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ASBESTOS COMPLIANCE INSPECTION
CALAVERAS ASBESTOS, LTD.
Copperopolis, California

January 1985

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Denver, Colorado

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INTRODUCTION

Calaveras Asbestos Ltd. operates an asbestos mine and mill near Copperopolis, California. The mill recovers chrysotile asbestos fibers from serpentine ore by the dry asbestos process which consists of a series of crushing, screening and air-lifting operations. Asbestos mills are subject to the requirements of the National Emission Standards for Hazardous Air Pollutants (NESHAP) under 40 CFR, Chapter 1, Part 61, Subpart M - National Emission Standard for Asbestos.

During an inspection by the California Air Resources Board (CARB) on June 19, 1984, violations of the NESHAP standards were documented. As a followup to the CARB inspection, EPA, Region IX, on October 17, 1984, requested the National Enforcement Investigations Center (NEIC) to conduct a NESHAP survey of the facility to include visible emissions observations and a limited number of bulk asbestos samples and subsequent analyses.

On October 30, 1984, NEIC personnel, accompanied by a representative from the Calaveras County Air Pollution Control Division (CCAPCD), inspected the Calaveras Asbestos facility. The inspection was preceded by a visit to the offices of the CCAPCD where files were reviewed and the general background of the facility was discussed. The participants in the inspection are listed in Appendix A. Credentials were presented to Mr. Gordon A. Coats, President, and Michael R. Dell'Orto of Calaveras Asbestos Ltd. and the purpose of the inspection was explained to the plant personnel. During the inspection, information was gathered on the process operations, emission points and related control equipment. In addition, the process operations were inspected to determine the compliance status with the asbestos NESHAP regulations.

The plant employs about 220 people and operates 5 days per week, three shifts per day for the mine and mill and two shifts per day for the ore preparation area. In recent years the mill has been shut down from the

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middle of December to April 1 of the following year. The mine usually resumes operation sometime in February. This year, the mill shut down on November 2, 1984, and will resume operation on April 1, 1985. The truck shop and mine closed November 21, 1984 and will reopen February 2, 1985.

This report includes a process description, a description of emission points and related control equipment and the results of the inspection, including sample analyses. Photographs were taken to document the inspection observations [Appendix F].

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SUMMARY AND CONCLUSIONS

SUMMARY

The two objectives of the inspection were to (1) determine the compliance status of the facility with the National Emission Standard for Asbestos, Subpart M of 40 CFR, Chapter 1, Part 61, the National Emission Standards for Hazardous Air Pollutants (NESHAP) and (2) determine the effectiveness of measures taken by the Company to ensure compliance at the E-5 conveyor system which was in violation during a recent CARB inspection. To meet these objectives, Calaveras Asbestos personnel were interviewed, records were reviewed, visible observations were made and a limited number of samples were taken and subsequently analyzed.

The NESHAP standards (40 CFR 61.142) require an owner or operator of an asbestos mill to either discharge no visible emissions or control the emissions with a fabric filter collection system that meets certain fabric and pressure drop specifications (40 CFR 61.154). Visible emission observations were made of all systems including crushers, screens, air lifting hoods, conveyor belts, transfer points and baghouse exhausts. Baghouse data were provided by the Company including air flow diagrams, manufacturers specifications and fabric specifications. Maintenance logs and baghouse pressure drop logs were reviewed and compared to readings taken during the inspection.

The NESHAP standards for active and inactive disposal sites at asbestos mills require the discharge of no visible emissions and the use of a wetting agent. The waste handling system and tailing piles were observed for visible emissions and to determine if use of the wetting agent was adequate to wet the dust and tailings to prevent wind erosion.

Samples of the material being handled in various areas of the plant were taken to confirm that the material contained asbestos and, therefore, was subject to the NESHAP requirements. Samples were taken in the ore preparation area, the mill and the tailings area. Chain-of-custody procedures were followed to maintain the integrity of the samples.

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The measures taken by the Company to eliminate the visible emissions problem observed during the CARB inspection were discussed with Company personnel. The tailing conveyor system was inspected to determine if the equipment was in place and if the visible emissions were eliminated. Photographs were taken to document the inspection observations.

CONCLUSIONS

The Calaveras Asbestos Ltd. facility near Copperopolis, California was found to be in compliance with the NESHAP standards during the inspection on October 30, 1984. No visible emissions were observed in the following process areas: ore preparation, dryers, dry rock storage and handling, mill and tailings. Also, the exhausts from all the baghouses were meeting the "no visible emission" rule. The following baghouse exhausts were observed: ore preparation baghouses A, B and C; baghouses MK1 through 6 and the mill baghouse.

Documents submitted by the Company indicate that the baghouse bags meet the requirements of §61.154(a)(1)(ii) and (iii) regarding type of fabric, permeability, thickness and weight. In addition to the bag specifications, §61.154(a)(1)(i) also requires that the pressure drop across the baghouse filters be no more than 4 inches water gauge to be exempt from the no visible emissions rule. Pressure drop readings taken at the time of the inspection and obtained from a review of the Company records show that the baghouses operate above 4 inches of water gauge immediately prior to cleaning. Once the bags are cleaned, the pressure drop falls below 4 inches water gauge. Because no visible emissions were observed from the baghouse exhausts, the pressure drop across the baghouse filters are within the requirements of §61.142 and §61.154. The cleaning cycle and pressure drop are within the baghouse manufacturer's specifications. From a review of the maintenance log, the baghouse appears to be operated and maintained properly.

No visible emissions were observed from the transfer of waste material to the tailing piles which meets the requirements of §61.151(c). Also the

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wetting agent, Dustrol, was being mixed with the waste material before depositing the material on the tailings pile which, additionally, meets the requirements of §61.151(c)(1)(i). No visible emissions were observed from the inactive portions of the mill tailings piles, meeting the requirements of §61.153(1). In addition, a crust had formed on the surface of the piles from the application of Dustrol. Windblown dust could be a problem in the future if the crust is broken. If windblown dust becomes a problem, provisions for limiting access and traffic on the tailings and adequate wetting would mitigate it.

Measures taken by the Company to eliminate the visible emission problem observed during the June 19, 1984 CARB inspection appear to be adequate. No visible emissions were observed from the E-5A tail pulley or the E-5A to E-5B transfer point. Measures taken by the Company included adding new sprayers, a new booster pump, new plows and additional skirting, curtains and enclosure.

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PROCESS DESCRIPTION

A schematic of the mine and mill operations is shown in Figure 1. The operations of the plant are divided into the following areas: mining, ore preparation, dry rock handling and storage and mill operations. The ore is mined in an open pit mine and the asbestos fibers are released and recovered from the serpentine rock by a series of crushing, screening and air-lifting operations.

MINING

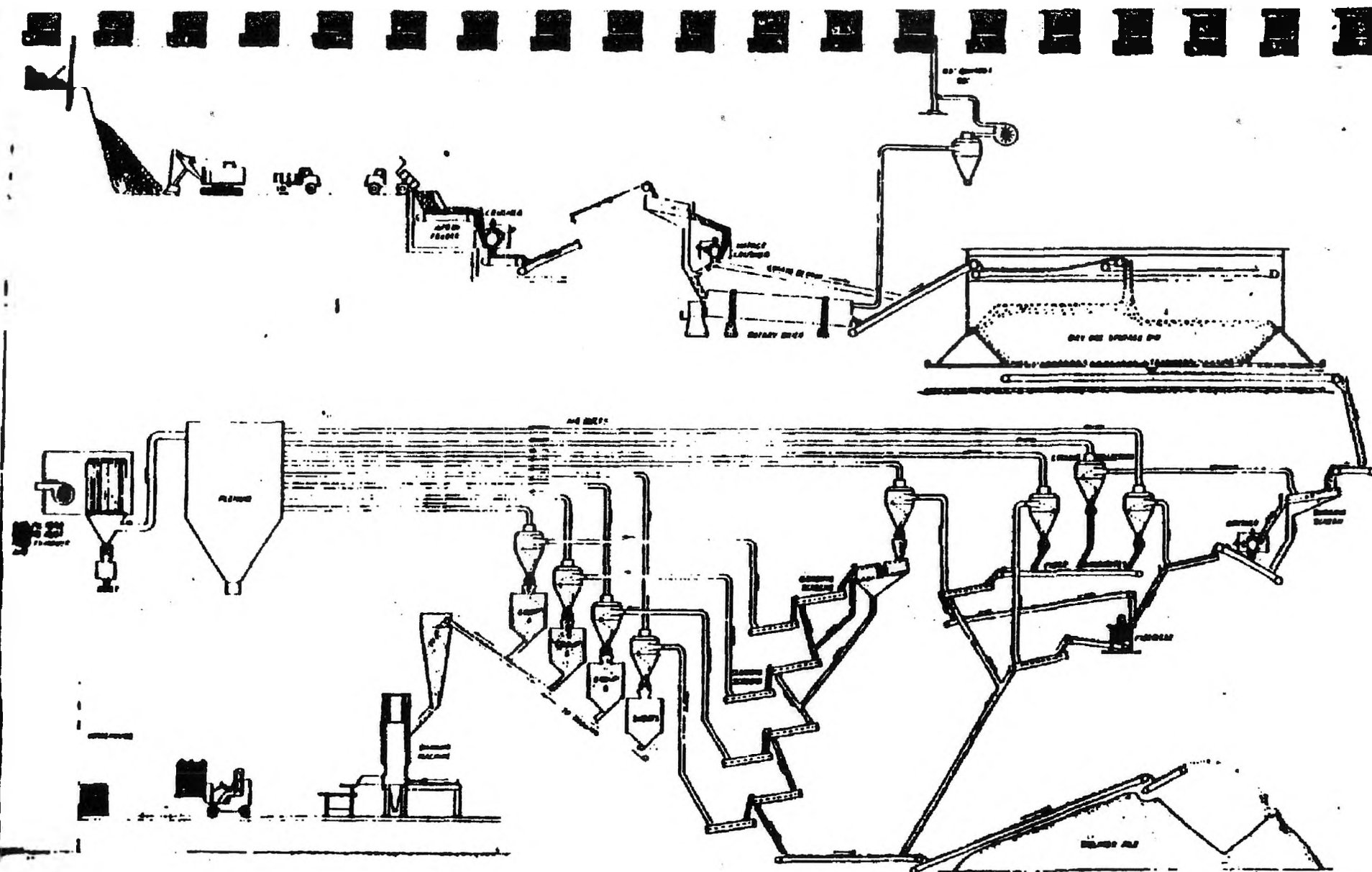
Asbestos ore is obtained from an open pit mine where the serpentine ore is mined from the deposit by pit blasting. The present depth of the pit is 440 feet and about 5,000 tons of ore are mined each day. Pit blasting occurs about four times per week. A blasting schedule was requested but the mine does not blast on a set schedule. Blasting is usually determined the day before and depends upon the size of material needed by the mill. Different areas of the mine produce different size fibers of exclusively chrysotile asbestos.

