necessary only after the analyzer has not been used for 24 hours or longer.

Positions 3—50-ppm standard, freshly prepared.

Positions 4—500-ppm standard, freshly prepared.

Position 5—2000-ppm standard, freshly prepared.

Position 6—4000-ppm standard, freshly prepared.

Position 7—Sample No. 7 (This is the first sample of the day, but is given as 7 to be consistent with the turntable and the integrator printout.)

After all samples have been postitioned, insert the second set of 50-, 500-, 2000-, and 4000-ppm standards. Samples, including standards, must be conditioned in the bath of 90°C for 1 hour (not to exceed 5 hours).

8.3.4 Start Chromatograph Program. When all samples, including standards, have been conditioned at 90°C for 1 hour, start the analysis program according to the manufacturer's instructions. These instructions must be carefully followed when starting and stopping a program to prevent damage to the dosing assembly.

8.3.5 Determination of Total Solids (TS). For wet cake, slurry, resin solution, and PVC latex samples, determine TS for each sample by accurately weighing approximately 3 to 4 grams of sample in an aluminum pan before and after placing in a draft oven (105 to 110°C). Samples must be dried to constant weight. After first weighing, return the pan to the oven for a short period of time, and then reweigh to verify complete dryness. TS is then calculated as the final sample weight divided by initial sample weight.

9. *Calibration.*

Calibration is to be performed each 8-hour period when the instrument is used. Each day, prior to running samples, the column should be conditioned by running two 2000-ppm standards from the previous day.

9.1 Preparation of Standards. Calibration standards are prepared as follows: Place two drops of distilled water (with the use of an eyedropper) in the sample vial, then fill the vial with the VCM/nitrogen standard, rapidly seat the septum, and seal with the aluminum cap. Use a ⅛-in. stainless steel line from the cylinder to the vial. Do not use rubber or tygon tubing. The sample line from the cylinder must be purged (into a properly vented hood) for several minutes prior to fill the vials. After purging, reduce the flow rate to 500 to 1000 cc/min. Place end of tubing into vial (near bottom). Position a septum on top of the vial, pressing it against the ⅛-in. filling tube to minimize the size of the vent opening. This is necessary to minimize mixing air with the standard in the vial. Each vial is to be purged with standard for 90 seconds, during which time the filling tube is gradually slid to the top of the vial. After the 90 seconds, the tube is removed with the septum, simultaneously sealing the vial. Practice will be necessary to develop good technique. Rubber gloves should be worn during the above operations. The sealed vial must then be pressurized for 60 seconds using the vial pre-pressurizer. Test the vial for leakage by placing a drop of water on the septum at the needle hole.

9.2 Preparation of Chromatograph Calibration Curve.

Prepare two 50-, 500-, 2000-, and 4000-ppm standard samples. Run the calibration samples in exactly the same manner as regular samples. Plot A_s, the integrator area counts for each standard sample, versus C_c, the concentration of vinyl chloride in each standard sample. Draw a straight line through the points derived by the least squares method.

10. *Calculations.*

10.1 Response Factor. If the calibration curve described in section 9.2 passes through zero, a response factor, R_f, may be used to compute vinyl chloride concentrations. To compute a response factor, divide any particular A_s by the corresponding C_c.

$$R_f = A_s / C_c \qquad \text{Eq. 107-1}$$

If the calibration curve does not pass through zero, the calibration curve must be employed to calculate each sample concentration unless the error introduced by using a particular R_f is known.

10.2 Residual Vinyl Chloride Monomer Concentration, (C_{rvc}) or Vinyl Chloride Monomer Concentration. Calculate C_{rvc} in ppm or mg/kg as follows:

$$C_{rvc} = \frac{A_s P_a}{R_f T_1}\left[\frac{M_v V_g}{R m} + K_p (TS) T_2 + K_w (1 - TS) T_2\right] \qquad \text{Eq. 107-2}$$

Where:

A_s = Chromatograph area counts of vinyl chloride for the sample.

P_a = Ambient atmospheric pressure, mm Hg.

R_f = Response factor in area counts per ppm VCM.

T_1 = Ambient laboratory temperature, °K.

M_v = Molecular weight of VCM (62.5 g/mole).

V_g = Volume of the vapor phase, cm^3.

R = Gas constant (62360 cm^3 · mm Hg/mole · °K).

m = Sample weight, g.

K_p = Henry's Law Constant for VCM in PVC @ 90°C (6.52×10^{-6} g/g/mm Hg).

TS = Total solids expressed as a decimal fraction.

T_2 = Equilibrium temperature, °K.

K_w = Henry's Law Constant for VCM in water @ 90°C (7×10^{-7} g/g/mm Hg).

Assuming the following conditions are met, these values can be substituted into equation 107-2:

P_a = 750 mm Hg.

V_g = Vial volume—sample volume (Fisher vials are 22.0 cm^3 and Perkin-Elmer vials are 21.8 cm^3).

T_1 = 23°C or 296°K.

T_2 = 90°C or 363°K.

$$C_{rvc} = \frac{A_s}{R_f}\frac{750}{296}\left[\frac{(62.5)\ 21.8 - \frac{m(TS)}{1.36} - \frac{m(1-TS)}{0.9653}}{62360\ m} + 6.25\times10^{-6}(TS)(363) + 7.0\times10^{-7}(1-TS)(363)\right]$$

Results calculated using these equations represent concentration based on the total sample. To obtain results based on dry PVC content, divide by TS.

11. *References.*

1. Residual Vinyl Chloride Monomer Content of Polyvinyl Chloride Resins, Latex, Wet Cake, Slurry and Water Samples, B. F. Goodrich Chemical Group Standard Test Procedure No. 1005-E. B. F. Goodrich Technical Center, Avon Lake, Ohio, October 8, 1979.

2. Berens, A. R., "The Diffusion of Vinyl Chloride in Polyvinyl Chloride," ACS—Division of Polymer Chemistry, Polymer Preprints 15 (2): 197, 1974.

3. Berens, A. R., "The Diffusion of Vinyl Chloride in Polyvinyl Chloride," ACS—Division of Polymer Chemistry, Polymer Preprints 15 (2): 203, 1974.

4. Berens, A. R., L. B. Crider, C. J. Tomanek and J. M. Whitney, "Analysis for Vinyl Chloride in PVC Powders by Head—Space Gas Chromatography," to be published.

[FR Doc. 80-35850 Filed 11-17-80; 8:45 am]

BILLING CODE 6560-26-M

federal register

Tuesday
November 18, 1980

Part III

Department of Health and Human Services

Food and Drug Administration

Single-Entity Barbiturates; Class Labeling Guideline

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

[Docket No. 80D-0278]

Single-Entity Barbiturates; Class Labeling Guidance

AGENCY: Food and Drug Administration.

ACTION: Notice.

SUMMARY: The Food and Drug Administratiaon (FDA) is issuing a class labeling guideline for the professional labeling of prescription single-entity barbiturate drug products. Class labeling is appropriate for these products because they are all closely related in chemical structure, pharmacology, therapeutic activity, and adverse reactions. The guideline is intended to promote the use of identical professional labeling for each member of the single-entity barbiturate drug class.

DATE: Effective November 18, 1980, a person may adopt the class labeling guideline for single-entity barbiturate drug products and rely on it to meet the prescription drug labeling requirements.

ADDRESS: Written comments to the Hearing Clerk (HFA-305), Food and Drug Administration, Rm. 4-62, 5600 Fishers Lane, Rockville, MD 20857.

FOR FURTHER INFORMATION CONTACT: Benjamin P. Lewis, Jr., Bureau of Drugs (HFD-107), Food and Drug Administration, 5600 Fishers Land, Rockville, MD 20857, 301-443-6004.

SUPPLEMENTARY INFORMATION: The Food and Drug Administration (FDA) has prepared a guideline for the professional labeling of prescription single-entity barbiturate drug products. The guideline labeling can be used for each product within drug class becuase all druge in the class are closely related in chemical structure, pharmacology, therapeutic activity, and adverse reactions.

A drug is misbranded under section 502(f) of the Federal Food, Drug, and Cosmetic Act (the act) (21 U.S.C. 352(f)) unless the drug's labeling bears adequate directions for use by laypersons. FDA may, however, exempt drugs from that requirement. Section 201.100 (21 CFR 21.100) of FDA's general labeling regulations exempts prescription drugs from the requirement under the condition that their labeling contain adequate information for health care professionals to prescribe and administer the drug (21 CFR 201.100(d)). The labeling is required to contain the information and be in the format specified in §§ 201.56 and 201.57 (21 CFR 201.56 and 201.57) (published in the **Federal Register** of June 26, 1979; 44 FR 37434), which sections provide general and specific requirements on the content and format of professional labeling for human prescription drugs. The application of those regulations to drug products is proceeding under a schedule established in § 201.59 (21 CFR 201.59) (published in **Federal Register** of May 16, 1980; 45 FR 32550). As described more fully in § 201.59, the regulations apply to single-entity barbiturate drug products as follows: (1) on April 10, 1981 to drug products that are not subject to section 505 of the act (21 U.S.C. 355), (2) on July 1, 1983 to drug products that on December 26, 1979 were subject to an approved new drug application under section 505 of the act, and duplicates of those products, and (3) as of December 26, 1979 to other single-entity barbiturate drug products for which marketing approval under section 505 of the act is sought from FDA.

A manufacturer of a prescription drug product may use any one of three types of professional labeling to comply with the labeling requirements for prescription drug products: what FDA refers to as product specific labeling, generic labeling, and class labeling. "Product specific labeling" refers to labeling that pertains only to a single manufacturer's drug product, and the labeling refers to the product by its brand name. "Generic labeling" refers to labeling that pertains to drug products that each contain the same active drug ingredient, but the products may be marketed under different brand names and by different persons. "Class labeling" refers to labeling that pertains to each drug in a therapeutic class of drugs and provides information about all drugs in the class, but the products may be marketed under different brand names and by different persons, and the products may contain different active drug ingredients.

The agency now provides guideline class labeling for the professional labeling for oral contraceptive drug products (see the **Federal Register** of January 31, 1978 (43 FR 4223)), digoxin drug products (see 21 CFR 310.500), and intrauterine devices for contraception (IUD's) that are regulated as prescription drugs (see 21 CFR 310.502(b)(1)). The agency intends to continue to develop class labeling for each therapeutic class in which the members of the class are closely related in chemical structure, pharmacology, therapeutic activity, and adverse reactions and to make that labeling available as a guideline. Although FDA has sometimes codified class labeling (as it did with digoxin and IUD's), most recently it has simply made the labeling publicly available either by publication in the **Federal Register** of the guideline itself or a notice of its availability. Because this guideline for single-entity barbiturates is the first of several new class labeling guidelines the agency intends to issue, the agency believes that both manufacturers of single-entity barbiturates and other persons who may be interested in future guidelines for other drug classes will want to to review this guideline. Thus, the expected interest in this guideline warrants the publication of the guideline text in the **Federal Register.** The agency does not, however, plan to publish the text of future class labeling guidelines in the **Federal Register,** but instead plans to publish only notices of their availability.

Class labeling guidelines should enhance the agency's regulatory program for prescription drugs. The guidelines will help FDA monitor labeling for members of each drug class and help the agency review proposed labeling for new drugs and antibiotics. They will also help drug manufacturers prepare labeling for drugs they propose to market and help them determine whether the labeling for their marketed products is in compliance with legal requirements. Finally, class labeling will be most helpful to health care professionals who prescribe and dispense prescription drug products. Because class labeling contains information about each member of the drug class, its use will help prescribers and dispensers recognize similarities between drug products and will help them focus their attention upon the actual differences between the products. Although most information now in product-specific and generic labeling applies to each member of the drug class, similarities and differences among the drugs and drug products in the class are not identified. Thus, prescribers and dispensers must now compare the labeling for members of a drug class to determine the similarities and differences among the products in the class. The use of class labeling will eliminate the need for such comparisons.

The guideline that is the subject of this notice is intended to provide class labeling for the single-entity barbiturate drug class. FDA finds that this guideline is appropriate as the basis for labeling for the following drugs in the single-entity bartiburate drug class and in the dosage forms identified in parentheses:

Amobarbital (oral)
Amobarbital sodium (oral, intramuscular, and intravenous)
Aprobarbital (oral)

Butabarbital sodium (oral)
Hexobarbital (oral)
Mephobarbital (oral)
Methbarbital (oral)
Pentobarbital sodium (oral, rectal, intramuscular, and intravenous)
Phenobarbital (oral)
Phenobarbital sodium (oral, rectal, subcutaneous, intramuscular, and intravenous)
Secobarbital (oral)
Secobarbital sodium (oral, rectal, intramuscular, and intravenous)
Talbutal (oral)

The publication of this guideline is part of a larger effort by FDA to develop guideline professional labeling for classes of prescription drug products. In 1975, FDA awarded a contract to the American Society of Hospital Pharmacists (ASHP) to develop draft labeling for the 20 classes of prescription drugs listed below. A copy of the contract has been placed on public display in the FDA Hearing Clerk's office, address given above.

Aminoglycosides
Androgens
Anorectics (nonamphetamines)
Anticoagulants—oral
Antidepressants
Antipsychotics
Barbiturates
Cardiac glycosides
Cephalosporins
Glucocorticoids
Insulins
Narcotic analgesics
Penicillins—G & V
Penicillins—penicillinase-resistant
Quinidine salts
Rauwolfia alkaloids
Sulfonamides
Tetracyclines
Thiazides
Thyroids

ASHP researched the scientific literature pertaining to each drug class and prepared draft labeling for the agency. The agency worked with ASHP to revise the drafts for the agency's use in developing class labeling guidelines. The literature reviews and draft labeling prepared by ASHP under the contract provide a firm foundation for the agency's development of guideline labeling for each drug class.

In 1978 the agency awarded a second contract to the National Medical Advisory Service to develop draft labeling for 12 additional classes of prescription drugs. A copy of the contract has been placed on public display in the FDA Hearing Clerk's office, address given above. The following 12 classes are included under that contract:

Anesthetics—local
Anticholinergics—centrally active
Anticholinergics—synthetic
Antihistamines
Benzodiazepines
Corticosteroids—topical
Diagnostic intravenous radiopaques
Diagnostic oral radiopaques
Erythromycin
Neuromuscular blocking drugs
Penicillin—semi-synthetic
Potassium preparations

In 1979, products in the 32 drug classes accounted for more than 500 million prescriptions and more than $2 billion in retail costs to consumers of prescription drugs. (See the FDA Summary of IMS America, Ltd. Data on Survey of Prescription Drugs Dispensed in Retail Pharmacies for the Year 1979; a copy of which has been placed on public display in the FDA Hearing Clerk's office, address given above.)

This notice is issued under § 10.90(b) (21 CFR 10.90(b)), which provides for the use of guidelines to establish procedures of general applicability that are not legal requirements but are acceptable to the agency. A person who follows a guideline is assured that his or her conduct is acceptable to the agency. The agency advises that the class labeling guideline for single-entity barbiturate drug products complies with the prescription drug labeling regulations in §§ 201.56, 201.57, and 201.100 and may be relied upon by any person to meet those requirements. Under the provisions of § 314.8(d) (21 CFR 314.8(d)), the guideline labeling may be used before approval of a supplement to a new drug application. A person may choose to use alternative labeling statements that are not provided for in the guideline. If a person chooses to depart from the guideline, he or she may discuss the matter further with the agency to prevent expenditure of money and effort for labeling that the agency may later determine to be unacceptable.

Effective November 18, 1980, a person may adopt the class labeling guideline for single-entity barbiturate prescription drug labeling requirements. Interested persons may submit written comments on the guideline to the Hearing Clerk (HFA-305), Food and Drug Administration, Rm. 4-62, 5600 Fishers Lane, Rockville, MD 20857. Comments will be considered in determining whether further amendments to or revisions of the guideline are warranted. Comments should be in four copies except that individuals may submit single copies, identified with the Hearing Clerk docket number found in brackets in the heading of this document. The guideline and received comments may be seen in the Hearing Clerk's office between 9 a.m. and 4 p.m., Monday through Friday.

The class labeling guideline for the professional labeling of single-entity barbiturate drug products follows:

Barbiturate Class Labeling

Description. The barbiturates are nonselective central nervous system depressants which are primarily used as sedative hypnotics and also anticonvulsants in sybhypnotic doses (Ref. 1). The barbiturates and their sodium salts are subject to control under the Federal Controlled Substances Act. The barbiturates included in this class are:

Name of drug	Route	Dosage form	DEA* schedule
Amobarbital	Oral	Tablet, elixir	II
Amobarbital sodium.	Oral	Capsule	II
Do	IM, IV	Injectable	II
Aprobarbital	Oral	Elixir	III
Butabarbital sodium.	Oral	Elixir, tablet, capsule.	III
Hexobarbital	Oral	Tablet	III
Mephobarbital	Oral	Tablet	IV
Metharbital	Oral	Tablet	III
Pentobarbital	Oral	Elixir	II
Pentobarbital sodium.	Oral	Capsule, elixir	II
Do	Rectal	Suppository	III
Do	IM, IV	Injectable	II
Phenobarbital	Oral	Elixir, tablet	IV
Phenobarbital sodium.	Oral	Tablet	IV
Do	Rectal	Suppository	IV
Do	IM, IV	Injectable	IV
Secobarbital	Oral	Elixir	II
Secobarbital sodium.	Oral	Capsule	II
Do	Rectal	Suppository	III
Do	IM, IV	Injectable	II
Talbutal	Oral	Tablet	III

*Drug Enforcement Administration.

The sodium salts of amobarbital, pentobarbital, phenobarbital, and secobarbital are available as sterile parenteral solutions.

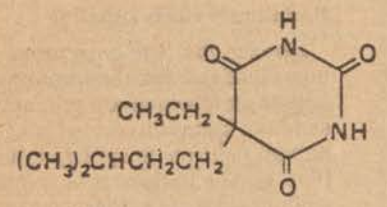
Barbiturates are substituted pyrimidine derivatives in which the basic structure common to these drugs is barbituric acid, a substance which has no central nervous system (CNS) activity. CNS activity is obtained by substituting alkyl, alkenyl, or aryl groups on the pyrimidine ring (Ref. 1). (Additional information as required by 21 CFR 201.57 will be supplied by the manufacturer or distributor.)

Structural formulas for this class follow:

BILLING CODE 4110-03-M

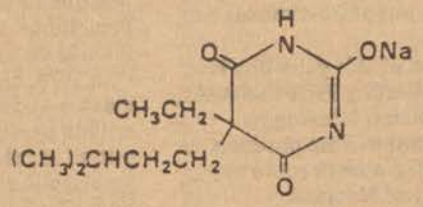
STRUCTURAL FORMULAS

AMOBARBITAL



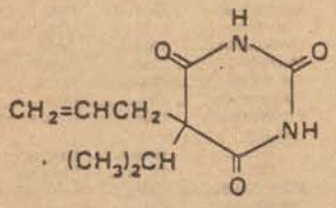
$C_{11}H_{18}N_2O_3$ 226.27 [CAS 57-43-2]
5-Ethyl-5-isopentylbarbituric acid

AMOBARBITAL SODIUM



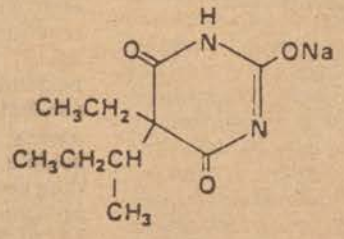
$C_{11}H_{17}N_2NaO_3$ 248.26 [CAS 64-43-7]
Sodium 5-ethyl-5-isopentylbarbiturate

APROBARBITAL



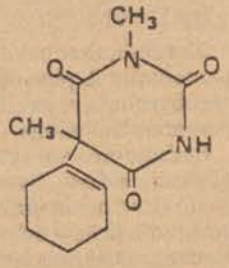
$C_{10}H_{14}N_2O_3$ 210.23 [CAS 77-02-1]
5-allyl-5-isopropylbarbituric acid

BUTABARBITAL SODIUM



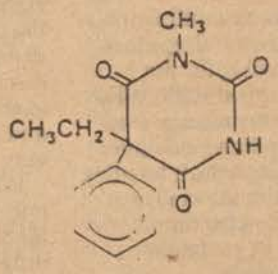
$C_{10}H_{15}N_2NaO_3$ 234.23 [CAS 143-81-7]
Sodium 5-sec-butyl-5-ethylbarbiturate

HEXOBARBITAL



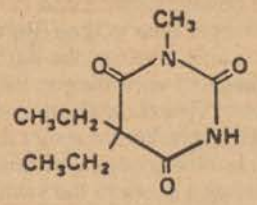
$C_{12}H_{16}N_2O_3$ 236.26 [CAS 56-29-1]
5-(1-cyclohexen-1-yl)-1,5-dimethylbarbituric acid

MEPHOBARBITAL



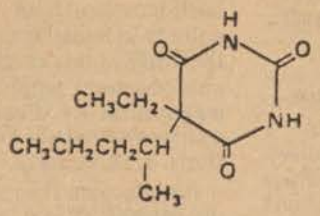
$C_{13}H_{14}N_2O_3$ 246.27 [CAS 115-38-8]
5-Ethyl-1-methyl-5-phenylbarbituric acid

METHARBITAL



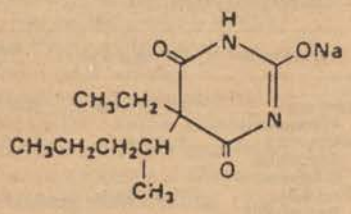
$C_9H_{14}N_2O_3$ 198.22 [CAS 50-11-3]
5,5-Diethyl-1-methylbarbituric acid

PENTOBARBITAL



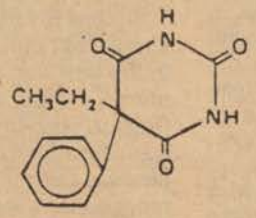
$C_{11}H_{18}N_2O_3$ 226.27 [CAS 76-74-4]
5-Ethyl-5-(1-methylbutyl) barbituric acid

PENTOBARBITAL SODIUM



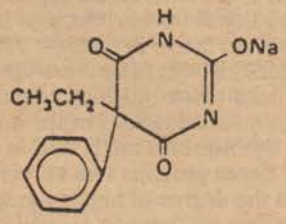
$C_{11}H_{17}N_2NaO_3$ 248.26 [CAS 57-33-0]
Sodium 5-ethyl-5-(1-methylbutyl) barbiturate

PHENOBARBITAL



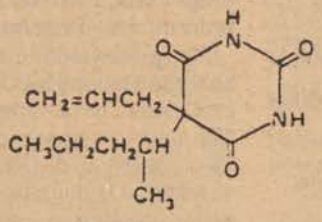
$C_{12}H_{12}N_2O_3$ 232.24 [CAS 50-06-6]
5-Ethyl-5-phenylbarbituric acid

PHENOBARBITAL SODIUM



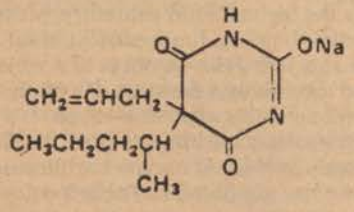
$C_{12}H_{11}N_2NaO_3$ 254.22 [CAS 57-30-7]
Sodium 5-ethyl-5-phenylbarbiturate

SECOBARBITAL



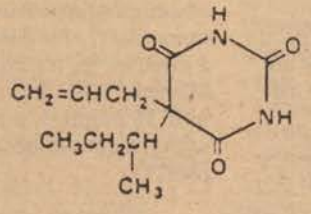
$C_{12}H_{18}N_2O_3$ 238.29 [CAS 76-73-3]
5-Allyl-5-(1-methylbutyl) barbituric acid

SECOBARBITAL SODIUM



$C_{12}H_{17}N_2NaO_3$ 260.27 [CAS 309-43-3]
Sodium 5-allyl-5-(1-methylbutyl) barbiturate

TALBUTAL



$C_{11}H_{16}N_2O_3$ 224.26 [CAS 115-44-6]
5-Allyl-5-sec-butylbarbituric acid

BILLING CODE 4110-03-C

Clinical Pharmacology

Barbiturates are capable of producing all levels of CNS mood alteration from excitation to mild sedation, to hypnosis, and deep coma. Overdosage can produce death. In high enough therapeutic doses, barbituates induce anesthesia (Refs. 1 and 2).

Barbiturates depress the sensory cortex, decrease motor activity, alter cerebellar function, and produce drowsiness, sedation, and hypnosis.

Barbiturate-induced sleep differs from physiological sleep. Sleep laboratory studies have demonstrated that barbiturates reduce the amount of time spent in the rapid eye movement (REM) phase of sleep or dreaming stage. Also, Stages III and IV sleep are decreased (Refs. 1, 3, 4, and 5). Following abrupt cessation of barbiturates used regularly, patients may experience markedly increased dreaming, nightmares, and/or insomnia. Therefore, withdrawal of a single therapeutic dose over 5 or 6 days has been recommended to lessen the REM rebound and disturbed sleep which contribute to drug withdrawal syndrome (for example, decrease the dose from 3 to 2 doses a day for 1 week) (Ref. 4).

