

HEALTH HAZARD EVALUATION REPORT 72-117-53
HAZARD EVALUATION SERVICES BRANCH
DIVISION OF TECHNICAL SERVICES

Establishment : Cincinnati Branch Federal Reserve
Bank of Cleveland
Cincinnati, Ohio

Report Prepared By : Raymond L. Ruhe, Industrial Hygienist
Hazard Evaluation Services Branch
Cincinnati, Ohio

Field Evaluation : Raymond L. Ruhe, Industrial Hygienist

Laboratory Analyses: Leonard Limtiaco, Chemist
Physical and Chemical Analysis Branch
Division of Laboratory and Criteria Development

Originating Office : Jerome P. Flesch, Chief
Hazard Evaluation Services Branch
Cincinnati, Ohio

JUNE 1973

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45202

TABLE OF CONTENTS

	<u>Page</u>
I. Summary Determination	1
II. Introduction	3
III. Background Information	3
A. Standards	3
B. Toxic Effects	3
IV. Health Hazard Evaluation	4
A. Observational Survey	4
B. Environmental Evaluation	5
C. Medical Evaluation	7
D. Conclusions	7
V. Recommendations	7
VI. Tables	8

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
CINCINNATI, OHIO 45202

HEALTH HAZARD EVALUATION REPORT 72-117
CINCINNATI BRANCH, FEDERAL RESERVE BANK
OF CLEVELAND

JUNE 1973

I. SUMMARY DETERMINATION

A. Introduction

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative of employees to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The National Institute for Occupational Safety and Health (NIOSH) received such a request from an employer regarding exposure to lead and ink dusts generated in the mechanical destruction of U.S. currency and food coupons at the Cincinnati Branch, Federal Reserve Bank of Cleveland.

B. Federal Standards

Occupational health standards applicable to substances of this evaluation as promulgated by the U. S. Department of Labor (Federal Register Part II, 1910.93, Table G-2 and G-3) are:

<u>Substance</u>	<u>Standard^a</u>
Lead, and its inorganic compounds	0.2 mg/M ³
Nuisance dust, total	15.0 mg/M ³

^a Milligrams of substance per cubic meter of air based upon an 8-hour time weighted average concentration.

C. Environmental Evaluation Results

An observational survey of the operation was conducted on March 7, 1973 by a NIOSH industrial hygienist and a follow-up environmental medical evaluation conducted on April 5-6, 1973. Ten personal breathing zone air samples were collected during the associated currency and coupon destruction procedures. None of the samples produced concentrations in excess of the standards for nuisance dust and lead. Results for nuisance dust ranged from <0.6 to 14.0 mg/M³; and for lead from <0.004 to 0.017 mg/M³.

D. Medical Evaluation Results

Five employees who have worked in the destruction room were interviewed using a screening survey questionnaire for occupational illness. No symptoms or cases of illness obtained from the workers were job related.

E. Toxicity Determination

Based upon the results of the environmental study reported above, it has been determined that, under conditions found at the time of the survey, concentrations of lead and total nuisance dust were not toxic and do not constitute a hazard to the health of workers in the destruction room of Cincinnati Branch, Federal Reserve Bank of Cleveland. Various recommendations have, however, been made to management to assist them in further providing a more desirable working environment for all employees.

F. Distribution

Copies of this summary determination of the evaluation are available from the Hazard Evaluation Services Branch, National Institute for Occupational Safety and Health, U. S. Post Office Building, Room 508, 5th and Walnut Streets, Cincinnati, Ohio 45202. Copies have been sent to:

- a) Cincinnati Branch Federal Reserve Bank of Cleveland
- b) U. S. Department of Labor, Region V

For purposes of informing the approximately 25 "affected employees", the employer will promptly "post" the summary determination in a prominent place near where affected employees work for a period of 30 calendar days.

