009 SURFACE MISC ( 21%)
<b>(5)</b>					
OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 75%)					
NITRIC ACID	3	3	2	2 GALS.	009 SURFACE MISC ( 21%)
<b>(5)</b>					
OCCUPATIONS					
514 LABORATORY TECHNICIAN ( 75%)					
NITROGEN	2	2	1	0 LBS.	009 SURFACE MISC ( 14%)
<b>(5)</b>					
OCCUPATIONS					
514 LABORATORY TECHNICIAN ( 25%)		619 WELDER ( 50%)			
PHOSPHORIC ACID	3	3	2	5 LBS.	009 SURFACE MISC ( 21%)
<b>(5)</b>					
OCCUPATIONS					
514 LABORATORY TECHNICIAN ( 75%)					
SODIUM HYDROXIDE	4	4	3	8 GALS.	009 SURFACE MISC ( 29%)
<b>(5)</b>					
OCCUPATIONS					
456 ENGINEER; TECHNICAL SERVICES ( 50%)		514 LABORATORY TECHNICIAN ( 75%)			

MSHA REGULATED CHEMICALS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
SULFURIC ACID	4	4	3	6 GALS. 47,000 LBS.	009 SURFACE MISC ( 29%)
<b>(5) OCCUPATIONS</b>					
456 ENGINEER, TECHNICAL SERVICES ( 50%) 514 LABORATORY TECHNICIAN ( 75%)					

PORTLAND CEMENT	1	1	<1	680,240 LBS.	(6) LOCATIONS
<b>(5) OCCUPATIONS</b>					
456 ENGINEER, TECHNICAL SERVICES ( 50%)					

MERCURIC CHLORIDE	3	3	2	5 LBS.	(6) LOCATIONS
<b>(5) OCCUPATIONS</b>					
514 LABORATORY TECHNICIAN ( 75%)					
009 SURFACE MISC ( 21%)					

TABLE 2, PAGE 1 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

CHEMICALS FOUND ON MINE PROPERTY THAT HAVE A NIOSH RECOMMENDED EXPOSURE LIMIT BUT ARE NOT REGULATED BY MSHA

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE
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NO DATA FOR THIS TABLE IN THIS COMMODITY

CHEMICALS FOUND ON MINE PROPERTY THAT HAVE NO NIOSH RECOMMENDATION OR MSHA EXPOSURE LIMIT

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
ALUMINUM	2	2	1	250 LBS.	
(5) OCCUPATIONS	-----				
514 LABORATORY TECHNICIAN ( 25%)		619 WELDER ( 50%)			009 SURFACE MISC ( 14%)
#2 DIESEL FUEL	6	6	4	194,025 GALS.	
(5) OCCUPATIONS	-----				
393 WEIGHMAN; SCALE MAN (100%)		782 FRONT-END LOADER OPTR (100%)			010 SURFACE MILL ( 10%)
METHYLENE BROMIDE	1	1	<1	5 GALS.	
(5) OCCUPATIONS	-----				
456 ENGINEER; TECHNICAL SERVICES ( 50%)					009 SURFACE MISC ( 7%)
TRINITROBENZENE	3	3	2	5 GALS.	
(5) OCCUPATIONS	-----				
514 LABORATORY TECHNICIAN ( 75%)					009 SURFACE MISC ( 21%)

TABLE 3, PAGE 2 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

CHEMICALS FOUND ON MINE PROPERTY THAT HAVE NO NIOSH RECOMMENDATION OR MSHA EXPOSURE LIMIT

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
BUNKER OIL	4	4	3	50,000 GALS.	010 SURFACE MILL ( 7%)
<b>(5)</b>					
OCCUPATIONS	379 DRYER OPTR; KILN OPTR ( 21%)				
STARCH INDICATOR	3	3	2	3 LBS.	009 SURFACE MISC ( 21%)
<b>(5)</b>					
OCCUPATIONS	514 LABORATORY TECHNICIAN ( 75%)				
DIESEL	12	12	8	140,000 GALS.	006 SURFACE CRUSHING ( 43%) 009 SURFACE MISC ( 14%) 010 SURFACE MILL ( 12%)
<b>(5)</b>					
OCCUPATIONS	079 CRUSHER OPTR (100%) 619 WELDER (100%)				
ALUMINUM SULPHATE	1	1	<1	414,550 LBS.	009 SURFACE MISC ( 7%)
<b>(5)</b>					
OCCUPATIONS	456 ENGINEER; TECHNICAL SERVICES ( 50%)				