In studies, secobarbital sodium and pentobarbital sodium have been found to lose most of their effectiveness for both inducing and maintaining sleep by the end of 2 weeks of continued drug administration even with the use of multiple doses (Refs. 3, 4, 6, and 7). As with secobarbital sodium and pentobarbital sodium, other barbiturates might be expected to lose their effectiveness for inducing and maintaining sleep after about 2 weeks. The short-, intermediate-, and, to a lesser degree, long-acting barbiturates have been widely prescribed for treating insomnia. Although the clinical literature abounds with claims that the short-acting barbiturates are superior for producing sleep while the intermediate-acting compounds are more effective in maintaining sleep, controlled studies have failed to demonstrate these differential effects (Ref. 8). Therefore, as sleep medications, the barbiturates are of limited value beyond short-term use (Ref. 3).

Barbiturates have little analgesic action at subanesthetic doses (Ref. 1). Rather, in subanesthetic doses these drugs may increase the reaction to painful stimuli (Refs. 9 and 10). All barbiturates exhibit anticonvulsant activity in anesthetic doses. However, of the drugs in this class, only phenobarbital, mephobarbital, and metharbital are effective as oral anticonvulsants in subhypnotic doses (Refs. 1, 10, and 11).

Barbiturates are respiratory depressants. The degree of respiratory depression is dependent upon dose (Refs. 1, 10, and 12). With hypnotic doses, respiratory depression produced by barbiturates is similar to that which occurs during physiologic sleep with slight decrease in blood pressure and heart rate (Refs. 1 and 10).

Studies in laboratory animals have shown that barbiturates cause reduction in the tone and contractility of the uterus, ureters, and urinary bladder (Refs. 10 and 13). However, concentrations of the drugs required to produce this effect in humans are not reached with sedative-hypnotic doses (Refs. 1 and 10).

Barbiturates do not impair normal hepatic function, but have been shown to induce liver microsomal enzymes, thus increasing and/or altering the metabolism of barbiturates and other drugs (Refs. 1, 10, 14, 15 and 16). (See precautions—Drug Interactions below.)

Pharmacokinetics. Barbiturates are absorbed in varying degrees following oral, rectal, or parenteral administration. The salts are more rapidly absorbed than are the acids (Ref. 17). The rate of absorption is increased if the sodium salt is ingested as a dilute solution or taken on an empty stomach (Refs. 17 and 18).

The onset of action for oral or rectal administration varies from 20 to 60 minutes. For IM administration, the onset of action is slightly faster. Following IV administration, the onset of action ranges from almost immediately for pentobarbital sodium to 5 minutes for phenobarbital sodium. Maximal CNS depression may not occur until 15 minutes or more after IV administration for phenobarbital sodium (Ref. 1).

Duration of action, which is related to the rate at which the barbiturates are redistributed throughout the body, varies among persons and in the same person from time to time (Refs. 1, 19, and 20). In Table 1 below, the barbiturates are classified according to their duration of action. This classification should not be used to predict the exact duration of effect, but the grouping of drugs should be used as a guide in the selection of barbiturates.

No studies have demonstrated that the different routes of administration are equivalent with respect to bioavailability.

Table 1.—*Classification, Onset, and Duration of Action of Commonly used Barbiturates Taken Orally* (Ref. 21)

Classification	Onset of action	Duration of action
Long-acting Phenobarbital.	1 hr or longer	10 to 12 hr.
Intermediate Amobarbital Butabarbital.	¾ to 1 hr	6 to 8 hr.
Short-acting Pentobarbital Secobarbital.	10 to 15 min	3 to 4 hr.

Barbiturates are weak acids that are absorbed and rapidly distributed to all tissues and fluids with high concentrations in the brain, liver, and kidneys (Refs. 1, 10, 22, 23, and 24). Lipid solubility of the barbiturates is the dominant factor in their distribution within the body. The more lipid soluble the barbiturate, the more rapidly it penetrates all tissues of the body (Ref. 25). Barbiturates are bound to plasma and tissue proteins to a varying degree with the degree of binding increasing directly as a function of lipid solubility (Refs. 1, 10, 26, 27).

Phenobarbital has the lowest lipid solubility, lowest plasma binding, lowest brain protein binding, the longest delay in onset of activity, and the longest duration of action. At the opposite extreme is secobarbital which has the highest lipid solubility, plasma protein binding, brain protein binding, the shortest delay in onset of activity, and the shortest duration of action. Butabarbital is classified as an intermediate barbiturate (Ref. 28). The plasma half-life for some barbiturates in this class are listed in Table 2 below.

Table 2.—*Plasma Half-Life Values for Some Barbiturates in Humans*

Drug	Half-life (hours)				References
	Adult		Child/newborn		
	Range	(Mean)	Range	(Mean)	
Amobarbital	16 to 40	(25)	[1]	[1]	29, 30 and 31.
Aprobarbital	14 to 34	(24)	[1]	[1]	32.
Butabarbital	66 to 140	(100)	[1]	[1]	33.
Hexobarbital	5		[1]	[1]	[4]1.
Pentobarbital	15 to 50	[2]	[1]	[1]	1, 18 and 26.
Phenobarbital	53 to 118	(79)	60 to 180[4]	([4]110)	1, 32, 34, 35, 36 and 37.
Secobarbital	15 to 40	(28)	[1]	[1]	1 and 28.

[1] No information available at this time.
[2] Pentobarbital seems to follow dose-dependent kinetics. When a 50-mg dose and a 100-mg dose were used in subjects, the mean half-life of elimination was 50 hours and 22 hours, respectively.
[3] Limited information as reporterd in the literature.
[4] Half-life values were determined for newborn age being defined as 48 hours or less.

Data are inadequate to provide information on the half-life of the following drugs: mephobarbital, metharbital, and talbutal.

Barbiturates are metabolized primarily by the hepatic microsomal enzyme system, and the metabolic products are excreted in the urine, and less commonly, in the feces. Approximately 25 to 50 percent of a dose of aprobarbital or phenobarbital is eliminated unchanged in the urine, whereas the amount of other barbiturates excreted unchanged in the urine is negligible. The excretion of unmetabolized barbiturate is one feature that distinguishes the long-acting category from those belonging to other categories which are almost entirely metabolized (Ref. 28). The inactive metabolites of the barbiturates are excreted as conjugates of glucuronic acid (Refs. 1 and 39).

Indications and Usage

1. *Oral and parenteral.*

a. Sedatives.

b. Hypnotics, for the short-term treatment of insomnia, since they appear to lose their effectiveness for sleep induction and sleep maintenance after 2 weeks (See CLINICAL PHARMACOLOGY above).

c. Preanesthetics.

d. Long-term anticonvulsants, (phenobarbital, mephobarbital, and metharbital) for the treatment of generalized tonic-clonic and cortical focal seizures. And, in the emergency control of certain acute convulsive episodes, e.g., those associated with status epilepticus, cholera, eclampsia, meningitis, tetanus, and toxic reactions to strychnine or local anesthetics. Phenobarbital sodium may be administered IM or IV as an anticonvulsant for emergency use. When administered IV, it may require 15 or more minutes before reaching peak concentrations in the brain. Therefore, injecting phenobarbital sodium until the convulsions stop may cause the brain level to exceed that required to control the convulsions and lead to severe barbiturate induced depression.

2. *Rectal.* Barbiturates administered rectally are absorbed from the colon and are used occasionally in infants for prolonged convulsive states, or when oral or parenteral administration may be undesirable. If the rectal form is not available, the soluble sodium salt may be incorporated in a retention enema.

Contraindications

Barbiturates are contraindicated in patients with known barbiturate sensitivity. Barbiturates are also contraindicated in patients with a history of manifest or latent porphyria.

Warnings

1. *Habit forming.* Barbiturates may be habit forming. Tolerance, psychological and physical dependence may occur with continued use (Refs. 10, 40, 41, 42, 43, and 44). (See DRUG ABUSE AND DEPENDENCE below and PHARMACOKINETICS above.) Patients who have psychological dependence on barbiturates may increase the dosage or decrease the dosage interval without consulting a physician and may subsequently develop a physical dependence on barbiturates. To minimize the possibility of overdosage or the development of dependence, the prescribing and dispensing of sedative-hypnotic barbiturates should be limited to the amount required for the interval until the next appointment. Abrupt cessation after prolonged use in the dependent person may result in withdrawal symptoms, including delirium, convulsions, and possibly death (Refs. 44 and 45). Barbiturates should be withdrawn gradually from any patient known to be taking excessive dosage over long periods of time (Refs. 46 and 47). (see DRUG ABUSE AND DEPENDENCE below).

2. *IV administration.* Too rapid administration may cause respiratory depression, apnea, laryngospasm, or vasodilation with fall in blood pressure.

3. *Acute or chronic pain.* Caution should be exercised when barbiturates are administered to patients with acute or chronic pain, because paradoxical excitement could be induced or important symptoms could be masked. However, the use of barbiturates as sedatives in the postoperative surgical and as adjuncts to cancer chemotherapy is well established.

4. *Use in pregnancy.* Barbiturates can cause fetal damage when administered to a pregnant woman. Retrospective, case-controlled studies have suggested a connection between the maternal consumption of barbiturates and a higher than expected incidence of fetal abnormalities (Refs. 48 and 49). Following oral or parenteral administration, barbiturates readily cross the placental barrier and are distributed throughout fetal tissues with highest concentrations found in the placenta, fetal liver, and brain. Fetal blood levels approach maternal blood levels following parenteral administration (Refs. 1, 10, 50, and 51).

Withdrawal symptoms occur in infants born to mothers who receive barbiturates throughout the last trimester of pregnancy (Refs. 52 and 53). (See DRUG ABUSE AND DEPENDENCE below.) If this drug is used during pregnancy, or if the patient becomes pregnant while taking this drug, the patient should be apprised of the potential hazard to the fetus.

5. *Synergistic effects.* The concomitant use of alcohol or other CNS depressants may produce additive CNS depressant effects (Refs. 54 and 55).

Precautions

General. Barbiturates may be habit forming. Tolerance and psychological and physical dependence may occur with continuing use (Refs. 10, 41, 42, and 43). (See DRUG ABUSE AND DEPENDENCE below.) Barbiturates should be administered with caution, if at all, to patients who are mentally depressed, have suicidal tendencies, or a history of drug abuse (Ref. 5).

Elderly or debilitated patients may react to barbiturates with marked excitement, depression, and confusion (Refs. 5 and 56). In some persons, barbiturates repeatedly produce excitement rather than depression (Ref. 1).

In patients with hepatic damage, barbiturates should be administered with caution and initally in reduced doses. Barbiturates should not be administered to patients showing the

premonitory signs of hepatic coma (Refs. 1 and 14).

Parenteral solution of barbiturates are highly alkaline. Therefore, extreme care should be taken to avoid perivascular extravasation or intra-arterial injection. Extravascular injection may cause local tissue damage with subsequent necrosis; consequences of intra-arterial injection may vary from transient pain to gangrene of the limb (Refs. 57, 58, and 59). Any compliant of pain in the limb warrants stopping the injection.

Information for the patient. Practitioners should give the following information and instructions to patients receiving barbiturates.

1. The use of barbiturates carries with it an associated risk of psychological and/or physical dependence. The patient should be warned against increasing the dose of the drug without consulting a physician.

2. Barbiturates may impair mental and/or physical abilities required for the performance of potentially hazardous tasks (e.g., driving, operating mechinery, etc.) (Refs. 42 and 55).

3. Alcohol should not be consumed while taking barbiturates. Concurrent use of the barbiturates with other CNS depressants (e.g., alcohol, narcotics, tranquilizers, and antihistamines) may result in additional CNS depressant effects (Refs. 54, 55, and 60).

Laboratory tests. Prolonged therapy with barbiturates should be accompanied by periodic laboratory evaluation of organ systems, including hematopoietic, renal, and hepatic systems (See PRECAUTIONS (General) above and ADVERSE REACTIONS below).

Drug interactions. Most reports of clinically significant drug interactions ocurring with the barbiturates have involved phenobarbital. However, the application of these data to other barbiturates appears valid and warrants serial blood level determinations of the relevant drugs when there are multiple therapies.

1. *Anticoagulants.* Phenobarbital lowers the plasma levels of dicumarol (name previously used: bishydroxycoumarin) and causes a decrease in anticoagulant activity as measured by the prothrombin time (Ref. 61). Barbiturates can induce hepatic microsomal enzymes resulting in increased metabolism and decreased anticoagulant response of oral anticoagulants (e.g., warfarin (Refs. 15, 62, and 63), acenocoumarol, dicumarol, and phenprocoumon (Ref. 15)). Patients stabilized on anticoagulant therapy may require dosage adjustments if barbiturates are added to or withdrawn from their dosage regimen (Refs. 54 and 63).

2. *Corticosteroids.* Barbiturates appear to enhance the metabolism of exogenous corticosteroids probably through the induction of hepatic microsomal enzymes (Ref. 64). Patients stablized on cortixosteroid therapy may require dosage adjustments if barbiturates are added to or withdrawn from their dosage regimen.

3. *Griseofulvin.* Phenobarbital appears to interfere with the absorption of orally administered griseofulvin, thus decreasing its blood level (Refs. 65 and 66). The effect of the resultant decreased blood levels of griseofulvin on therapeutic response has not been established. However, it would be preferable to avoid concomitant administration of these drugs.

4. *Doxycycline.* Phenobarbital has been shown to shorten the half-life of doxycycline for as long as 2 weeks after barbiturate therapy is discontinued (Ref. 8).

This mechanism is probably through the induction of hepatic microsomal enzymes that metabolize the antibiotic. If phenobarbital and doxycycline are administered concurrently, the clinical response to doxycycline should be monitored closely (Ref. 67).

5. *Phenytoin, sodium valproate, valproic acid.* The effect of barbiturates on the metabolism of phenytoin appears to be variable. Some investigators report an accelerating effect, while others report no effect (Refs. 68, 69, and 70). Because the effect of barbiturates on the metabolism of phenytoin in not predictable, phenytoin and barbiturate blood levels should be monitored more frequently if these drugs are given concurrently (Ref. 55). Sodium valproate and valproic acid appear to decrease barbiturate metabolism; therefore, barbiturate blood levels should be monitored and appropriate dosage adjustments made as indicated.

6. *Central nervous system depressants.* The concomitant use of other central nervous system depressants, including other sedatives or hypnotics, antihistamines, tranquiliers, or alcohol, may produce additive depressant effects (Refs. 54, 55, and 60).

7. *Monoamine oxidase inhibitors (MAOI).* MAOI prolong the effects of barbiturates probably because metabolism of the barbiturate is inhibited (Ref. 8).

8. *Estradiol, estrone, progesterone and other steroidal hormones.* Pretreatment with or concurrent administration of phenobarbital may decrease the effect of estradiol by increasing its metabolism. There have been reports of patients treated with antiepileptic drugs (e.g., phenobarbital) who become pregnant while taking oral contraceptives. An alternate contraceptive method might be suggested to women taking phenobarbital (Ref. 55).

Carcinogenesis—1. *Animal data.* Phenobarbital sodium is carcinogenic in mice and rats after lifetime administration. In mice, it produced benign and malignant liver cell tumors. In rats, benign liver cell tumors were observed very late in life (Ref. 71).

2. *Human data.* In a 29-year epidemiological study of 9,136 patients who were treated on an anticonvulsant protocol which included phenobarbital, results indicated a higher than normal incidence of hepatic carcinoma. Previously, some of these patients were treated with thorotrast, a drug which is known to produce hepatic carcinomas. Thus, this study did not provide sufficient evidence that phenobarbital is carcinogenic in humans (Ref. 71).

A retrospective study of 84 children with brain tumors matched to 73 normal controls and 78 cancer controls (malignant disease other than brain tumors) suggested an association between exposure to barbiturates prenatally and an increased incidence of brain tumors (Ref. 72).

Pregnancy—1. *Teratogenic effects.* Pregnancy Category D—See WARNINGS—Use in Pregnancy above.

2. *Nonteratogenic effects.* Reports of infancts suffering from long-term barbiturate exposure in utero included the acute withdrawal syndrome of seizures and hyperirritability from birth to a delayed onset of up to 14 days. (See DRUG ABUSE AND DEPENDENCE below.)

Labor and delivery. Hypnotic doses of these barbiturates do not appear to significantly impair uterine activity during labor. Full anesthetic doses of barbiturates decrease the force and frequency of uterine contractions (Ref. 10). Administration of sedative-hypnotic barbiturates to the mother during labor may result in respiratory depression in the newborn (Ref. 1). Premature infants are particularly susceptible to the depressant effects of barbiturates. If barbiturates are used during labor and delivery, resuscitation equipment should be available.

Data are currently not available to evaluate the effect of these barbiturates when forceps delivery or other intervention is necessary. Also, data are not available to determine the effect of these barbiturates on the later growth, development, and functional maturation of the child.

Nursing mothers. Caution should be exercised when a barbiturate is administered to a nursing woman since

small amounts of barbiturates are excreted in the milk (Ref. 10).

Adverse Reactions

The following adverse reactions and their incidence were compiled from surveillance of thousands of hospitalized patients. Because such patients may be less aware of certain of the milder adverse effects of barbiturates, the incidence of these reactions may be somewhat higher in fully ambulatory patients (Refs. 73, 74, and 75).

More than 1 in 100 patients. The most common adverse reaction estimated to occur at a rate of 1 to 3 patients per 100 is: *Nervous system:* Somnolence.

Less than 1 in 100 patients. Adverse reactions estimated to occur at a rate of less than 1 in 100 patients listed below, grouped by organ system, and by decreasing order of occurrence are:

Nervous system: Agitation, confusion, hyperkinesia, ataxia, CNS depression, nightmares, nervousness, psychiatric disturbance, hallucinations, insomnia, anxiety, dizziness, thinking abnormality.

Respiratory system: Hypoventilation, apnea.

Cardiovascular system: Bradycardia, hypotension, syncope.

Digestive system: Nausea, vomiting, constipation.

Other reported reactions: Headache, injection site reactions, hypersensitivity reactions (angioedema, skin rashes, exfoliative dermatitis), fever, liver damage, megaloblastic anemia following chronic phenobarbital use.

Drug Abuse and Dependence

Barbiturates may be habit forming: Tolerance, psychological dependence, and physical dependence may occur especially following prolonged use of high doses of barbiturates (Refs. 41 and 42). Daily administration in excess of 400 milligrams (mg) of pentobarbital or secobarbital for approximately 90 days is likely to produce some degree of physical dependence (Ref. 10). A dosage of from 600 to 800 mg taken for at least 35 days is sufficient to produce withdrawal seizures (Ref. 47). The average daily dose for the barbiturate addict is usually about 1.5 grams (Ref. 19). As tolerance to barbiturates develops, the amount needed to maintain the same level of intoxication increases; tolerance to a fatal dosage, however, does not increase more than two-fold. As this occurs, the margin between an intoxicating dosage and fatal dosage becomes smaller (Ref. 8).

Symptoms of acute intoxication with barbiturates include unsteady gait, slurred speech, and sustained nystagmus. Mental signs of chronic intoxication include confusion, poor judgment, irritability, insomnia, and somatic complaints (Ref. 8).

Symptoms of barbiturate dependence are similar to those of chronic alcoholism (Ref. 60). If an individual appears to be intoxicated with alcohol to a degree that is radically disporportionate to the amount of alcohol in his or her blood the use of barbiturates should be suspected. The lethal dose of a barbiturate is far less if alcohol is also ingested (Ref. 8).

The symptoms of barbiturate withdrawal can be severe and may cause death (Refs. 10 and 41). Minor withdrawal symptoms may appear 8 to 12 hours after the last dose of a barbiturate. These symptoms usually appear in the following order: anxiety, muscle twitching, tremor of hands and fingers, progressive weakness, dizziness, distortion in visual perception, nausea, vomiting, insomnia, and orthostatic hypotension (Refs. 42, 44, and 76). Major withdrawal symptoms (convulsions and delirium) may occour within 16 hours and last up to 5 days after abrupt cessation of these drugs (Refs. 45 and 77). Intensity of withdrawal symptoms gradually declines over a period of approximately 15 days (Ref. 45). Individuals susceptible to barbiturate abuse and dependence include alcoholics and opiate abusers, as well as other sedative-hypnotic and amphetamine abusers.

Drug dependence to barbiturates arises from repeated administration of a barbiturate or agent with barbiturate-like effect on a continuous basis, generally in amounts exceeding therapeutic dose levels. The characteristics of drug dependence to barbiturates include: (a) a strong desire or need to continue taking the drug; (b) a tendency to increase the dose; (c) a psychic dependence on the effects of the drug related to subjective and individual appreciation of those effects; and (d) a physical dependence on the effects of the drug requiring its presence for maintenance of homeostasis and resulting in a definite, characteristic, and self-limited abstinence syndrome when the drug is withdrawn (Ref. 78).

Treatment of barbiturate dependence consists of cautious and gradual withdrawal of the drug (Ref. 46). Barbiturate-dependent patients can be withdrawn by using a number of different withdrawal regiments. In all cases withdrawal takes an extended period of time. One method involves substituting a 30-mg dose of phenobarbital for each 100- to 200-mg dose of barbiturate that the patient has been taking. The total daily amount of phenobarbital is then administered in 3 to 4 divided doses, not to exceed 60 mg daily. Should signs of withdrawal occur on the first day of treatment, a loading dose of 100 to 200 mg of phenobarbital may be administered IM in addition to the oral dose. After stablization on phenobarbital, the total daily dose is decreased by 30 mg a day as long as withdrawal is proceeding smoothly (Refs. 8, 46, and 47). A modification of this regimen involves initiating treatment at the patient's regular dosage level and decreasing the daily dosage by 10 percent if tolerated by the patient (Ref. 76).

Infants physically dependent on barbiturates may be given phenobarbital 3 to 10 mg/kg/day. After withdrawal symptoms (hyperactivity, disturbed sleep, tremors, hyperreflexia) are relieved, the dosage of phenobarbital should be gradually decreased and completely withdrawn over a 2-week period (Ref. 53).

Overdosage

The toxic dose of barbiturates varies considerably. In general, an oral dose of 1 gram of most barbiturates produces serious poisoning in an adult. Death commonly occurs after 2 to 10 grams of ingested barbiturate (Refs. 1 and 79). Barbiturate intoxication may be confused with alcoholism, bromide intoxication, and with various neurological disorders (Ref. 41).

Acute overdosage with barbiturates is manifested by CNS and respiratory depression which may progress to Cheyne-Stokes respiration, areflexia, constriction of the pupils to a slight degree (though in severe poisoning they may show paralytic dilation), oliguria, tachycardia, hypotension, lowered body temperature, and coma. Typical shock syndrome (apena, circulatory collapse, respiratory arrest, and death) may occur.

In extreme overdose, all electrical activity in the brain may cease, in which case a "flat" EEG normally equated with clinical death cannot be accepted. This effect is fully reversible unless hypoxic damage occurs. Consideration should be given to the possibility of barbiturate intoxication even in situations that appear to involve trauma (Ref. 8).

Complications such as pneumonia, pulmonary edema, cardiac arrhythmias, congestive heart failure, and renal failure may occur. Uremia may increase CNS sensitivity to barbiturates if renal function is impaired (Refs. 1 and 79). Differental diagnosis should include hypoglycemia, head trauma, cerebrovascular accidents, convulsive states, and diabetic coma. Blood levels from acute overdosage for some barbiturates are listed in Table 3 below.

Treatment of overdosage is mainly supportive and consists of the following:

1. Maintenance of an adequate airway, with assisted respiration and oxygen administration as necessary.

2. Monitoring of vital signs and fluid balance.

3. If the patient is conscious and has not lost the gag reflex, emesis may be induced with ipecac. Care should be taken to prevent pulmonary aspiration of vomitus. After completion of vomiting, 30 grams activated charcoal in a glass of water may be administered.

4. If emesis is contraindicated, gastric lavage may be performed with a cuffed endotracheal tube in place with the patient in the face down position. Activated charcoal may be left in the emptied stomach and a saline cathartic administered.

5. Fluid therapy and other standard treatment for shock, if needed.

6. If renal function is normal, forced diuresis may aid in the elimination of the barbiturate. Alkalinization of the urine increases renal excretion of some barbiturates, especially phenobarbital, also aprobarbital, and mephobarbital (which is metabolized to phenobarbital).

7. Although not recommended as a routine procedure, hemodialysis may be used in severe barbiturate intoxications or if the patient is anuric or in shock.