II. INTRODUCTION

Section 20(a)(6) of the Occupational Safety and Health Act of 1970, 29 U.S.C. 669(a)(6), authorizes the Secretary of Health, Education, and Welfare, following a written request by any employer or authorized representative of employees to determine whether any substance normally found in the place of employment has potentially toxic effects in such concentrations as used or found.

The National Institute for Occupational Safety and Health (NIOSH) received such a request from an employer at the Cincinnati Branch, Federal Reserve Bank of Cleveland, 150 East Fourth Street, Cincinnati, Ohio.

In September of 1972 the Cincinnati Branch of the Federal Reserve Bank (FRB) of Cleveland moved into its new modern facility at 150 East Fourth Street, Cincinnati, Ohio. In this facility the F.R.B. uses a new process for destroying unfit United States currency and cancelled United States food coupons. A concern was expressed regarding the potential exposure to lead and other compounds found in the inks that are used for printing U. S. currency and food coupons when the material is destroyed.

III. BACKGROUND HAZARD INFORMATION

A. Federal Standards

The Occupational Health Standards as promulgated by the U. S. Department of Labor (Federal Register, Part II, 1910.93, Tables G-2 and G-3) applicable to substances of this evaluation are as follows:

<u>Substance</u>	<u>Standard</u>
Lead and its inorganic compounds	0.2mg/M ³ *
Dust (nuisance)	15 mg/M ³ *

* Eight-hour time-weighted average concentration in milligrams of particulate per cubic meter of air

B. Toxic Effects

Lead and Its Inorganic Compounds

Lead poisoning may be acute or chronic. The symptoms of acute lead poisoning are experienced by a burning sensation in the mouth, stomach pain, nausea, vomiting, and constipation and diarrhea.

However, most cases of lead poisoning in industry are of a chronic nature. Chronic lead poisoning is slow and vague in its beginnings and the signs and the symptoms are not well defined. No one symptom indicates the occurrence of lead poisoning. At first, one may experience a general ill-feeling, fatigue, exhaustion, irritability, loss of weight and appetite, or vague abdominal discomfort. These symptoms may be followed by more severe stomach pain, constipation and sleep disturbance. Occasionally workers may notice a blue discoloration of their gums. In advanced stages of chronic lead poisoning, several body functions and organs such as the liver and kidney may be affected. Since the signs and symptoms of lead poisoning are usually vague and not well defined, if workers exposed to lead show any evidence of disturbance of the digestive system, muscle pain, stiffness in joints, general weariness or weight loss, they should seek the attention of a physician for his evaluation.

Dust (Nuisance)

Nuisance dusts are called biologically "inert" but the latter term is inappropriate to the extent that there is no particulate which does not evoke some cellular response in the lungs when inhaled in sufficient amounts.¹ Excess amounts of these dusts in the workroom air may seriously reduce visibility, may cause unpleasant deposits in the eyes, ears and nasal passages, or cause injury to the skin or mucous membranes by chemical or mechanical action per se or by vigorous cleansing procedures necessary for their removal.

IV. HEALTH HAZARD EVALUATION

A. Initial Visit - Observational Survey

An initial hazard evaluation survey of the Cincinnati Branch, Federal Reserve Bank of Cleveland was made on March 7, 1973 by the National Institute for Occupational Safety and Health representative Mr. Raymond L. Ruhe. The function of the National Institute for Occupational Safety and Health and its relation to Section 20(a)(6) of the Occupational Safety and Health Act of 1970 was explained to Messrs. Jerry S. Wilson, Assistant Vice President, and Richard P. Oettinger, Building Director.

Messrs. Wilson and Oettinger assisted in completing the National Surveillance Network Questionnaire.

¹ ACGIH: Documentation of TLV, 3rd Ed., P. 190, 1971.