CHEMICALS FOUND ON MINE PROPERTY THAT HAVE NO NIOSH RECOMMENDATION OR MSHA EXPOSURE LIMIT

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
AMMONIUM HYDROXIDE	3	3	2	10 GALS.	009 SURFACE MISC ( 21x)
<b>(5) OCCUPATIONS</b>					
514 LABORATORY TECHNICIAN ( 75x)					
BORIC ACID	4	4	3	4,800 LBS.	010 SURFACE MILL ( 7x)
<b>(5) OCCUPATIONS</b>					
879 BAGGING OR PACKING WRKR ( 50x)					
MAGNESIUM SULFATE	15	15	10	3,000 LBS.	010 SURFACE MILL ( 14x) 007 SURFACE GRINDING ( 36x) 009 SURFACE MISC ( 21x)
<b>(5) OCCUPATIONS</b>					
379 DRYER OPTR; KILN OPTR ( 42x)					
514 LABORATORY TECHNICIAN ( 75x)					

CHEMICALS FOUND ON MINE PROPERTY THAT HAVE NO NIOSH RECOMMENDATION OR MSHA EXPOSURE LIMIT

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
PHENOLPHTHALEIN	3	3	2	1 LBS.	009 SURFACE MISC ( 21%)
<b>OCCUPATIONS</b>					
514 LABORATORY TECHNICIAN ( 75%)					
<b>SODIUM SILICATE</b>					
(5) OCCUPATIONS	5	5	3	560,000 LBS.	(6) LOCATIONS
456 ENGINEER; TECHNICAL SERVICES ( 50%)					009 SURFACE MISC ( 7%) 010 SURFACE MILL ( 7%)
<b>SODA ASH</b>					
(5) OCCUPATIONS	4	4	3	12,000 LBS.	(6) LOCATIONS
879 BAGGING OR PACKING WRKR ( 50%)					010 SURFACE MILL ( 7%)
<b>SODIUM HEXAMETAPHOSPHATE</b>					
(5) OCCUPATIONS	1	1	<1	38,800 LBS.	(6) LOCATIONS
456 ENGINEER; TECHNICAL SERVICES ( 50%)					009 SURFACE MISC ( 7%)

CHEMICALS FOUND ON MINE PROPERTY THAT HAVE NO NIOSH RECOMMENDATION OR MSHA EXPOSURE LIMIT

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
POTASSIUM DICHROMATE	3	3	2	5 LBS.	009 SURFACE MISC ( 21%)
<b>(5)</b>					
OCCUPATIONS	514 LABORATORY TECHNICIAN ( 75%)				
SODIUM METASILICATE	4	4	3	36,000 LBS.	010 SURFACE MILL ( 7%)
<b>(5)</b>					
OCCUPATIONS	879 BAGGING OR PACKING WRKR ( 50%)				
PERCHLORIC ACID	3	3	2	320 LBS.	009 SURFACE MISC ( 21%)
<b>(5)</b>					
OCCUPATIONS	514 LABORATORY TECHNICIAN ( 75%)				
TALL OIL	1	1	<1	35,020 LBS.	009 SURFACE MISC ( 7%)
<b>(5)</b>					
OCCUPATIONS	456 ENGINEER; TECHNICAL SERVICES ( 50%)				

CHEMICALS FOUND ON MINE PROPERTY THAT HAVE NO NIOSH RECOMMENDATION OR MSHA EXPOSURE LIMIT

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
BROMOCRESOL GREEN	3	3	2	1 LBS.	009 SURFACE MISC ( 21%)
<b>(5) OCCUPATIONS</b>					
514 LABORATORY TECHNICIAN ( 75%)					
<b>BENTONITE</b>					
	4	4	3	1,200 LBS.	010 SURFACE MILL ( 7%)
<b>(5) OCCUPATIONS</b>					
879 BAGGING OR PACKING HRKR ( 50%)					
<b>GASOLINE, LEADED</b>					
	2	2	1	1,120 GALS.	005 SURFACE SHOP ( 3%) 010 SURFACE MILL ( 2%)
<b>(5) OCCUPATIONS</b>					
604 MECHANIC ( 4%)				649 ADMN, SUPERVISORY, MGT PERSNL ( 14%)	

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CHEMICALS FOUND ON MINE PROPERTY THAT HAVE NO NIOSH RECOMMENDATION OR MSHA EXPOSURE LIMIT

COMMODITY NAME: MAGNESITE

CHEMICAL NAME	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
GASOLINE--UNLEADED	3	3	2	26,200 GALS.	
<b>(5)</b>					
OCCUPATIONS	649 ADMN, SUPERVISORY, MGT PERSNL ( 14%)				009 SURFACE MISC ( 14%)
619 WELDER (100%)					010 SURFACE MILL ( 2%)



TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
A.W. CHESTERTON CO.					
CHESTERTON SPRAGRIP NO. 80308(AERO SOL)	2	2	1	36 LBS.	009 SURFACE MISC ( 14%)
(5) OCCUPATIONS					
619 WELDER (100%)					
AIRCO INC.					
AIRCO 6011 NO. 1318-3694 E6011	2	2	1	100 LBS.	005 SURFACE SHOP ( 6%)
(5) OCCUPATIONS					
619 WELDER (100%)					
EASY-ARC 7018 MR NO. 1318-2834	2	2	1	400 LBS.	
(5) OCCUPATIONS					
619 WELDER (100%)					
ALLIED CORPORATION-ALLIED CHEMICAL					
CALCIUM CHLORIDE 77% CODE 060-7200	3	3	2	3,000 LBS.	009 SURFACE MISC ( 14%) 010 SURFACE MILL ( 2%)
(5) OCCUPATIONS					
619 WELDER (100%)					
679 FLOTATION/CONCTR OPTR ( 33%)					

