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Inter Office

Personnel and Organization Staff

Mr. H. R. Clemett, Manager
Arizona Proving Grounds

1 June 1983

cc R. C. Albertson
C. Phillips

R. M. Quarles
V. M. Ronchetto

Subject: Industrial Hygiene Study - Arizona Proving Grounds

As you requested, on May 2 and 3, 1983 an industrial hygiene study was conducted at the Arizona Proving Grounds to quantify employee asbestos exposure from brake evaluation operations and to perform an industrial hygiene audit of the facility.

SUMMARY AND RECOMMENDATIONS

Summary

- o Because of the location of exhaust pickup slots and flexible exhaust tubing, the ventilation for the brake grinder was insufficient. On-site modifications were made to correct the deficiencies.
- o The time-weighted average exposure (TWA) of employees performing brake grinding is less than the permissible occupational exposure limit (PEL) and medical monitoring limit for asbestos.
- o Even though no exposures were found in excess of the medical monitoring limit during this study and recent studies, exposures were found in 1973 and 1974 that were in excess of the medical monitoring limit and the short-term exposure limits (STEL). Recommendations were made at that time that technicians performing brake work should be placed on medical monitoring. That action was never taken.
- o Technicians were observed rebuilding asbestos brakes without using a vacuum cleaner to remove residual dust. When questioned about this practice, they replied that there was only one vacuum, and it is not always available.
- o Exhaust ventilation for potentially hazardous operations was evaluated and, with the exception of two seldom-used welding benches, the ventilation was adequate.
- o An inspection of the facility indicated potentially hazardous exposures were adequately controlled.

Recommendations

1. Based on employee exposure studies of 1973 and 1974, recommendations were made to place technicians who performed brake rebuilds, inspections or maintenance on medical monitoring. This recommendation became part of OSHA and Company directives in 1978 and must be implemented.
2. The two stationary welding benches in the garage maintenance shop should have exhaust air flows increased or not be used.
3. Technicians performing brake work on asbestos brakes must use vacuum method for dust cleanup. The purchase of an additional vacuum should be considered to insure that a vacuum is conveniently available.

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GENERAL DISCUSSION

Over the last 10 years industrial hygiene issues at the Arizona Proving Grounds have included:

- o Employee exposure to asbestos from brake evaluation and rebuilding operations
- o Employee exposure to asbestos from pipe and vehicle insulation
- o Dust exposure from truck durability tests
- o Carbon monoxide exposures from emission testing
- o Organic lead exposure at the fuel laboratory
- o Whole-body vibration exposure from light truck durability testing

Because of changes in tests conducted, only the asbestos brake exposure issue remains open. However, a walk-through audit and ventilation measurements were performed to assure that no new problems had developed.

Testing of asbestos brake linings has diminished as the Company is making an effort to eliminate asbestos from brake linings. Where it was relatively common to observe technicians in some stage of evaluation of asbestos brakes, it is now difficult to locate a test involving asbestos brake lining. Therefore, where technician exposure to asbestos was a daily occurrence, technicians now may not be exposed more than one hour per week.

The main purpose of our visit was to evaluate the Shephard Thomason brake grinder. The grinder was brought into the facility during March of this year for a special truck brake project. Employees who are required to operate the grinder immediately complained of excess dust concentration while grinding non-asbestos brakes and refused to operate the grinder on asbestos linings (see attached photo). The grinder was then modified, as recommended by the manufacturer, with a local exhaust system consisting of two high-efficiency vacuum cleaners.

When we first observed the grinder we measured poorly distributed exhaust air flows and noted the exhaust pickup slot was poorly located. In order to obtain uniform exhaust air flow in excess of good design criteria of 2000 feet per minute, the exhaust slot was relocated and the configuration of the two vacuum cleaners and their exhaust tubing changed. After this modification, it was then possible to obtain exhaust air flows of 2300 fpm and grind brake shoes without observing dust emissions.

A series of air samples were taken during and after completion of modifications to the grinder. The air samples were evaluated for total particulate, metals, and asbestos fiber concentration. These samples were breathing zone samples to determine short-term and time-weighted average exposures, and general air samples to determine background levels in the garage. Results of the air samples taken indicate exposure to total particulate, metals, and asbestos fibers are well below permissible limits.

A tear-down inspection of a vehicle with asbestos brake linings was also evaluated. During this inspection care is taken not to disturb the residual dust on the brake assemblies and drums. Results of the air sample taken during this operation were also less than the PEL, STEL, and medical monitoring limit for asbestos.