Once the ore has been blasted loose, the rock is loaded into dump trucks and hauled to the ore preparation area.

ORE PREPARATION

Run-of-the-mine ore is fed to a primary jaw crusher which reduces the ore to minus 6-inch material. The capacity of the jaw crusher is 300 tons per hour. Of this amount, about one-third of the material is eventually rejected by the subsequent crushing and screening operations and two-thirds of the material is sent to the mill area for further processing. A belt conveyor moves the crushed material to a secondary cone crusher which reduces the material size to minus $\frac{1}{2}$ inch. The material is then screened by two triple-deck shakers where the minus $\frac{3}{8}$ inch and minus $\frac{1}{2}$ inch material are dropped onto belt conveyor E-2 which transports the material from the ore preparation area to the dryers. The oversize material is sent to

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ASBESTOS MINING AND MILLING
CALAVERAS COUNTY CALIFORNIA

Figure 1
PROCESS FLOW DIAGRAM

Calaveras Asbestos Ltd.
Copperopolis, California

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two Hazmag tertiary crushers by a belt conveyor. The discharge of the tertiary crushers are sent by a belt conveyor, OP-4, to another set of triple-deck shakers where the minus 3/8-inch material is discharged onto belt E-2 and the oversize material is returned to the tertiary crushers or sent to the rock reject pile by a belt conveyor.

The crushed ore is transported to the dryer and dry rock area by belt conveyor E-2. The conveyor discharges the ore to a vibrating screen where the ore is separated into various size fractions. Minus 1/2-inch material is sent to the vertical dryer and minus 3/8-inch material can be sent to either the vertical dryer or the horizontal dryer. The plus 3/8-inch material is sent to the horizontal dryer. The vertical dryer handles about one-fourth of the material from the ore preparation area and the horizontal dryer dries the remainder of the ore. Discharge from the dryers is sent to a sifter screen that recovers 40-mesh material which is sent by belt conveyors E-3 and E-4 to the dry rock storage building. Waste from the sifter screen is conveyed by belt E-5 to the tailings pile.

DRY ROCK HANDLING AND STORAGE

The dry rock storage building is an A-frame sheet metal building which houses the storage piles. Ore is removed from the building by a belt conveyor housed in a concrete tunnel located under the storage piles. Ore is fed onto the conveyor belt by vibrating feeders located at openings in the concrete tunnel. Ores are blended by operating several feeders at the same time. Blended ores are delivered to the mill building by the E-6 belt conveyor.

MILL OPERATION

In the mill building, the ore is subjected to a series of six stages of crushing and four screening and air-lifting operations to liberate and recover the asbestos fibers. The maximum process weight rate for the mill is 150 tons per hour and the normal rate is 100 tons per hour. Operating in the mill building are 12 crushers, 40 screening decks, 19 collectors and four baghouses.

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The ore is passed over a series of shaker screens for separation into size fractions of plus 3/16 inch down to minus 20 mesh. The material larger than 3/16 inch is returned to the crushers for further size reduction. Each shaker screen is fitted with an aspirating hood to lift off asbestos fibers as the material passes from screen to screen. The liberated fibers are collected in a series of cyclone collectors that discharge to horizontal rotary graders where a rough separation of fibers is made by fiber length. The fiber products are grouped and collected in four bins and are fed by screw feeders to pressure-type bag packers. The bags are then flattened and palletized for storage and shipment.

Barren rock or non-fibrous material from the final screening operation is sent to tailings by a series of belt conveyors. The dust and waste material are fed to a water screw where the material is saturated with water and wetting agent to prevent visible emissions.

TAILING AREAS

The facility produces three types of tailings: mining waste (overburden), rock rejects from the ore preparation area (aggregate) and mill waste tailings. The mine waste tailings are northeast of the mill around the east side of the pit. The rock reject tailing piles are northwest of the mill on the southeast edge of the pit. The mill tailings are piled east of the mill. The Company adds a surfactant (Dustol) to the mill tailings before depositing the waste on the tailings pile. The surfactant is mixed with water and sprayed on the material at a rate of about 20 gph.

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AIR POLLUTION CONTROL EQUIPMENT

The air pollution control equipment (baghouses) and related process operations are permitted annually by the Calaveras County APCD. A listing of the active operating permits is given in Table 1. The baghouse design data are listed in Table 2.

ORE PREPARATION BAGHOUSES

The ore preparation feed and dust control system flow sheet is shown in Figure 2. The ore preparation baghouses (A, B and C) vent and control the dust from the following process equipment:

- Jaw crusher, cone crusher and Hazemag impact crushers
- Four tripledeck shakers
- Conveyor belts, including the E-2 conveyor belt to the mill

All of the equipment is vented to baghouse C, then the air flow is split between baghouses A and B before being vented to the atmosphere.

The ore preparation baghouse specifications are given in Table 2. Baghouse C is a Fuller baghouse with four compartments. Each compartment has 4,000 square feet of cloth area for a total cloth area of 16,000 square feet. The air-to-cloth ratio is 2:1. The bag specifications are given in the Compliance Evaluation section of this report.

Baghouses B and C were manufactured by Industrial Clean Air-Reese and have one compartment each. The total cloth area for baghouse B is 4,200 square feet with an air-to-cloth ratio of 3:1. Baghouse C has a total cloth area of 7,000 square feet with an air-to-cloth ratio of 3:1. The design pressure drop for both baghouses is less than 4 inches water gauge.

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Table 1
 CALAVERAS COUNTY APCD
 OPERATING PERMITS
 CALAVERAS ASBESTOS LTD.
 Copperopolis, California

Operating Permit No.	Equipment Listed	Rating	Permit Period
84-03-02	Pulseflo filter MK-1 Pulseflo filter MK-2 Vertical (tower) dryer	4,300,000 Btu/hr	4/2/84 to 4/2/85
84-03-03	Pulseflo filter MK-3 Pulseflo filter MK-4 Horizontal (rotary) dryer	13,000,000 Btu/hr	4/2/84 to 4/2/85
84-03-04	Pulseflo filter MK-5 Pulseflo filter MK-6	480 hp	4/2/84 to 4/2/85
84-03-05	Baghouses A, B, C Draco fabric filter C Model HMB-100 Ore prep., primary crushing dust control	1500 hp	4/2/84 to 4/2/85
84-03-07	Mill dust conveyor system and all equipment in mill building	4900 hp	4/2/84 to 4/2/85

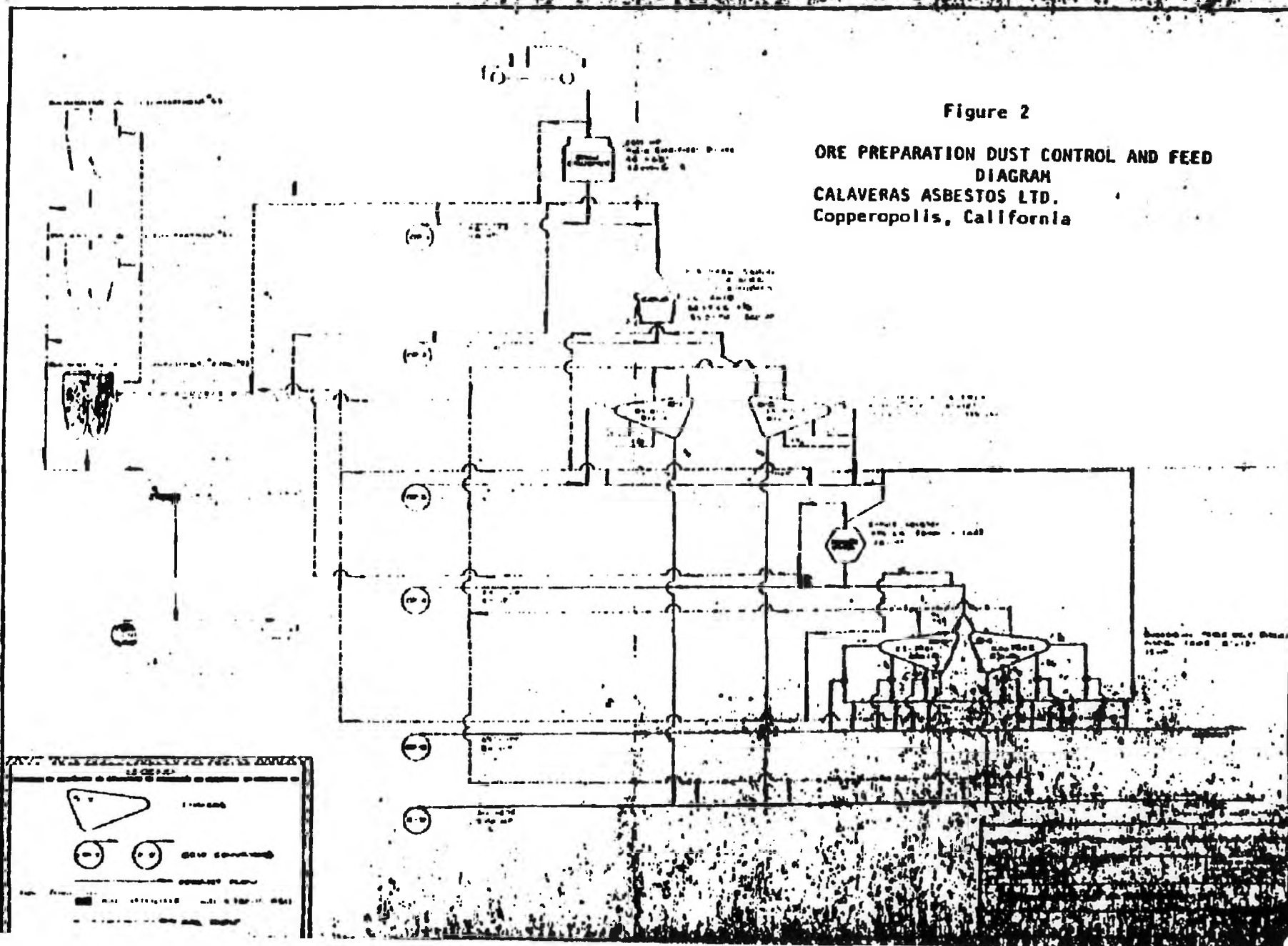
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Table 2
BAGHOUSE DESIGN DATA
CALAVERAS ASBESTOS LTD.
Copperopolis, California