A tour of the destruction room was made. The destruction room is located in the basement of the building and covers 1,387 square feet of space. The floor is cement, the walls are acoustical ceramic tiles and the ceiling is a vinyl acoustical tile. The following equipment is located in the destruction room: A "Jay Bee Paper Disintegrator", Mmaren Baler, and a J. B. Sedberry 32 Bag Dust Collector. The alleged potential health hazard was identified as exposure to dust and lead from printing inks used in U. S. currency and food coupons. The potential exposure occurs when the currency and food coupons are destroyed. The process is accomplished by placing unservicable material on a conveyor belt and fed into a hammer mill where it is mangled. The hammer mill is completely enclosed and ventilated. Two bulk samples were collected, one from the crushed U. S. currency and another from crushed food coupons.

Two service men operating the baler are exposed for a period of one hour three days per week and two hours the other two days. In addition, twenty-three clerical employees are exposed one hour each day on a rotating basis.

Normally two service men, two custodians and one destructor work in the destruction room when currency and food coupons are destroyed. Destruction rate of currency is approximately 990 pounds per hour. The food coupons were destroyed at the rate of 1,150 pounds per hour. One bale 22" x 16" x 60" and weighing 80-100 pounds (depending on currency or food coupons) was discharged from the baler every twelve minutes.

B. Environmental Evaluation

A total of ten personal samples for total dust and lead were collected during the day shift on April 5-6, 1973. Unserviceable U.S. currency and food coupons were destroyed during the sampling period. Sampling time ranged from 50 minutes to one hour and twenty minutes. Employees' exposures to airborne dust were monitored with personal monitor air sampling equipment which samples air in close proximity to the employee's actual breathing zone. MSA Model G battery powered vacuum pumps were used to draw air through open-face Millipore Air Monitors fitted with analytically preweighted, 37 mm type AA, 0.8 micrometer pore size cellulose filters. Air sampling rates were maintained at two (2) liters per minute. Filter monitors were attached to workers in an inverted orientation at the lapel or collar.

The air samples were analyzed by the Division of Laboratories and Criteria Development, NIOSH in Cincinnati. The analysis for total dust was done by taking the difference in weights (sample + filter - weight of filter). After total weights were determined, they were then treated with distilled (HNO₃) Nitric Acid for lead analysis employing atomic absorption spectrophotometry.

Results

None of the ten samples collected exceeded the Federal Standards for either nuisance dust or lead. In nine of the ten filter samples, a weight difference could not be detected, i.e. less than 0.1 mg, so that the resultant air concentration levels were less than 0.6 mg/M^3 for nuisance dust. The one measurable sample produced a concentration of 14.0 mg/M^3 for total dust; the associated lead concentration for this sample was 0.017 mg/M^3 . All other samples for lead were below 0.004 mg/M^3 .

The one detectable sample was worn by the service man operating the baler and performing clean-up operations. This exposure to dust occurs when the baler operator manually collects the destroyed unservicable material which has fallen on the floor from the baler. The operator collects and manually breaks the crushed material into fine pieces. The small fine pieces are placed in a plastic bag and recycled through the baler. This operation is performed without the aid of ventilation. Because good industrial hygiene practice precludes direct contact with an operation without any protective control this phase of the currency and coupons destruction was discouraged after the first day of sampling. On the second day of sampling this practice was stopped and the air dust level on the service man was greatly reduced.

Ventilation measurements were obtained at the "Jay Bee Paper Disintegrator" air inlet with an Alnor Jr Velometer. The average face velocity was 700 feet per minute (FPM) both days, which is adequate to control paper dust at the custorians and destructor work areas. The Alnor Jr Velometer was calibrated prior to taking the readings.

At the time of the survey the temperature was 78°F . with a relative humidity of 38 per cent on both days, April 5-6, 1973.

Noise

It has been determined that "substances" as presently defined in Section 20(a)(6) of the Act do not include physical agents. However, for completeness of our overall responsibilities for acknowledging any occupational health hazards encountered during an evaluation of a place of employment, the following noise survey is reported.

The standard for occupational noise exposure as published in the Federal Register, Part II, 1910.95, Table G-16, is shown in Table I. Sound levels were measured with a General Radio Company Permissible Sound Level Meter. Type 1565-B in dBA with a slow response and are summarized in Table II of this report. The sound level results are at various locations inside the destruction room, and no 8-hour evaluation of any employees' total integrated exposure to noise was accomplished.