8. Patient should be rolled from side to side every 30 minutes.

9. Antibiotics should be given if pneumonia is suspected.

10. Appropriate nursing care to prevent hypostatic pneumonia, decubiti, aspiration, and other complications of patients with altered states of consciousness (Refs. 36, 81, 82, and 83).

Dosage and Administration

Suggested doses of barbiturates for specific indications may be found in the Pediatric and Adult Dosage Information Tables 4 and 5 below. Dosages of barbiturates must be individualized with full knowledge of their particular characteristics and recommended rate of administration. Factors of consideration are the patient's age, weight, and condition. Parenteral routes should be used only when oral administration is impossible or impractical.

IM injection of the sodium salts of barbiturates should be made deeply into a large muscle, and a volume of 5 mL should not be exceeded at any one site because of possible tissue irritation. After IM injection of a hypnotic dose, the patient's vital signs should be monitored.

IV injection is restricted to conditions in which other routes are not feasible, either because the patient is unconscious (as in cerebral hemorrhage, eclampsia, or status epilepticus), or because the patient resists (as in delirium), or because prompt action is imperative. Slow IV injection is essential, and patients should be carefully observed during administration. This requires that blood pressure, respiration, and cardiac function be maintained, vital signs be recorded, and equipment for resuscitation and artificial ventilation be available (Ref. 84). The rate of IV injection for adults should not exceed 60 mg/min for phenobarbital sodium and 50 mg/15 sec for secobarbital sodium (Ref. 85).

Anticonvulsant use. A therapeutic anticonvulsant level of phenobarbital in the serum is 10 to 25 μg/mL (Refs. 37 and 86). To achieve the blood levels considered therapeutic in children, higher per-kilogram dosages are generally necessary for phenobarbital and most other anticonvulsants. In children and infants, phenobarbital at loading dose of 15 to 29 mg/kg produces blood levels of about 20 μg/mL shortly after administration (Ref. 87).

In status epilepticus, it is imperative to achieve therapeutic blood levels of a barbiturate (or other anticonvulsants) as rapidly as possible. When administered intravenously, phenobarbital sodium may require 15 minutes or more to attain peak concentrations in the brain. If phenobarbital sodium is injected continuously until the convulsions stop, the brain concentration would continue to rise and could eventually exceed that required to control the seizures. Because a barbiturate-induced depression may occur along with a postictal depression once the seizures are controlled, it is important, therefore, to use the minimal amount required, and to wait for the anticonvulsant effect to develop before administering a second dose (Ref. 1).

Phenobarbital has been used in the treatment and prophylaxis of febrile seizures. However, it has not been established that prevention of febrile seizures influences the subsequent development of epilepsy (Ref. 88).

Special patient population. Dosage should be reduced in the elderly or debilitated because these patients may be more sensitive to barbiturates. Dosage should be reduced for patients with impaired renal function or hepatic disease.

Inspection. Parenteral drug products should be inspected visually for particulate matter and discoloration prior to administration, whenever solution containers permit. Solutions for injection showing evidence of precipitation should not be used.

How Supplied

The manufacturer or distributor is responsible for the information contained in this section of the labeling.

Table 3.—*Concentration of Barbiturate in the Blood Versus Degree of CNS Depression* (Ref. 80)

Barbiturate	Onset/duration	Degree of depression in nontolerant persons*				
		1	2	3	4	5
Pentobarbital	Fast/short	≤2	0.5 to 3	10 to 15	12 to 25	15 to 40.
Secobarbital	Fast/short	≤2	0.5 to 5	10 to 15	15 to 25	15 to 40.
Amobarbital	Intermediate/intermediate.	≤3	2 to 10	30 to 40	30 to 60	40 to 80.
Butabarbital	Intermediate/intermediate.	≤5	3 to 25	40 to 60	50 to 80	60 to 100.
Phenobarbital	Slow/long	≤10	5 to 40	50 to 80	70 to 120	100 to 200.

*Categories of degree of depression in nontolerant persons:

1. Under the influence and appreciably impaired for purposes of driving a motor vehicle or performing tasks requiring alertness and unimpaired judgment and reaction time.
2. Sedated, therapeutic range, calm, relaxed, and easily aroused.
3. Comatose, difficult to arouse, significant depression of respiration.
4. Compatible with death in aged or ill persons or in presence of obstructed airway, other toxic agents, or exposure to cold.
5. Usual lethal level, the upper end of the range includes those who received some supportive treatment.

Table 4.—*Barbiturate Pediatric Dosage Information recommended by the American Academy of Pediatrics (Ref. 89)*

[Intended only as a guide]

Drug	Route administration	Pediatric preoperative	Pediatric anticonvulsant [1]
Amobarbital	PO	2–6 mg/kg, maximum 100 mg	
Amobarbital sodium	IV	65–500 mg or 3–5 mg/kg [2]	
Butabarbital sodium	PO	2–6 mg/kg, maximum 100 mg	
Mephobarbital	PO		8–15 mg/kg.
Pentobarbital sodium	PO, IM	2–6 mg/kg, maximum 100 mg	
	Rectal	30 mg (2 mo to 1 yr), 30–60 mg (1 to 4 yr), 60 mg (5 to 12 yr), 60–120 mg (12 to 14 yr)	
Phenobarbital	PO	1–3 mg/kg	
Phenobarbital sodium	PO, IM, IV	1–3 mg/kg	4–6 mg/kg/day for 7–10 days to blood level 10–15 μg/mL or 10–15 mg/kg/day.
	IV		For status: 15–20 mg/kg over 10–15 minutes.
Secobarbital sodium	PO	2–6 mg/kg, maximum 100 mg	
	IM	4–5 mg/kg	
	Rectal	15–60 mg [3] (up to 6 mo), 60 mg [3] (6 mo to 3 yr), 60–120 mg [3] (3 yr)	

[1] All should be adjusted to blood levels measured as phenobarbital.
[2] Dependent upon patient's condition and desired level of sedation.

Table 5.—*Barbiturate Adult Dosage Information (Refs. 90 and 91)*

[Intended only as a guide]

Drug	Route	Daytime sedation	Bedtime hypnotic	Preoperative sedation	Anticonvulsant
I. More commonly used:					
Pentobarbital	PO	20 mg 3–4 times daily	100 mg		
Pentobarbital sodium	PO	20 to 40 mg 2–3 times daily	100 mg		
	IM		150 to 200 mg		
	IV		70 kg adult, 100 mg initially		
Phenobarbital	PO	30 to 120 mg daily in 2–3 divided doses.	100 to 320 mg		50 to 100 mg 2–3 times daily.
Phenobarbital sodium	IM, IV	30 to 120 mg daily in 2–3 divided doses.	100 to 320 mg	IM only: 100 to 200 mg 60–90 min before surgery.	Status epilipticus: 200 repeated in 6 hr as necessary.
Secobarbital	PO		100 mg	200 to 300 mg 1–2 hr before surgery.	
Secobarbital sodium	PO		100 mg	200 to 300 mg 1–2 hr before surgery.	
	IM		100 to 200 mg	Dentistry: 1 mg per lb body wt. For light sedation, 0.5 to 0.75 mg per lb 10–15 min before procedure.	
	IV		50 to 250 mg	Dentistry: (prior to nerve block procedure 100–150 mg.	Tetanus: 2.5 mg per lb body wt repeated every 3–4 hr as needed.
	Rectal	120 to 200 mg daily in 3 divided doses.	120 to 200 mg		
II. Less comonly used:					
Amobarbital	PO	50 to 300 mg daily in divided doses.	65 to 200 mg		
Amobarbital sodium	PO	50 to 300 mg daily in divided doses.	65 to 200 mg		
	IM, IV	30 to 50 2–3 times daily	65 to 200 mg		
Aprobarbital	PO	40 mg 3 times daily	40 to 160 mg		
Butabarbital sodium	PO	15 to 30 mg 3–4 times daily	50 to 100 mg	50 to 100 mg 60–90 minutes before surgery.	
Hexobarbital	PO	250 mg repeated as needed	250 to 500 mg		
Mephobarbital	PO	90 to 400 mg in 3–4 divided doses.			200 mg at bedtime to 600 mg daily in divided doses.
Metharbital	PO				Usual dose: 100 mg 1–3 times daily. Dose range: 100 to 800 mg daily.
Talbutal	PO	30 to 60 mg 2–3 times daily	120 mg 15–30 min before retiring		

References

1. Harvey, S. C., "Hypnotics and Sedatives: The Barbiturates," *in* "The Pharmacological Basis of Therapeutics," 5th Ed., Edited by Goodman, L. S. and A. Gilman, The MacMillan Co., New York, pp. 102–123, 298, 1975.

2. Mark, L. C., "Commentary-Archaic Classification of Barbiturates," *Clinical Pharmacology and Therapeutics*, 10:287–291, 1979.

3. Kales, A., et al., "Effectiveness of Hypnotic Drugs with Prolonged Use: Flurazepam and Pentobarbital," *Clinical Pharmacology and Therapeutics*, 18:356–63, 1975.

4. Kales, A., et al., "Chronic Hypnotic-Drug Use: Ineffectiveness, Drug-Withdrawal Insomnia, and Dependence," *Journal of the American Medical Association*, 227:513–517, 1974.

5. Greenblatt, D. J. and R. I. Shader, "The Clinical Choice of Sedative-Hypnotics," *Annals of Internal Medicine*, 77:91–100, 1972.

6. Kales, A., et al., "Effectiveness Intermediate-Term Use of Secobarbital." *Clinical Pharmacology and Therapeutics*, 20:541–545, 1976.

7. Kales, A. and J. D. Kales, "Shortcomings in the Evaluation and Promotion of Hypnotic Drugs," *New England Journal of Medicine*, 293:826–827, 1975.

8. Wesson, D. R. and D. E. Smith, "Barbiturates: Their Use, Misuse, and Abuse," Human Sciences Press, New York, pp. 24, 25, 30–47, 81, 96–103, 1978.

9. Clutton-Brock, J., "Pain and the Barbiturates," *Anaesthesia*, 16:80–88, 1961.

10. Shidemann, F. E., "Clinical Pharmacology of Hypnotics and Sedatives," *Clinical Pharmacology and Therapeutics*, 2:313–344, 1961.

11. Millichap, J. G., "Drug Treatment of Convulsive Disorders," *New England Journal of Medicine*, 286:464–469, 1972.

12. Brown, C. R., W. H. Forrest, and J. H. Hayden, "The Respiratory Effects of Pentobarbital and Secobarbital in Clinical Doses," *Journal of Clinical Pharmacology*, 13:28–35, 1973.

13. deBodo, R. C. and K. G. Prescott, "The Antidiuretic Action of Barbiturates (Phenobarbital, Amytal, Pentobarbital) and the Mechanism Involved in This Action," *Journal of Pharmacology and Experimental Therapeutics*, 85:222–233, 1945.

14. Sessions, J. T., et al., "The Effect of Barbiturates in Patients with Liver Disease," *Journal of Clinical Investigation*, 33:1116–1127, 1954.

15. Koch-Weser, J. and E. M. Sellers, "Drug Interaction with Coumarin Anticoagulants (Second of Two Parts)," *New England Journal of Medicine*, 285:547–558, 1971.

16. Freudenthal, R. I. and F. I. Carroll, "Metabolism of Certain Commonly Used Barbiturates," *Drug Metbolism Reviews*, 2:265–278, 1973.

17. Sjogren, J., L. Solvell and I. Karlsson, "Studies on the Absorption Rate of Barbiturates in Man," *Acta Medica Scandinavica*, 178:553–559, 1965.

18. Smith, R. B., et al., "Pharmocokinetics of Pentobarbital After Intraveneous and Oral Administration," *Journal of Pharmocokinetics and Biopharmaceutics*, 1:5–16, 1973.

19. "Central Nervous System Depressants: Sedatives and Hypnotics," *in* "Textbook of

Organic Medicinal and Pharmaceutical Chemistry," 5th Ed., Edited by Wilson, C. O., O. Gisvold and R. F. Doerge, J. B. Lippincott Co., Philadelphia, pp. 372–377, 1966.

20. Mautner, G. and H. C. Clemson, "Hypnotics and Sedatives, "*in* "Medicinal Chemistry," Vol. II, 3d Ed., Edited by Burger, A., Wiley Interscience, New York, pp. 1365–1385, 1970.

21. Musser, Ruth D. and John J. O'Neill, "Pharmacology and Therapeutics," 4th Ed., Macmillan Co., London, pp. 449–457, 1969.

22. Way, W. L. and A. J. Trevor, "Sedative-Hypnotics," *Anesthesiology, 34:170–182, 1971.*

23. Waddell, W. H. and T. C. Butler, "The Distribution and Excretion of Phenobarbital," *Journal of Clinical Investigation,* 36:1217–1226, 1957.

24. Brodie, B. B., et al., "The Fate of Pentobarbital in Man and Dog and a Method for its Estimation in Biological Material," *Journal of Pharmacology and Experimental Therapeutics,* 109:26–34, 1953.

25. Mark, L. C., "Pharmocokinetics of Barbiturates," *in* "Acute Barbiturate Poisoning," Edited by Matthew, H., Excerpta Medica, Amsterdam, pp. 75–83, 1971.

26. Ehrnebo, M., "Pharmacokinetics and Distribution Properties of Pentobarbital in Human Following Oral and Intraveneous Administration," *Journal of Pharmaceutical Sciences,* 63:1114–1118, 1974.

27. Brabstad, J. and U. Meresaar, "Complex Formation Between Macromolecles and Drugs VII: The Binding of Some Barbiturates to Serum Albumin at Varying pH," *Acta Pharmaceutica Suecica,* 9:129–134, 1972.

28. Aviado, Domingo M., "Pharmacologic Principles of Medical Practice," 8th Ed., Williams and Wilkins Co., Baltimore, pp. 56–74, 1972.

29. Grove, J. and P. A. Toseland, "The Excretion of Hydroxyamylobarbitone in Man after Oral Administration of Amylobaritone," *Journal of Pharmacy and Pharmacology,* 23:936–940, 1971.

30. Kadar, D., et al., "Comparative Drug Elimination Capacity in Man—Glutethimide, Amobarbital, Antipyrine, and Sulfinpyrazone," *Clinical Pharmacology and Therapeutics* 14:552–560, 1973.

31. Balasubramaniam, K., et al., "The Kinetics of Amylobarbitone Metabolism in Healthy Men and Women," *British Journal of Pharmacology,* 39:564–572, 1970.

32. Lous, P., "Plasma Levels and Urinary Excretion of Three Barbituric Acids after Oral Administration to Man," *Acta Pharmacolgica et Toxicologica,* 10:147–165, 1954.

33. "Butabarbital Bioavailability Study," McNeil Laboratories, Fort Washington, PA, 1978.

34. Pitlick, W., M. Painter and C. Pippenger, "Phenobarbital Pharmacokinetics in Neonates," *Clinical Pharmacology and Therapeutics,* 23:346–350, 1978.

35. Maynert, E. W., "Phenobarbital, Mephobarbital, and Metharbital: Absorption, Distribution, and Excretion," *in* "Antiepileptic Drugs," Edited by Woodbury, D. W., J. K. Penry and R. P. Schmidt, Raven Press, New York, pp. 303–310, 1972.

36. Mark, L. D., "Metabolism of Barbiturates in Man," *Clinical Pharmacology and Therapeutics,* 4:504–530, 1963.

37. Jalling, B., "Plasma Concentrations of Phenobarbital in the Treatment of Seizures in Newborns," *Acta Paediatr Scand,* 64:514–524, 1975.

38. Clifford, J. M., J. H. Cookson, and P. E. Wickham, "Absorption and Clearance of Secobarbital, Heptabarbital, Methaqualone, and Ethinamate," *Clinical Pharmacology and Therapeutics,* 16:376–389, 1974.

39. Richards, R. K. and J. D. Taylor, "Some Factors Influencing Distribution, Metabolism and Action of Barbiturates: A Review," *Anesthesiology,* 17:414.458, 1956.

40. Sunshine, I., "Chemical Evidence of Tolerance of Phenobarbital," *Journal of Laboratory and Clinical Medicine,* 50:127–133, 1957.

41. Isbell, H., "Addiction to Barbiturates and the Barbiturate Abstinence Syndrome," *Annals of Internal Medicine,* 33:108–121, 1950.

42. Essig, C. F., "Addiction to Barbiturate and Nonbarbiturate Sedative Drugs," Research Publications—Association for Research in Nervous and Mental Diseases, pp. 188–198, 1968.

43. Belleville, R. E. and H. F. Fraser, "Tolerance to Some Effects of Barbiturates," *Journal of Pharmacology and Experimental Therapeutics,* 120:469–474, 1957.

44. Isbell, H., et al., "Chronic Barbiturate Intoxication," *Archives of Neurology and Psychiatry,* 64:1–28, 1950.

45. Fraser, H. F., et al., "Chronic Barbiturate Intoxication," *Archives of Internal Medicine,* 94:34–41, 1954.

46. Smith, D. E. and D. R. Wesson, "A New Method for Treatment of Barbiturate Dependence," *Journal of the American Medical Association,* 213:294–295, 1970.

47. Gay, G. R., et al., "Outpatient Barbiturate Withdrawal Using Phenobarbital," *International Journal of the Addictions,* 7:17–26, 1972.

48. Nelson, M. M. and J. O. Forfar, "Associations Between Drugs Administered During Pregnancy and Congenital Abnormalities of the Fetus," *British Medical Journal,* 1:523–527, 1971.

49. Crombie, D. L., et al., "Teratogenic Drugs-R.C.G.P. Survey," *British Medical Journal,* 4:178–179, 1970.

50. Persson, B. H., "Studies on the Accumulation of Certain Barbiturates in the Brain of the Human Fetus," *Acta Obstetrica et Gynecologica Scandinavica,* 39:88–99, 1960.

51. Moya, F. and V. Thorndike, "Passage of Drugs Across the Placenta," *American Journal of Obstetrics and Gynecology,* 84:1778–1798, 1962.

52. Desmond, M. M., et al., "Maternal Barbiturate Utilization and Neonatal Withdrawal Symptomatology," *Journal of Pediatrics,* 80:191–197, 1972.

53. Bleyer, W. A. and R. E. Marshall, "Barbiturate Withdrwal Syndrome in a Passively Addicted Infant," *Journal of the American Medical Association,* 221:185–186, 1972.

54. Hansten, P. D., "Drug Interactions," 3d Ed., Lea and Febiger, Philadelphia, pp. 28, 156, 201, 1975.

55. "Evaluations of Drug Interactions," 2d Ed., American Pharmaceutical Association, Washington, DC, pp. 180–185, 205–207, 592, 593, 1976.

56. Dawson-Butterworth, K., "The Chemopsychotherapeutics of Geriatric Sedation," *Journal of the American Geriatrics Society,* 18:97–114, 1970.

57. Albo, D., et al., "Effect of Intra-Arterial Injections of Barbiturates,"*American Journal of Surgery,* 120:676–678, 1970.

58. Cohen, S. M., "Accidental Intra-Arterial Injection of Drugs," *Lancet,* 2:361–371, 1948.

59. Cohen, S. M., "Accidental Intra-Arterial Injection of Drugs," *Lancet,* 2:409–417, 1948.

60. Devenyi, P. and M. Wilson, "Barbiturate Abuse and Addiction and Their Relationship to Alcohol and Alcoholism," *Canadian Medical Association Journal,* 104:215–218, 1971.

61. Cucinell, S. A., et al., "Drug Interactions in Man: 1. Lowering Effect of Phenobarbital on Plasma Levels of Bishydroxycoumarin (Dicumarol) and Dephenylhydantoin (Dilantin)," *Clinical Pharmacology and Therapeutics,* 6:420–429, 1965.

62. Robinson, D. A. and M. G. MacDonald, "The Effect of Phenobarbital Administration on the Control of Coagulation Achieved During Warfarin Therapy in Man," *Journal of Pharmacology and Experimental Therapeutics,* 153:250–253, 1966.

63. MacDonald, M. G. and D. S. Robinson, "Clinical Observations of Possible Barbiturate Interference with Anticoagulation," *Journal of the American Medical Associaiton,* 204:97–100, 1968.

64. Brooks, S. M., et al., "Adverse Effects of Phenobarbital on Corticosteroid Metabolism in Patients with Bronchial Asthma," *New England Journal of Medicine,* 286:1125–1128, 1972.

65. Riegelman, S., M. Rowland, and W. L. Epstein, "Griseofulvin-Phenobarbital Interaction in Man," *Journal of the American Medical Association,* 213:426–431, 1966.

66. Busfield, D., et al., "An Effect of Phenobarbitone on Blood-Levels of Griseofulvin in Man," *Lancet,* 2:1042–1043, 1963.

67. Neuvonen, P. J. and O. Penttila, "Interaction Between Doxycycline and Barbiturates," *British Medical Journal,* 1:535–536, 1974.

68. Garrettson, L. K. and P. G. Dayton, "Disappearance of Phenobarbital and Diphenylhydantoin from Serum of Children," *Clinical Pharmacology and Therapeutics,* 11:674–679, 1970.

69. Buchanan, R. A., J. C. Heffelfinger and C. F. Weiss, "The Effect of Phenobarbital on Diphenylhydantoin Metabolism in Children," *Pediatrics,* 43:114–116, 1969.

70. Buchanan, R. A. and R. J. Allen, "Diphenylhydantoin (Dilantin) and Phenobarbital Blood Levels in Epileptic Children," *Neurology,* 21:866–871, 1971.

71. "IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Man," *in* "Some Miscellaneous Pharmaceutical Substances," Vol. 13, World Health Organization, Lyon, France, pp. 157–181, 1977.

72. Gold, E., et al., "Increased Risk of Brain Tumors in Children Exposed to Barbiturates," *Journal of National Cancer Institute,* 61:1031–1034, 1978.

73. Correspondence from Biometrics Division to Drug Labeling, "Estimation of ADR Incidence Ratio for the Barbiturate Class of Drugs," June 23, 1978.

74. Miller, R. R. and D. J. Greenblatt, "Drug Effects in Hospitalized Patients—Experiences of Boston Collaborative Drug Surveillance Program 1966–1975," John Wiley and Sons, New York, pp. 184–191, 1976.

75. Shapiro, S., et al., "Clinical Effects of Hyponotics II. An Epidemiologic Study," *Journal of the American Medical Association*, 209:2016–2020, 1969.

76. Ewing, J. A. and W. E. Bakewell, "Diagnosis and Management of Depressant Drug Dependence," *American Journal of Psychiatry*, 120:909–917, 1967.

77. Essig, C. F., "Clinical and Experimental Aspects of Barbiturate Withdrawal Convulsions," *Epilepsia*, 8:21–30, 1967.

78. World Health Organization Technical Report Series 273; "WHO Expert Committee on Addiction-Producing Drugs," World Health Organization, Geneva, Switzerland, 1964.

79. "Clinical Toxicology of Commercial Products," *in* "Acute Poisonings," 4th Ed., Edited by Gleason, M. N., et al., The Williams and Wilkins Co., Baltimore, pp. 49–57, 1976.

80. Parker, K. D., et al., "Blood and Urine Concentrations of Subjects Receiving Barbiturates, Meprobamate, Glutethimide or Diphenylhydantoin," *Clinical Toxicology*, 3:131–145, 1970.

81. Setter, J. G., J. F. Maher and G. E. Schreiner, "Barbiturate Intoxication, Evaluation of Therapy Including Dialysis in a Large Series Selectively Referred Because of Severity," *Archives of Internal Medicine*, 117:224–236, 1966.

82. Clemmesen, C. and E. Nilsson, "Therapeutic Trends in the Treatment of Barbiturate Poisoning: The Scandanavian Method," *Clinical Pharmacology and Therapeutics*, 2:220–229, 1961.

83. Berman, L. B., et al., "Hemodialysis, an Effective Therapy for Acute Barbiturate Poisoning," *Journal of the American Medical Association*, 161:820–827, 1956.

84. Dodson, W. E., et al., "Management of Seizure Disorders: Selected Aspects. Part 1," *Journal of Pediatrics*, 89:527–540, 1976.

85. Trissel, L. A., "Handbook of Injectable Drugs," American Society of Hospital Pharmacists, Washington, D.C., pp. 23–25, 290–294, 338–340, 1977.

86. Buchthal, F. and M. A. Lennox-Buchthal, "Phenobarbital: Relation of Serum Concentration to Control of Seizures," *in* "Antiepileptic Drugs," Edited by Woodbury, D. M., J. K. Penry and R. P. Schmidt, Raven Press, New York, pp. 335–343, 1972.

87. Solomon, G. E. and H. Kutt, "Epilepsy," *in* "Current Neurology," Edited by Tyler, H. R. and D. M. Dawson, Houghton Mifflin Publishers, Boston, pp. 243–259, 1978.