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
ALVIN PRODUCTS, INC					
TELCON DRY LUBRICANT AND RELEASEAG ENT (AEROSOL)	2	2	1	6 LBS.	
OCCUPATIONS					
514 LABORATORY TECHNICIAN ( 25%)			619 WELDER ( 50%)		009 SURFACE MISC ( 14%)
AMERICAN CYANAMID CO.					
AEROFROTH 76 FROTHER	7	7	4	660 GALS.	
OCCUPATIONS					
053 UTILITY MAN (100%)					(6) LOCATIONS
679 FLOTATION/CONCR OPTR (100%)			488 DRY SCREENING PLANT OPTR ( 43%)		010 SURFACE MILL ( 12%)
ANDERSON LABORATORIES, INC.					
VWR BUFFER SOLUTION PH7 NO. 34180- 297	2	2	1	1 GALS.	
OCCUPATIONS					
514 LABORATORY TECHNICIAN ( 25%)			619 WELDER ( 50%)		(6) LOCATIONS
ANSUL FORAY					
ANSUL FORAY (3771) FIRE PROTECTION	1	1	<1	50 LBS.	
OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					(6) LOCATIONS
					010 SURFACE MILL ( 2%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
ATUB ABRASIVE WHEEL CO.					
GRADE A24UB 71/4 IN.	2	2	1	50 LBS.	
<b>(5)</b>					
OCCUPATIONS					
619 WELDER (100%)					005 SURFACE SHOP ( 6%)

AZ PRODUCTS CO.

AZ 14	7	7	4	3,960 GALS.	
<b>(5)</b>					
OCCUPATIONS					
053 UTILITY MAN (100%)					
679 FLOTATION/CONCTR OPTR (100%)					010 SURFACE MILL ( 12%)

BOYLE-MIDWAY, INC.

SANI-FLUSH TOILET BOWL CLEANER	1	1	<1	26 LBS.	
<b>(5)</b>					
OCCUPATIONS					
679 FLOTATION/CONCTR OPTR ( 33%)					010 SURFACE MILL ( 2%)

CENTURY HULBURT SPECIALIZING LUBRICATION CO.

CENTURY HULBURT BLACKBERRY SPRAY 0	2	2	1	110 LBS.	
PEN GEAR GREASE 1871 80					
<b>(5)</b>					
OCCUPATIONS					
488 DRY SCREENING PLANT OPTR ( 14%)					010 SURFACE MILL ( 3%)
679 FLOTATION/CONCTR OPTR ( 33%)					