Baghouse Manufacturer	No. of Compartments	Cloth Area (sq. ft.)	Air-to-Cloth Ratio	Design Pressure Drop (inches W.G.)	Air Flow (cfm)	Fan (hp)
Ore Preparation Baghouses						
Baghouse A Industrial Clean Air - Reese	4	16,000	2:1	<4	33,000	100
Baghouse B Industrial Clean Air - Reese	1	4,200	3:1	<4	12,600	75
Baghouse C Fuller	1	7,000	3:1	<4	21,000	100
Radical Dryer Baghouse						
HK1-2 Western Precipitation - Joy	2	11,300	2.5:1	4-6	29,000	150
Horizontal Dryer Baghouse						
HK3-4 Western Precipitation - Joy	2	11,200	3.3:1	4-6	38,000	150
Dry Rock Storage Baghouse						
HK5-6 Western Precipitation - Joy	2	11,300	3:1	4-6	32,000	200
11 Baghouse						
Rock Dust System Wheelabrator	4	27,500	2.5:1	<4	50,000	800
Fiber Dust System Wheelabrator	3	83,000	2.5:1	<4	175,000	incl above
Dust Hygiene System Wheelabrator	4	incl. above	2.5:1	<4	incl. above	incl above

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Figure 2
 ORE PREPARATION DUST CONTROL AND FEED
 DIAGRAM
 CALAVERAS ASBESTOS LTD.
 Copperopolis, California



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DRYER AND DRY ROCK STORAGE BAGHOUSES

The vertical dryer, horizontal dryer and dry rock storage are vented to baghouses MK1 through 6. The MK baghouse air flow diagram is shown in Figure 3 and the design specifications are listed in Table 1. All of the MK baghouses were manufactured by Western Precipitation - Joy Manufacturing. All of the bag specifications are given in the Compliance Evaluation section of this report.

The vertical dryer is vented to the MK1-2 baghouse, then to the atmosphere. The baghouse has two compartments with a total cloth area of 11,300 square feet. The air-to-cloth ratio is 2.5:1.

The horizontal dryer is vented to the MK3-4 baghouse which has two compartments. The total cloth area is 11,300 square feet with an air-to-cloth ratio of 3.3:1. The design pressure drop is 4 to 6 inches of water-gauge and the air flow is 38,000 cfm.

MK5-6 baghouse vent the dry rock storage area, the mill basement, E-5 conveyor system and E-6 tunnel. The MK5-6 baghouse has a total cloth area of 11,300 square feet with an air-to-cloth ratio of 3:1. The design pressure drop is 4 to 6 inches water gauge.

MILL BAGHOUSES

The mill baghouse was manufactured by Wheelabrator, with a design pressure drop of less than 4 inches water gauge. The mill baghouse is located in the mill building penthouse that collects air from three different systems: the rock circuit, the fiber circuit and the hygiene circuit. The mill baghouse air-flow diagram is shown in Figure 4 and the design data is given in Table 2. The air is sent to two large plenum chambers, through the baghouse compartment, then to the atmosphere.

The rock dust system baghouse has four compartments with a total cloth area of 27,500 square feet. The air to cloth ratio is 2.5:1. The fiber circuit has three compartments with a total cloth are of 83,000 square feet.

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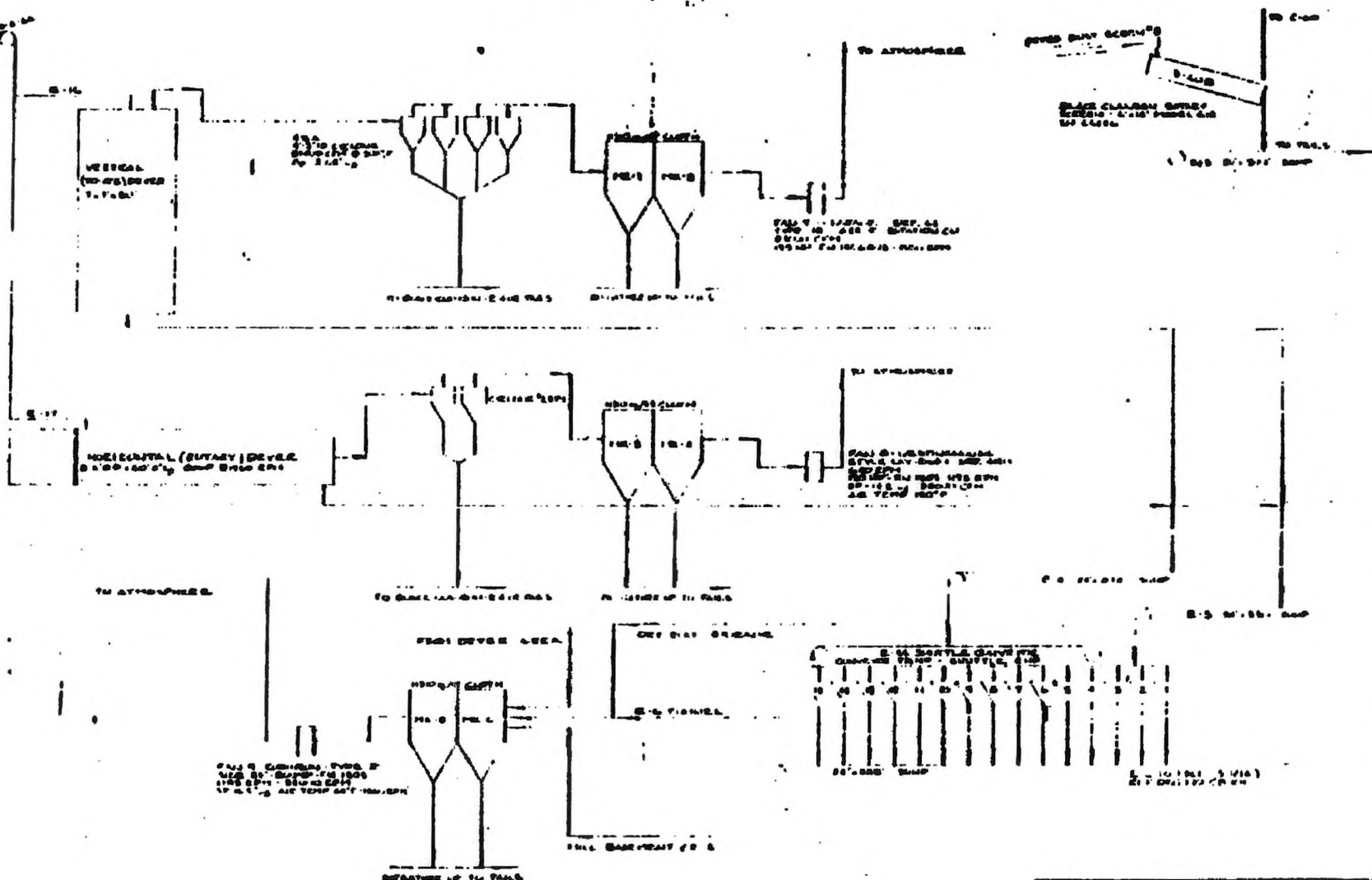
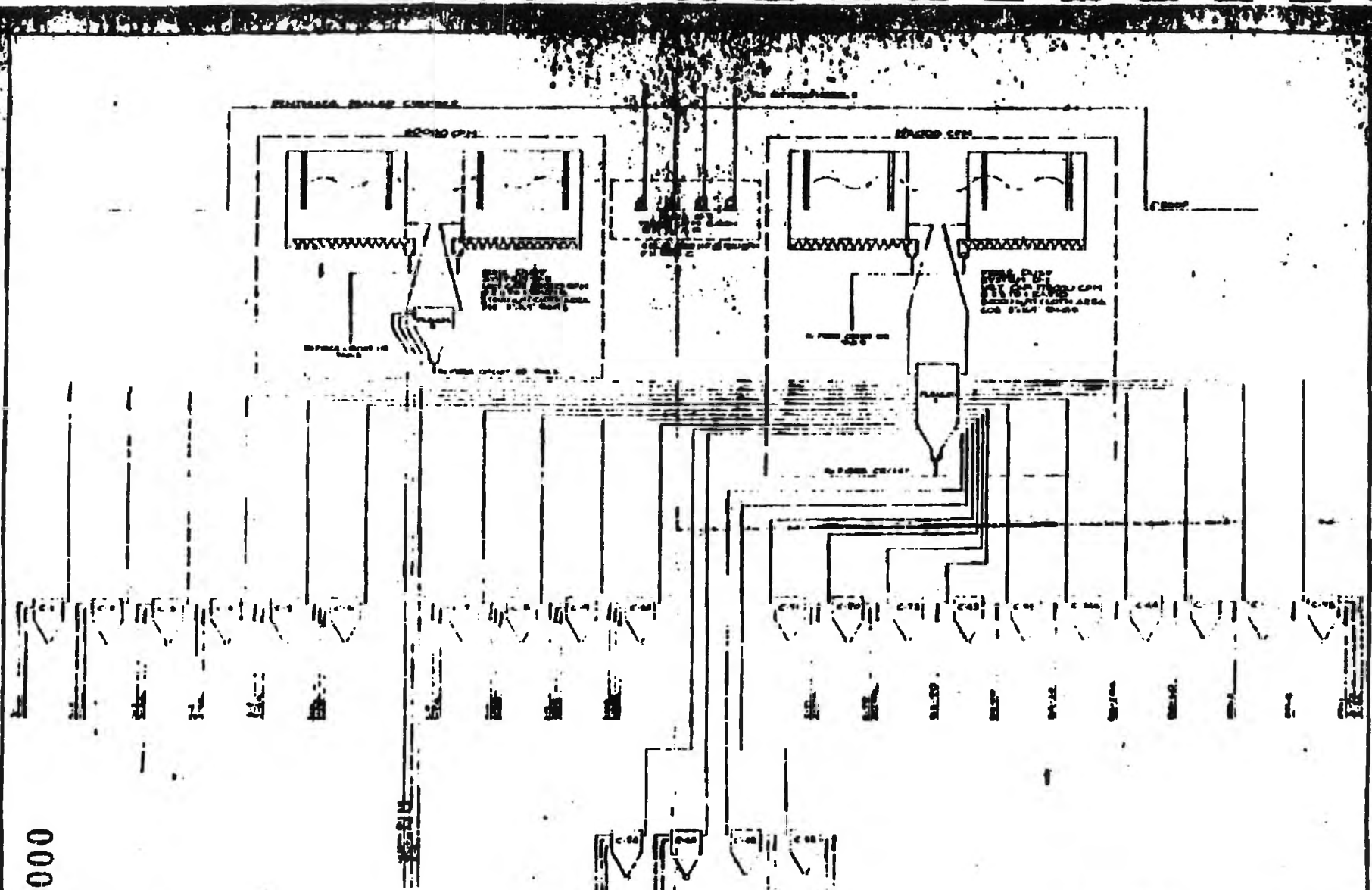