88. Fishman, M. A., "Febrile Seizures: The Treatment Controversy," *Journal of Pediatrics*, 94:177–184, 1979.

89. Correspondence from Sydney Segal to Dr. Martha M. Freeman, "Barbiturate Pediatric Dosage Information Recommended by the American Academy of Pediatrics, Committee on Drugs," July 6, 1978.

90. "AMA Drug Evaluations—1977, 3d Ed.," American Medical Association, Littleton, MA, pp. 400–403, 459–461, 1977.

91. "American Hospital Formulary Service," American Society of Hospital Pharmacists, Washington, D.C. 28:24, 1979.

Dated: November 5, 1980.

Jere E. Goyan,

Commissioner of Food and Drugs.

[FR Doc. 80-35842 Filed 11-17-80; 8:45 am]

BILLING CODE 4110-03-M

federal register

Tuesday
November 18, 1980

Part IV

Department of Energy

Economic Regulatory Administration

Voluntary Guideline for the Advertising Standard Under the Public Utility Regulatory Policies Act of 1978; Proposed Guideline and Public Hearing

DEPARTMENT OF ENERGY

Economic Regulatory Administration

[Docket No. ERA-R-80-39]

Voluntary Guideline for the Advertising Standard Under the Public Utility Regulatory Policies Act of 1978; Proposed Guideline and Public Hearing

AGENCY: Economic Regulatory Administration, Department of Energy.

ACTION: Notice of Proposed Guideline and Public Hearing.

SUMMARY: Title I of the Public Utility Regulatory Policies Act of 1978 (PURPA) establishes certain Federal purposes and policy standards for the regulation of electric utilities and imposes a set of obligations upon State regulatory authorities and certain nonregulated utilities with respect to the standards established by sections 111 and 113.

Pursuant to section 131 of PURPA, the Secretary of Energy may prescribe voluntary guidelines respecting consideration of the standards for electric utilities. The Appendix of this Notice is the proposed voluntary guideline respecting the advertising standard established by section 113(b)(5) of PURPA. Written comments will be received and a public hearing will be held with respect to the proposed guideline.

DATE: Written comments must be received by January 19, 1981, 4:30 p.m., e.d.t. A public hearing will be held beginning at 9:30 a.m., local time, on the date and location specified below:

City	Hearing date	Request to testify to be received by—	Submit request to testify to—	Hearing location
Washington, D.C	Dec. 17, 1980	Dec. 10, 1980	Lorrain Hall, DOE, ERA, Room B210, 2000 M St. NW., Washington, D.C. 20461. Telephone (202) 653-3984.	Room 2105, 2000 M St., Washington, D.C.

FOR FURTHER INFORMATION CONTACT: Stephen S. Skjei, Division of Regulatory Assistance, Office of Utility Systems, Economic Regulatory Administration, Department of Energy, 2000 M Street, NW., Room 4016D, Washington, D.C. 20461, telephone (202) 653-3913. William L. Webb, Office of Public Information, Economic Regulatory Administration, Department of Energy, 2000 M Street, NW., Room B-110, Washington, D.C. 20461, telephone (202) 653-4055.

Arthur Perry Bruder, Office of the General Counsel, Department of Energy, 1000 Independence Avene, SW., Room 1E-258, Washington, D.C. 20585, telephone (202) 252-9516. Cynthia Ford, Office of Public Hearings Management, Economic Regulatory Administration, Department of Energy, 2000 M Street, NW., Room B-210, Washington, D.C. 20461 telephone (202) 653-3971.

SUPPLEMENTARY INFORMATION: .

I. Background

On November 8, 1978, the President signed into law the Public Utility Regulatory Policies Act of 1978 (PURPA), Pub. L. 95-617, 92 Stat. 3117 *et seq.* (16 U.S.C. 2601 *et seq.*), as one part of the National Energy Act.

Section 113(b)(5) of PURPA establishes an advertising standard applicable to electric utilities. The electric utility advertising standard, which must be considered by State regulatory authorities and certain nonregulated utilities in a manner specified by PURPA, provides that—

No electric utility may recover from any person other than the shareholders (or other owners) of such utility any direct or indirect expenditure by such utility for promotional or political advertising as defined in section 115(h).

Section 115(h) provides that for the purposes of section 113(b)(5)—

(A) The term "advertising" means the commercial use, by an electric utility of any media, including newspaper, printed matter, radio, and television, in order to transmit a message to a substantial number of members of the public or to such utility's electric consumers.

(B) The term "political advertising" means any advertising for the purpose of influencing public opinion with respect to legislative, administrative or electoral matters, or with respect to any controversial issue of public importance.

(C) The term "promotional advertising" means any advertising for the purpose of encouraging any person to select or use the service or additional service of an electric utility or the selection or installation of any appliance or equipment designed to use such utility's service.

Section 115(h) further stipulates that the terms "political advertising" and "promotional advertising" do not include:

(A) Advertising which informs electric consumers how they can conserve energy or can reduce peak demand for electric energy,

(B) Advertising required by law or regulation, including advertising required under part 1 of title II of the National Energy Conservation Policy Act,

(C) Advertising regarding service interruptions, safety measures or emergency conditions,

(D) Advertising concerning employment opportunities with such utility,

(E) Advertising which promotes the use of energy efficient appliances, equipment or services, or

(F) Any explanation or justification of existing or proposed rate schedules, or notifications of hearings thereon.

The Advertising Standard for electric utilities does not restrict the type of advertising a utility may undertake. Rather, this standard is concerned solely with whether direct or indirect expenditures for certain types of advertising may be recoverable from the utility's ratepayers.

II. Guideline Issues

In promulgating this guideline, DOE's main objective is to offer guidance on those provisions of the standard concerned (a) with conservation oriented advertising (PURPA sections 115(h)(2) (A) and (B)), and (b) with advertising which promotes the use of energy efficient equipment (PURPA section 115(h)(2)(E)). The guideline focuses on these provisions primarily because of DOE's interest in increased efforts to encourage energy conservation. In particular, DOE is committed to encourage utilities to expand their role so that the energy needs of their customers, and the Nation, may be met in the most efficient and least costly manner. The other provisions of the advertising standard are not directly addressed in this guideline because they are relatively straightforward and do not appear to require more specific Federal guidance at this tilme to achieve their purpose.

This guideline does not suggest the regulatory authority prohibit or restrict the type of advertising undertaken by utilities. Therefore, this guideline does not conflict with the recent U.S. Supreme Court decisions in (1) *Central Hudson Gas and Electric Corporation v. Public Service Commission of New York*, 48 U.S.L.W. 4783, June 20, 1980, which held that a ban on utility promotional advertising violates the First and Fourteenth Amendments, or (2) *Consolidated Edison Company of New York v. Public Service Commission of New York*, 48 U.S.L.W. 4776, June 20, 1980, which held that a ban on utility bill inserts discussing controversial issues of public policy violates the First and Fourteenth Amendments.

A. Conservation Advertising

Utility advertising which encourages the conservation of, or the reduction of peak demand for electricity is consistent with the three purposes of PURPA and

can lead to reduced consumption of scarce fossil fuels. Such advertising can take a variety of forms. It might encourage residential customers to insulate their homes or it might promote the use of electrical or other equipment which is primarily designed to reduce overall electric energy consumption or to shift consumption from peak to offpeak periods. In the long run, all customers can benefit from such advertising.

B. Advertising Which Promotes the Efficient Use of Energy

Utility advertising which encourages the purchase of energy efficient appliances, equipment or services is also consistent with the three purposes of PURPA. The cost-effectiveness of such devices may vary from utility to utility, depending on the fuels involved. Therefore, this type of advertising should be considerd by the State regulatory authority on a utility-specific basis.

III. The Proposed Guideline

Comments are invited on all aspects of the proposed guideline. The guideline, when promulgated in final form, will be advisory in nature and not legally binding. It will, however, consititute DOE policy respecting consideration of the Federal standard for advertising.

IV. Written Comments and Public Hearing Procedures

A. Written Comments

The public is invited to participate in this proceeding by submitting to DOE's Economic Regulatory Administration (ERA) information, views or arguments with respect to the proposal set forth in the Appendix to this Notice. Comments should be submitted by 4:30 p.m. January 19, 1981, to the Public Hearings Division, Economic Regulatory Administration, Room B-210, 200 M Street, N.W., Washington, D.C. 20461. Comments should be identified on the outside of the envelope with the designation: "Proposed Voluntary Guideline on Advertising, Docket No. ERA-R-80-39". Fifteen copies should be submitted. All comments received will be available for public inspection in the DOE Reading Room, 1E-190, James Forrestal Building, 1000 Independence Avenue, SW, Washington, D.C. 20585, and the ERA Office of Public Information, Room B-110, 2000 M Street, NW., Washington, D.C. 20461, between the hours of 8:00 a.m. and 4:30 p.m., Monday through Friday.

Pursuant to the provisions of 10 CFR 1004.11 (44 FR 1908, January 8, 1979), any person submitting information which he or she believes to be confidential and which may be exempt by law from public disclosure should submit one complete copy and fifteen copies from which information claimed to be confidential has been deleted. In accordance with the procedures established at 10 CFR 1004.11, DOE shall make its own determination with regard to any claim that information submitted be exempt from public disclosure.

B. Public Hearing

(1) *Procedures for Request to make Oral Presentation.* The time and place for the hearing are indicated in the "DATES" section of this Notice. Any person who has an interest in this proposed guideline or represents a person, group or class of persons that has an interest, may make a written request for an opportunity to speak at the public hearing. Requests to speak should be sent to the address shown in the "DATES" section and be received by December 10, 1980. The request should include a telephone number where the speaker may be contacted through the day before the hearing.

All persons participating in the hearing will be so notified on or before December 12, 1980. Speakers should submit 100 copies of their hearing testimony for distribution at the hearing by 4:30 p.m., December 16, 1980, to the Office of Public Hearings Management, U.S. Department of Energy, Room B-210, 2000 M Street, NW., Washington, D.C. 20461.

(2) *Conduct of the Hearing.* DOE reserves the right to select the persons to be heard at these hearings (in the event there are more requests to be heard than time allows), to schedule their respective presentations, and to establish the procedures governing the conduct of the hearings. The length of each presentation may be limited, based upon the number of persons requesting to be heard.

A DOE official will be designated to preside at each of the hearings. These will not be judicial or evidentiary-type hearings. Questions may be asked only by those conducting the hearings, and there will be no cross-examination of persons presenting statements. At the conclusion of all initial oral statements, each person who has made an oral statement will be given the opportunity to make a rebuttal statement. The rebuttal statements will be given in the order in which the initial statements were made and will be subject to time limitations.

Any person at the hearings who wishes to ask a question may submit the question, in writing, to the presiding officer. The presiding officer will detemine whether these questions are relevant and whether time limitations permit them to be presented for answers. Any further procedural rules needed for the proper conduct of a hearing will be announced by the presiding officer.

A transcript of the hearing will be made, and the entire record of the hearings, including the transcripts, will be retained by DOE and made available for inspection at the Freedom of Information Office, Room 1E-190, Forrestal Building, 1000 Independence Avenue, SW., Washington, D.C. between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday, and at the Office Public Information, Economic Regulatory Adminstration, Room B-110, 2000 M Street, NW., Washington, D.C. 20461.

In the event that it becomes necessary to cancel a hearing, every effort will be made to publish advance notice of the cancellation in the **Federal Register**, and DOE will notify all persons scheduled to testify at the hearing.

Since it is generally not possible to give actual notice of cancellations or changes to persons not participants, persons desiring to attend a hearing are advised to contact DOE on the last working day before the hearing to confirm that it will be held as scheduled.

(Public Utility Regulatory Policies Act of 1978, Pub. L. 95-617, 92 Stat. 3117 *et seq.* (16 U.S.C. 2601 *et seq.*); Department of Energy Organization Act, Pub. L. 95-91 (42 U.S.C. 7101 *et seq.*))

Issued in Washington, D.C., on November 10, 1980.

Hazel R. Rollins,

Administrator, Economic Regulatory Administration.

Appendix.—PURPA Guideline Number 5: Advertising

A. Introduction

On November 8, 1978, the President signed into law the Public Utility Regulatory Policies Act of 1978 (PURPA), Pub. L. 95-617, 92 Stat. 3117 *et seq.* (16 U.S.C. 2601 *et seq.*) as one part of the National Energy Act.

Section 113(b)(5) of title I of PURPA establishes a standard for advertising for State regulatory authorities and certain nonregulated electric utilities. The standard provides that "no electric utility may recover from any person other than the shareholders (or other owners) of such utility any direct or indirect expenditures by such utility for promotional or political advertising as defined in section 115(h)."

Under section 115(h) of PURPA, advertising political advertising and promotional advertising, for the

purposes of section 113(b)(5) are defined as follows:

(1) The term "advertising" means the commercial use, by an electric utility, of any media, including newspaper, printed matter, radio and television, in order to transmit a message to a substantial number of members of the public or to such utility's electric consumers.

(2) The term "political advertising" means any advertising for the purpose of influencing public opinion with respect to legislative, administrative or electoral matters, or with respect to any controversial issue of public importance.

(3) The term "promotional advertising" means any advertising for the purpose of encouraging any person to select or use the service or additional service of an electric utility or the selection or installation or any appliance or equipment designed to use such utility's service.

(4) For purposes of section 113(b)(5), the terms "political advertising" and "promotional advertising" do not include—

"(A) Advertising which informs electric consumers how they can conserve energy or can reduce peak demand for electric energy,

(B) Advertising required by law or regulation, including advertising required under part 1 of title II of the National Energy Conservation Policy Act,

(C) Advertising regarding service interruptions, safety measures, or emergency conditions,

(D) Advertising concerning employment opportunities with such utility,

(E) Advertising which promotes the use of energy efficient appliances, equipment or services, or

(F) Any explanation or justification of existing or proposed rate schedules, or notifications of hearings thereon."

This guideline is limited to a discussion of the types of advertising set forth in (4)(A), (B) and (E) above.

B. Coverage

This guideline covers the PURPA standard on advertising and specifically addresses certain advertising direct or indirect expenditures which are exempt from the prohibitions established by the PURPA standard.

C. Definitions

As used in this guideline, except as otherwise specifically provided—

The term "electric utility" means any person, State agency, or Federal agency, which sells electric energy.

The term "evidentiary hearing" means—

(1) In the case of a State agency, a proceeding which (a) is open to the public, (b) includes notice to participants and an opportunity for such participants to present direct and rebuttal evidence and to cross-examine witnesses, (c) includes a written decision, based upon evidence appearing in a written record of the proceeding, and (d) is subject to judicial review;

(2) In the case of a Federal agency, a proceeding conducted as provided in section 554, 556, and 557 of title 5, United States Code; and

(3) In the case of a pending conducted by any entity other than a State or Federal agency, a proceeding which conforms, to the extent appropriate, with the requirements of subparagraph (1).

The term "Federal agency" means an executive agency (as defined in section 105 of title 5 of the United States Code).

The term "nonregulated electric utility" means any electric utility other than a State regulated electric utility.

The term "rate" means (a) any price, rate, charge, or classification made, demanded, observed, or received with respect to sale of electric energy by an electric utility to an electric consumer, (b) any rule, regulation, or practice respecting any such rate, charge, or classification, and (c) any contract pertaining to the sale of electric energy to an electric consumer.

The term "ratepayer" means any person, State agency, or Federal agency, which purchases electric energy in accordance with an approved rate schedule.

The term "rate schedule" means the designation of the rates which an electric utility charges for electric energy.

The term "State" means a State, the District of Columbia, and Puerto Rico.

The term "State agency" means a State, political subdivision thereof, and any agency or instrumentality of either.

The term "State regulatory authority" means any State agency which has ratemaking authority with respect to the sale of electric energy by any electric utility (other than such State agency), and in the case of an electric utility with respect to which the Tennessee Valley Authority has ratemaking authority, such term means the Tennessee Valley Authority.

D. DOE Guidance

In general, the PURPA advertising standard, if implemented by a State regulatory authority or nonregulated utility, would prohibit the recovery from ratepayers of direct or indirect expenditures for either political or promotional advertising. Section 115(h)(2) contains several exceptions to or clarifications of this general prohibition. Certain of these exceptions deserve careful attention in light of their implications for national energy policy. These are:

(1) Conservation advertising (sections 115(h)(2)(A) and (B) of PURPA); and

(2) Advertising which promotes the efficient use of energy (section 115(h)(2)(E) of PURPA).

Both conservation advertising and advertising which promotes the efficient use of energy are consistent with the purposes of title I of PURPA. Both can lead to reduced consumption of scarce fossil fuels. These exceptions are the focus of this guideline because of DOE's interest in increased efforts to encourage energy conservation. In particular, DOE is committed to encourage utilities to expand their role so that the energy needs of their customers, and the Nation, may be met in the most efficient and least costly manner.

1. *Conservation Advertising.* Advertising which encourages electric consumers to conserve energy or reduce peak demand for electric energy is beneficial to the utility, the utility's ratepayers and is in the public interest. Such advertising can result in the conservation of scarce imported fossil fuels either through reduced consumption during peak periods or the development of alternative technologies, e.g., load management devices and solar hot water heaters.

One of the more effective forms of conservation advertising is that which provides information on alternative ways to weatherize buildings, on specific methods for reducing energy usage, and on the cost saving potential of specific solar alternatives as a supplement to electric energy. General statements which promote the utility's own image or its activities related to energy conservation do not inform consumers how to conserve energy. Therefore, advertising of this type may not be exempted from the PURPA prohibitions relating to promotional advertising.

A good example of informative advertising is that required under the Residential Conservation Service (RCS) Program (specifically mentioned in section 115(h)(2)(B) of PURPA). The RCS Program, which is mandatory for all covered electric utilities, requires these utilities to provide certain types of information about residential energy conservation and renewable resource measures to all residential customers. This information includes a list of suggested measures, and estimate of the

savings likely to result from their installation, an offer of an on-site energy audit and a list of qualified suppliers and contractors. Another example of informative advertising is that which emphasizes conservation opportunities that offer significant benefits at minimal cost.

Certain conservation oriented advertising may promote the purchase of electrical equipment used to shift the time period at which consumption occurs. Such advertising would encourage, among other things, reduced peak kilowatt consumption through the use of electric heat storage units, electric time clock control mechanisms, or other devices designed to limit or control maximum kilowatt demand. Such advertising is beneficial to the ratepayer since its objective is to reduce peak period demand, thus conserving scarce fossil fuels or lowering utility costs (and ratepayer bills) through the deferral of new plant construction.

2. *Advertising Which Promotes the Use of Energy Efficient Appliance, Equipment or Services.* This type of advertising may also be beneficial to the utility's ratepayers and in the public interest. It includes advertising which encourages the purchase of cost effective, efficient electric appliances to replace existing less efficient electric appliances, or advertising which promotes, the initial use of cost-effective, energy efficient appliances, equipment or services, e.g., heat pumps to replace less efficient or more costly types of heating equipment; electric equipment designed to supplement solar or other renewable resource systems; or electric water heaters designed to utilize waste heat from air conditioning systems.

Whether replacing other types of heating equipment with heat pumps will increase efficiency depends greatly on climate and other factors which vary substantially around the country. It should be recognized, for example, that conversions from oil heating to heat pumps might actually increase oil consumption in some regions. Therefore, it is appropriate that benefits to the ratepayers and the cost-effectiveness of these replacements be determined by the State regulatory authority or the nonregulated utility.

Advertising of energy efficient appliances is especially helpful to the electric consumer when it provides specific substantive information about the appliance, such as, appliance efficiency labeling and standards information and data regarding the life cycle costs of alternative appliances relative to the initial capital costs of such appliances.

[FR Doc. 80-35875 Filed 11-17-80; 8:45 am]
BILLING CODE 6450-01-M

federal register

Tuesday
November 18, 1980

Part V

Department of Housing and Urban Development

Office of Assistant Secretary for Housing—Federal Housing Commissioner

Mortgage Insurance and Home Improvement Loans; Changes in Maximum Mortgage Amounts

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

Office of Assistant Secretary for Housing—Federal Housing Commissioner

24 CFR Parts 203, 220, 221, 226, 227, 234, and 240

[Docket No. R-80-885]

Mortgage Insurance and Home Improvement Loans; Changes in Maximum Mortgage Amounts

AGENCY: Department of Housing and Urban Development (HUD), Office of the Assistant Secretary for Housing—Federal Housing Commissioner.

ACTION: Interim rule.

SUMMARY: The Housing and Community Development Act of 1980 amended the National Housing Act to permit a change in the mortgage amounts under HUD's single family mortgage insurance programs.

EFFECTIVE DATE: November 18, 1980.

COMMENTS DUE: Comments must be received on or before January 19, 1981.

ADDRESS: Written comments should refer to the docket number and date and should be submitted to the Rules Docket Clerk, Office of the General Counsel, Room 5218, Department of Housing and Urban Development, 451 Seventh Street, S.W., Washington, D.C. 20410.

A copy of each communication will be available for public inspection during regular business hours at the above address.

FOR FURTHER INFORMATION CONTACT: John D. McNees, Deputy Assistant Secretary, Single Family Housing and Mortgagee Activities, Department of Housing and Urban Development, Room 9282, 451 Seventh Street, SW., Washington, D.C. 20410, (202) 755-6675. (This is not a toll-free number.)

SUPPLEMENTARY INFORMATION: The Housing and Community Development Act of 1980 was signed into law on October 8, 1980. Revisions are being made to Chapter II of the 24 CFR to change the maximum mortgage amounts for single family housing programs under Sections 203(b), and 220(d)(3)(A)(i), to reflect the new authorization. The maximum mortgage amounts under Sections 213, 222, 240, 244, 245(a), 245(b), 809, and 810 are incorporated by reference and continue to be those established for Section 203(b). This means that any of the programs stated above will utilize the increased mortgage amounts in designated areas, and otherwise the outstanding limits will apply. The maximum mortgage amount for Section 234(c) is also being revised and is listed separately.

Due to the regional differences in the cost of housing, the new provisions of the 1980 Act have provided for a more equitable means for establishing maximum mortgage amounts. Under this new authority, in areas where middle- and moderate-income persons have limited housing opportunities due to high prevailing housing sales prices, the maximum mortgage will be higher than those mortgage limits for areas where housing costs are not as great. Therefore, in areas where the high cost of housing is not considered a significant factor in determining the dollar limitation, the maximum mortgage amount will continue to be $67,500 for a one-family unit, $76,000 for a two-family unit, $92,000 for a three-family unit, and $107,000 for a four-family unit. In areas designated by the Commissioner as having limited housing opportunities, the formula set by statute for determining the maximum mortgage amount for a one-family unit is to be determined based on a level which does not exceed the lesser of (a) 133.33 percent of $67,500 ($90,000), or (b) 95 percent of the median sales price of a one-family residence in the area. The maximum mortgage amount for a two-family unit is based on a level which does not exceed the lesser of (a) 133.33 percent of $76,000 ($101,300), or 107 percent of the median sales price of a one-family residence in the area. The maximum mortgage amount for a three-family unit is based on a level which does not exceed the lesser of (a) 133.33 percent of $92,000 ($122,650), or 130 percent of the median sales price of a one-family residence in the area. The maximum mortgage amount for a four-family unit is based on a level which does not exceed the lesser of 133.33 percent of $107,000 ($142,650), or (b) 150 percent of the median sales price of a one-family residence in the area.

The formula for determining the maximum mortgage amount for mortgages insured under Section 234(c) has also been revised in the 1980 Act, with the same area designation as utilized under Section 203(b). The maximum mortgage amount for a one-family condominium continues to be $67,500 except in areas where limited housing opportunities for middle- and moderate-income persons exist, and the formula for determining the dollar limitation is a level which does not exceed the lesser of (a) 111 percent of $67,500 ($74,900), or (b) 95 percent of the median sales price of a one-family residence in the area.

To comply with the intent of the legislation, it is necessary for the Department to establish which areas are eligible for increases, as well as what the new maximum mortgage amount for these areas will be. These designations are the product of a Departmental review and analysis of recent year sales activity both nationally and in local housing markets which compared the base FHA mortgage limits and the patterns of sales prices in individual markets. Following the adjustments noted below, areas in which 95 percent of median sales price exceeded the base FHA mortgage limits were designated as ones in which middle- and moderate-income persons have limited housing opportunities due to high prevailing prices, and have received mortgage limit increases.