TABLE 4, PAGE 4 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
CHEVRON OIL CO.					
CHEVRON AM MACHINE OIL #68	1	1	<1	35 GALS.	(6) LOCATIONS
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					010 SURFACE MILL ( 2%)
CHEVRON DELO 400 MOTOR OIL, SAE 30	1	1	<1	20 GALS.	(6) LOCATIONS
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					005 SURFACE SHOP ( 3%)
CHEVRON DELO 400 MOTOR OIL, 15W-40	1	1	<1	20 GALS.	(6) LOCATIONS
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					005 SURFACE SHOP ( 3%)
CHEVRON EP INDUSTRIAL OIL, 100X	1	1	<1	90 GALS.	(6) LOCATIONS
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					010 SURFACE MILL ( 2%)
CHEVRON INDUSTRIAL GREASE, MEDIUM	1	1	<1	175 LBS.	(6) LOCATIONS
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					010 SURFACE MILL ( 2%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURER'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
CHEVRON PINION GREASE, 100 CB	1	1	<1	350 LBS.	010 SURFACE MILL ( 2%)
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					
CHEVRON PINION GREASE, 250 CB	1	1	<1	35 LBS.	
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					005 SURFACE SHOP ( 3%)
CHEVRON STANDARD ATF SPECIAL	1	1	<1	5 GALS.	
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					005 SURFACE SHOP ( 3%)
CHEVRON THINNER #325	1	1	<1	55 GALS.	
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					010 SURFACE MILL ( 2%)
CRC CHEMICALS U.S.A.					
CRC 3-36 NO. 03005 (AEROSOL)	2	2	1	53 LBS.	
(5) OCCUPATIONS					
619 WELDER (100%)					009 SURFACE MISC ( 14%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
DEVCON CORP					
DEVCON PLASTIC STEEL PUTTY (A)	2	2	1	100 LBS.	(6) LOCATIONS
-----					
(5) OCCUPATIONS					
619 WELDER (100%)					009 SURFACE MISC ( 14%)
PLASTIC STEEL B	2	2	1	40 LBS.	(6) LOCATIONS
-----					
(5) OCCUPATIONS					
619 WELDER (100%)					009 SURFACE MISC ( 14%)
DOW CHEMICAL CO.					
DOWFAX 9N9	1	1	<1	1,920 LBS.	(6) LOCATIONS
-----					
(5) OCCUPATIONS					
456 ENGINEER; TECHNICAL SERVICES ( 50%)					009 SURFACE MISC ( 7%)
FAULTLESS STARCH/BON AMI CO.					
BONAMI POLISHING CLEANSER	1	1	<1	21 LBS.	(6) LOCATIONS
-----					
(5) OCCUPATIONS					
679 FLOTATION/CONCTR OPTR ( 33%)					010 SURFACE MILL ( 2%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
FISHER SCIENTIFIC CO. 1000 PPM CALCIUM CERTIFIED AA STAN DARDS	3	3	2	1 GALS.	
<hr/>					
(5) OCCUPATIONS 514 LABORATORY TECHNICIAN ( 75%)					009 SURFACE MISC ( 21%)
<hr/>					
1000 PPM MAGNESIUM CERTIFIED AA ST ANDARD	3	3	2	1 GALS.	
<hr/>					
(5) OCCUPATIONS 514 LABORATORY TECHNICIAN ( 75%)					009 SURFACE MISC ( 21%)
<hr/>					
1000 PPM SODIUM CERTIFIED AA STAND ARD	3	3	2	1 GALS.	
<hr/>					
(5) OCCUPATIONS 514 LABORATORY TECHNICIAN ( 75%)					009 SURFACE MISC ( 21%)
<hr/>					
GENERAL ELECTRIC CO./SILICONE PRODUCTS DIVISION GE INDUSTRIAL SILICONE SEALANT	2	2	1	14 GALS.	
<hr/>					
(5) OCCUPATIONS 619 WELDER (100%)					009 SURFACE MISC ( 14%)

TABLE 4, PAGE 8 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
INLAND CHEMICAL CO. INCHCO SAFETY SOLVENT CLEANER, AER OSOL	5	5	3	10 LBS.	005 SURFACE SHOP ( 16%)
-----					
602 ELECTRICIAN (100%)					
-----					
INTERNATIONAL MINERAL & CHEMICAL CORPORATION ZORB-ALL FLOOR ABSORBENT	2	2	1	250 LBS.	009 SURFACE MISC ( 14%)
-----					
619 WELDER (100%)					
-----					
KAISER AGRICULTURAL CHEMICALS BLUE RIDGE PLANT FOOD GRANULAR 10- 10-10	2	2	1	4,000 LBS.	009 SURFACE MISC ( 14%)
-----					
619 WELDER (100%)					
-----					
LEE MARK CO. BLACK INK	2	2	1	4 GALS.	010 SURFACE MILL ( 3%)
-----					
616 LABORER; BULLGANG (100%)					

TABLE 4, PAGE 9 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
LEHN & FINK PRODUCTS DIVISION OF STERLING DRUG INC.					
LYSOL DISINFECTANT SPRAY SCENT II (AEROSOL)	1	1	<1	18 LBS.	010 SURFACE MILL ( 2%)
OCCUPATIONS					
679 FLOTATION/CONCR OPTR ( 33%)					
LINCOLN ELECTRIC					
FLEETWELD SP E6010	23	23	15	600 LBS.	005 SURFACE SHOP ( 71%) 010 SURFACE MILL ( 2%)
OCCUPATIONS					
604 MECHANIC ( 96%)					
JETWELD LH-70, E7016					
	23	23	15	600 LBS.	005 SURFACE SHOP ( 71%) 010 SURFACE MILL ( 2%)
OCCUPATIONS					
604 MECHANIC ( 96%)					
LINCOLN ELECTRIC CO.					
JETWELD, 6011	1	1	<1	20 LBS.	005 SURFACE SHOP ( 71%) 010 SURFACE MILL ( 2%)
OCCUPATIONS					
604 MECHANIC ( 4%)					