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Although results of air samples taken during this study and recent studies indicate concentrations of asbestos fiber are less than the medical monitoring limit, medical monitoring still must be done. In this case the decision for medical monitoring is based on results of air samples taken during 1973 and 1974 and the fact that technicians, if they don't observe proper procedures while working on asbestos brakes, may be exposed to asbestos fibers in excess of the medical monitoring limit. We were told medical monitoring was not initiated as we recommended in 1973 (see attached report). Medical monitoring for asbestos, which includes lung function and chest X-ray, must be implemented for technicians involved in the rebuilding, repair, or evaluation of asbestos brake linings. The monitoring must include individuals that perform these duties now and those who have performed these duties in the past.

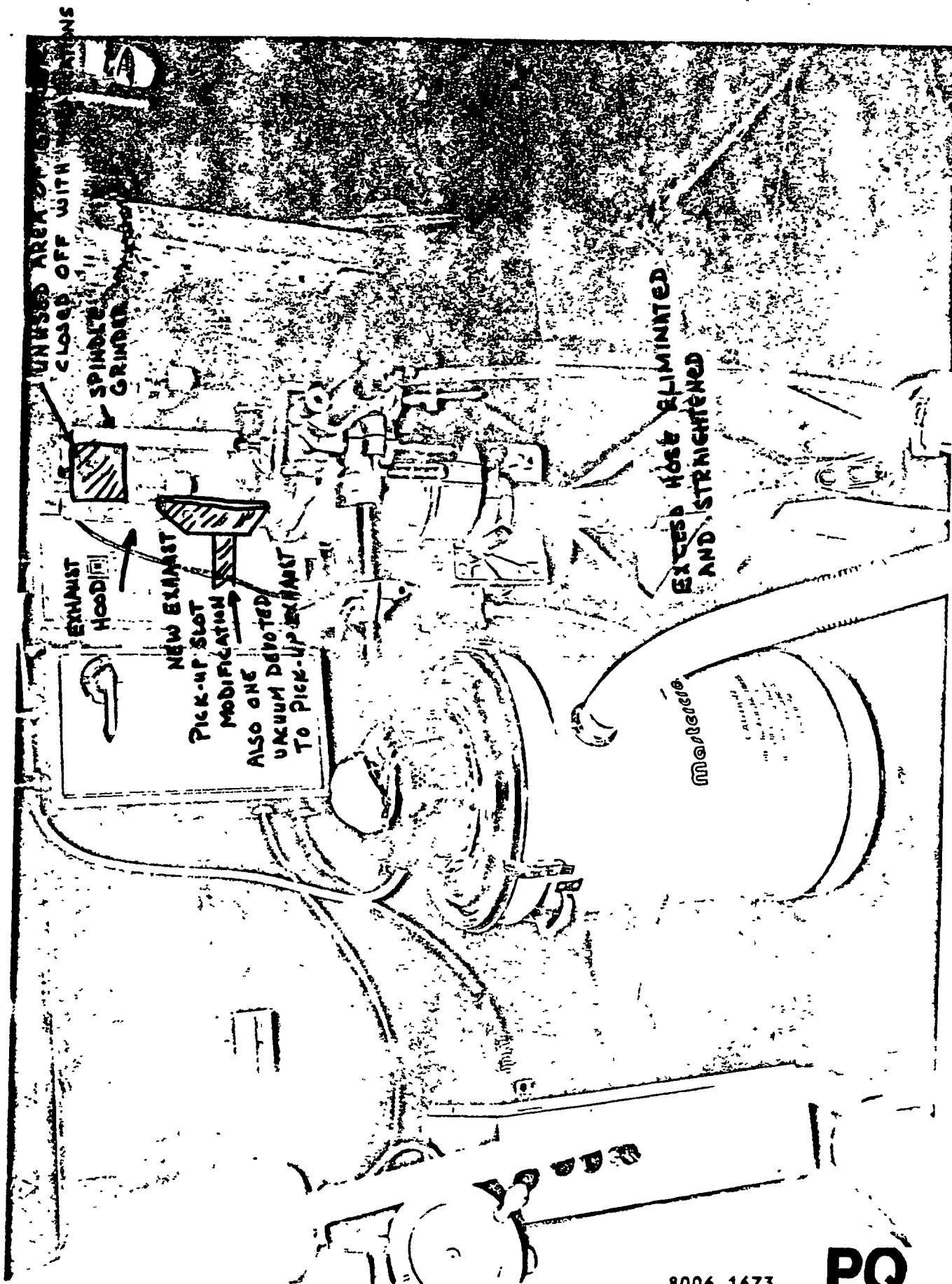
Because of the employee interest in asbestos and concurrent concern in Globe, Arizona of environmental asbestos contamination from mining, a sample of mine mill tailings from the Duval Mine was analyzed for metals and asbestos. These tailings are of interest because they are used as packed dirt in corrosion tests. Results of the analyses indicated no form as asbestos present and only traces of various metals.