The primary data reference employed by HUD in the development of new area-wide limits was the Federal Home Loan Bank Board's (FHLBB's) survey of "Terms on Conventional Home Mortgages", the most comprehensive survey of home sales prices by local market areas presently available. From the survey, median sales price estimates by Standard Metropolitan Statistical Areas (SMSAs) and non-SMSA state-wide areas were obtained for the period of September 1979 through August 1980. HUD adjusted these estimates, first to trend them forward to the effective program year (Fiscal Year 1981), and second, to correct for the absence of FHA and VA activity in the FHLBB survey data. Other data sources, including the FHA Homes Series, a HUD report of Section 203(b) new and existing home sales, the Bureau of Census Construction Report Series and the National Association of Realtor's Existing Home Sales Survey, were used to augment FHLBB home sales data in cases of underreporting by individual SMSAs in the FHLBB data base. In addition, these data sources were employed for the purpose of assessing the validity of FHLBB survey estimates in predicting home purchase opportunities available to middle- and moderate-income persons in individual housing markets. Thus, where FHLBB data supported a higher mortgage limit, but where FHA data indicated that substantial numbers of households were finding houses well within the FHA limits, a higher mortgage limit was not approved.

The basic geographic units for which new area-wide mortgage limits were developed and assigned are SMSAs and non-SMSA areas within state boundaries. However, where it was feasible to do so and consistent with the

statute's objectives, the Department combined data from two or more SMSAs or from SMSAs and non-SMSA areas to provide area-wide limits, thus reducing disparities between communities and simplifying the system for buyers, sellers, builders and mortgagees. Aggregate sales price data from contiguous SMSAs, or from SMSAs and non-SMSA areas on a HUD Field Office basis, were employed as a basis for mortgage limit assignments only where area housing markets are essentially homogeneous in character and where median home sales prices are comparable in amount.

In areas where middle- and moderate-income persons have limited housing opportunities due to high prevailing housing sales prices, an appendix is attached to the Section 203(b) regulations, and the Section 234(c) regulations identifying the maximum mortgage amount for the area. Any area not listed in the appendices will utilize the outstanding maximum mortgage amount of $67,500 (1-unit). Individuals who read the appendices will be able to determine what the maximum mortgage amounts for their area will be without reference to other publications.

In cases where interested parties determine that the designated maximum mortgage limits do not accurately reflect the extent to which middle- and moderate-income persons have limited housing opportunities in local market areas due to high prevailing housing sales prices, the parties may submit documented evidence in support of an alternative maximum mortgage limit. Such documentation should include local market sales price data for new and existing home sales covering a recent period of time (3 months or longer). Adjustments to mortgage limits will not be given to sub-market areas within SMSAs, or within non-SMSA state-wide areas. Requests for adjustments to maximum mortgage limits, together with the appropriate documentation, shall be submitted to the appropriate HUD Field Office for review and recommendation. Field Offices shall forward such requests, documentation and recommendations to the Assistant Secretary for Housing for determination.

The Secretary has determined that it is urgent that the benefits afforded by this provision of the Act be made available as soon as possible. Publishing a notice of proposed rulemaking and giving the public an opportunity to comment prior to the effective date of this regulation would cause a substantial delay in making the benefits available. A delay could cause unnecessary hardships to homebuyers who need to use the increased mortgage amounts which the Act provides. Therefore, the Secretary finds that notice and prior public procedure on this regulation would be contrary to the public interest. Since these regulations relieve restrictions contained in present regulations, it is necessary to accelerate the effective date as much as possible. However, an opportunity for public comment is being provided to be followed by issuance of a final rule. The Department is particularly interested in comments relating to: (1) alternative data sources; (2) alternative area designations (i.e. state-wide, larger than SMSA, smaller than SMSA); (3) particular groupings of SMSAs used; and (4) the basis for granting appeals. Accordingly, these amendments will become effective November 18, 1980.

A Finding of No Significant Impact with respect to the environment has been made in accordance with HUD regulations in 24 CFR Part 50 which implement Section 102(2)(c) of the National Environmental Policy Act of 1969. The Finding of No Significant Impact is available for public inspection during regular business hours in the Office of the Rules Docket Clerk at the address set forth above. In addition, the Chairmen and Ranking Minority Members of the Committee on Banking, Housing, and Urban Affairs of the Senate and the Committee on Banking, Finance and Urban Affairs of the House of Representatives have waived the delay of effective date required by Section 7(o)(3) of the Department of Housing and Urban Development Act and the prepublication review of this rule provided for in Section 7(o)(2) of the Department of Housing and Urban Development Act.

This rule is not listed in the Department's seminannual agenda of significant rules, published pursuant to Executive Order 12044, as extended by Executive Order 12221.

The following numbers identify the programs, as listed in the Catalog of Federal Domestic Assistance, affected by the regulation change.

Section 203(b)=14.117 Mortgage Insurance—Homes (F), =14.118 Mortgage Insurance—Homes for Certified Veterans (F)
Section 213=14.126 Mortgage Insurance—Management Type Cooperative Projects (F)
Section 220=14.122 Mortgage Insurance—Homes In Urban Renewal Areas (F)
Section 221(d)(2)=14.120 Mortgage Insurance—Homes for Low and Moderate Income Families (F)
Section 222=14.166 Mortgage Insurance—Servicemen (F)
Section 234(c)=14.133 Mortgage Insurance—Purchase of Units in Condominiums (F)
Section 240=14.130 Mortgage Insurance—Purchase by Homeowners of the Fee Simple Title by Lessors (F)
Section 244=14.161 Single Family Mortgage Coinsurance (F)
Section 245(a) and 245(b)=14.159 Section 245 Graduated Payment Mortgage Program (F)
Section 809=14.167 Mortgage Insurance—Armed Services Housing—Civilian Employees (F)
Section 810=14.168 Armed Services Housing—Impacted Areas (F)

Accordingly, Chapter II is amended as follows:

PART 203—MUTUAL MORTGAGE INSURANCE AND INSURED HOME MORTGAGE IMPROVEMENT LOANS

Subpart A—Eligibility Requirements

The following new Section is added and designated as § 203.18b.

§ 203.18b Increased mortgage amount.

(a) The dollar limitations specified in § 203.18(a) are increased to the amounts set forth in Appendix A to this part, for the geographical areas indicated in the Appendix. In any geographical area where the Commissioner finds that middle- and moderate-income persons have limited housing opportunities due to the high prevailing housing sales prices, the Commissioner may change the dollar limitations specified in § 203.18(a) or in Appendix A to the extent he/she deems necessary by publishing the dollar limitation in the **Federal Register.**

(b) The increased dollar limitation shall not exceed the lesser of (1) 133.33 percent of the dollar limitation specified in § 203.18(a), or (2) the following percentage of the median one-family house price in the area as determined by the Commissioner.

(i) 95 percent for a one-family residence.

(ii) 107 percent for a two-family residence.

(iii) 130 percent for a three-family residence.

(iv) 150 percent for a four-family residence.

Section 203.43c paragraphs (a) and (g) are revised to read as follows:

§ 203.43c Eligibility of mortgages involving a dwelling unit in a cooperative housing development.

* * * * *

(a) The provisions of §§ 203.16a, 203.17, 203.18, 203.18a, 203.18b, 203.23, 203.24, 203.26, 203.37, 203.38, 203.43b, 203.44, 203.45, and 203.50 of this part shall not apply to mortgages insured under Section 203(n) of the National Housing Act.

* * * * *

(g) The mortgage shall not exceed the balance remaining after subtracting from the amount determined under §§ 203.18(a), 203.18a, and 203.18b of this part an amount equal to the portion of the unpaid balance of the blanket mortgage covering the cooperative development which is attributable to the dwelling unit the mortgagor is entitled to occupy as of the date the mortgage is accepted for insurance.

* * * * *

Section 203.44 is amended by revising paragraph (g) to read as follows:

§ 203.44 Eligibility of open-end advances.

* * * * *

(g) The amount of any such advance (computed in even dollar amounts) when added to the unpaid balance of the original principal obligation of the mortgage shall not exceed the original principal obligation of the mortgage: *Provided,* That if the mortgagor certifies that the proceeds of such open-end advance will be used to finance the construction of an additional room or rooms or other additional enclosed space as a part of the dwelling, the aggregate amount of the unpaid balance of the original principal obligation, plus the amount of the open-end advance, may exceed the amount of the original principal obligation of the mortgage, but in no event shall such aggregate amount exceed the maximum amounts prescribed by the limitations of §§ 203.18, 203.18a, 203.18b, or 203.43.

* * * * *

Section 203.45 is amended by revising paragraph (c)(1) to read as follows:

§ 203.45 Eligibility of graduated payment mortgages.

* * * * *

(c) * * *

(1) The limits prescribed by §§ 203.18(a), 203.18(b), 203.18a, and 203.18b or,

* * * * *

Section 203.46 is amended to revise paragraph (d)(1) to read as follows:

§ 203.46 Eligibility of modified graduated payment mortgages.

* * * * *

(d) * * *

(1) The limits prescribed in §§ 203.18(a), 203.18(b), 203.18a, and 203.18b: *Provided,* That the appraised value shall not exceed 110 percent of the median prototype housing costing limits as established by the Commissioner for the market area in which the property is located, or

* * * * *

Section 203.50 is amended by revising paragraphs (f)(1) and (2) to read as follows:

§ 203.50 Eligibility of rehabilitation loans.

* * * * *

(f) * * *

(1) The limits prescribed in §§ 203.18(a)(1) and (2), 203.18(c), 203.18a, and 203.18b, based upon the sum of the estimated cost of rehabilitation and the Commissioner's estimate of the value of the property before rehabilitation, or

(2) The limits prescribed in §§ 203.18(a)(1) and (2), 203.18(c), 203.18a, and 203.18b, based upon 110 percent of the Commissioner's estimate of value of the property after rehabilitation.

* * * * *

Part 203 is amended by adding the following Appendix A at the end of the Part:

BILLING CODE 4210-01-M

APPENDIX A

SCHEDULE OF SECTION 203(b) AREA-WIDE ONE- TO FOUR-FAMILY MORTGAGE LIMITS

For any market area (county or part of a county) not listed in Appendix A below, the following maximum mortgage limits shall apply: $67,500 for a one-family unit; $76,000 for a two-family unit; $92,000 for a three-family unit; and $107,000 for a four-family unit.

Region I

HUD Field Office: Hartford Area Office

Market Area Designation	Local Jurisdictions	Section 203(b) Mortgage Limits 1-Family	2-Family	3-Family	4-Family
BRIDGEPORT, CT SMSA	Fairfield County (part) -- Bridgeport City -- Shelton City -- Easton Town -- Fairfield Town -- Monroe Town -- Stratford Town -- Trumbull Town New Haven County (part) -- Derby City -- Milford City	$ 69,500	$ 78,500	$ 95,500	$ 110,000
DANBURY, CT SMSA	Fairfield County (part) -- Danbury City -- Bethel Town -- Brookfield Town -- New Fairfield Town -- Newtown Town -- Redding Town Litchfield County (part) -- New Milford Town	$ 75,000	$ 84,000	$ 102,500	$ 118,000
NORWALK, CT SMSA	Fairfield County (part) -- Norwalk City -- Weston Town -- Westport Town -- Wilton Town	$ 75,000	$ 84,000	$ 102,500	$ 118,000
STAMFORD, CT SMSA	Fairfield County (part) -- Stamford City -- Darien Town -- Greenwich Town -- New Canaan Town	$ 75,000	$ 84,000	$ 102,500	$ 118,000

Region II

HUD Field Office: New York Area Office

Market Area Designation	Local Jurisdictions	Section 203(b) Mortgage Limits 1-Family	2-Family	3-Family	4-Family
NEW YORK AND NASSAU-SUFFOLK, NY SMSAS (Combined)	Bronx County Kings County Nassau County New York County Putnam County Queens County Richmond County Rockland County Suffolk County Westchester County	$ 72,000	$ 81,000	$ 98,500	$ 113,500

HUD Field Office: Newark Area Office

STATE OF NEW JERSEY --NORTHERN METRO AREAS	Bergen County Essex County Hudson County Middlesex County Monmouth County Morris County Passaic County Somerset County Union County	$ 77,000	$ 86,500	$ 105,000	$ 122,000

HUD Field Office: Camden Service Office

ATLANTIC CITY, NJ SMSA	Atlantic County	$ 69,000	$ 77,500	$ 94,000	$ 108,500
TRENTON, NJ SMSA	Mercer County	$ 68,500	$ 77,000	$ 93,500	$ 108,000

Region III

HUD Field Office: Washington, DC Area Office

WASHINGTON, DC-MD-VA SMSA	District of Columbia Montgomery County, MD Prince Georges County, MD Alexandria City, VA Fairfax City, VA Falls Church City, VA Manassas City, VA Manassas Park City, VA Arlington County, VA Fairfax County, VA Loudoun County, VA Prince William County, VA	$ 89,500	$ 100,500	$ 122,000	$ 141,500

Market Area Designation	Local Jurisdictions	Section 203(b) Mortgage Limits 1-Family	2-Family	3-Family	4-Family
HUD Field Office: Baltimore Area Office					
WASHINGTON, DC-MD-VA SMSA	Charles County, MD	$ 89,500	$ 100,500	$ 122,000	$ 141,500
HUD Field Office: Richmond Area Office					
NEWPORT NEWS-HAMPTON AND NORFOLK-VA BEACH-PORTSMOUTH, VA SMSAS (Combined)	Chesapeake City Hampton City Newport News City Norfolk City Poquoson City Portsmouth City Suffolk City Virginia Beach City Williamsburg City Gloucester County James City County York County	$ 76,500	$ 86,000	$ 104,500	$ 120,500
Region IV					
HUD Field Office: Greensboro Area Office					
NEWPORT NEWS-HAMPTON AND NORFOLK-VA BEACH-PORTSMOUTH, VA SMSA	Currituck County	$ 76,500	$ 86,000	$ 104,500	$ 120,500
HUD Field Office: Columbia Area Office					
CHARLESTON-NORTH CHARLESTON, SC SMSA	Berkeley County Charleston County Dorchester County	$ 75,000	$ 84,000	$ 102,500	$ 118,000
HUD Field Office: Atlanta Area Office					
ATLANTA, GA SMSA	Butts County Cherokee County Clayton County Cobb County De Kalb County Douglas County Fayette County Forsyth County Fulton County Gwinnett County Henry County Newton County Paulding County Rockdale County Walton County	$ 70,500	$ 79,000	$ 96,500	$ 111,000

Market Area Designation	Local Jurisdictions	Section 203(b) Mortgage Limits 1-Family	2-Family	3-Family	4-Family
HUD Field Office: Birmingham Area Office					
MOBILE, AL SMSA	Baldwin County Mobile County	$ 75,000	$ 84,000	$ 102,500	$ 118,000
MONTGOMERY, AL SMSA	Autauga County Elmore County Montgomery County	$ 75,000	$ 84,000	$ 102,500	$ 118,000
HUD Field Office: Memphis Service Office					
MEMPHIS, TN-AR-MS SMSA	Shelby County Tipton County	$ 75,000	$ 84,000	$ 102,500	$ 118,000
HUD Field Office: Jackson Area Office					
MEMPHIS, TN-AR-MS SMSA	De Soto County	$ 75,000	$ 84,000	$ 102,500	$ 118,000
Region V					
HUD Field Office: Minneapolis-St. Paul Area Office					
MINNEAPOLIS-ST PAUL, MN SMSA	Anoka County Carver County Chisago County Dakota County Hennepin County Ramsey County Scott County Washington County Wright County	$ 71,000	$ 80,000	$ 97,500	$ 112,500
HUD Field Office: Milwaukee Area Office					
MINNEAPOLIS-ST PAUL, MN SMSA	St. Croix County	$ 71,000	$ 80,000	$ 97,500	$ 112,500
MILWAUKEE, WI SMSA	Milwaukee County Ozaukee County Washington County Waukesha County	$ 71,500	$ 80,500	$ 98,000	$ 113,000

Region VI

HUD Field Office: Dallas Area Office

Market Area Designation	Local Jurisdictions	Section 203(b) Mortgage Limits 1-Family	2-Family	3-Family	4-Family
DALLAS-FT. WORTH AND SHERMAN-DENISON, TX SMSAS (Combined)	Collin County Dallas County Denton County Ellis County Grayson County Kaufman County Rockwall County	$ 70,500	$ 79,000	$ 96,000	$ 111,000

HUD Field Office: Fort Worth Service Office

DALLAS-FT. WORTH AND SHERMAN-DENISON, TX SMSAS (Combined)	Hood County Johnson County Parker County Tarrant County Wise County	$ 70,500	$ 79,000	$ 96,000	$ 111,000

HUD Field Office: Houston Service Office

HOUSTON, TX SMSA	Brazoria County Ft. Bend County Harris County Liberty County Montgomery County Waller County	$ 69,500	$ 78,000	$ 95,000	$ 109,500

HUD Field Office: Lubbock Service Office

AMARILLO, TX SMSA	Potter County Randall County	$ 68,500	$ 77,000	$ 93,500	$ 108,000
LUBBOCK, TX SMSA	Lubbock County	$ 70,000	$ 78,500	$ 95,500	$ 110,500
MIDLAND, TX SMSA	Ector County Midland County	$ 70,000	$ 78,500	$ 95,500	$ 110,500

Market Area Designation	Local Jurisdictions	Section 203(b) Mortgage Limits 1-Family	2-Family	3-Family	4-Family
HUD Field Office: San Antonio Area Office					
AUSTIN AND SAN ANTONIO, TX SMSAS (Combined)	Bexar County Comal County Guadalupe County Hays County Travis County Williamson County	$ 69,500	$ 78,500	$ 95,500	$ 110,000
CORPUS CHRISTI, TX SMSA	Nueces County San Patricio County	$ 70,000	$ 78,500	$ 95,500	$ 110,500
HUD Field Office: Little Rock Area Office					
MEMPHIS, TN-AR-MS SMSA	Crittenden County	$ 75,000	$ 84,000	$ 102,500	$ 118,000
HUD Field Office: New Orleans Area Office					
BATON ROUGE AND NEW ORLEANS, LA SMSAS (Combined)	Ascension Parish East Baton Rouge Parish Jefferson Parish Livingston Parish Orleans Parish St. Bernard Parish St. Tammany Parish West Baton Rouge Parish	$ 71,500	$ 80,500	$ 98,000	$ 113,000
HUD Field Office: Albuquerque Service Office					
ALBUQUERQUE, NM SMSA	Bernalillo County Sandoval County	$ 70,500	$ 79,500	$ 97,000	$ 111,500
HUD Field Office: Tulsa Service Office					
TULSA, OK SMSA	Creek County Mayes County Osage County Rogers County Tulsa County Wagoner County	$ 69,000	$ 78,000	$ 94,500	$ 109,500

Region VIII

HUD Field Office: Denver Area Office

Market Area Designation	Local Jurisdictions	Section 203(b) Mortgage Limits 1-Family	2-Family	3-Family	4-Family
DENVER-BOULDER, CO SMSA	Adams County Arapahoe County Boulder County Denver County Douglas County Gilpin County Jefferson County	$ 70,500	$ 79,500	$ 96,500	$ 111,500

HUD Field Office: Helena Service Office

BILLINGS, MN SMSA	Yellowstone County	$ 75,000	$ 84,000	$ 102,500	$ 118,000
GREAT FALLS, MN SMSA	Cascade County	$ 75,000	$ 84,000	$ 102,500	$ 118,000

Region IX

HUD Field Office: Los Angeles Area Office

LOS ANGELES AREA OFFICE METRO AND NON-METRO AREAS	Los Angeles County San Luis Obispo County Santa Barbara County Ventura County	$ 90,000	$ 101,300	$ 122,600	$ 142,600

HUD Field Office: San Francisco Area Office

SAN FRANCISCO AREA OFFICE METRO AND NON-METRO AREAS	Alameda County Contra Costa County Del Norte County Humboldt County Lake County Marin County Mendocin County Monterey County Napa County San Benito County San Francisco County San Mateo County Santa Clara County Santa Cruz County Solano County Sonoma County	$ 90,000	$ 101,300	$ 122,600	$ 142,600

Market Area Designation	Local Jurisdictions	Section 203(b) Mortgage Limits 1-Family	2-Family	3-Family	4-Family
HUD Field Office: Fresno Service Office					
FRESNO SERVICE OFFICE METRO AND NON-METRO AREAS	Fresno County Kern County Kings County Madera County Mariposa County Merced County Stanislaus County Tulare County	$ 69,500	$ 78,000	$ 95,000	$ 110,000
HUD Field Office: Sacramento Service Office					
SACRAMENTO SERVICE OFFICE METRO AND NON-METRO AREAS	Alpine County Amador County Butte County Calaveras County Colusa County El Dorado County Glenn County Lassen County Modoc County Nevada County Placer County Plumas County Sacramento County San Joaquin County Shasta County Sierra County Siskiyou County Sutter County Tehama County Trinity County Tuolumne County Yolo County Yuba County	$ 79,000	$ 89,000	$ 108,500	$ 125,000
HUD Field Office: San Diego Service Office					
SAN DIEGO SERVICE OFFICE METRO AND NON-METRO AREAS	Imperial County San Diego County	$ 87,500	$ 98,000	$ 119,500	$ 138,000

Market Area Designation	Local Jurisdictions	Section 203(b) Mortgage Limits 1-Family	2-Family	3-Family	4-Family
HUD Field Office: Santa Ana Service Office					
SANTA ANA SERVICE OFFICE METRO AREAS	Orange County Riverside County San Bernardino County	$ 90,000	$ 101,300	$ 122,600	$ 142,600
SANTA ANA SERVICE OFFICE NON-METRO AREAS	Inyo County Mono County	$ 69,500	$ 78,000	$ 95,000	$ 110,000
HUD Field Office: Las Vegas Service Office					
LAS VEGAS, NV SMSA	Clark County	$ 90,000	$ 101,300	$ 122,600	$ 142,600
STATE OF NEVADA--NON-METRO AREAS	Lincoln County Nye County (part)	$ 75,000	$ 84,000	$ 102,500	$ 118,000
HUD Field Office: Reno Service Office					
RENO, NV SMSA	Washoe County	$ 86,500	$ 97,500	$ 118,500	$ 136,500
STATE OF NEVADA--NON-METRO AREAS	Carson City County Churchill County Douglas County Elko County Esmeralda County Eureka County Humboldt County Lander County Lyon County Mineral County Nye County (part) Pershing County Storey County White Pine County	$ 75,000	$ 84,000	$ 102,500	$ 118,000
HUD Field Office: Phoenix Service Office					
PHOENIX, AZ SMSA	Maricopa County	$ 81,000	$ 91,500	$ 111,500	$ 128,500
HUD Field Office: Tucson Service Office					
TUCSON, AZ SMSA	Pima County	$ 68,500	$ 77,000	$ 94,000	$ 108,000

Region X

HUD Field Office: Seattle Area Office

Market Area Designation	Local Jurisdictions	Section 203(b) Mortgage Limits 1-Family	2-Family	3-Family	4-Family
SEATTLE-EVERETT AND TACOMA, WA SMSAS (Combined)	King County Pierce County Snohomish County	$ 71,000	$ 80,000	$ 97,500	$ 112,500
RICHLAND-KENNEWICK AND YAKIMA, WA SMSAS (Combined)	Yakima County	$ 72,000	$ 81,500	$ 99,000	$ 114,000

HUD Field Office: Spokane Service Office

RICHLAND-KENNEWICK AND YAKIMA, WA SMSAS (Combined)	Benton County Franklin County	$ 72,000	$ 81,500	$ 99,000	$ 114,000

HUD Field Office: Boise Service Office

BOISE CITY, ID SMSA	Ada County	$ 70,000	$ 78,500	$ 95,500	$ 110,500

BILLING CODE 4210-01-C

PART 220—URBAN RENEWAL MORTGAGE INSURANCE AND INSURED IMPROVEMENT LOANS

Subpart A—Eligibility Requirements—Homes

Section 220.1 is amended by revising the list of provisions in paragraph (a) to read as follows:

§ 220.1 Cross-reference.

(a) * * *

Sec.
203.15 Certification of appraisal amount.
203.18 Maximum mortgage amount.
203.18a Solar energy systems.
203.18b Increased mortgage amount.
203.19 Mortgagor's minimum investment.
203.28 Economic soundness of project.
203.40 Location of property.
203.42 Rental properties.
203.50 Eligibility of rehabilitation loans.
* * * * *

Section 220.25 is amended to read as follows:

§ 220.25 Maximum mortgage amounts—dollar limitation.

The mortgage shall involve a principal obligation not in excess of the dollar limitation set forth in § 203.18(a)(1) or § 203.18b plus not to exceed $9,165 for each additional unit in excess of four.

Section 220.100 is amended by revising the list of provisions in paragraph (a) to read as follows:

§ 220.100 Incorporation by reference.