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
JETWELD, 7014	1	1	<1	10 LBS.	005 SURFACE SHOP ( 3%)
<hr/>					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					
<hr/>					
JETWELD, 7016	1	1	<1	10 LBS.	
<hr/>					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					005 SURFACE SHOP ( 3%)
<hr/>					
REMACO INC.					
<hr/>					
COLD VULCANIZING FLUID, #207	1	1	<1	3 GALS.	
<hr/>					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					005 SURFACE SHOP ( 3%)
<hr/>					
RUBBER BUFFER, #71	1	1	<1	3 GALS.	
<hr/>					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					005 SURFACE SHOP ( 3%)
<hr/>					
SPECIAL VULCANIZING CEMENT, #57	1	1	<1	1 LBS.	
<hr/>					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)					005 SURFACE SHOP ( 3%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
REXNORD					
NORDBAK STEEL TROWEL MIX RESIN 745 1 0165-101	2	2	1	40 LBS.	(6) LOCATIONS
OCCUPATIONS					
619 WELDER (100%)					009 SURFACE MISC ( 14%)
REXNORD CHEMICAL PRODUCTS					
NORDBACK BACKING COMPOUND	22	22	14	10 GALS.	(6) LOCATIONS
OCCUPATIONS					
604 MECHANIC ( 92%)					005 SURFACE SHOP ( 71%)
SAN JOAQUIN CHEMICAL INC.					
#10003H, BROMO THYMOL BLUE INDICAT OR	1	1	<1	1 GALS.	(6) LOCATIONS
OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					010 SURFACE MILL ( 2%)
#1003L, META CRESOL PURPLE INDICAT OR	1	1	<1	1 GALS.	(6) LOCATIONS
OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					010 SURFACE MILL ( 2%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
#288, STANNOUS CHLORIDE INDICATOR	1	1	<1	1 GALS.	010 SURFACE MILL ( 2%)
<hr/>					
(5) OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					
#601, MOLYBDATE REAGENT	1	1	<1	1 GALS.	010 SURFACE MILL ( 2%)
<hr/>					
(5) OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					
#627, 50 SULFURIC (N/50) SOLUTION	1	1	<1	1 GALS.	010 SURFACE MILL ( 2%)
<hr/>					
(5) OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					
#630, CHROMATE INDICATOR	1	1	<1	1 GALS.	010 SURFACE MILL ( 2%)
<hr/>					
(5) OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					
#639-15, SILVER NITRATE SOLUTION	1	1	<1	1 GALS.	010 SURFACE MILL ( 2%)
<hr/>					
(5) OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
PHENOLPHTHALEIN INDICATOR, #638	1	1	<1	1 GALS.	
(5) OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					010 SURFACE MILL ( 2%)
SANATHERM 8234	1	1	<1	1 GALS.	
(5) OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					010 SURFACE MILL ( 2%)
SANATHERM 8302	1	1	<1	1 GALS.	
(5) OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					010 SURFACE MILL ( 2%)
SANATHERM 8901	1	1	<1	1 GALS.	
(5) OCCUPATIONS					
614 SAMPLER; DUST SAMPLER ( 25%)					010 SURFACE MILL ( 2%)
SARGENT-WELCH SCIENTIFIC CO.					
STANDARD BUFFER SOLUTION PH7 NO. S 2	2	2	1	1 GALS.	
-50141-10-B					
(5) OCCUPATIONS					
514 LABORATORY TECHNICIAN ( 25%)			619 WELDER ( 50%)		009 SURFACE MISC ( 14%)

TABLE 4, PAGE 14 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
SOUTHERN OXYGEN CO.					
ANTI-BORAX BRAZING FLUX	1	1	<1	30 LBS.	
(5) OCCUPATIONS					
619 WELDER ( 50%)					005 SURFACE SHOP ( 3%)
STANDARD OIL/CHEVRON					
#503 METAL WORKING FLUID	1	1	<1	111 GALS.	
(5) OCCUPATIONS					
660 MACHINIST (100%)					005 SURFACE SHOP ( 3%)
A. W. TURBINE OIL #32	3	3	2	696 GALS.	
(5) OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		010 SURFACE MILL ( 5%)
CHEVRON #5 TORQUE FLUID	3	3	2	330 GALS.	
(5) OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		010 SURFACE MILL ( 5%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
CHEVRON A. W. HYDRAULIC OIL #68	3	3	2	1,320 GALS.	010 SURFACE MILL ( 5%)
(5) OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		
CHEVRON A. W. TURBINE OIL #68	3	3	2	1,539 GALS.	010 SURFACE MILL ( 5%)
(5) OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		
CHEVRON A.W. MACHINE OIL #150	3	3	2	330 GALS.	010 SURFACE MILL ( 5%)
(5) OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		
CHEVRON DELO 300 MOTOR OIL, 10W	3	3	2	55 GALS.	010 SURFACE MILL ( 5%)
(5) OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		

TABLE 4, PAGE 16 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
CHEVRON DELO 400 MOTOR OIL, 10W	3	3	2	2,250 GALS.	010 SURFACE MILL ( 5%)
<hr/>					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)	618 GREASER; OILER (100%)				
<hr/>					
CHEVRON DELO 400 MOTOR OIL, 15W/40	3	3	2	1,800 GALS.	010 SURFACE MILL ( 5%)
<hr/>					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)	618 GREASER; OILER (100%)				
<hr/>					
CHEVRON DURA-LITH GREASE EP-0	3	3	2	3,000 LBS.	010 SURFACE MILL ( 5%)
<hr/>					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)	618 GREASER; OILER (100%)				
<hr/>					
CHEVRON EP INDUSTRIAL OIL, 100X	3	3	2	1,101 GALS.	010 SURFACE MILL ( 5%)
<hr/>					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)	618 GREASER; OILER (100%)				