The fact that ear protectors were worn for the operation was not taken into consideration in calculating noise exposure. It can be assumed that exposures of those persons making proper use of prescribed ear protection were materially reduced.

C. Medical Evaluation

Five employees who have worked in the destruction room were interviewed using the screening survey questionnaire (see appendix) for occupational illness. No symptoms or cases of illness were obtained from workers interviewed which were job related.

D. Conclusions

Based on the environmental and medical findings resulting from this survey, it is concluded that the alleged hazard to lead and total nuisance dust from printing inks when U. S. currency and food coupons are destroyed does not exist, and that the substance found in the work place had no toxic effects in such concentrations as were used or found at the time of the survey.

V. RECOMMENDATIONS

The following recommendations are submitted to management to obviate the potential hazard from exposure to noise levels, and to provide a more desirable working environment for all personnel.

1. Reduce noise levels below the Federal Standard by instituting engineering control methods where feasible.
2. Continue to provide and encourage workers to wear properly-fitted hearing protection devices until the high noise level is eliminated, or where it is not feasible to control the high noise levels by engineering methods.
3. The clean-up operation at the baler should be performed by instituting vacuum sweeping methods.

TABLE I
PERMISSIBLE NOISE EXPOSURES*

<u>Duration Per Day, Hours</u>	<u>Sound Level dBA Slow Response</u>
8	90
6	92
4	95
3	97
2	100
1½	102
1	105
½	110
¼ or less	115 Ceiling Value

* When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. If the sum of the following fractions: $C_1/T_1 + C_2/T_2 + C_n/T_n$ exceeds unity, then the mixed exposure should be considered to exceed the limit value. C_n indicates the total time of exposure at a specified noise level, and T_n indicates the total time of exposure permitted at that level.

Exposure to impulsive or impact noise should not exceed 140dB peak sound pressure level.

TABLE II

SUMMARY NOISE MEASUREMENTS

Food Coupons - 4/5/73

<u>Location</u>	<u>Sound Level dBA</u>
Custodian Platform	93-96
Hammer Mill (3" from mill)	107
Hammer Mill (2' from mill)	101
Baler Area	92
End of Baler near the disintegrator	96
Entrance to Destruction Room	92
Dust Collector Area	83
Background in Room before Disintegrator is turned on	45

U. S. Currency - 4/6/73

Custodian Platform	96-100
Hammer Mill (3" from mill)	107
Hammer Mill (2' from mill)	101
Baler Area	92
End of Baler near the Disintegrator	93
Entrance to Destruction Room	92
Dust Collector Area	87
Background in Room before Disintegrator is turned on	45

NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
SCREENING QUESTIONNAIRE FOR OCCUPATIONAL ILLNESS

PLANT NAME _____
ADDRESS _____
PHONE _____

NAME _____ AGE _____ SEX _____ HOME TEL. _____

HOME ADDRESS _____
Street _____ City _____ State _____ Zip Code _____

WORK AREA _____ JOB (Describe) _____ SHIFT _____

DURATION OF EMPLOYMENT: _____ TIME ON PRESENT JOB: _____

1. Have you had any health problems or complaints since employed here? Yes _____ No _____

Describe (use back if additional space needed) _____

2. Did you have a similar problem(s) before starting work here? Yes _____ No _____

3. Does this problem(s) improve or disappear when you are away from the job?
(circle whether improves or disappears)

Yes _____ No _____

If Yes, how long until this improvement occurs?

- (a) Overnight _____
- (b) Over the weekend _____
- (c) On vacations _____

4. Have you consulted a physician regarding this problem? Yes _____ No _____

If Yes, Physician's name and address: _____

5. Do you or your physician think this problem(s) is related to your work?

Yes _____ No _____

If Yes, what do you think is causing the problem? _____