Figure 3
M-K Baghouse Air Flow Diagram
Calaveras Asbestos, Ltd
Copperopolis, California

M-K BAGHOUSE AIR FLOW SHEET			
NO.	NAME	TYPE	REMARKS
1	CALAVERAS ASBESTOS, LTD		
2	3-10-61		6-10-61



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Figure 4
Hill Baghouse Air Flow Diagram
Calaveras Asbestos, Ltd.
Copperopolis, California

HILL BAGHOUSE AIR FLOW SHEET	
DATE	BY
CALAVERAS ASBESTOS, LTD.	
3-6-61	400-6-1

The air to cloth ratio is 2.5:1. The dust hygiene system is included with the rock dust system. The baghouse compartments for the mill building are located in the sealed penthouse that is accessible for inspection. Personnel can enter the penthouse routinely for maintenance and bag-leak checks.

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INSPECTION RESULTS

COMPLIANCE EVALUATION

The compliance evaluation of the facility was based on the NESHAP requirements, 40 CFR Part 61, Subpart M - National Emission Standards for Asbestos. The visible emissions standard for asbestos mills (40 CFR 61.142) requires that the owner or operator either discharge no visible emissions to the outside air or control the emissions with a fabric filter collection system that meets certain fabric and pressure drop specifications (40 CFR 61.154). Visible emission observations were made of all operations including crushers, screens, air lifting hoods, conveyor belts, transfer points and baghouse exhausts. Baghouse data was provided by the Company including air flow diagrams, manufacturer's specifications and fabric specifications. Maintenance and baghouse pressure drop logs were reviewed and pressure drop readings were taken.

After a short briefing meeting with Company personnel, the following plant areas were inspected: the ore preparation area, the dryer and dry rock handling area, the mill and the tailing areas for the mine and mill. Samples of the material being handled in the various areas of the plant were taken to confirm that the material contained asbestos, thus subjecting the facility to the NESHAP requirements. Samples were taken in the ore preparation area, the mill, the tailings area and the mine and haul roads. Chain-of-custody procedures were followed to maintain the integrity of the samples.

Ore Preparation Area

The ore preparation area reduces the mined ore to minus 6 inches of material and separates the asbestos-containing ore from the serpentine rock. Fugitive dust from the crushing, screening and transfer operations is controlled by baghouse A, B and C, water sprays and enclosures. During the inspection, no visible emissions were observed from any points in the ore preparation area. This includes the baghouse exhausts, transfer points, crushing area and the rock reject bin.

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The aggregate material in the rock reject bin was wet and no visible emissions or dust were observed when the material was dumped into a truck for transfer to the rock reject tailings pile. The material being handled at the rock reject bin was sampled for asbestos content to determine if the NESHAP standards were applicable. The aggregate was covered with a white fibrous material. The white material was analyzed and found to contain 65-85% chrysotile asbestos confirming that the handling of the reject rock and the reject rock tailing piles are subject to the "no visible emission" rule of NESHAP. At the time of the inspection, this area was in compliance with this rule. The laboratory results of the sampling, the sampling record and the chain-of-custody forms are contained in Appendix B.

Drying and Dry Rock Storage

The material from the ore preparation area is transferred to the dryers via a covered conveyor belt (E-2). No visible emissions were observed from the belt or the transfer points to the dryers. Both dryers are controlled by baghouses. Baghouse MK1-2 controls the emissions from the vertical dryer and baghouse MK3-4 controls the emissions from the horizontal dryer. No visible emissions were noted from the exhausts from either baghouse.

From the dryers, the material is screened and conveyed to the dry rock storage building via a covered conveyor. No visible emissions were observed from this operation.

The dry rock is stored in an enclosed building and moved to a mill building by a number of covered conveyor belts running under the storage piles. The dry rock storage area and conveyor system is controlled by baghouse MK5-6. No visible emissions were observed from the baghouse exhaust or from the conveyor system.

Mill Operation

The asbestos fibers are released and collected by a series of crushing, screening and air-lifting operations. These systems are enclosed and

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ducted to a series of cyclones, a plenum chamber and the mill baghouse. During the inspection, visible dust was negligible within the building and around the crushing, screening and lifting operations. The beams, stairways and walkways were clean and no accumulations of dust were observed. No visible emissions were observed from the transfer equipment within the building or from the baghouse exhaust. A sample of the material being handled in the mill building was taken at the hood opening of the E-6 head pulley. The white material covering the rock in the sample contained 60-80% chrysotile asbestos. The sampling results are documented in Appendix 8.

The mill waste is conveyed to the mill tailings pile by a series of conveyor belts (E-5, E-5A and E-5B). The transfer points between these conveyors were observed to be in violation of the visible emission requirement during an inspection by the ARB on June 19, 1984. Since that time, the Company has completed a project at the E-5A tail pulley to eliminate the visible emissions. The project included the following:

1. Enclosure was extended about 20 feet.
2. Skirting was added around the tail pulley and the full length of the enclosure (added rubber between enclosure and belt).
3. Plows were installed to spread material on belt.
4. Six new sprays were added.
5. New sprayers were added in the water screw.
6. Curtains were added inside the enclosure to direct the water sprays onto belt.
7. High pressure water booster pump (7 1/2 hp) and a 500-gallon storage tank for the surfactant (Dustrol) were added to provide a more consistent and steady mixture of surfactant to the sprayers.
8. Monitoring and cleanup of the area was increased.

The work done at the E-5A tail pulley has also solved the problem at the E-5A and E-5B transfer point since the material is kept wet. No visible emissions were observed at any of the transfer points including the dropoff to the tailings pile. A sample of the aggregate in the tailings pile was taken and the white material covering the aggregate was found to

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contain 30-60% asbestos fibers. The actual weight percent of asbestos in the aggregate was not determined. Company personnel indicated that the mill tailings contain 0.4-0.6% asbestos by weight but most of the asbestos is bound in the aggregate.

Tailings Areas

The NESHAP standards for active and inactive waste disposal sites (§§61.151 and 61.153) require either the discharge of no visible emissions or the use of an adequate wetting agent to effectively wet the dust and tailings. During the inspection, no visible emissions were observed from the tailing areas. The Company adds a surfactant (Dustrol) to the mill tailings before depositing the waste on the tailings pile. The surfactant is mixed with water and sprayed on the material at a rate of about 20 gph. A crust formed on the piles that was easily broken by walking on the piles - exposing the loose material under the crust. Those areas of the waste piles that are routinely disturbed, such as roadways, should be kept wet to prevent fugitive dust emissions.

Runoff from Tailings

Because the mine and mill tailings are located close to the Stanislaus River, the California State Water Quality Control Board (WQCB) annually inspects the tailings area to determine if runoff or asbestos-containing material enters the river. The last inspection by the WQCB was done on September 20, 1984. The results of the inspection were not available. The WQCB has required Calaveras Asbestos to do the following to prevent the erosion of material or runoff from entering the Stanislaus River.

1. Maintain catch basins to prevent runoff from entering the river.
2. Sample the river upstream and downstream of the tailings piles for asbestos whenever runoff enters the river. The sampling will start next year using the sampling method described in EPA Publication 600/54-83-044 dated November 1983.

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3. Take pictures annually of the tailing piles from specific points to show that the piles have not severely eroded during the past year. These pictures are submitted to the WQCB annually.

The catch basins were observed and there was no evidence of overflowing. The north pond and a series of three catch basins on the northeast side of the pit catch runoff from the mine tailing piles. A series of six catch basins in Long Canyon catch the runoff from the mill tailings.

Mined Land Reclamation Test Plot

About 4 years ago the Bureau of Mines established a test plot on the mill tailings pile. Various grasses, trees and shrubs were planted to determine if the waste could support these plants. The grass and the trees were living and stabilized the test plot soil. However, the test plot was level and the problem with growing grass and/or shrubs on the tailing piles is the slope of the piles. Company personnel indicated that growing material on their tailings pile is not feasible. The Bureau of Mines has not completed their study of the test plot.

Baghouses

The Company has installed baghouses to meet the air-cleaning requirements of §61.154 which could exempt them from the "no visible emission" rule at certain points in their process. Table 3 was developed from data received from the Company during the inspection. The fabric specifications meet the requirements of §61.154(1)(ii)(iii) and (iv).

