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**ENVIRONMENTAL
PROTECTION
AGENCY**

**IDENTIFICATION OF
PRODUCTS AS MAJOR
SOURCES OF NOISE**

**Pavement Breakers and Rock Drills,
Report**

ENVIRONMENTAL PROTECTION AGENCY

(PRL 663-3)

IDENTIFICATION OF PRODUCTS AS MAJOR SOURCES OF NOISE: PAVEMENT BREAKERS AND ROCK DRILLS

Report

The Noise Control Act of 1972 (PL 92-574, 86 Stat. 1234) established a National Policy "to promote an environment for all Americans free from noise that jeopardizes their health or welfare." To further this policy, the Noise Control Act provides for a mechanism to establish Federal noise emission standards for products distributed in commerce. The first step towards the promulgation of noise emission standards for a new product or product class is its identification as a major source of noise. Pursuant to section 5(b), "The Administrator shall, after consultation with appropriate Federal agencies, compile and publish a report or series of reports: (1) identifying products (or classes of products) which in his judgment are major sources of noise, and (2) giving information on techniques for control of noise from such products, including available data on the technology, costs and alternate methods of noise control."

Section 5(a) (1) (c) specifies four categories of important noise sources:

1. Construction equipment;
2. Transportation equipment (including recreational vehicles and related equipment);
3. Any motor or engine (including any equipment of which an engine or motor is an integral part);
4. Electrical or electronic equipment.

On June 21, 1974 (39 FR 22207), the Administrator published the first report pursuant to section 5(b) (1). This report identified medium and heavy duty trucks and portable air compressors as major sources of noise and listed a number of other products as candidates for possible future identification. Final noise emission regulations have been promulgated for portable air compressors (41 FR 2162, January 14, 1976) and for medium and heavy duty trucks (41 FR 15538, April 13, 1976). On May 20, 1975 (40 FR 23069), a second report, pursuant to section 5(b) (1), was published. In this report, the following products were identified as major sources of noise: motorcycles, buses, wheel and truck loaders, wheel and track dozers, truck transport refrigeration units, and truck mounted solid waste compactors (special auxiliary equipment on trucks). In addition to the identification of the five specific products as major noise sources, the May 20, 1975 report served to give notice that other products were being considered as possible candidates for major noise source identification and subsequent regulatory action. Included in this listing were pavement breakers and rock drills.

APPROACH USED TO ASSESS ENVIRONMENTAL IMPACT

To accomplish the broad intent of the Noise Control Act of 1972, the EPA has developed an overall framework for as-

sessing the environmental impact of all the sources of environmental noise. The first step of this development was the Title IV report ("Report to the President and Congress on Noise, 92d Congress 2d Session, February 1972"), which provided an initial data base on noise reduction technology, appropriate to various product types, environmental noise levels and criteria related to public health and welfare. The second step was the publication of the "Criteria Document" ("Public Health and Welfare Criteria for Noise", EPA, July 27, 1973) as required by section 5(a) (1) of the Noise Control Act of 1972. The third step was the publication of the "Levels Document" ("Information on Levels of Environmental Noise Regulate to Protect Public Health and Welfare with an Adequate Margin of Safety", EPA, March 1974) as required by section 5(a) (2).

The levels identified in the "Levels Document" are based on the risks to public health and welfare from noise pollution without regard for cost or technical feasibility. To identify the levels, EPA selected two cumulative energy measures for quantifying noise exposures that can be related to human responses.

1. *Leq*, the A-weighted equivalent sound level (the source level in dBA conveying the same sound energy as the actual time-varying sound during a given period) was selected as a descriptor of noise relative to long-term hazard to hearing.

2. *Ldn*, the day-night average sound level (the 24 hour *Leq* with a 10 dBA penalty applied to the period from 10 p.m. to 7 a.m.) was selected as a descriptor of noise relative to interference with human activities, e.g., speech communication, sleep, and other factors that may lead to annoyance.

An abbreviated summary of the levels of noise requisite to protect public health and welfare is given in Table 1.

TABLE 1.—Noise levels protective of health and welfare
(in decibels)

Human response	<i>Leq</i>	<i>Ldn</i>
Hearing loss (5 h)	75	
Hearing loss (24 h)	70	
Outdoor interference and annoyance		55
Indoor interference and annoyance		45

BASIS FOR THE IDENTIFICATION OF MAJOR NOISE SOURCES

In determining whether a product (or class of products) is a major noise source for regulation under section 6 of the Act, the Administrator considers primarily the following factors:

1. The intensity, character and/or duration of the noise emitted by the product (or class of products) and the number of people impacted by the noise;

2. Whether the product, alone or in combination with other products, causes noise exposure in defined areas under various conditions, which exceed the levels requisite to protect the public health and welfare with an adequate margin of safety;

3. Whether the spectral content or temporal characteristics, or both, of the noise make it irritating or intrusive, even though the noise level may not otherwise be excessive;

4. Whether the noise emitted by the product causes intermittent single event exposure leading to annoyance or activity interference.