(a) * * *

Sec.
203.14 Builder's warranty.
203.15 Certification of appraisal amount.
203.17 Mortgage provisions.
203.18 Maximum mortgage amount.
203.18a Solar energy systems.
203.18b Increased mortgage amount.
203.19 Mortgagor's minimum investment.
203.23 Mortgagor's payments to include other charges.
203.24 Application of payments.
203.26 Mortgagor's payments when mortgage is executed.
203.28 Economic soundness of project.
203.32 Mortgage lien.
203.37 Nature of title to realty.
203.38 Location of dwelling.
203.40 Location of property.
203.42 Rental properties.
203.43b Eligibility of mortgages covering housing intended for seasonal occupancy.
203.43c Eligibility of mortgages involving a dwelling unit in a cooperative housing development.
203.45 Eligibility of graduated payment mortgages.
203.46 Eligibility of modified graduated payment mortgages.
203.50 Eligibility of rehabilitation loans.
* * * * *

PART 221—LOW COST AND MODERATE INCOME MORTGAGE INSURANCE

Subpart A—Eligibility Requirements—Low Cost Homes

Section 221.1 is amended by revising the list of provisions in paragraph (a) to read as follows:

§ 221.1 Cross-reference.

(a) * * *

Sec.
203.17 Mortgage provisions.
203.18 Maximum mortgage amount.
203.18a Solar energy systems.
203.18b Increased mortgage amount.
203.19 Mortgagor's minimum investment.
203.28 Economic soundness of project.
203.40 Location of property.
203.42 Rental properties.
203.45 Eligibility of graduated payment mortgages.
203.46 Eligibility of modified graduated payment mortgages.
203.50 Eligibility of rehabilitation loans.
* * * * *

PART 222—SERVICEMEN'S MORTGAGE INSURANCE

Subpart A—Eligibility Requirements

Section 222.1 is amended by revising the list of provisions in paragraph (a) to read as follows:

§ 221.1 Cross-reference

(a) * * *

Sec.
203.18 Maximum mortgage amount.
203.18a Solar energy systems.
203.18b Increased mortgage amount.
203.24 Application of payments.
203.31 Owner-occupancy in military service cases.
203.38 Location of dwelling.
203.50 Eligibility of rehabilitation loans.
* * * * *

Section 222.3 is amended to read as follows:

§ 222.3 Maximum mortgage amounts—dollar limitation.

The mortgage shall involve a principal obligation not in excess of the dollar limitation for a one-family residence set forth in § 203.18(a)(1) or § 203.18b or for a one-family unit in a condominium project set forth in § 234.27, except that a mortgage meeting the requirements of §§ 203.18(d), 221.10 or 221.11 shall not exceed the dollar limitation provided in the applicable section.

PART 226—ARMED SERVICES HOUSING CIVILIAN EMPLOYEES (SECTION 809)

Subpart A—Eligibility Requirements

Section 226.1 is amended by revising the list of provisions in paragraph (a) to read as follows:

§ 226.1 Cross-reference.

(a) * * *

Sec.
203.18 Maximum mortgage amount.
203.18a Solar energy systems
203.18b Increased mortgage amount.
203.28 Economic soundness of project.
203.42 Rental properties.
203.43a Eligibility of housing in declining urban areas.
203.50 Eligibility of rehabilitation loans.
* * * * *

Section 226.4 is amended to read as follows:

§ 226.4 Maximum mortgage amount—dollar limitation.

The mortgage shall involve a principal obligation not in excess of the dollar limitation set forth in § 203.18(a)(1) or § 203.18b.

PART 227—ARMED SERVICES HOUSING IMPACTED AREAS (SEC. 810)

Subpart C—Eligibility Requirements—Individual Mortgages

Section 227.501 is amended by revising the list of provisions in paragraph (b) to read as follows:

§ 227.501 Cross-reference.

* * * * *

(b)(1) * * *

Sec.
203.17 Mortgage provisions.
203.18 Maximum mortgage amount.
203.18a Solar energy systems.
203.18b Increased mortgage amount.
203.19 Mortgagor's minimum investment.
203.28 Economic soundness of project.
203.29 Eligible mortgages in Alaska, Guam or Hawaii.
203.40 Location of property.
203.42 Rental properties.
203.43 Eligibility of miscellaneous type mortgages.
203.43a Eligibility of housing in declining urban areas.
203.50 Eligibility of rehabilitation loans.

(2) * * *

PART 234—CONDOMINIUM OWNERSHIP MORTGAGE INSURANCE

Subpart A—Eligibility Requirements—Individually Owned Units

Section 234.27 is amended by revising paragraph (b) to read as follows:

§ 234.27 Maximum mortgage amounts.

(a) * * *

(b) *Increased mortgage amount.* The dollar limitations specified in subparagraph (a)(1) of this section are increased to the amounts set forth in Appendix A to this part, for the geographical areas indicated in the Appendix. In any geographical area where the Commissioner finds that middle- and moderate-income persons have limited housing opportunities due to the high prevailing housing sales prices, the Commissioner may increase or decrease the dollar limitations specified in § 234.27(a) or in Appendix A to the extent he/she deems necessary by publishing the dollar limitation in the **Federal Register.** The increased dollar limitation shall not exceed the lesser of 111 percent of the amount specified in subparagraph (a)(1) or 95 percent of the median one-family house price in the area as determined by the Commissioner.

* * * * *

Section 234.75 is amended by revising paragraph (c)(1) to read as follows:

§ 234.75 Eligibility of graduated payment mortgages.

* * * * *

(c) * * *

(1) The limits prescribed in §§ 234.27(a), 234.27(b), and 234.27(c), or

* * * * *

Section 234.76 is amended by revising paragraph (d) to read as follows:

§ 234.76 Eligibility of modified graduated payment mortgages.

* * * * *

(d) * * *

(1) The limits prescribed in §§ 234.27(a), 234.27(b), and 234.27(c), provided that the appraised value shall not exceed 110 percent of the median prototype housing cost limits as established by the Commissioner for the market area in which the property is located.

* * * * *

Part 234 is amended by adding the following Appendix A at the end of the Part:

BILLING CODE 4210-01-M

APPENDIX A

SCHEDULE OF SECTION 234(c) AREA-WIDE ONE-FAMILY MORTGAGE LIMITS

For any market area (county or part of a county) not listed in Appendix A below, the maximum mortgage limit for a one-family condominium unit insured under Section 234(c) shall be $67,500.

Region I

HUD Field Office: Hartford Area Office

Market Area Designation	Local Jurisdictions	Section 234(c) Mortgage Limit
BRIDGEPORT, CT SMSA	Fairfield County (part) -- Bridgeport City -- Shelton City -- Easton Town -- Fairfield Town -- Monroe Town -- Stratford Town -- Trumbull Town New Haven County (part) -- Derby City -- Milford City	$ 69,500
DANBURY, CT SMSA	Fairfield County (part) -- Danbury City -- Bethel Town -- Brookfield Town -- New Fairfield Town -- Newtown Town -- Redding Town Litchfield County (part) -- New Milford Town	$ 74,900
NORWALK, CT SMSA	Fairfield County (part) -- Norwalk City -- Weston Town -- Westport Town -- Wilton Town	$ 74,900
STAMFORD, CT SMSA	Fairfield County (part) -- Stamford City -- Darien Town -- Greenwich Town -- New Canaan Town	$ 74,900

Region II

HUD Field Office: New York Area Office

Market Area Designation	Local Jurisdictions	Section 234(c) Mortgage Limit
NEW YORK AND NASSAU-SUFFOLK, NY SMSAS (Combined)	Bronx County Kings County Nassau County New York County Putnam County Queens County Richmond County Rockland County Suffolk County Westchester County	$ 72,000

HUD Field Office: Newark Area Office

STATE OF NEW JERSEY—NORTHERN METRO AREAS	Bergen County Essex County Hudson County Middlesex County Monmouth County Morris County Passaic County Somerset County Union County	$ 74,900

HUD Field Office: Camden Service Office

ATLANTIC CITY, NJ SMSA	Atlantic County	$ 69,000
TRENTON, NJ SMSA	Mercer County	$ 68,500

Region III

HUD Field Office: Washington, DC Area Office

WASHINGTON, DC-MD-VA SMSA	District of Columbia Montgomery County, MD Prince Georges County, MD Alexandria City, VA Fairfax City, VA Falls Church City, VA Manassas City, VA Manassas Park City, VA Arlington County, VA Fairfax County, VA Loudoun County, VA Prince William County, VA	$ 74,900

Market Area Designation	Local Jurisdictions	Section 234(c) Mortgage Limit
HUD Field Office: Baltimore Area Office		
WASHINGTON, DC-MD-VA SMSA	Charles County, MD	$ 74,900
HUD Field Office: Richmond Area Office		
NEWPORT NEWS-HAMPTON AND NORFOLK-VA BEACH-PORTSMOUTH, VA SMSAS (Combined)	Chesapeake City Hampton City Newport News City Norfolk City Poquoson City Portsmouth City Suffolk City Virginia Beach City Williamsburg City Gloucester County James City County York County	$ 74,900
Region IV		
HUD Field Office: Greensboro Area Office		
NEWPORT NEWS-HAMPTON AND NORFOLK-VA BEACH-PORTSMOUTH, VA SMSA	Currituck County	$ 74,900
HUD Field Office: Columbia Area Office		
CHARLESTON-NORTH CHARLESTON, SC SMSA	Berkeley County Charleston County Dorchester County	$ 74,900
HUD Field Office: Atlanta Area Office		
ATLANTA, GA SMSA	Butts County Cherokee County Clayton County Cobb County De Kalb County Douglas County Fayette County Forsyth County Fulton County Gwinnett County Henry County Newton County Paulding County Rockdale County Walton County	$ 70,500

Market Area Designation	Local Jurisdictions	Section 234(c) Mortgage Limit
HUD Field Office: Birmingham Area Office		
MOBILE, AL SMSA	Baldwin County Mobile County	$ 74,900
MONTGOMERY, AL SMSA	Autauga County Elmore County Montgomery County	$ 74,900
HUD Field Office: Memphis Service Office		
MEMPHIS, TN-AR-MS SMSA	Shelby County Tipton County	$ 74,900
HUD Field Office: Jackson Area Office		
MEMPHIS, TN-AR-MS SMSA	De Soto County	$ 74,900
Region V		
HUD Field Office: Minneapolis-St. Paul Area Office		
MINNEAPOLIS-ST PAUL, MN SMSA	Anoka County Carver County Chisago County Dakota County Hennepin County Ramsey County Scott County Washington County Wright County	$ 71,000
HUD Field Office: Milwaukee Area Office		
MINNEAPOLIS-ST PAUL, MN SMSA	St. Croix County	$ 71,000
MILWAUKEE, WI SMSA	Milwaukee County Ozaukee County Washington County Waukesha County	$ 71,500

Region VI

HUD Field Office: Dallas Area Office

Market Area Designation	Local Jurisdictions	Section 234(c) Mortgage Limit
DALLAS-FT. WORTH AND SHERMAN-DENISON, TX SMSAS (Combined)	Collin County Dallas County Denton County Ellis County Grayson County Kaufman County Rockwall County	$ 70,500

HUD Field Office: Fort Worth Service Office

DALLAS-FT. WORTH AND SHERMAN-DENISON, TX SMSAS (Combined)	Hood County Johnson County Parker County Tarrant County Wise County	$ 70,500

HUD Field Office: Houston Service Office

HOUSTON, TX SMSA	Brazoria County Ft. Bend County Harris County Liberty County Montgomery County Waller County	$ 69,500

HUD Field Office: Lubbock Service Office

AMARILLO, TX SMSA	Potter County Randall County	$ 68,500
LUBBOCK, TX SMSA	Lubbock County	$ 70,000
MIDLAND, TX SMSA	Ector County Midland County	$ 70,000

Market Area Designation	Local Jurisdictions	Section 234(c) Mortgage Limits
HUD Field Office: San Antonio Area Office		
AUSTIN AND SAN ANTONIO, TX SMSAS (Combined)	Bexar County Comal County Guadalupe County Hays County Travis County Williamson County	$ 69,500
CORPUS CHRISTI, TX SMSA	Nueces County San Patricio County	$ 70,000
HUD Field Office: Little Rock Area Office		
MEMPHIS, TN-AR-MS SMSA	Crittenden County	$ 74,900
HUD Field Office: New Orleans Area Office		
BATON ROUGE AND NEW ORLEANS, LA SMSAS (Combined)	Ascension Parish East Baton Rouge Parish Jefferson Parish Livingston Parish Orleans Parish St. Bernard Parish St. Tammany Parish West Baton Rouge Parish	$ 71,500
HUD Field Office: Albuquerque Service Office		
ALBUQUERQUE, NM SMSA	Bernalillo County Sandoval County	$ 70,500
HUD Field Office: Tulsa Service Office		
TULSA, OK SMSA	Creek County Mayes County Osage County Rogers County Tulsa County Wagoner County	$ 69,000

Region VIII

HUD Field Office: Denver Area Office

Market Area Designation	Local Jurisdictions	Section 234(c) Mortgage Limit
DENVER-BOULDER, CO SMSA	Adams County Arapahoe County Boulder County Denver County Douglas County Gilpin County Jefferson County	$ 70,500

HUD Field Office: Helena Service Office

BILLINGS, MN SMSA	Yellowstone County	$ 74,900
GREAT FALLS, MN SMSA	Cascade County	$ 74,900

Region IX

HUD Field Office: Los Angeles Area Office

LOS ANGELES AREA OFFICE METRO AND NON-METRO AREAS	Los Angeles County San Luis Obispo County Santa Barbara County Ventura County	$ 74,900

HUD Field Office: San Francisco Area Office

SAN FRANCISCO AREA OFFICE METRO AND NON-METRO AREAS	Alameda County Contra Costa County Del Norte County Humboldt County Lake County Marin County Mendocin County Monterey County Napa County San Benito County San Francisco County San Mateo County Santa Clara County Santa Cruz County Solano County Sonoma County	$ 74,900

Market Area Designation	Local Jurisdictions	Section 234(c) Mortgage Limit
HUD Field Office: Fresno Service Office		
FRESNO SERVICE OFFICE METRO AND NON-METRO AREAS	Fresno County Kern County Kings County Madera County Mariposa County Merced County Stanislaus County Tulare County	$ 69,500
HUD Field Office: Sacramento Service Office		
SACRAMENTO SERVICE OFFICE METRO AND NON-METRO AREAS	Alpine County Amador County Butte County Calaveras County Colusa County El Dorado County Glenn County Lassen County Modoc County Nevada County Placer County Plumas County Sacramento County San Joaquin County Shasta County Sierra County Siskiyou County Sutter County Tehama County Trinity County Tuolumne County Yolo County Yuba County	$ 74,900
HUD Field Office: San Diego Service Office		
SAN DIEGO SERVICE OFFICE METRO AND NON-METRO AREAS	Imperial County San Diego County	$ 74,900

Market Area Designation	Local Jurisdictions	Section 234(c) Mortgage Limit
HUD Field Office: Santa Ana Service Office		
SANTA ANA SERVICE OFFICE METRO AREAS	Orange County Riverside County San Bernardino County	$ 74,900
SANTA ANA SERVICE OFFICE NON-METRO AREAS	Inyo County Mono County	$ 69,500
HUD Field Office: Las Vegas Service Office		
LAS VEGAS, NV SMSA	Clark County	$ 74,900
STATE OF NEVADA--NON-METRO AREAS	Lincoln County Nye County (part)	$ 74,900
HUD Field Office: Reno Service Office		
RENO, NV SMSA	Washoe County	$ 74,900
STATE OF NEVADA--NON-METRO AREAS	Carson City County Churchill County Douglas County Elko County Esmeralda County Eureka County Humboldt County Lander County Lyon County Mineral County Nye County (part) Pershing County Storey County White Pine County	$ 74,900
HUD Field Office: Phoenix Service Office		
PHOENIX, AZ SMSA	Maricopa County	$ 74,900
HUD Field Office: Tucson Service Office		
TUCSON, AZ SMSA	Pima County	$ 68,500

Region X

HUD Field Office: Seattle Area Office

Market Area Designation	Local Jurisdictions	Section 234(c) Mortgage Limit
SEATTLE-EVERETT AND TACOMA, WA SMSAS (Combined)	King County Pierce County Snohomish County	$ 71,000
RICHLAND-KENNEWICK AND YAKIMA, WA SMSAS (Combined)	Yakima County	$ 72,000

HUD Field Office: Spokane Service Office

RICHLAND-KENNEWICK AND YAKIMA, WA SMSAS (Combined)	Benton County Franklin County	$ 72,000

HUD Field Office: Boise Service Office

BOISE CITY, ID SMSA	Ada County	$ 70,000

BILLING CODE 4210-01-C

PART 235—MORTGAGE INSURANCE AND ASSISTANCE PAYMENTS FOR HOMEOWNERSHIP AND PROJECT REHABILITATION

Subpart A General; Eligibility Requirements—Homes for Lower Income Families

Section 235.1 is amended by revising the list of provisions in paragraph (a) to read as follows:

§ 235.1 Cross-reference.

(a) * * *

Sec.
203.16 Certificate and contract regarding use of dwelling for transient or hotel purposes.
203.17 Mortgage provisions.
203.18 Maximum mortgage amount.
203.18a Solar energy systems.
203.18b Increased mortgage amount.
203.19 Mortgagor's minimum investment.
203.25 Late charge.
203.28 Economic soundness of project.
203.29 Eligible mortgages in Alaska, Guam or Hawaii.
203.33 Relationship of income to mortgage payments.
203.36 Certificate and contract regarding use of dwelling for transient or hotel purposes.
203.38 Location of dwelling.
203.42 Rental properties.
203.43 Eligibility of miscellaneous type mortgages.
203.44 Eligibility of open-end advances.
203.45 Eligibility of graduated payment mortgages.
203.46 Eligibility of modified graduated payment mortgages.
203.50 Eligibility of rehabilitation loans.
* * * * *

PART 240—MORTGAGE INSURANCE ON LOANS FOR FEE TITLE PURCHASE

Subpart A—Eligibility Requirements

Section 240.1 is amended by revising the list of provisions in paragraph (a) to read as follows:

* * * * *

Sec.
203.14 Builder's warranty.
203.15 Certification of appraisal amount.
203.16a Mortgagor and mortgagee requirement for maintaining insurance coverage.
203.17 Mortgage provisions.
203.18 Maximum mortgage amount.
203.18a Solar energy systems.
203.18b Increased mortgage amount.
203.19 Mortgagor's minimum investment.
203.23 Mortgagor's payments to include other charges.
203.24 Application of payments.
203.26 Mortgagor's payments when mortgage is executed.
203.28 Economic soundness of project.
203.32 Mortgage lien.
203.37 Nature of title to realty.
203.38 Location of dwelling.
203.39 Standard for buildings.
203.43b Eligibility of mortgages covering housing intended for seasonal occupancy.
203.43c Eligibility of mortgages involving a dwelling unit in a cooperative housing development.
203.45 Eligibility of graduated payment mortgages.
203.46 Eligibility of modified graduated payment mortgages.
203.50 Eligibility of rehabilitation loans.
* * * * *

Section 240.5 is amended by revising paragraph (b) to read as follows:

§ 240.5 Maximum loan amounts.

* * * * *

(b) An amount which when added to any outstanding indebtedness related to the property, as determined by the Commissioner, creates a total outstanding indebtedness which does not exceed the limits prescribed in §§ 203.18(a)(1), 203.18(b), 203.18(c), 203.18a, 203.18b of this Chapter as applicable.

Authority: (Sec. 211 of the National Housing Act (12 U.S.C. 1709, 1715)).

Issued at Washington, D.C., October 24, 1980.

Clyde McHenry,

Deputy Assistant Secretary for Housing, Federal Housing Commissioner.

[FR Doc. 80-35909 Filed 11-14-80; 8:45 am]

BILLING CODE 4210-01-M

federal register

Tuesday
November 18, 1980

Part VI

Environmental Protection Agency

Standards of Performance for New Stationary Sources: Asphalt Processing and Asphalt Roofing Manufacture and Priority List; Proposed Rules and Public Hearing

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 60

[AD-FRL-1505-7]

Standards of Performance for New Stationary Sources; Asphalt Processing and Asphalt Roofing Manufacture

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule and notice of public hearing.

SUMMARY: The proposed standards would limit atmospheric emissions of particulate matter from new, modified, and reconstructed asphalt blowing stills, asphalt saturators, asphalt storage tanks, and mineral handling and storage operations in the asphalt processing and roofing manufacturing industry. In addition, the proposed standards will limit the opacity of emissions from asphalt blowing stills, asphalt saturators, asphalt storage tanks, and mineral handlings and storage operations and fugitive emissions from asphalt saturator hooding. Two EPA reference methods are also being proposed along with the standards.

The standards implement Section 111 of the clean Air Act and are based on the Administrator's determination that asphalt processing and asphalt roofing manufacturing facilities contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. The intended effect is to require new, modified, and reconstructed affected facilities in asphalt roofing manufacturing plants, oil refineries, and asphalt processing plants to use the best demonstrated system of continuous emission reduction, considering costs, non-air quality health and environmental impacts, and energy impacts.

If requested, a public hearing will be held to provide interested persons an opportunity for oral presentation of data, views, or arguments concerning the proposed standards.

DATES: *Comments.* Comments must be received on or before January 19, 1981.

Public Hearing. A public hearing will be held, if requested. Persons wishing to request a public hearing must contact EPA by December 2, 1980. If a hearing is requested, an announcement of the date and place will appear in a separate **Federal Register** notice.

ADDRESSES: *Comments.* Comments should be submitted (in duplicate if possible) to: Central Docket Section (A-130), Attention: Docket No. OAQPS A-79-39. U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460.

Public Hearing. Persons wishing to request a public hearing should notify Ms. Deanna B. Tilley, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone (919) 451-5477.

Background Information Document. The background information document (BID) for the proposed standards may be obtained from the U.S. EPA Library (MD-35), Research Triangle Park, North Carolina 27711, telephone (919) 541-2777. Please refer to "Asphalt Roofing Manufacturing Industry, Background Information for Proposed Standards," EPA-450/3-80-021a.

Docket. A docket, number OAQPS A-79-39, containing information used by EPA in development of the proposed standards, is available for public inspection between 8:00 a.m. and 4:00 p.m. Monday through Friday, at EPA's Central Docket Section (A-130), West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street, S.W., Washington, D.C. 20460.

FOR FURTHER INFORMATION CONTACT: Ms. Susan R. Wyatt, Emission Standards and Engineering Division (MD-13), Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone (919) 541-5477.

SUPPLEMENTARY INFORMATION:

Proposed Standards

The proposed standards would limit particulate emissions from the following new, modified, or reconstructed affected facilities in asphalt roofing manufacturing plants, oil refineries, and asphalt processing plants: Blowing stills; saturators, wet loopers, and coaters; asphalt storage tanks; and mineral handling and storage areas. The saturator, wet looper, and coater are considered to be one facility and are designated as the saturator.

Particulate emission limitations are proposed for blowing stills and saturators. Blowing still particulate emissions would be limited to 0.60 kg/Mg (1.28 lb/ton) of asphalt charged during conventional blowing and 0.67 kg/Mg (1.34 lb/ton) of asphalt charged during catalytic blowing. When No. 6 fuel oil is used to fire the afterburner, the particulate emissions from blowing stills would be limited to 0.64 kg/Mg (1.28 lb/ton) of asphalt charged for conventional blowing and 0.71 kg/Mg (1.42 lb/ton) of asphalt charged for catalytic blowing. Saturator particulate emissions would be limited to 0.04 kg/Mg (0.08 lb/ton) of shingle and mineral-surfaced roll roofing produced or to 0.4 kg/Mg (0.8 lb/ton) of saturated felt and smooth-surfaced roll roofing produced, depending on the product.

An opacity standard is proposed for each affected facility as follows: 0 percent for blowing stills, 20 percent for saturators, 0 percent for asphalt storage tanks, and 1 percent for mineral handling and storage areas. A fugitive emission standard of no visible emissions 80 percent of the time is proposed for saturator capture systems.

Continuous monitoring of the operating temperature of the control devices used to meet the proposed standards would be required to ensure proper operation and maintenance.

The performance test methods for determining compliance with the proposed standards would be Reference Method 26 for particulate emissions, Reference Method 9 for opacity, and Reference Method 22 for fugitive emissions. Methods 22 and 26 are being proposed along with the proposed standards.

Summary of Environmental, Energy, and Economic Impacts

It is projected that the equivalent of three new medium-size asphalt processing and roofing plants will be constructed within 5 years from the proposal date of the standards. The proposed standards would reduce particulate emissions from asphalt processing and asphalt roofing plants by about 490 megagrams per year (540 tons per year) in the fifth year after the standards are proposed. This represents a reduction in particulate emissions of 65 percent from State Implementation Plan (SIP) levels.

The proposed standards would increase wastewater from a typical asphalt roofing plant by approximately 1.0 percent. There would be no change in the quality of the wastewater as a result of the proposed standards. The impact of the proposed standards on solid waste disposal would be negligible. There would be no impact on noise.