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Table 3
BAGHOUSE SPECIFICATIONS
CALAVERAS ASBESTOS LTD.
Copperopolis, California

Baghouse Number	Equipment Services	Bag Description	BAGHOUSE		FABRIC SPECIFICATIONS							
			Pressure Drop (W.G.)		Type of Fabric		Permeability cfm/ft ² (Q ₄ "W.G.)		Weight oz./yd. ²		Thickness inches	
			Mfg. Spec.	Fed. Rel. Max.	Mfg. Spec.	Fed. Req.	Mfg. Spec.	Fed. Req. Max.	Mfg. Spec.	Fed. Req. Min.	Mfg. Spec.	Fed. Req. Min.
A	Ore Prep	Cotton Sateen - Style 100 F.F.	-4"	-4"	Woven	Woven or Felt	12	If Woven 30	9 1/2	Not Felt None	.023	Not Felt None
B	Ore Prep.	Cotton Sateen-Style 100 F.F.	-4"	-4"	Woven	Woven or Felt	12	If Woven 30	9 1/2	Not Felt None	.012	Not Felt None
C 1,2,4	Ore Prep.	Cotton Sateen-Style 100 F.F.	-4"	-4"	Woven	Woven or Felt	12	If Woven 30	9 1/2	Not Felt None	.023	Not Felt None
C ₃	Ore Prep.	Cotton Sateen, C-14 Fuller	-4"	-4"	Woven	Woven or Felt	20-30	If Woven 30	8-8 1/2	Not Felt None	.019 to .021	Not Felt None
MK-1 and MK-2	Vertical Dryer	Momex W.P. (Globe) #039-11397-31-2	4"-6"	-4"	Felted	Woven or Felted	25	If Felt and on Dryer 45	15-16	If Felt 14	.08	If Felt .0625
MK-3 and MK-4	Rotary Dryer	Momex W.P. (Globe) 039-11397-31-2	4"-6"	-4"	Felted	Woven or Felted	25	If Felt and on Dryer 45	15-16	If Felt 14	.08	If Felt .0625
MK-5 and MK-6	Dryrock Storage	Dacron Polyester W.P. (Globe) #069-11397-31-2	4"-6"	-4"	Felted	Woven or Felted	30	If Felt and on Mill 35	16	If Felt 14	.08	If Felt .0625
Wheelabrator	Mill	Polyester 7K2435-60 Sateen W.W. Criswell		-4"	Woven	Woven or Felted	15-25	If Woven 30	8	Not Felt None	.015	Not Felt None
Wheelabrator	Mill	Cotton Fire-Retardant 101-20 Sateen W.W. Criswell		-4"	Woven	Woven or Felted	8-12	Woven 30	10 1/2	Not Felt None	.022	Not Felt None

000046

During the inspection, pressure drop readings were taken of various baghouses to determine if the requirements of §61.154(l)(i) were being met. The readings were taken for all of the baghouses except the ore preparation baghouses. The readings were recorded on the Company's Manometer Reading Record form and are shown in Appendix D. Ore preparation baghouse pressure drop readings were not available at the time of the inspection. Typical ore preparation baghouse pressure drop readings are given in Appendix C. The readings were between 3 inches and 6 inches of water column and within the manufacturer's specifications. The lower readings were on those compartments just cleaned and the higher readings were made on those compartments awaiting cleaning. The cleaning cycle time was not known, but was set by the various manufacturer's of the baghouses.

Since March of 1984, the Company has been recording the baghouse pressure drop readings weekly. Before, they were recorded monthly. The log was reviewed and a copy of a typical manometer reading record is shown in Appendix C. The baghouse pressure drop readings are routinely above 4 inches water gauge. Because no visible emissions were observed from the baghouse exhausts, the pressure drop across the baghouse filters are within the requirements of §§61.142 and 61.154. The baghouse exhausts must meet the no visible emissions requirements of §61.142.

The Company maintains a baghouse maintenance log book where a record of routine maintenance, dye checks, repairs and bag replacement are recorded. A typical log sheet is shown in Appendix E. The bags in the Mark 1 through 6 baghouses are dye checked for leaks at least once per month and sometimes weekly. The bags in the mill and ore preparation baghouses are visually checked for leaks weekly. It appeared that the baghouses were being operated and maintained properly since there were no visible emissions at the time of the inspection.

Mine and Haul Roads

Although the mine and haul roads from the mine are exempt from the NESHAP requirements, the mining operation was observed to determine the magnitude of the dust plume generated by a pit blast.

000047

During the inspection a blast was observed. A plume of dust was generated but was confined to the pit area. The blast occurred at the bottom of the pit under favorable wind conditions. The dust plume had settled within 10 minutes of the blast.

In order to minimize the dust generated during blasting, the Company changed the blasting procedures. For the past 2 years, the Company has been using the following blasting procedures.

1. Use a 10-circuit blasting board set at 33 milliseconds to control the firing sequence of the charges.
2. Use slurry type #927 Dupont explosive rather than stick explosive for better control of blast.
3. Blast only under favorable wind conditions.

As a result of these changes, Company personnel indicated that the blasts are uniform and localized, generating a smaller dust plume than before. In addition, less explosive is used than before the changes were made. The Company presently used about 9-12,000 pounds per shot or about 120,000 pounds per month.

The haul roads from the pit to the ore preparation area and in the vicinity of the mill were wetted and no visible dust was being generated by the truck traffic. The pit roads were also wetted and negligible dust was being generated from the loading of ore into the ore trucks. The visible dust was confined to the bottom of the pit.

000048

APPENDICES

- A INSPECTION PARTICIPANTS**
- B SAMPLING RESULTS AND DOCUMENTATION**
- C COPY OF TYPICAL COMPANY MONOMETER READING RECORD**
- D BAGHOUSE PRESSURE DROP READINGS**
- E COPY OF TYPICAL WEEKEND MAINTENANCE LOG SHEET**
- F PHOTO LOG SHEET AND PHOTOS**

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APPENDIX A

OCTOBER 30, 1984
INSPECTION PARTICIPANTS
CALAVERAS ASBESTOS LTD.
COPPEROPOLIS, CALIFORNIA

000030

Appendix A
INSPECTION PARTICIPANTS
CALAVERAS ASBESTOS LTD.
Copperopolis, California
October 30, 1984

Name	Title	Affiliation and Address	Telephone
Gordon A. Coats	President	Calaveras Asbestos Ltd. P.O. Box 127 Copperopolis, CA 95228	(209)785-2201
Michael R. Dell'Orto	Director of Purchasing	Calaveras Asbestos Ltd. P.O. Box 127 Copperopolis, CA 95228	(209)785-2201
George Jackson	Project Engineer	Calaveras Asbestos Ltd P.O. Box 127 Copperopolis, CA 95228	(209)785-2201
Joey E. Toney	Director of Environmental Affairs	Calaveras Asbestos Ltd. P.O. Box 127 Copperopolis, CA 95228	(209)785-2201
Michael P. Redgrave	Assistant Sanitarian	Calaveras County Health Department Environmental Health Government Center San Andreas, CA 95249	(209)754-3849
Richard B. Ida	Environmental Engineer	U.S. EPA National Enforcement Investigations Center Denver Federal Center Bldg. 53, Box 25227 Denver, CO 80225	(303)236-5139 FTS 776-5139

000051

APPENDIX B

**SAMPLING RESULTS AND DOCUMENTATION
OCTOBER 30, 1984 INSPECTION
CALAVERAS ASBESTOS LTD.
COPPEROPOLIS, CALIFORNIA**

000052

ENVIRONMENTAL PROTECTION AGENCY
OFFICE OF ENFORCEMENT
NATIONAL ENFORCEMENT INVESTIGATIONS CENTER
BUILDING 53, BOX 25227, DENVER FEDERAL CENTER
DENVER, COLORADO 80225

DATE: December 3, 1984

Richard Ida
Operations Division

FROM :

Douglas Kendall *Douglas Kendall*
Laboratory Services Division

SUBJECT:

Asbestos Determinations - Calaveras Asbestos

Background

On November 5, 1984, three samples collected from the Calaveras Asbestos Company were received at NEIC for the determination of asbestos. The samples were collected by Richard Ida of NEIC.

Results

All three of the samples were found to contain chrysotile asbestos. The samples consisted of black and gray crushed rock covered with a white, fibrous material. Only the white material was examined and it was this material in all of the samples that contained major amounts of chrysotile asbestos.

Tag N-13074, Station No. 1, from the reject rock bin, contained 65 to 85% asbestos. Tag N-13075, Station No. 10, from a tailings pile, contained 30 to 50% asbestos in the white covering of the rock. Tag N-13076, Station No. 15, from the head pulley feed, contained 60 to 80% chrysotile asbestos in the white material.

Method

The analysis was performed by polarized light microscopy using the EPA "Interim Method for the Determination of Asbestos in Bulk Insulation Samples". Samples are mounted in liquids of various refractive indices and examined under the microscope for fibers. If fibers are observed, their optical properties are determined to see if those properties are characteristic of one of the forms of asbestos. Asbestos is identified from its morphology, extinction characteristics, sign of elongation, refractive indices, birefringence and any color or pleochroism. Quality assurance includes participation in the EPA sponsored round robin program and checks by a second analyst.

000053

Name of Facility
CALAVERAS ASBESTOS LTD

Facility Location
P.O. Box 127
Copperopolis CA 95228

[illegible]

Distribution: Original to Coordinator Field Files, Copy to Facility

N 885

000054

**Building 53, Box 25227, Denver Federal Center
Denver, Colorado 80225**

Re: [redacted] Original Accompaniment Shipment; Copy to Coordinator Field Files

APPENDIX C

COPY OF TYPICAL COMPANY MONOMETER READING RECORD
OCTOBER 12, 1984
CALAVERAS ASBESTOS LTD.
COPPEROPOLIS, CALIFORNIA

000056

Manometer Reading Record

Date 14-12-81

Time 11:55

Boothouse Location	Compartment	Reading at Left Side	Reading at Right Side	Inches of Oil	Conversion Factor	Pressure Drop		Notes
						Inches of H ₂ O	Maximum Fed. Soap	
Mill	1	2 3/4	2 5/8	5.375	0.826	4.427	4	
	2	2 3/4	2 5/8	5.375		4.437	4	
	3	2 1/2	2 5/8	5.125		4.223	4	
	4	2 3/4	2 7/8	5.625		4.646	4	
	5 1/2	2 7/8	2 3/4	5.625		4.646	4	
	6	2 7/8	3	5.875		4.835	4	
	7	2 7/8	2 3/4	5.625		4.645	4	
	1A	2 1/8	2 1/8	4.25		3.413	4	
	2A	2 1/8	2 1/8	4.25		3.413	4	
	3A	2 1/4	2 1/4	4.75		3.922	4	
	4A	2 1/4	2 1/4	4.75		3.920	4	
Vertical Dryer	MX-1 & MX-2	2	1 7/8	3.875		3.200	4	
Rotary Dryer	MX-3 & MX-4	2 1/8	2 1/4	4.375		3.615	4	
Dryrock Storage	MX-5 & MX-6	2	1 7/8	3.875		3.200	4	
Ore Prep	BHA	2	2 1/8	4.125		3.407	4	
	BHB	1 5/8	1 5/8	3.875		3.200	4	
Ore Prep	BHC	2 3/8	2 3/4	5.625		4.645	4	
	Comp. 1	2 1/4	2 5/8	4.625	1.1MM	4.625	4	
	Comp. 2	2 3/4	2 5/8	5.0		4.1	4	
	Comp. 3	2 1/2	2 3/4	5.375		4.251	4	
	Comp. 4	2 1/4	2 3/8	4.625		4.625	4	

000057

APPENDIX D

**BAGHOUSE PRESSURE DROP READINGS
TAKEN DURING OCTOBER 30, 1984 INSPECTION
CALAVERAS ASBESTOS LTD.
COPPEROPOLIS, CALIFORNIA**

000058

Manometer Reading Record

Date 10/20/89

Time _____

Taken by: F. R.