PRELIMINARY IMPACT ASSESSMENT

It is estimated that over 27 million people are exposed to construction site noise levels that jeopardize their health and/or welfare. Since construction site noise is typically comprised of contributions from more than twenty different types of construction equipment, regulation of the majority of the pieces of equipment will be required to appreciably and effectively reduce overall site noise levels.

In some cases one piece of construction equipment is used to provide primary power to operate other pieces of equipment. Such is the case with the portable air compressor which provides compressed air to operate pneumatic pavement breakers and rock drills. Similarly, wheel and crawler tractors, trucks and other devices with integral hydraulic systems are used to provide hydraulic fluid under pressure to operate hydraulic pavement breakers and rock drills.

Portable air compressors and medium and heavy duty trucks are identified as the first pieces of construction equipment requiring noise emission control to foster the long-term reduction of construction site noise. It is anticipated that the noise emission regulations for new portable air compressors (41 FR 2162) and new medium and heavy duty trucks (41 FR 15538) will ultimately result in a reduction of between 25 and 35 percent in the adverse impact of construction site noise in terms of extensiveness (number of people exposed) and intensiveness (severity of exposure). It is further estimated that noise emission regulations currently under development for wheel and crawler tractors will reduce construction site noise impact by an additional 10-20 percent. Regulations that control the noise emissions of portable air compressors, crawler and wheel tractors, and medium and heavy trucks which contain hydraulic systems in effect result in the de facto control of noise emissions of major "power sources" for a range of equipment, thus, leaving only the "powered" machine to be addressed in terms of being a major source of noise.

Of the remaining construction machinery that have not yet been identified as major sources of noise, pavement breakers and rock drills, which emit noise as high as 103 dBA, at 7 meters, are second only to pile drivers in terms of their noise levels. The very substantial difference in machine population dictated that pavement breakers and rock drills be addressed first; prerogative studies of pile drivers are scheduled for FY 75.

Pavement breakers and rock drills are used in most types and phases of con-

NOTICES

6723

struction activity. Surveys have shown pavement breaker and rock drill usage to be highly prevalent in non-residential, industrial, and public works construction during clearing, excavation, and finishing phases of the activity. Their typical intermittent operation results in rather intense and objectionable short-term or single-event exposures which are generally perceived as highly disruptive and intrusive to the community. Furthermore, the impulsive character of the noise is found to be particularly irritating to the exposed population.

It is anticipated that reduction of the noise emissions from pavement breakers and rock drills, combined with reductions of noise from new trucks, portable air compressors, and wheel and crawler tractors will result in a 45 to 55 percent reduction in the extensiveness and severity of overall construction site noise impact on the population of the United States.

It is further estimated that operators of pavement breakers and rock drills can

be exposed to noise levels ranging from 90 to 120 dBA. Although a given operator may only operate a tool a few hours each day, he is generally in the immediate proximity of the tool during the full work shift. Inasmuch as operator usage of this equipment may range from 2 to 8 hours per day, such exposure presents a high risk of hearing loss and must be considered a severe health problem.

SUMMARY

The environmental noise impact due to pavement breakers and rock drills can be defined in terms of some 27 million people exposed to construction site noise levels that jeopardize their health and/or welfare, plus a number of operators that are subject to a risk of severe hearing loss. It is evident from preliminary studies that both the community and the equipment operator would derive great benefits from quieted pavement breakers and rock drills.

Accordingly, the EPA hereby identifies pavement breakers and rock drills as

major sources of noise in accordance with section 5(b)(1) of the Noise Control Act of 1972. Additional information, as prescribed in section 5(b)(2) of the Act, will include information on techniques for control of noise, available data on technology, associated costs and alternate methods of noise control.

In the development of regulations for pavement breakers and rock drills, possible noise labeling requirements pursuant to section 8 of the Act will be examined in addition to noise emission standards.

This report is issued under authority of the Noise Control Act of 1972, section 5(b)(1), 86 Stat. 1236, 42 U.S.C. 4904(b)(1).

Dated: January 19, 1977.

JOHN CHARLES,
Acting Administrator.

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