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
CHEVRON GEAR COMPOUND 1500 NL	3	3	2	4,800 LBS.	010 SURFACE MILL ( 5%)
<b>(5)</b>					
OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		
<b>(5)</b>					
CHEVRON GEAR COMPOUND 220NL	4	4	3	8,808 LBS.	010 SURFACE MILL ( 7%)
<b>(6)</b>					
OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		
779 PELLETIZING OPERATIONS WORKER (100%)					
<b>(5)</b>					
CHEVRON GEAR COMPOUND 460 NL	4	4	3	4,800 LBS.	010 SURFACE MILL ( 7%)
<b>(6)</b>					
OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		
779 PELLETIZING OPERATIONS WORKER (100%)					
<b>(5)</b>					
CHEVRON INDUSTRIAL GREASE MEDIUM	3	3	2	2,640 LBS.	010 SURFACE MILL ( 5%)
<b>(6)</b>					
OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		

TABLE 4, PAGE 18 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
CHEVRON INHITED INSULATING OIL	3	3	2	55 GALS.	
(5) OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		010 SURFACE MILL ( 5%)
CHEVRON MILL LUBRICANT HEAVY	3	3	2	14,400 LBS.	
(5) OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		010 SURFACE MILL ( 5%)
CHEVRON MULTI-MOTIVE GREASE #0	3	3	2	400 LBS.	
(5) OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		010 SURFACE MILL ( 5%)
CHEVRON PEARL OIL (KEROSENE)	3	3	2	165 GALS.	
(5) OCCUPATIONS					
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)		010 SURFACE MILL ( 5%)

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
CHEVRON PINION GREASE 100 CB	3	3	2	19,200 LBS.	010 SURFACE MILL ( 5%)
-----					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)	618 GREASER; OILER (100%)				
-----					
CHEVRON SAE 80W/90 UNIVERSAL GEAR LUBE	3	3	2	600 LBS.	010 SURFACE MILL ( 5%)
-----					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)	618 GREASER; OILER (100%)				
-----					
CHEVRON UTILITY GREASE LIGHT	3	3	2	35 LBS.	010 SURFACE MILL ( 5%)
-----					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)	618 GREASER; OILER (100%)				
-----					
CHEVRON VISTAC #150X	3	3	2	660 GALS.	010 SURFACE MILL ( 5%)
-----					
(5) OCCUPATIONS					
604 MECHANIC ( 4%)	618 GREASER; OILER (100%)				

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(5) OCCUPATIONS	(6) LOCATIONS
CHEVRON VISTAC OIL#220X	3	3	2	222 GALS.		010 SURFACE MILL ( 5%)
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)			
CHEVRON 250 CB PINION GREASE	3	3	2	840 LBS.		010 SURFACE MILL ( 5%)
604 MECHANIC ( 4%)			618 GREASER; OILER (100%)			
CHEVRON 325 THINNER (SOLVENT)	2	2	1	330 GALS.		010 SURFACE MILL ( 3%)
616 LABORER; BULLGANG (100%)						
TRIPLE S BRAND PENETRATING LUBRICA NT, AEROSOL	1	1	<1	10 LBS.		005 SURFACE SHOP ( 3%)
660 MACHINIST (100%)						

STANDARDIZED SANITATION SYSTEMS

TABLE 4, PAGE 21 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
TAPMATIC CORP.					
TAPMATIC FLUID	1	1	<1	20 GALS.	(6) LOCATIONS
-----					
(5) OCCUPATIONS					
660 MACHINIST (100%)					005 SURFACE SHOP ( 3%)
-----					
THE SHERWIN-WILLIAMS CO.					
OSHA YELLOW B54 Y 17 617-0807	2	2	1	12 GALS.	(6) LOCATIONS
-----					
(5) OCCUPATIONS					
619 WELDER (100%)					009 SURFACE MISC ( 14%)
-----					
UNION OIL COMPANY OF CALIFORNIA					
GUARDOL SAE 30 MOTOR OIL	5	5	3	72 GALS.	(6) LOCATIONS
-----					
(5) OCCUPATIONS					
079 CRUSHER OPTR (100%)			619 WELDER (100%)		006 SURFACE CRUSHING ( 43%) 009 SURFACE MISC ( 14%)
-----					
UNION UNAX AW ISO VG 32					
	1	1	<1	440 GALS.	(6) LOCATIONS
-----					
(5) OCCUPATIONS					
679 FLOTATION/CONCTR OPTR ( 33%)					010 SURFACE MILL ( 2%)

NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
UNION UNAX AM ISO VG 68	5	5	3	385 GALS.	
<b>(5) OCCUPATIONS</b>					
053 UTILITY MAN (100%)				488 DRY SCREENING PLANT OPTR ( 43%)	010 SURFACE MILL ( 8%)
679 FLOTATION/CONCTR OPTR ( 33%)					
UNION 76 HEAVY DUTY 30 SAE	3	3	2	156 GALS.	
<b>(5) OCCUPATIONS</b>					
619 WELDER (100%)				649 ADMN, SUPERVISORY, MGT PERSNL ( 14%)	009 SURFACE MISC ( 14%) 010 SURFACE MILL ( 2%)
UNION 76 MP GEAR LUB LS SAE 80W/90	4	4	3	120 GALS.	
<b>(5) OCCUPATIONS</b>					
488 DRY SCREENING PLANT OPTR ( 14%)				619 WELDER (100%)	009 SURFACE MISC ( 14%) 010 SURFACE MILL ( 3%)
679 FLOTATION/CONCTR OPTR ( 33%)					
UNOBA MOLY HD NO. 2 5467	7	7	4	180 GALS.	
<b>(5) OCCUPATIONS</b>					
053 UTILITY MAN (100%)				488 DRY SCREENING PLANT OPTR ( 43%)	009 SURFACE MISC ( 14%) 010 SURFACE MILL ( 8%)
619 WELDER (100%)				679 FLOTATION/CONCTR OPTR ( 33%)	

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE	(6) LOCATIONS
W.A. HAMMOND DRIERITE CO. DRIERITE	2	2	1	2 LBS.	
(5) OCCUPATIONS					
514 LABORATORY TECHNICIAN ( 25%)		619	WELDER ( 50%)		009 SURFACE MISC ( 14%)
ZEP AEROSOLVE-SOLVENT DEGREASER	5	5	3	20 LBS.	
(5) OCCUPATIONS					
602 ELECTRICIAN (100%)					005 SURFACE SHOP ( 16%)
ZEP PRESERVE PENETRATING OIL	1	1	<1	10 LBS.	
(5) OCCUPATIONS					
660 MACHINIST (100%)					005 SURFACE SHOP ( 3%)

TABLE 4, PAGE 23 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

TRADENAME PRODUCTS FOUND ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MANUFACTURE'S NAME AND TRADENAME PRODUCTS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(4) PREDICTED ANNUAL USAGE

TABLE 5, PAGE 1 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

PHYSICAL AGENT CONDITIONS IDENTIFIED ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)
PHYSICAL AGENT CONDITION	56	56	36
NOISE			
<b>(5)</b>			
OCCUPATIONS			
053 UTILITY MAN (100%)		079 CRUSHER OPTR (100%)	
379 DRYER OPTR; KILN OPTR ( 58%)		388 SCALPER-SCREEN OPTR (100%)	
488 DRY SCREENING PLANT OPTR (100%)		604 MECHANIC ( 4%)	
614 SAMPLER; DUST SAMPLER ( 75%)		618 GREASER; OILER (100%)	
619 WELDER (100%)		649 ADMN, SUPERVISORY, MGT PERSNL (100%)	
669 BIN PULLER; TRUCK LOADER (100%)		679 FLOTATION/CONCTR OPTR (100%)	
779 PELLETIZING OPERATIONS WORKER (100%)		782 FRONT-END LOADER OPTR (100%)	
879 BAGGING OR PACKING WRKR ( 50%)			
<b>(6)</b>			
LOCATIONS			
		006 SURFACE CRUSHING ( 43%)	
		005 SURFACE SHOP ( 3%)	
		009 SURFACE MISC ( 29%)	
		007 SURFACE GRINDING (100%)	
		010 SURFACE MILL ( 69%)	

	(5)	(6)
SEGMENTAL BODY VIBRATION	2	2
OCCUPATIONS		
619 WELDER (100%)		1

	(5)	(6)
TEMPERATURE(PROCESS RELATED)	3	3
OCCUPATIONS		
488 DRY SCREENING PLANT OPTR ( 43%)		2

	(5)	(6)
WHOLE BODY VIBRATION	17	17
OCCUPATIONS		
053 UTILITY MAN (100%)		11
488 DRY SCREENING PLANT OPTR ( 43%)		079 CRUSHER OPTR (100%)
		619 WELDER (100%)

(CONTINUED NEXT PAGE)