Boothhouse Location	Compartment	Reading at Left Side	Reading at Right Side	Inches of Oil	Conversion x Factor	Pressure Drop		Notes
						Inches of H ₂ O	Maximum Fed. Spec.	
<i>Mill Water</i>	1	3.7	3.6	7.3	0.826	6.0	4	
<i>Rock</i>	2	3.4	3.4	6.8	1	5.6	4	
	3	3.2	3.1	6.3		5.2	4	
	4	3.0	3.0	6.0		5.0	4	
<i>Feder Crane</i>	5 1/2	3.6	3.6	7.2		5.9	4	
	6	2.8	2.8	5.6		4.6	4	<i>after cleaning</i>
	7	3.5	3.5	7.0		5.8	4	
<i>Heart Hopper</i>	1A	3.2	3.1	6.3		5.2	4	
	2A	(0) 2.6	(0) 2.6	(during cleaning) 5.2		4.3	4	<i>after cleaning</i>
	3A	3.5	3.5	7.0		5.8	4	
	4A	3.3	3.3	6.6		5.5	4	
<i>Vertical Dryer</i>	MK-1 & MK-2	2.3	2.3	4.6		3.8	4	
<i>Story Dryer</i>	MK-3 & MK-4	1.8	1.8	3.6		3.0	4	
<i>Dryrock Storage</i>	MK-5 & MK-6	1.3	2.6	3.9		3.2	4	<i>manometer not filled</i>
<i>Ore Prep</i>	BHA						4	
<i>Ultrafine House</i>	BHB						4	
<i>Ore Prep</i>	BHC						4	
	Comp. 1				1.000		4	
	Comp. 2						4	
	Comp. 3						4	
	Comp. 4						4	

000059

APPENDIX E

COPY OF TYPICAL WEEKEND MAINTENANCE LOG SHEET
CALAVERAS ASBESTOS LTD.
COPPEROPOLIS, CALIFORNIA

000060

WEEKEND MAINTENANCE

DATE 7-1-84

OFF

Ron

Job	Job Description	Comp.	Mechanic's Names
1	Vacuum Baghouse	yes	Jack
2	Replaced 12 Bags in baghouse	yes	Jack & John
3	die check m.k. 1 & 2	yes	Jack John
4	Replaced 19 horns in m.k. 2	yes	Jack & John
5	Replaced Bearing in m.k. 4	yes	Jack & John
6	checked all Bearings	yes	Jack & John
7	O.P. Bearing Check	yes	Tom & Mark
8	Repair Radiator on 484	yes	Tom
9	Replaced 34 Bags in Baghouse C.	yes	Tom & Mark
10	Vacuum baghouse A.P.C.	yes	Tom & Mark
11			
12			
13			
14			
15			
16			
17			
18			
19			
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23			
24			
25			

000001

APPENDIX F

**CALAVERAS ASBESTOS LTD.
PHOTOS
OCTOBER 30, 1984
COPPERPOLIS, CALIFORNIA**

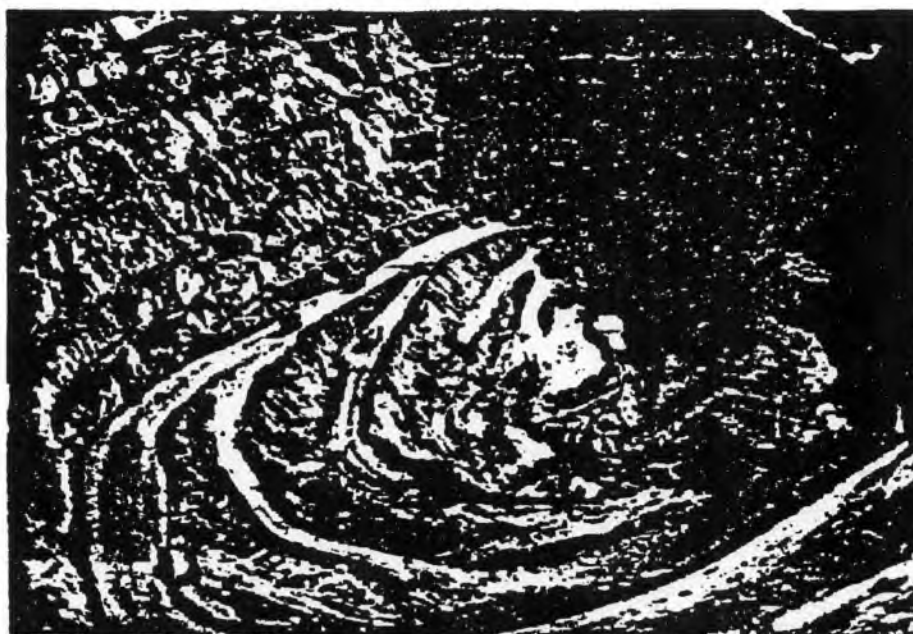
000062

Appendix F
 PHOTO LOG
 CALAVERAS ASBESTOS LTD.
 Copperopolis, California
 October 30, 1984

Picture Number	Description
1 through 6	Sequence of pictures of open pit mine taken from NW edge of pit.
7	Blasting of asbestos ore from SE edge of pit.
8 (not printed)	Blast dust plume from SE edge of pit.
9 (not printed)	Blast dust plume from SE edge of pit.
10	Blast dust plume from SE edge of pit.
11	#2 catch basin at edge of mine tailing pile next to Stanislaus River.
12	#3 catch basin of mine tailing pile.
13	Mine tailing pile next to river.
14	Emergency spillway for dam north of pit. Taken from mine tailing pile.
15	Reject rock being dumped into truck.
16	Baghouse B exhaust and conveyor or OP-1 in ore preparation area.
17	Baghouse A exhaust and conveyor belt OP-6 in background feeding reject belt.
18	E-5 head pulley, water screw 2 and E-5A tail pulley and water spray enclosure.
19	Long canyon catch basins #3, #2, #1 (can't be seen), #3 in foreground. Catch basins are for mill tailings piles.
20	Long canyon catch basins #3, #2, #1. #1 can't be seen very well. SE end of property by Stacker #3.
21	E-5C head pulley to Stacker #3. Stacker #3 to pile.
22	Horizontal dryer.
23	Baghouse MK3-4 for horizontal dryer and collectors.
24	Dry rock storage air line (circular). Belts, E-3 and E-4 to dry rock storage E-6 from storage to mill.

000063

PHOTOS



#1



#2

000064



#3



#4

000065

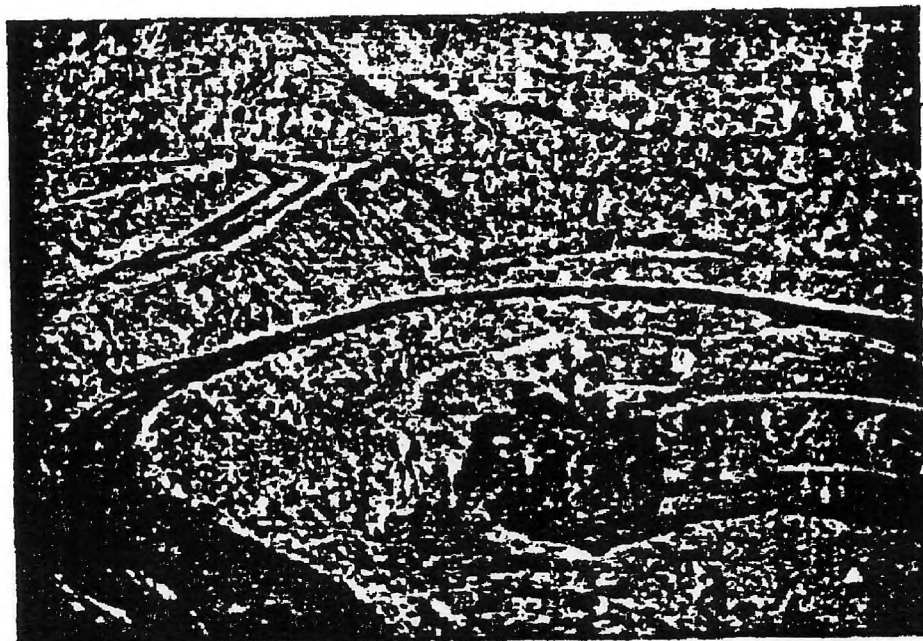
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07井