The proposed standards would increase the total energy consumption of a typical asphalt roofing plant by about 3.2 percent. This would increase the nationwide energy usage by the equivalent of approximately 600 cubic meters (3,800 barrels) of oil per year in the fifth year after the standards go into effect.

Capital costs for industry compliance with the proposed standards over the first 5 years would be $0.30 million. Fifth-year annualized costs would be $0.09 million. As a result of the proposed

standards, the product wholesale price could increase about 0.15 percent, or $0.02/square (80 shingles), which could increase the price for a roof on a typical three-bedroom house by about $3. If the price of shingles cannot be increased and the industry must absorb all of the costs of compliance with the proposed standards, the resulting drop in net profit after taxes would be about 0.4 percent. The costs of emission controls required by the proposed standards is not expected to have any impact on expansion or construction in the asphalt roofing manufacturing industry.

Rationale

Selection of Source for Control

The asphalt processing and asphalt roofing industry is a significant contributor to nationwide emissions of particulate matter. EPA's priority list, 44 FR 49222 of August 21, 1979, identifies source categories chosen for development of new source performance standards (NSPS). During development of the list, consideration was given to the quantity of emissions from each source category, the extent to which each pollutant endangers health and welfare, and the mobility and competitive nature of each source category. The asphalt roofing manufacturing industry is number 45 out of the 59 source categories chosen for NSPS.

The asphalt roofing industry encompasses not only asphalt roofing plants but certain production units at oil refineries and asphalt processing plants which were not included on the Priority List promulgated on August 21, 1979. At asphalt roofing plants, paper and fiberglass felts are saturated with asphalt and sold as saturated felt or saturated and coated with asphalt and surfaced with selected mineral aggregates to produce roll roofing or shingles. The asphalt used for saturants and coatings is prepared by blowing air through hot asphalt flux. Asphalt is blown at 17 oil refineries, at 2 asphalt processing plants, and at about 70 percent of the 118 asphalt roofing plants. An amendment which would add asphalt processing units at oil refineries and asphalt processing plants to the EPA priority list for development of standards of performance is being proposed today in a separate **Federal Register** notice.

The asphalt roofing industry supplies over 80 percent of the domestic demand for roofing materials. Although a 34 percent increase in asphalt roofing prices since 1974 has caused some acceleration in the search for substitutes, asphalt roofing continues to dominate the market.

The construction of new houses and the renovation of existing structures are the primary determinants of the demand for asphalt roofing products. Declines in construction of new homes have generally been offset by increasing strength in the replacement roofing market; thus, there has been a stable demand for asphalt roofing products. For the past 10 years, the industry has grown 2.0 percent annually; projections for the next 5 years show an expected annual growth of 1.5 to 2.0 percent. Asphalt processing and asphalt roofing plants are located in urban areas where future growth is also expected to take place.

For these reasons, the asphalt processing and asphalt roofing industry has been selected for the developent of new source performance standards.

Selection of Pollutants

The asphalt processing and roofing industry is a source of hydrocarbon particulate, polycyclic organic matter (POM), aldehyde, and sulfur dioxide (SO_2) emissions.

The emissions from the asphalt processing and roofing industry are aerosols containing particulate hydrocarbons. The particulate hydrocarbons comprise 75 percent of all pollutants emitted from an average asphalt roofing plant controlled to typical SIP levels. It is expected that by 1985, annual nationwide particulate emissions from this industry will increase by 770 Mg (850 tons) if emissions are controlled to the level of a typical SIP regulation. These emissions can be significantly reduced by available control technology that has been demonstrated.

Test data indicate that aldehyde and SO_2 emissions from asphalt processing and asphalt roofing manufacture are relatively low compared to particulate emissions. By 1985 the increase in emissions would be only 4.5 Mg/yr (5.0 tons/yr) for aldehyde and 13.5 Mg/yr (15.0 tons/yr) for SO_2. Therefore, SO_2 and aldehyde were not selected for regulation at this time.

By 1985 the annual nationwide increase in POM emissions from new, modified, or reconstructed asphalt processing and asphalt roofing manufacturing plants would be 4.6 Mg (5.1 tons). Control devices generally used to control particulate emissions from asphalt processing roofing manufacture are capable of reducing POM emissions by about 90 percent from uncontrolled levels. Since particulate control devices also control POM, a separate standard for this pollutant is not being proposed at this time.

For the reasons stated in the preceding paragraphs, particulate is the only pollutant selected for regulation by standards of performance at this time. This decision does not preclude the future regulation of aldehyde or POM emissions from asphalt roofing and asphalt processing plants if the Administrator finds that either of these two pollutants endangers health or welfare.

Selection of Facilities To Be Considered for Regulation

The major sources of particulate emissions are asphalt blowing stills; saturators; asphalt storage tanks; and mineral handling and storage facilities, which consist of the unloading area, conveyor transfer points, and storage bins. All of these sources are found in asphalt roofing plants. The asphalt blowing stills and asphalt storage tanks may also be located at oil refineries and asphalt processing plants. The blowing stills and asphalt storage tanks at oil refineries and asphalt processing plants were also considered for regulation by standards of performance because the emissions, processes, and applicable controls are the same as those in asphalt roofing plants.

Typical baseline (SIP) emissions from each facility in a medium size plant are:

Blowing still: 43 kg/h (95 lb/h);
Saturator: 18 kg/h (40 lb/h);
Asphalt storage tanks: 1.8 kg/h (4.0 lb/h); and
Mineral handling and storage area: 1.0 kg/h (2.2 lb/h).

Coater-mixers and mineral surfacing, two relatively insignificant sources of particulate emissions, are located at asphalt roofing plants. Coater-mixers are usually enclosed, and no emissions escape to the atmosphere. Emissions from mineral surfacing are contained within the building. Therefore, these two emission sources were excluded from further consideraton for regulation by standards of performance.

Particulate emission control technolgy exists in the asphalt processing and asphalt roofing industry for all significant sources of particulate emissions. The minerals, the transfer and storage equipment, and the control technology used in the asphalt roofing industry for mineral handling and storage operations are the same as those used in the nonmetalic minerals industries. Therefore, it is appropriate to transfer the control technolgy from these industries to the asphalt roofing manufacturing industry. Blowing stills, saturators, asphalt storage tanks, and mineral handling and storage areas

were selected as facilities to consider for regulation because they are significant sources of particulate emissions for which control technology is available.

Selection of Basis of Proposed Standards

Tests at four asphalt roofing plants have demonstrated that particulate emissions from saturators and asphalt storage tanks may be effectively controlled to essentially the same emission level by any one of three pollution control devices: Afterburner (A/B), high velocity air filter (HVAF), or electrostatic precipitator (ESP). These three devices are commonly used to meet State Implementation Plans; however, the SIP Limits do not necessarily require that the devices achieve the best level of control. To achieve the best level of control, each of the control devices must be operated at the proper temperature. Afterburner effectiveness generally increases with increasing combustion temperature. Exhaust gases entering the HVAF and ESP must be cooled to condense the hydrocarbons and allow their capture.

A survey of asphalt roofing manufacturers and State, regional, and local agencies was conducted to find well-controlled asphalt roofing plants. As a result of this survey, 27 asphalt roofing plants were visited to select the best plants for emissions testing. During the plant visits, opacity readings were taken at control device outlets, the control devices were visually inspected, engineering drawings were examined, and emission reports, when available, were studied. The information collected during the plant inspections was evaluated, and the best-controlled plants were selected for emissions testing.

Tests indicated that an afterburner controlling emissions from a saturator and operating at a temperature above 649°C (1200°F) could achieve about a 93 percent emission reduction. Tests also indicated that an ESP or HVAF could achieve about a 93 percent particulate emission reduction if the saturator exhaust gases are cooled below 60°C (140°F).

An afterburner was the only device tested for control of emissions from blowing stills. The effectiveness of an afterburner in controlling emissions varies with the temperature in the combustion zone. Test data show that an afterburner operating over a temperature range of 760°C to 870°C (1400°F to 1660°F) reduced emissions from the blowing still by 95 percent. The exact relationship between degree of control and operating temperature varies with the concentration of combustible gases in the inlet gas and the size of the control equipment.

The test data show that the emissions from asphalt storage tanks can be effectively controlled by venting the emissions through either a mist eliminator or a particulate control device on the saturator. It is general industry practice for asphalt storage tanks to be vented to the saturator control device when the saturator is operating and to a mist eliminator when the saturator is not operating. However, emissions from the asphalt storage tanks can also be continuously controlled by a mist eliminator or other control device.

Fabric filters are used to control the emissions from the minerals handling and storage operations at some plants in the asphalt roofing industry; however, they have not been tested. These filters have been shown to be effective (through observations of opacity) in reducing particulate emissions from minerals handling and storage operations in the non-metallic minerals industries. Since the minerals handled and the handling and storage operations for the minerals are the same for the two industries, fabric filters are selected as representative of the best technological system for continuous emission reduction from mineral handling and storage operations at asphalt roofing plants.

The proposed standards are based on the pollution control devices that were tested. Other pollution control devices are available that may achieve the level of contol required by the proposed standards. Any control technique that achieves the emission limit outlined in the proposed standards could be used to comply with the standards.

Selection of Regulatory Alternatives

The impacts that varying amounts of emission control would have on the industry, the consumer, and the environment were considered during development of the emission standards. For saturators, each of the three control devices tested demonstrated essentially equal levels of control. For the other facilities, only one type of control device could be tested. Since only one level of control was demonstrated for each respective facility, regulatory alternatives that require control of different combinations of the facilities were defined so that varying impacts could be considered. No new source performance standard (NSPS) would be promulgated under Alternative 1. The facilities would be controlled by existing State regulations. Alternative 2 would require NSPS control for saturators and asphalt storage tanks; Alternative 3 would require NSPS control for saturators, asphalt storage tanks, and asphalt blowing stills; Alternative 4 would require NSPS control for saturators, asphalt storage tanks, and mineral handling and stortage areas; and Alternative 5 would require NSPS control for all affected facilities.

The projected five-year industry growth after proposal of the standards is equal to three medium-size asphalt roofing plants with blowing stills. The environmental and energy impacts of one medium-size plant are one-third the values given below and are based on an HVAF and ESP controlling a saturator, an afterburner controlling a blowing still, a fabric filter controlling mineral handling and storage facilities, and a mist eliminator controlling asphalt storage tanks.

Environmental Impacts

Regulatory Alternative 1, the baseline condition, represents the typical SIP level of control. The actual emissions from individual plants may vary from the emissions allowed by the typical SIP due to differences in State regulations and control methodologies. However, it was judged reasonable to select the typical SIP level of control as the baseline condition for the purposes of comparing environmental impacts. The uncontrolled emissions in the fifth year would be about 2,800 Mg/yr (3,100 tons/yr). The fifth-year environmental impact, if no NSPS is established, would be an increase in nationwide particulate emissions of 770 Mg/yr (850 tons/yr). The fifth-year reduction in emissions beyond SIP control would be 230 Mg/yr (250 tons/yr) for Regulatory Alternative 2; 480 Mg/yr (530 tons/yr) for Alternative 3; 240 Mg/yr (260 tons/yr) for Alternative 4; and 490 Mg/yr (540 tons/yr) for Alternative 5. This would be a reduction of 30 percent for Alternative 2, 62 percent for Alternative 3, 31 percent for Alternative 4, and 64 percent for Alternative 5.

The water pollution impact resulting from adoption of any one of Regulatory Alternatives 2 through 5 would be minimal. Water sprays used to cool inlet fumes of a saturator control device would increase the amount of wastewater to be treated in the fifth year by 30 to 40 m^3/yr (8,000 to 10,500 gal/yr).

Adoption of any of the Regulatory Alternatives 2 through 5 would result in only a small increase in solid waste. The only solid waste generated by the control devices used in the asphalt roofing industry is the saturated filter media from the HVAF.

Dispersion modeling was used to assess the air quality impact of

particulate emissions from asphalt processing and asphalt roofing manufacturing plants under worst-case meteorological conditions. The dispersion analysis used 1964 climatological data for Pittsburgh, Pennsylvania, and Oklahoma City, Oklahoma. Both data sets are reasonably consistent with meteorological conditions representing maximum impact for short stacks. The National Ambient Air Quality Standards (NAAQS) 24-hour maximum primary standard is 260 $\mu g/m^3$, and the 24-hour maximum secondary standard is 150 $\mu g/m^3$. The dispersion analysis for a medium-size asphalt processing and asphalt roofing plant indicated that the primary standard would not be exceeded by a plant controlled under any of the regulatory alternatives but that the secondary standard could be exceeded under Regulatory Alternatives 1, 2, and 4. Adoption of either Regulatory Alternative 3 or Regulatory Alternative 5 would result in a concentration of particulate emissions from an asphalt processing or asphalt roofing plant considerably below the NAAQS 24-hour maximum secondary standard.

Energy Impacts

The construction of three new medium-size asphalt roofing plants controlled by SIP's (Regulatory Alternative 1) would result in an energy usage of 19,100 m^3/yr (120,000 bbl/yr) of oil for all plant operations in the fifth year. The fifth-year increase in energy over Regulatory Alternative 1 would be 20 m^3/yr (140 bbl/yr) of oil for Regulatory Alternative 2; 590 m^3/yr (3,700 bbl/yr) of oil for Alternative 3; 30 m^3/yr (200 bbl/yr) of oil for Alternative 4; 600 m^3/yr (3,800 bbl/yr) of oil for Alternative 5. This is an increase from Regulatory Alternative 1 of 0.1 percent for Alternative 2, 3.1 percent for Alternative 3, 0.2 percent for Alternative 4, and 3.2 percent for Aternative 5.

Economic Impacts

The fifth-year capital and annualized costs for the controls typically being installed by asphalt roofing plants to comply with SIP's would be $1,800,000 and $600,000 respectively. The increase in the fifth-year capital and annualized costs and the increase in the product price if the asphalt roofing manufacturing industry passes through the compliance costs associated with the proposed standards are summarized in the following paragraphs for Regulatory Alternatives 2, 3, 4, and 5.

Regulatory Alternative 2 would result in an increased capital cost of $215,000 and an increased annualized cost of $20,000. This increase in annualized costs could result in a 0.03 percent product price increase for asphalt shingles.

Regulatory Alternative 3 would increase capital costs by $215,000, annualized costs by $59,000, and the product price of asphalt shingles by 0.08 percent.

Regulatory Alternative 4 would increase capital costs by $305,000, annualized costs by $53,000, and the product price of asphalt shingles by 0.07 percent.

Regulatory Alternative 5 would increase capital costs by $305,000, annualized costs by $92,000, and the product price of asphalt shingles by 0.12 percent.

It is reasonable to expect that the industry could pass through these costs for any of the regulatory alternatives. However, if the industry must absorb all the costs for compliance with the proposed standards, the reduction in profit would be 0.4 percent.

A detailed analysis of the economic impact of the alternatives on the asphalt processing and asphalt roofing industry was developed for asphalt roofing plants, where the majority of the asphalt processing and asphalt roofing manufacture occurs. Oil refineries and asphalt processing plants contain only blowing stills and asphalt storage tanks. The regulatory alternatives would require the same controls for blowing stills and asphalt storage tanks at oil refineries, asphalt processing plants, and asphalt roofing plants. Therefore, the costs of meeting the alternatives would be no greater for oil refineries and asphalt processing plants than for asphalt roofing plants. For these reasons, product price increases for Alternatives 2 through 5 should be no greater for products produced at oil refineries than for those produced at asphalt roofing plants.

Historically, oil refineries have demonstrated the ability to pass through cost adjustments on the price of their products. If they have to absorb the costs of compliance with the proposed standards, the reduction in profit would be less than .01 percent. Therefore, there should be no adverse economic impact on oil refineries.

Regulatory Alternatives 2 through 5 are not expected to have an adverse impact on asphalt processing plants. No growth is anticipated in this industry. In fact, the number of asphalt processing plants has been declining in recent years. If new plants are constructed, they are expected to be able to pass through control costs.

Selection of the Alternative for the Standards

Regulatory Alternative 5 would result in the greatest reduction in emissions. Operation of the controls required to comply with Alternative 5 would increase the energy used in all plant operations by only 3.2 percent, and the adverse environmental impacts would be negligible. As discussed previously, the increased control costs would be the same for oil refineries, asphalt processing plants, and asphalt roofing plants. It is expected that all of the costs of compliance with the proposed standards would be passed through. If so, the wholesale product cost would increase by 0.12 percent. The cost to the consumer for a new roof on an average three-bedroom house would be increased by $3. However, if all of the compliance costs were absorbed, the reduction in profit would be 0.4 percent. Because Regulatory Alternative 5 would result in the greatest emission reduction and because, in the Administrator's judgment, the environmental, energy, and economic impacts associated with this emission reduction are reasonable, the Administrator selected Alternative 5 as the basis for the proposed standards.

Consideration of Growth Projections Made by the Industry

Industry representatives commented at the meeting of the National Air Pollution Control Techniques Advisory Committee (December 12, 1979) that EPA had underestimated the growth rate in the industry. They later projected that growth in the industry during the 5 years after proposal of the standards would be: 5 new medium-size plants; 5 new medium-size plants to replace 5 small-size obsolete plants; 5 plants with reconstructed saturators to replace saturators destroyed by fire; and 20 plants each modified to increase production from the saturator by 20 percent. (*1, 2*) The environmental, energy, and economic impacts of the growth projected by the industry have been considered to determine how the industry's growth projections could affect the selection of a regulatory alternative.

The environmental impacts of the growth projected by industry are as follows. The uncontrolled emissions in the fifth year would increase by 7,000 Mg/yr (7,700 tons/yr). If no NSPS is established, the nationwide particulate emissions would increase in the fifth year by 3,200 Mg/yr (3,500 tons/yr). The fifth-year reduction in emissions beyond the SIP level of control would be 960 Mg/yr (1,600 tons/yr) for Regulatory Alternative 2; 2,000 Mg/yr (2,200 tons/

yr) for Alternative 3; 1,000 Mg/yr (1,100 tons/yr) for Alternative 4; and 2,040 Mg/yr (2,250 tons/yr) for Alternative 5. The percent emission reductions for each alternative would be the same as those projected for the EPA growth estimates.

The growth projections made by the industry would increase the amount of wastewater to be treated in the fifth year by 200 to 235 m³/yr (56,000 to 62,000 gal/yr). Water pollution impact would be minimal.

The energy impacts resulting from the growth projections made by industry for the SIP level of control (Regulatory Alternative 1) would result in an energy usage of 48,000 m³/yr (300,000 bbl/yr) of oil for all plant operations in the fifth year. The fifth year increase in energy over Regulatory Alternative 1 would be 78 m³/yr (490 bbl/yr) of oil for Regulatory Alternative 2; 1,500 m³/yr (9,400 bbl/yr) of oil for Alternative 3; 100 m³/yr (650 bbl/yr) of oil for Alternative 4; and 1,530 m³/yr (9,600 bbl/yr) of oil for Alternative 5. The percent increase in energy usage for each alternative would be the same as the percent increase using the EPA growth estimate.

Using the growth projections made by the industry, the fifth-year capital and annualized costs for the controls typically being installed by asphalt roofing plants to comply with SIP's would be $4,500,000 and $1,500,000, respectively. The fifth-year capital and annualized costs would further increase by $1,070,000 and $270,000, respectively, for Regulatory Alternative 2, by $270,000, respectively, for Regulatory Alternative 2, by $1,070,000 and $370,000, respectively, for Regulatory Alternative 4, and by $1,300,000 and $450,000, respectively, for Regulatory Alternative 5.

The product price increase and/or the reduction in profit resulting from compliance with the proposed standards would be the same as previously reported for the EPA growth projection.

The growth projections made by the industry would not change the solid waste and noise impacts previously calculated by EPA.

Under either the industry or the EPA growth projections, Alternative 5 would result in the greatest reduction in emissions. The production cost increases and/or the percent reductions in profit associated with achieving the emission standards would be the same. Under either projection, the impacts of Alternative 5 on energy and the environment would be reasonable. For these reasons, the selection of Regulatory Alternative 5 as the basis for the proposed standard is not changed.

Selection of the Format of the Proposed Standards

Standards for asphalt roofing plants could be expressed either as concentration standards, which limit emissions per unit volume of exhaust gases discharged to the atmosphere, or as mass standards, which limit emissions per unit of production. In selecting a format for the proposed standards, the cost of compliance testing and the effect on reducing the mass emissions were considered.

In most cases, concentration standards are preferable to mass standards because the concentration format requires fewer calculations and measurements and is, therefore, less costly. Concentration standards, however, usually require correction factors to prevent dilution of exhaust gases as a means of meeting the standards. Excess air may be introduced into the exhaust flow either by poorly designed hooding or by lekage through doors and duct joints. Also, two of the control devices upon which the proposed standards are based may use additional air for cooling the gases before they enter the contol device. The quantity of air used for cooling would vary according to ambient temperature, temperature of the asphalt in the saturator, and the location of the control device. Therefore, development of the correction factor necessary for the concentration standards would be difficult. For this reason, concentration is not a desirable format.

Mass standards expressed as allowable emissions per unit of production require measurement of the production rate as well as of the concentration of emissions in the control equipment exhaust systems. Since asphalt processing and asphalt roofing production figures are readily available and plant personnel would not have to monitor production continuously, this format would not increase the cost of compliance testing above the cost of other formats. Dilution air would have no effect on the emission results. For these reasons, mass per unit of production is selected as the format for expressing the standards of performance for asphalt processing and asphalt roofing plants. The proposed standards are expressed as kilograms of pollutant per megagram (kg/Mg) of product for the saturator and as kilograms of pollutant per megagram (kg/Mg) of asphalt charged for the blowing still.

An opacity format for visible stack emissions for all facilities is proposed to aid enforcement and operating personnel in determining that emission control devices are properly maintained and operated. A visible emissions format is selected as the basis of the standard for the saturator capture system to ensure that a well-designed and well-operated capture system is used.

Selection of Numerical Emission Limits

Four saturators were tested for particulate emissions. Two of the saturators were controlled by a high velocity air filter (HVAF), one by electrostatic precipitators (ESP), and one by afterburners (A/B).

The saturator at plant A was controlled by two ESP modules operating in parallel. The average of three test runs conducted at or below a filtration temperature of 52° C (126° F) on this unit showed an emission rate of 0.019 kg/Mg (0.038 lb/ton). The fourth test run, shown in the BID, was conducted at a filtration temperature above the 52° C (126° F) temperature specified in Method 26 and, therefore, was not used in determining the average emission rate.

Two afterburners operating in parallel controlled the emissions from the saturator and asphalt storage tanks at plant B. A performance test consisting of three runs was completed on each of the afterburners. One afterburner was operating at 538° C (1000° F) and the other at 649° C (1200° F). The emissions from the afterburner operating at 538° C (1000° F) averaged 0.035 kg/Mg (0.07 lb/ton). The emissions from the afterburner operating at 649° C (1200° F) averaged 0.015 kg/Mg (0.03 lb/ton). The combined emissions from the two afterburners at plant B averaged 0.045 kg/Mg (0.09 lb/ton) during the performance test. If both afterburners had been operated at the higher temperature, 649° C (1200° F), the control efficiencies would have been approximately equal, and the average of the emissions from both afterburners would have been approximately 0.025 kg/Mg (0.05 lb/ton).

At plant C the emissions from the saturator and asphalt storage tanks are controlled by an HVAF. A performance test consisting of three test runs was conducted at this plant; the emissions averaged 0.026 kg/Mg (0.052 lb/ton).

An HVAF controlled the emissions from the saturator at plant D. The emission rate determined by the performance test consisting of three test runs averaged 0.035 kg/Mg (0.07 lb/ton).

The HVAF, ESP, and afterburner (operated at the higher temperature) all control mass emission rates to between 0.015 and 0.035 kg/Mg (0.03 and 0.07 lb/ton). Each of these control devices could meet a standard set at 0.04 kg/Mg (0.08 lb/ton). Therefore, the emission limit for the saturator and asphalt storage tanks

vented to the saturator control devices has been set at 0.04 kg/Mg (0.08 lb/ton), a level which can be achieved by the HVAF, ESP, or afterburner. This emission limit is based on data collected during production of 106.6–kg (235-lb) shingles. The proposed standard for a saturator producing shingles or mineral surfaced roll roofing requires that the performance tests be conducted while the saturator line is producing a 106.6-kg (235-lb) shingle in order to be consistent with the procedure used during the emissions tests.

A second emission limit for saturators in mass per unit of production is necessary because some asphalt roofing plants produce only saturated felt and roll roofing which are lighter than the shingles that were being produced during the emissions testing program. The uncontrolled mass of particulate emissions per unit time is the same from a saturator producing shingles as from a saturator producing saturated felt if the felt feed rate and asphalt temperature are the same. For saturators operating at the same felt feed rates, the weight of asphalt shingle produced is about 10 times greater than the weight of saturated felt produced. The particulate emissions rate for a saturator producing 106.6-kg (235-lb) shingles was divided by the production rate of a roofing line producing a 6.8-kg (15-lb) saturated felt to derive the proposed emission limit of 0.4 kg/Mg (0.8 lb/ton) for saturators producing a 6.8-kg (15-lb) saturated felt and smooth-surfaced roll roofing.