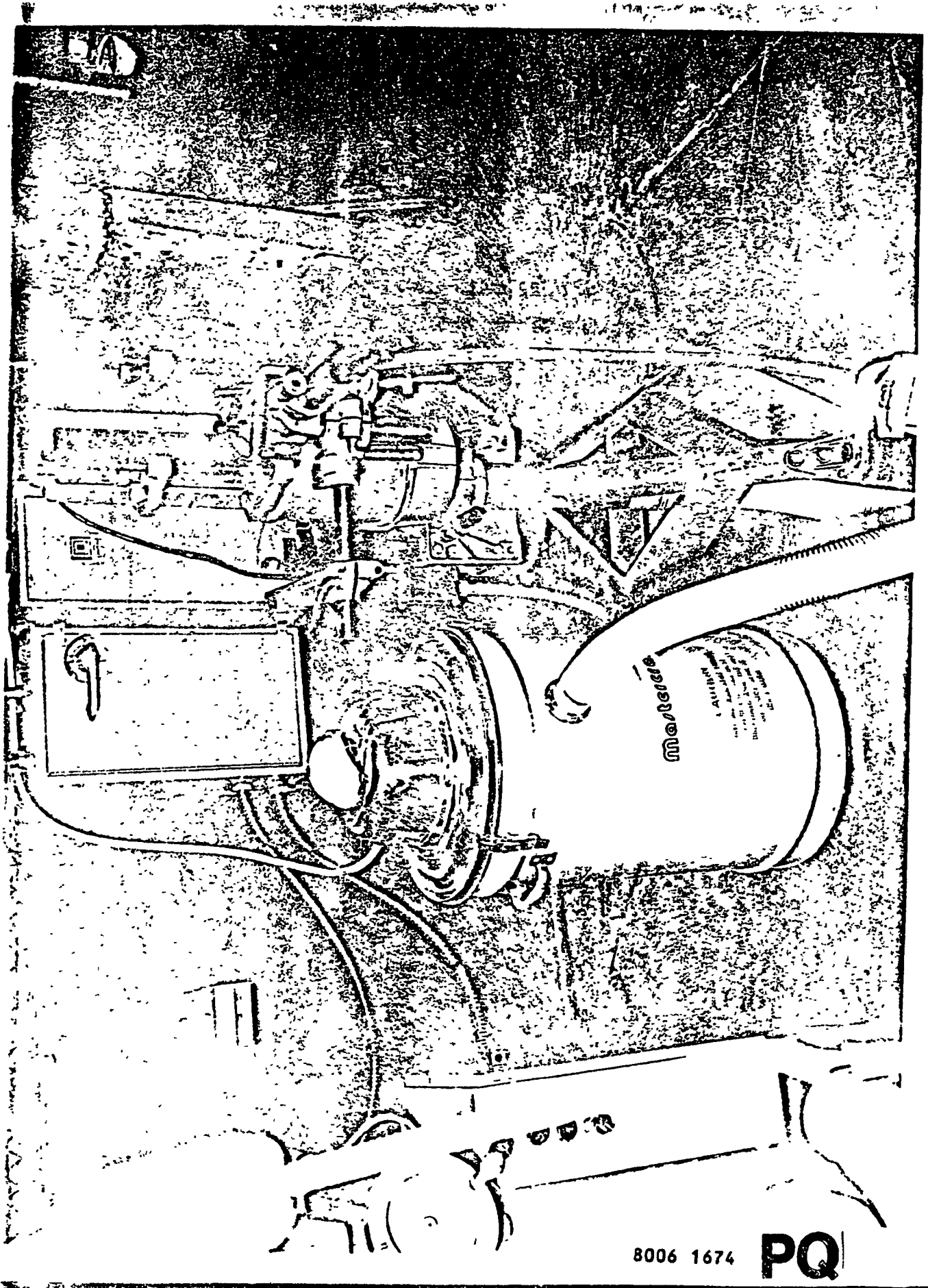


H. B. Lick, Senior Industrial Hygienist
Industrial Hygiene & Toxicology Department
Employee Health Services

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Attachments

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