5井





#7

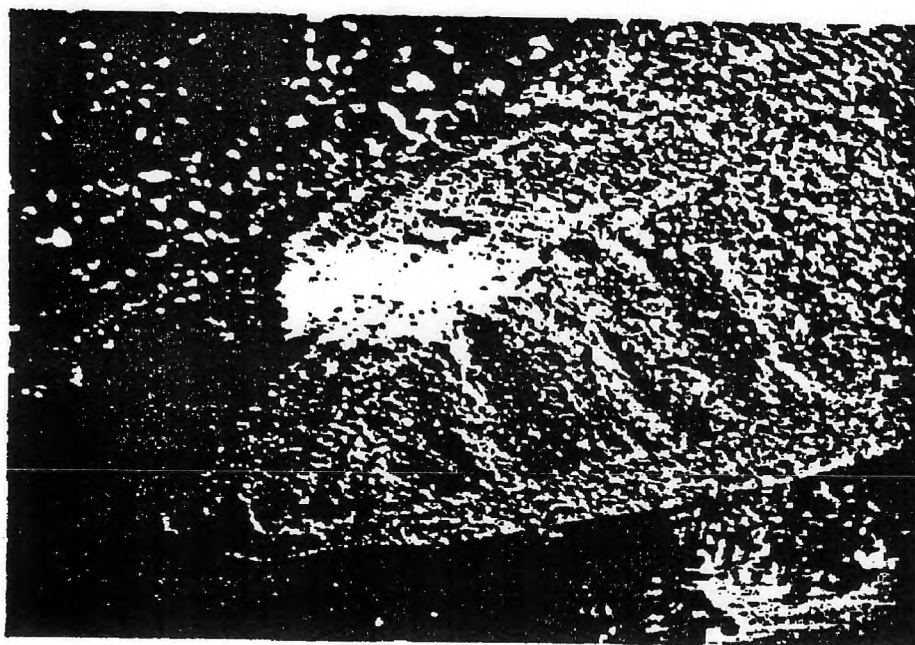


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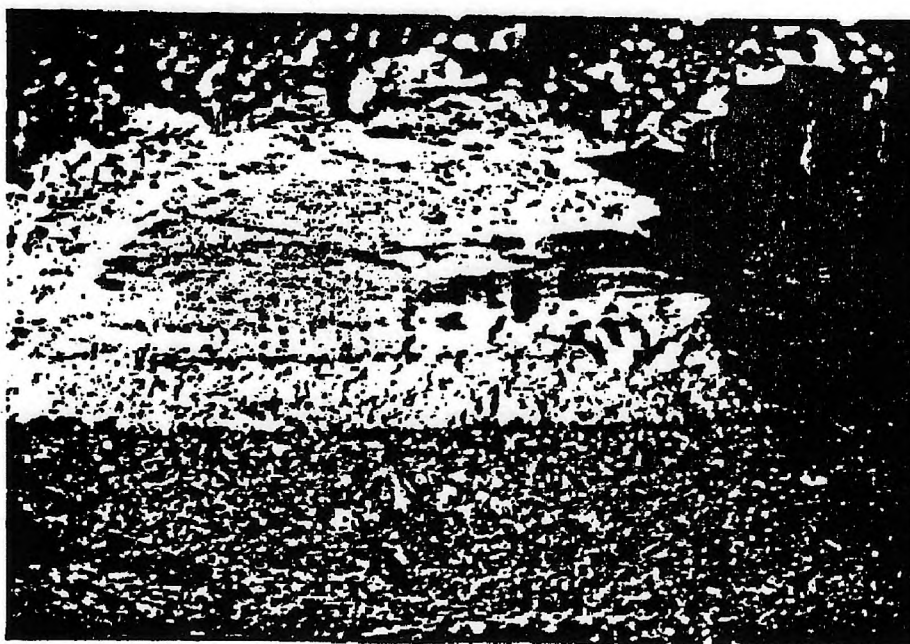
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890000

12



11





#13

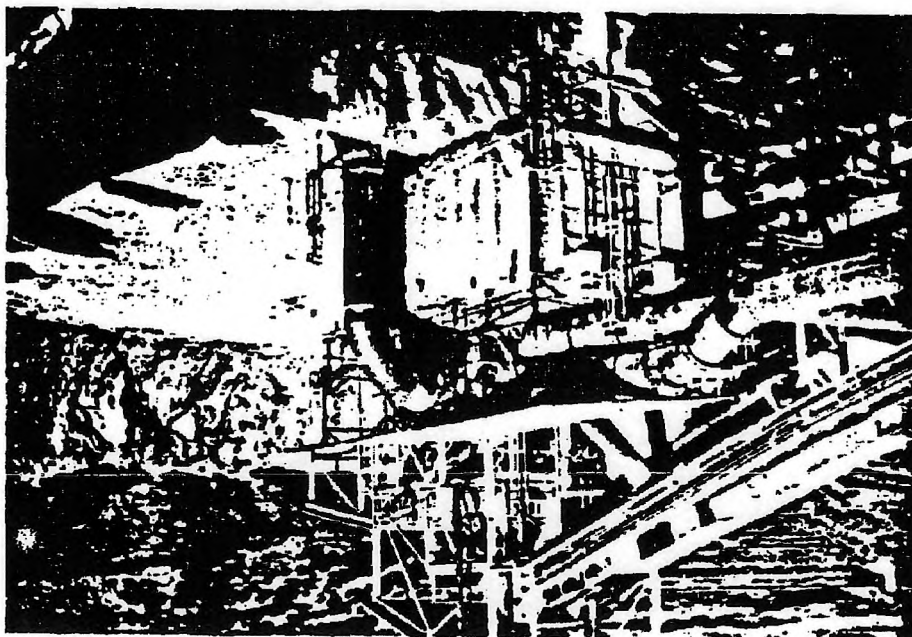


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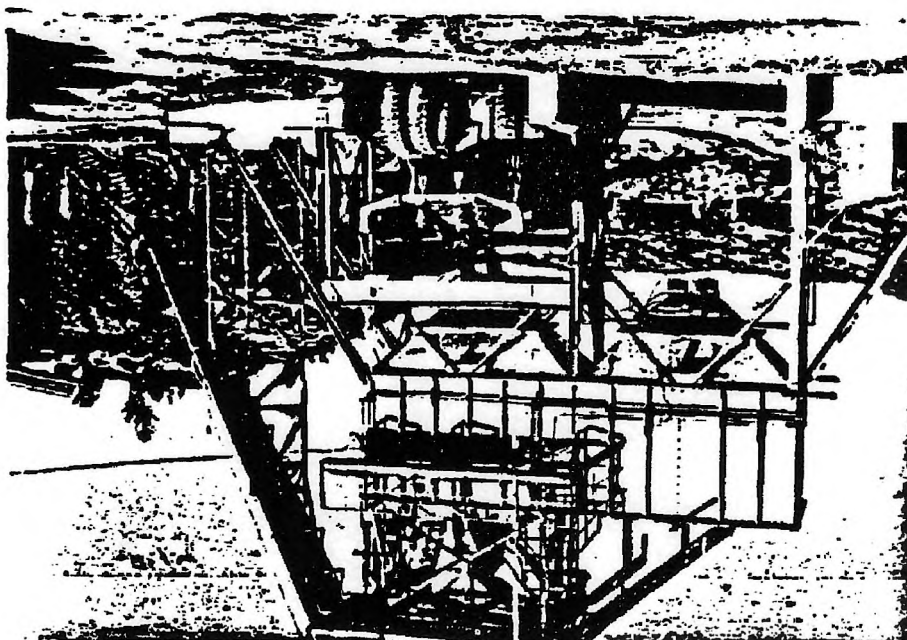
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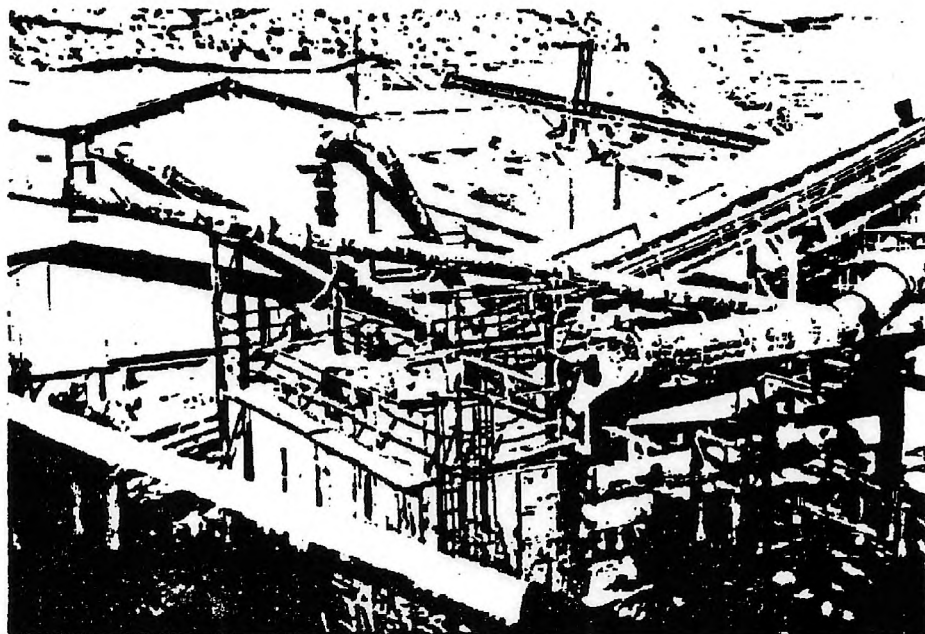
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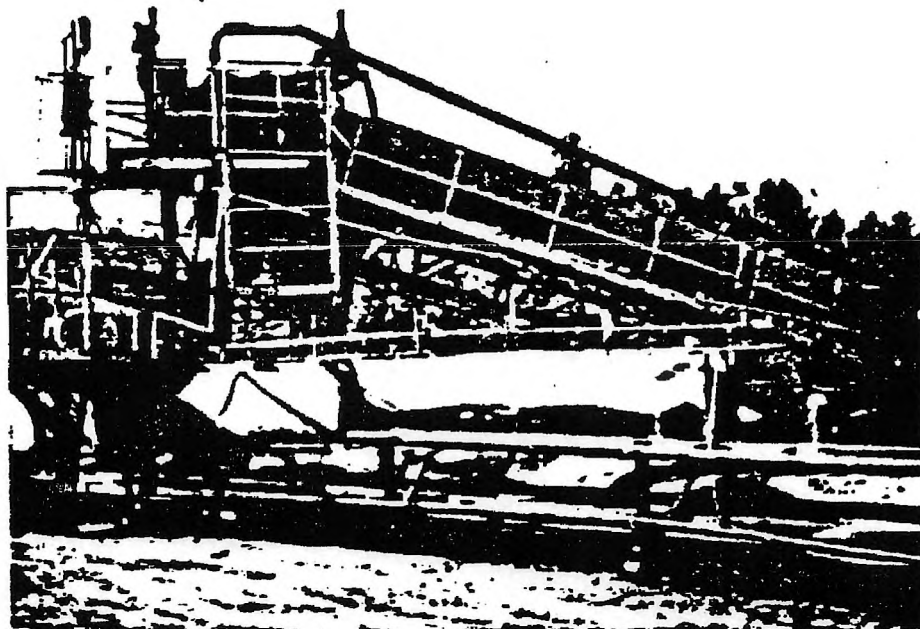