MUSCULOSKELETAL OVERLOAD CONDITIONS IDENTIFIED ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MUSCULOSKELETAL CONDITION	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(6) LOCATIONS
ANKWARD LIFTING	1	1	<1	009 SURFACE MISC ( 7%)
-----				
OCUPATIONS				(6) LOCATIONS
619 WELDER ( 50%)				
-----				
FOREARM, ARM, AND SHOULDER	3	3	2	
-----				
OCUPATIONS				(6) LOCATIONS
619 WELDER (100%)			679 FLOTATION/CONCTR OPTR ( 33%)	005 SURFACE SHOP ( 3%) 009 SURFACE MISC ( 7%) 010 SURFACE MILL ( 2%)
-----				
FINGER AND HANDS	1	1	<1	
-----				
OCUPATIONS				(6) LOCATIONS
679 FLOTATION/CONCTR OPTR ( 33%)				010 SURFACE MILL ( 2%)
-----				
FREQUENT LIFTING	8	8	5	
-----				
OCUPATIONS				(6) LOCATIONS
879 BAGGING OR PACKING WRKR (100%)				010 SURFACE MILL ( 14%)
-----				
HEAVY LIFTING	8	8	5	
-----				
OCUPATIONS				(6) LOCATIONS
879 BAGGING OR PACKING WRKR (100%)				010 SURFACE MILL ( 14%)

MUSCULOSKELETAL OVERLOAD CONDITIONS IDENTIFIED ON MINE PROPERTY

COMMODITY NAME: MAGNESITE

MUSCULOSKELETAL CONDITION	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(6) LOCATIONS
LOWER LIMB	5	5	3	
<b>(5) OCCUPATIONS</b>				
488 DRY SCREENING PLANT OPERATOR ( 43%)			619 WELDER ( 50%)	005 SURFACE SHOP ( 3%)
679 FLOTATION/CONCTR OPTR ( 33%)				010 SURFACE MILL ( 7%)
NECK AND/OR BACK	6	6	4	
<b>(5) OCCUPATIONS</b>				
488 DRY SCREENING PLANT OPERATOR ( 43%)			619 WELDER (100%)	005 SURFACE SHOP ( 3%)
649 ADMN, SUPERVISORY, MGT PERSNL ( 14%)				009 SURFACE MISC ( 7%)
PRONE OR SUPINE LYING	1	1	<1	
<b>(5) OCCUPATIONS</b>				
619 WELDER ( 50%)				005 SURFACE SHOP ( 3%)
SITTING	1	1	<1	
<b>(5) OCCUPATIONS</b>				
619 WELDER ( 50%)				005 SURFACE SHOP ( 3%)
WRIST	1	1	<1	
<b>(5) OCCUPATIONS</b>				
619 WELDER ( 50%)				009 SURFACE MISC ( 7%)

TABLE 7, PAGE 1 NOTE: THIS TABLE DOES NOT CONTAIN DATA CLAIMED TO BE TRADE SECRET.

WELDING POTENTIAL EXPOSURE

COMMODITY NAME: MAGNESITE

WELDING PROCESS	(1) #WORKERS POTENTIALLY EXPOSED (OBSERVED)	(2) #WORKERS POTENTIALLY EXPOSED (PREDICTED)	(3) %WORKERS POTENTIALLY EXPOSED (PREDICTED)	(6) LOCATIONS
ARC WELDING	2	2	1	005 SURFACE SHOP ( 6%)
<hr/>				
(5) OCCUPATIONS				
619 WELDER (100%)				
<hr/>				
OXYFUEL GAS CUTTING	2	2	1	
<hr/>				
(5) OCCUPATIONS				
619 WELDER (100%)				
<hr/>				
OXYACETYLENE WELDING	24	24	15	
<hr/>				
(5) OCCUPATIONS				
604 MECHANIC (100%)				
<hr/>				
(6) LOCATIONS				
005 SURFACE SHOP ( 74%)				
010 SURFACE MILL ( 2%)				



<b>REPORT DOCUMENTATION PAGE</b>	1. REPORT NO.	2.	PB90-180175	
4. Title and Subtitle National Occupational Health Survey of Mining. Magnesite Report			5. Report Date 87/09/29	
7. Author(s) Anonymous			6.	
9. Performing Organization Name and Address National Occupational Health Survey of Mining, NIOSH, Morgantown, West Virginia			8. Performing Organization Rept. No.	
			10. Project/Task/Work Unit No.	
			11. Contract (C) or Grant (G) No. (C) (G)	
12. Sponsoring Organization Name and Address			13. Type of Report & Period Covered	
			14.	
15. Supplementary Notes				
16. Abstract (Limit: 200 words) This report presents data collected by the National Occupational Health Survey of Mining for the magnesite commodity. Three magnesite mines were included in the survey. Thirteen chemicals were found on mine property that were regulated by the Mine Safety and Health Administration. No chemicals were found which had a NIOSH recommended exposure limit. Altogether, 96 trade named products were identified to which workers were potentially exposed. Potential exposures to noise, segmental vibration, whole body vibration and process related temperatures were noted. Ten possible musculoskeletal conditions which could arise among workers in this industry were identified. Three welding processes, arc welding, oxyfuel gas cutting, and oxyacetylene welding, were observed to be used at these locations.				
17. Document Analysis a. Descriptors				
b. Identifiers/Open-Ended Terms NIOSH-Publication, Safety-research, Mining-industry, Occupational-exposure, Health-hazards, Musculoskeletal-system-disorders, Heat-stress, Vibration-exposure, Noise-exposure				
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