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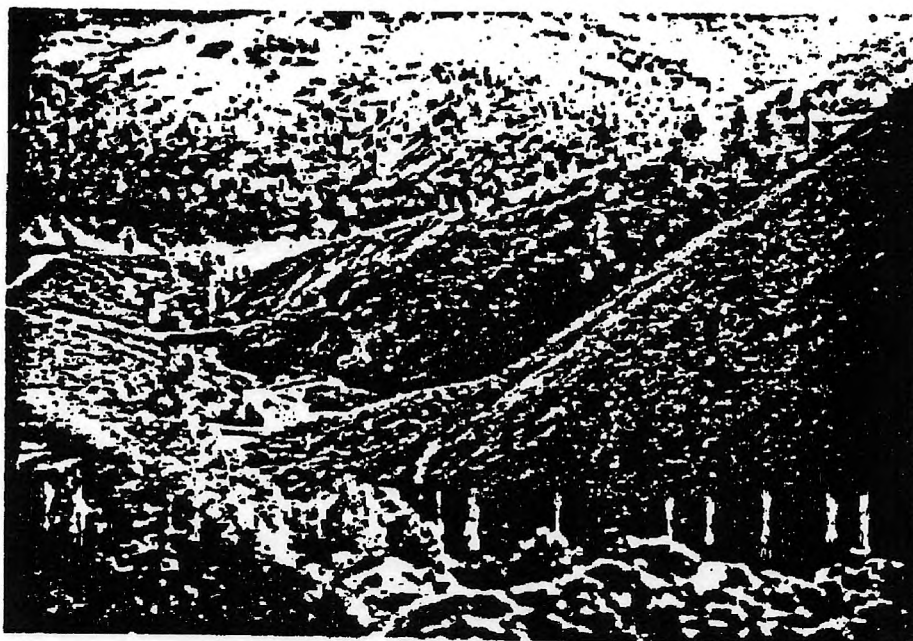




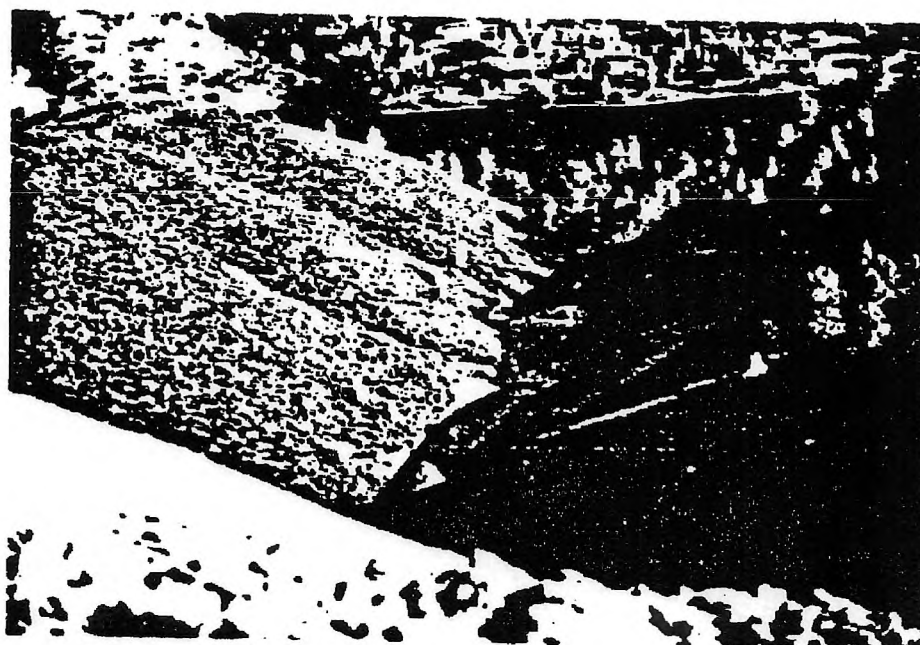
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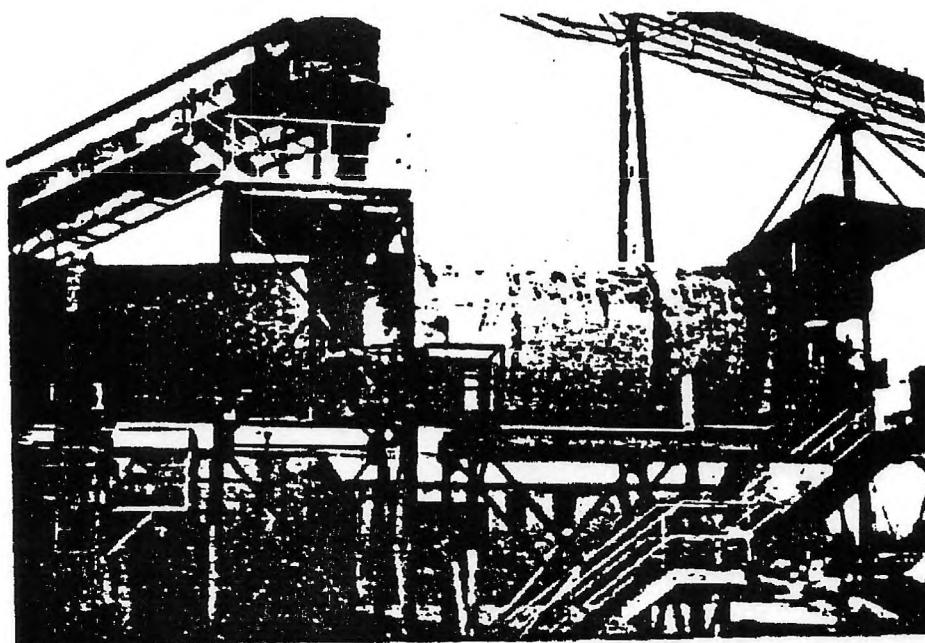
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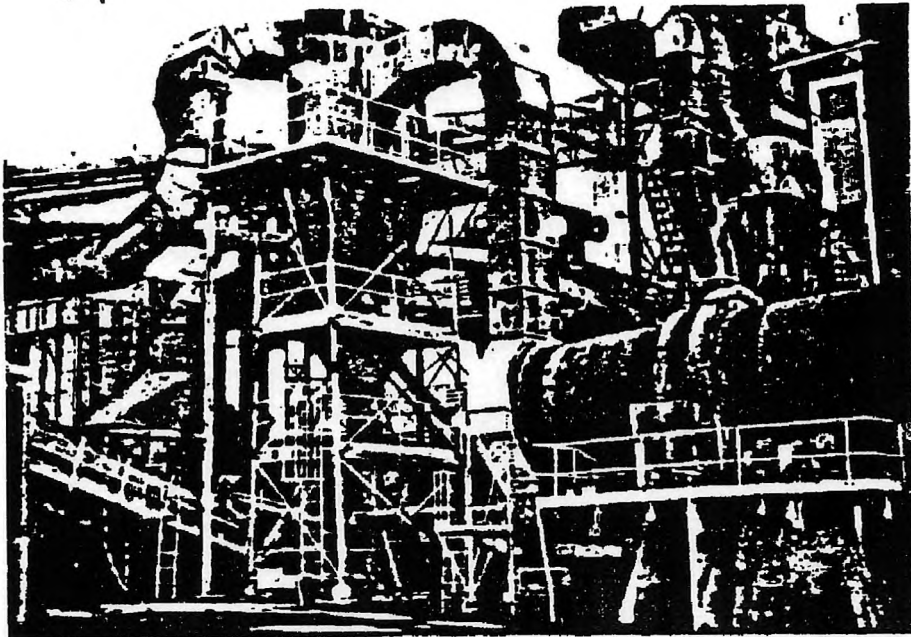
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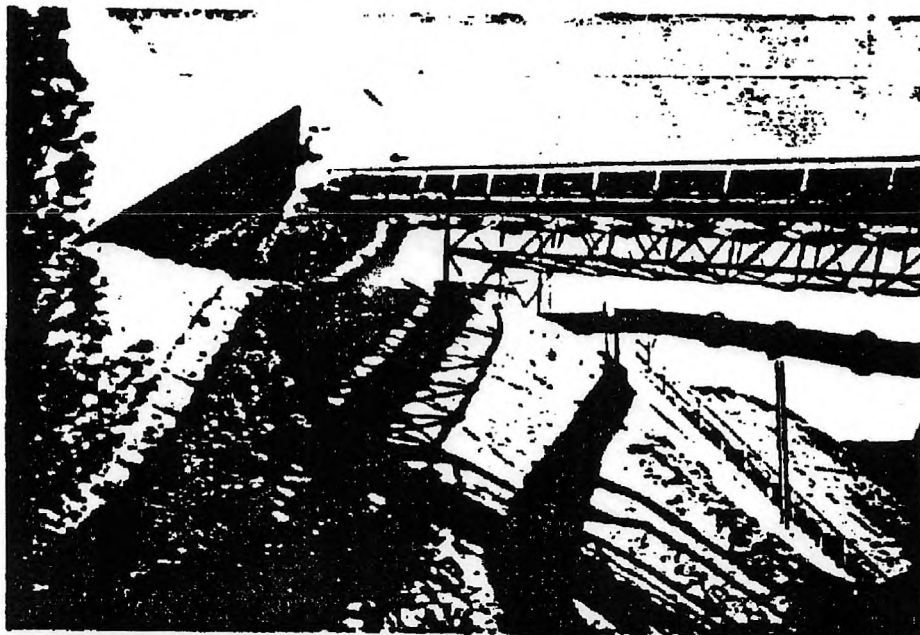
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#22



#23



#24