There was only one blowing still considered to be well controlled and suitable for emissions testing. Two performance tests, each consisting of three runs, were conducted at the afterburner controlling emissions from the blowing still at Plant E. The emission rate for the three saturant blows averaged 0.24 kg/Mg (0.48 lb/ton) of asphalt charged to the still. The emission rate for the three coating blows averaged 0.44 kg/Mg (0.88 lb/ton) with a high individual reading of 0.55 kg/Mg (1.1 lb/ton) of asphalt charged to the still. To allow for possible variations since only one blowing still was tested, the Administrator determined that the emission limit for blowing stills would be set above the highest individual reading observed during the two performance tests. Therefore, the emission limit for the blowing still has been set at 0.60 kg/Mg (1.2 lb/ton) of asphalt charged during conventional blowing, a level which can be achieved by an afterburner during either a coating or a saturant blow. The emission limit provides a 35 percent margin above the average of the individual test runs.

Industry representatives commented that three conditions may influence emissions and the achievability of the proposed emission standards for blowing stills and questioned whether the test results at Plant E are representative of the entire industry.(*1*) These conditions are:

1. The use of ferric chloride as a catalyst in the blowing stills,
2. The use of asphalt flux from different crudes, and
3. The use of No. 2 or No. 6 fuel oil in the afterburner. EPA has considered each of these conditions as discussed in the following paragraphs.

Industry representatives stated that by 1985 the use of a catalyst in the air blowing of asphalt may be widespread. They questioned whether the proposed emission limit, which is based on conventional blowing, would be achievable if catalytic blowing is used. A catalyst is added during air blowing to increase reaction rates and to achieve the desired properties of the coating asphalt. There are no data to quantify the emissions from catalytic blowing of asphalt or from an afterburner controlling the emissions from catalytic blowing. No well-controlled catalytic blowing stills that are suitable for testing are known to exist. However, available information on the operating characteristics of blowing stills and afterburners can be used to assess the achievability of the proposed emission limit when catalytic blowing is used.

In catalytic blowing, a ferric chloride catalyst is added to the still in amounts ranging from 0.2 to 0.5 percent by weight of asphalt charged to the still.(*4*) For ferric chloride to be emitted from the still, it would have to be contained in the liquid asphalt droplets that may be entrained in the gases leaving the still. Liquid drops in the fume that result from condensation of vaporized hydrocarbon material would not contain any ferric chloride. All blowing stills include knock-out boxes or cyclones to remove some of the liquid drops from the fume before incineration. The liquid captured by the knock-out box generally has a viscosity similar to a fuel oil. This indicates that the majority of particulate emissions result from the condensation of light compounds in the asphalt flux and not from entrained liquid droplets. If large amounts of entrained asphalt flux were present, the material captured would have a higher viscosity. Therefore, if tests were done, EPA expects that very little, if any, ferric chloride would be measured in the emissions from the afterburner. Since test data are not available and since afterburners, the control device on which the standard is based, would not control ferric chloride, the Administrator has decided to allow an increment in the standard for catalytic blowing.

In the unlikely event that all of the uncontrolled emissions during the emissions test at Plant E resulted from entrainment of liquid asphalt droplets and if these asphalt droplets contained 0.5 percent (the maximum amount used by industry) by weight of ferric chloride, the ferric chloride emissions would be 0.07 kg/Mg (0.14 lb/ton) of asphalt.

It is possible that ferric chloride will be converted to ferric oxide in the afterburner. If this happens, the mass of emissions would not change because the molecular weights of these compounds are equal. If the proposed emission limit for blowing stills were increased by 0.07 kg/Mg (0.14 lb/ton), the allowable emissions from a blowing still of a medium-size plant would increase from 25.4 to 26.8 Mg/yr (28 to 29.5 tons/yr). The amount by which controlled emissions would be reduced below the baseline level would be 97.5 Mg/yr (107.5 tons/yr) instead of 99 Mg/yr (109 tons/yr). These changes in the benefits of the proposed standard would be relatively small. After considering these factors, the Administrator concluded that an increment for catalytic blowing based on worst-case conditions and the emission test data from Plant E would be reasonable. The uncontrolled emissions at another plant could be higher than those at Plant E. However, after considering the small probability of finding ferric chloride in the emissions at a plant using catalytic blowing, the Administrator concluded that basing the increment on the emissions at Plant E is sufficient to ensure the achievability of the proposed emission limit. Therefore, the proposed emission limit for catalytic blowing is 0.67 kg/Mg (1.34 lb/ton) of asphalt charged to the still.

Industry representatives also expressed concern that catalytic blowing would change the characteristics of the particulate emissions and, therefore, affect the achievability of the proposed emission limit. (*1, 2*) EPA has considered the impacts of these possible changes in the emission characteristics on the achievability of the proposed emission standard as discussed in the following paragraphs.

Information gathered from the industry indicates that during catalytic blowing, the total mass of volatile organic emissions per unit of asphalt production and the flow rate of the blowing air will be the same as during blowing without a catalyst. (*4*) The blowing time may be reduced by as much as two-thirds. (*4*) Therefore, in the worst case, the mass per unit time and

the concentration of combustible particulate in the fume may be approximately three times higher than those measured when no catalyst is used. Even though the particulate emissions per unit time could triple, the total mass of particulate emissions per unit of production would remain the same. Therefore, the afterburner efficiency required to meet the proposed emission limit, which is in mass of emissions per unit of production, would be the same as that required if no catalyst were used. A well-designed afterburner could easily achieve the proposed emission limit under the worst-case conditions for catalytic blowing.

The fuel and the capital costs for the afterburner controlling catalytic blowing would differ from the costs reported for the model plants. The fuel costs reported for the model plant include enough fuel to raise the temperature of the fume to 760°C (1400°F) without taking any credit for the heating value of the particulate in the fume. For the plant tested, the fume provided approximately one-third of the total energy consumed. This method of estimating fuel costs was used to assure that the model plant fuel costs would represent worst-case conditions where the concentration of particulate in the fume is very small. Since the concentration of particulate in the fume from catalytic blowing could be as much as three times higher than the concentration in a fume from conventional blowing, the heating value of the catalytic blowing fume alone should be sufficient to maintain the afterburner at 760°C (1400°F). Therefore, if the combustible particulate in the fume triples, the fuel cost for the afterburner on a catalytic blowing still would be considerably less than the fuel cost for the afterburner at the model plant.

The capacity of an afterburner controlling catalytic blowing will have to be larger than the capacity of an afterburner controlling non-catalytic blowing. In the worst case, catalytic blowing reduces the blowing time by two-thirds and triples the rate of emissions. In this case, and assuming an uncontrolled emission rate equal to that at Plant E, the required afterburner capacity might be triple the capacity of the afterburner required for the losses from the still at Plant E or double the capacity of the model plant afterburner. (The model plant afterburner was 1.5 times the size needed for conditions at Plant E.) Doubling the afterburner capacity would be necessary to handle the mass of material just to meet the baseline condition (Regulatory Alternative 1) which is based on typical SIP's. The SIP's limit the mass rate of emissions to a specified level, e.g., 46 lbs/h for a medium-size plant. Doubling the capacity of the model plant afterburner at a medium-size plant would increase the capital cost of the afterburner from $121,000 to $172,000.(*3*) The capital charges resulting from the increased investment would increase baseline production costs from $13.480 to $13.484 per square of roofing shingle. The production cost for achieving the proposed emission limit (Regulatory Alternative 5) would increase from $13.500 to $13.504 per square of roofing shingle. These costs are reasonable and would not alter the selection of Regulatory Alternative 5 as the basis for the proposed standards. The incremental costs in achieving the proposed emission limit over baseline emission levels would not be increased.

Since the proposed emission limit has been adjusted to allow for emissions of an inorganic catalyst and since the adjusted limit can be achieved at a reasonable cost, the Administrator has determined that no additional adjustment in the proposed emission limit is needed for catalytic blowing.

Industry representatives stated that blowing asphalt fluxes from different crude oils may result in different emission rates. They questioned the achievability of the proposed emission limit when asphalt fluxes different from those used in the emissions testing program are blown. EPA has considered the impact of blowing asphalt fluxes from various crude oils on the achievability of the proposed emission limit as discussed in the following paragraphs.

Data from industry show that losses of material (measured at the outlet of the still) from blowing asphalt fluxes from different crude oils range from 1.0 to 3.9 percent of the asphalt charged to the still.(*4*) The flux used during the emissions test at Plant E was labeled a 2.0 percent volatility crude. The uncontrolled emissions during the test were measured at the outlet of the cyclone and equaled 1.3 percent of the asphalt charged to the still. In the worst case, without a cyclone, when uncontrolled emissions are 3.9 percent of the asphalt charged, an afterburner capable of destroying 98.5 percent of the particulate emissions would be required to achieve the proposed emission limit. The worst case (losses of 3.9-percent of asphalt flux) is not likely to occur. For a medium-size plant, a 3.9 percent loss of asphalt from the still would cost about $480,000 per year at current asphalt prices. Therefore, there is a strong incentive to use low-cost cyclones or knock-out boxes to recover the material that is lost from the still. Even if these devices were only 25 percent efficient, the afterburner efficiency required to achieve the emission limit would be reduced to 98 percent. Studies on afterburners show that a well-designed afterburner can achieve efficiencies in excess of 98.5 percent.(*5*) In fact, efficiencies approaching 100 percent can be achieved.(*5*) If the emission rates are tripled, the concentration of combustible particulates in the fume will also triple, making it easier to achieve higher afterburner efficiencies than those achieved during the test at Plant E.

The cost of achieving the proposed emission limit might increase above the costs reported for the model plants if the uncontrolled emissions are greater than those tested at Plant E. In the worst case (assuming no cyclone) the uncontrolled emissions would be triple those tested at Plant E. The fuel costs reported for the model plant would not increase because the model plant costs include enough fuel to maintain the afterburner at 760°C (1,400°F) without assuming any credit for the heating value of the fume. Any increase in the temperature required for a higher efficiency could come from the heating value of the fume, which would be sufficient to raise the combustion temperature from 760° to 930°C (1,400° to 1,700°F) without increasing the fuel consumption. Studies show that such an increase in temperature alone may be sufficient to achieve a 98.5 percent efficiency in a well-designated afterburner.(*5*)

The capital costs would increase above the costs reported for the model plant because a larger afterburner would be required to achieve a higher capacity and because a longer residence time may be needed to achieve the required efficiency. For the new capacity, the afterburner size may be triple the size needed for the test condition at Plant E or double the size of the model plant afterburner. (The model plant afterburner is 1.5 times the size needed for Plant E.) The afterburner cost for a medium-size model plant would increase from $121,000 to $172,000 if the size of the afterburner is doubled.

The higher afterburner capacity would be necessary to meet the baseline condition (typical SIP's) because the SIP's limit the mass rate of emissions. The increase in capital charges for the larger afterburner would increase the production costs associated with achieving the baseline emission levels (Regulatory Alternative 1) from $13.480 to $13.484 per square of roofing shingle. The production costs associated with

achieving the proposed emissions standard would increase the $13.500 to $13.504 per square of roofing shingle. A further increase in capital cost may result if it is necessary to increase the afterburner efficiency. For example, if emissions per unit of asphalt charged are tripled, the afterburner efficiency would need to increase to meet either the SIP level of control or the proposed standard. Since the SIP emission limits are lower than the proposed standard, the increased efficiency required to meet the SIP level of control might be achievable without increasing the size of the afterburner (e.g., by temperature adjustment). However, the increased efficiency needed to meet the proposed standard might require increasing the residence time in the afterburner. Therefore, to assure a worst-case cost analysis, the capital cost for a larger afterburner to achieve the increased residence time is charged to the incremental cost of achieving the proposed emission limit over the baseline. The model plant afterburner is designed for a residence time of 0.5 second. Control efficiencies generally increase with residence time up to 1.0 second.(7) In the worst case, the fume residence time in the model plant afterburner might need to be doubled to provide a 98.5 percent control efficiency. This would raise the capital cost from $172,000 to $244,000.(3) The increase in capital charges, resulting from the higher investment cost for compliance with the proposed emission limit, would increase production costs in a medium-size plant from $13.504 to $13.510 per square of roofing shingle. These costs for compliance could result in a product price increase of 0.19 percent or, if all costs are absorbed, a reduction in profit of 0.6 percent. These economic impacts would not reduce growth in the industry and are judged by the Administrator to be reasonable.

Catalytic blowing of a high-loss flux, the "extreme" worst-case situation could require an afterburner with 6 times the capacity of the medium-size model plant or 3 times the capacity of an afterburner for a high-loss flux. It is not likely that new plants will be designed that would allow the high losses because of the value of the material that could be recovered. Even if this "extreme" worst case existed, the afterburner fuel cost would decrease and the afterburner capital costs would increase. The increase in capital costs for an afterburner controlling emissions from a medium-size model plant would be $176,000. Because the need for this increase is uncertain and because it was analyzed only for an "extreme" worst-case condition, the increase in cost has been charged to the cost of achieving the standard. This increase in capital charges for the larger afterburner would increase the production costs associated with achieving the proposed standard (Regulatory Alternative 5) from $13.50 to $13.513 per square of roofing shingle. These costs for compliance could result in a product price increase of 0.24 percent, or, if all costs are absorbed, a reduction in profit of 0.8 percent. These economic impacts would not reduce growth in the industry and are judged by the Administrator to be reasonable.

Because well-designed control equipment could achieve the proposed emission limit without adverse economic impacts, the Administrator has determined that the proposed emission limit would apply to blowing stills processing asphalt fluxes from any crude oil.

Industry representatives have stated that the use of No. 6 and No. 2 fuel oil in an afterburner will affect controlled emissions because of the ash content of fuel oil and have questioned the achievability of the proposed standard when fuel oil is used. The afterburner controlling the emissions from the blowing still during the tests at Plant E was fired with natural gas.

The American Petroleum Institute (API) specifications for No. 6 fuel oil show that the ash content ranges from 0.01 to 0.05 percent.(8) The fuel consumption rate of the model plant afterburner (a conservative estimate because the heating value of fume was not considered in the calculation) was used to calculate the increased particulate resulting from the ash content of No. 6 fuel oil. The increased particulate would range from 0.0007 to 0.036 kg/Mg (0.0014 to 0.072 lb/ton) of asphalt charged to the still.(3) The worst-case conditions occur when No. 6 fuel oil with a 0.5 percent ash content is fired in the afterburner at the model plant fuel consumption rate. The Administrator has decided to add an increment to the proposed blowing still emission limits to allow for the worst-case conditions. Therefore, the proposed blowing still emission limits when No. 6 fuel oil is used are 0.64 kg/Mg (1.28 lb/ton) for conventional blowing and 0.71 kg/Mg (1.42 lb/ton) for catalytic blowing.

The API specifications show that No. 2 fuel oil has an ash content of <0.01 percent.(8) Based on the fuel consumption rate of the model plant afterburner, the contribution of ash from No. 2 fuel oil will be <0.0006 kg/Mg (<0.0012 lb/ton) of asphalt charged to the still.(3) This increase in particulate is negligible; therefore, no increment is added to the proposed blowing still emission limits when No. 2 fuel oil is fired in the afterburner.

Selection of Visible Emission Limits

An opacity standard is proposed for all the affected facilities to help ensure proper operation and maintenance of control systems on a day-to-day basis. EPA Reference Method 9 was used to take opacity readings for saturators and blowing stills at plants A, B, C, D, and E during particulate emission tests. Opacity readings for storage tanks were taken only at plant F. The 6-minute average opacity readings of the emissions from the saturators ranged from 0 to 16 percent. All the opacity readings for the emissions from the blowing still were 0 percent. All of the 6-minute average opacity readings for the emissions from the asphalt storage tanks were 0 percent.

In a study of the non-metallic minerals industry, EPA Reference Method 9 was used to take opacity readings at the outlet of fabric filters controlling emissions from handling and storage of materials (sand, talc, mineral stabilizer, and granules) similar to those used in the asphalt roofing industry. The opacity emission data from the "Draft Background Information Document for Non-Metallic Mineral Processing Plants" were used to establish the proposed opacity emission limit for mineral handling and storage facilities in the asphalt roofing industry. Ninety-two percent of the 6-minute averages showed zero percent opacity. The remaining 6-minute averages were greater than zero but less than or equal to 1 percent opacity.

The proposed opacity standards are set at or above the upper limit of the opacity data collected during the emissions testing program. The proposed standards are 0 percent opacity for blowing stills, 20 percent opacity for saturators, 0 percent opacity for asphalt storage tanks, and 1 percent opacity for minerals handling and storage.

A fugitive emission standard is proposed to ensure good capture of fugitive emissions from the saturator. During the emission testing program, several canopy hoods and one total enclosure hood were observed. Only the total enclosure hood achieved good capture of fugitive emissions. Total enclosure hoods can be used for new, modified, or reconstructed facilities. Therefore, total enclosure hoods were selected to represent the best technological system for continuous capture of fugitive emissions from saturators.

Only the total enclosure hood at plant B was available for testing at the time the emissions testing program was conducted. Observations of visible emissions at this plant form the basis of the proposed emission standard. During the emission testing program at plant B, the consecutive periods of observations taken while the saturator was operating under representative conditions (when the line speed was >80 percent of usual daily line speed) totaled 5.5 hours. Fugitive emissions were visible for not more than 16.7 percent of the time during any period of consecutive observations totaling 60 minutes, 12 percent of the time during any period of consecutive observations totaling 120 minutes, and 8 percent of the time during the full 5.5 hours of observations.

A period of consecutive observations, taken during representative operating conditions, totaling 60 minutes was chosen as a sufficient period of time to assess the performance of the capture system. During the test the highest average reading for such a 60-minute period was 16.7 percent. The proposed emission limit allows visible emissions from saturators for 20 percent of any period of consecutive observations, during representative operating condition, totaling 60 minutes.

Modification/Reconstruction Considerations

The proposed standards of performance would apply to saturators, blowing stills, asphalt storage tanks, and mineral handling and storage facilities. Any physical or operational change that increases the emissions to the atmosphere in kilograms per hour from any one of these facilities could be considered a modification according to Section 60.14 of Title 40 of the Code of Federal Regulations (CFR) and if so would subject that facility to the standards of performance. There are several physical and operational changes that may increase emissions to the atmosphere but are exempt from the modification provision. One such exemption is for a production rate increase that is accomplished without a capital expenditure. Asphalt roofing production lines are designed to operate at maximum line speeds (e.g., 600 feet per minute). Initial startup and operation of the production line is at a lower speed that the design capacity. Typically, the line speed is gradually increased, sometimes over a period of years, to approach the designed line speed. Because the line was originally designed for a maximum attainable line speed, there is no capital expediture, as defined in Section 60.14 Title 40 CFR, associated with any increases in line speed up to the designed capacity. These production rate increases are not considered to be modifications.

Other physical and operational changes which are exempted from the modification provision are maintenance, repair, and replacement determined to be routine; an increase in the hours of operation; and the addition or use of an air pollution control device that is environmentally beneficial. The use of alternative fuel or raw material, such as a different asphalt flux, is not a modification if the facility was designed to accommodate that alternative use. Physical and operational changes which do not increase the emission rate to the atmosphere would not be considered as modifications and therefore would not be covered by the standards.

"Reconstruction" means the replacement of components of an existing facility to such an extent that the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility and that it is technologically and economically feasible to meet the applicable standard set forth in Part 60. Reconstruction as defined in § 60.15(b) of title 40 CFR Part 60 would apply to each affected facility individually. For example, if a saturator is changed to the extent that it is considered reconstructed and is, therefore, required to conform to the proposed standards, this woud not cause the other facilities of an asphalt roofing plant to be subject to the provisions of the proposed standards.

It is technologically feasible and economically reasonable to install the same particulate control devices on modified or reconstructed facilities as would be installed on newly constructed facilities. Therefore, no special exemptions for modified and reconstructed facilities are included in the proposed standards of performance.

Selection of Performance Test Methods

Reference Method 5, "Determination of Particulate Emissions from Stationary Sources," was examined to determine its applicability to the asphalt processing and asphalt roofing industry. It was decided that this method was not suitable for determining particulate emissions from asphalt processing and asphalt roofing plants. Therefore, a program was initiated to develop a test method for particulate emissions from sources in these plants. The test method developed was Reference Method 26, "Determination of Particulate Emissions from the Asphalt Processing and Asphalt Roofing Industry." Emission measurements were conducted at seven asphalt roofing plants using this method.

In summary, problems associated with the use of Method 5 for asphalt processing and asphalt roofing plants were: (1) The filtration temperature was too high; (2) there was no precollector filter to reduce oil droplet loading; (3) the cleanup reagent did not effectively dissolve baked-on oil and asphalt; (4) sample loss occurred during analytical procedures; and (5) there was inadequate recovery of samples from condensed water collected in the cyclone collection flask. The following paragraphs explain how Method 26 alleviates the problems associated with Method 5.

At the collection temperature specified in Method 5, 121°C (250°F), a portion of the liquid particulate from asphalt processing and asphalt roofing plants vaporizes and passes through the particulate sampling device as a gas. The change of filtration temperature to 52°C (126°F) in Method 26 reduces this problem and provides a consistent basis for evaluating different control systems and the emissions from different plants. The data used in setting the emission limits proposed for saturators were collected at or below the 52°C (126°F) filtration temperature.

In Method 26 a precollector filter is used to reduce the oil droplet loading on the primary filter, which prevents oil from seeping through the glass fiber filter mat during periods of high droplet concentrations.

The cleanup reagent specified in Method 26 is 1,1,1-trichloroethane (TCE). The acetone used in Method 5 does not remove all baked-on oil and tar from the sampling apparatus. TCE is effective in dissolving the baked-on oil and asphalt.

The analytical procedure developed for Method 26 minimizes sample loss through evaporation. Experimental results showed that the weight loss from the evaporation process was minimal.

Collection and analytical procedures for condensed water were developed for Method 26. When Method 5 was used, condensation occurred in the filtration section of the sample train when the moisture content of the stack gases was above 10 percent. These conditions occurred during blowing still tests but not during saturator tests.

Method 26 is an effective test procedure for sampling emissions from asphalt processing and asphalt roofing plants and is being proposed with the proposed standards as the performance test method for particulate emissions from asphalt processing and asphalt roofing plants.

Reference Method 26, "Determination of Particulate Emissions from the

Asphalt Processing and Asphalt Roofing Industry," specifies: (1) Measurement system design criteria; (2) measurement system performance specifications and performance test procedures; and (3) procedures for emission sampling. Two hours per run is proposed as the sampling time for emission testing because this is sufficient time to collect a representative sample from asphalt processing and asphalt roofing plants. Each performance test would consist of three runs. Method 26 is sufficiently similar to Method 5 that test personnel experienced with Method 5 should have no difficulty obtaining reliable data.

Reference Method 22, "Visual Determination of Fugitive Emissions From Material Processing Sources," is being proposed as a performance test method to determine compliance with standards of performance limiting fugitive emissions from asphalt saturator capture systems. Reference Method 22 was developed because fugitive emissions from saturator capture systems may occur within asphalt roofing plant buildings where lighting and background conditions needed for opacity readings are not attainable.

Reference Method 9, "Visual Determination of the Opacity of Emissions from Stationary Sources," is selected as a test method to determine compliance with standards of performance limiting particulate emissions from asphalt processing and asphalt roofing plants. Reference Method 9 is used to read opacity of emissions from exhaust stacks of control devices which are outside the plant. Opacity readings can be used to indicate whether a control device is being properly operated and maintained.

Selection of Monitoring Requirements

Monitoring requirements can provide a convenient means for enforcement personnel to ensure that emission control systems are properly operated and maintained. For blowing stills and saturators, the most straightforward means of ensuring proper operation and maintenance of the control device would be to monitor particulate emissions. However, no continuous particulate monitors are available for this industry. Resolution of the sampling problems and development of performance standards for continuous particulate monitors would entail a major development program. For these reasons, continuous monitoring of particulate emissions from the asphalt processing and asphalt roofing industry is not required by the proposed standards.

Opacity can be used as an indication of poor operation of the control device. If the opacity from the control device exceeds the proposed limit, it is an indication that a control device is not operating properly and may not be meeting the particulate emission limit. However, the absence of opacity does not always indicate that the emission limit is being met.

The only instrument for continuous measurement of opacity is the transmissometer which is not ideally suited to the measurement of opacity in the effluent gas streams at asphalt processing and asphalt roofing plants. The particulate emissions from these plants are liquid hydrocarbon mixtures that are converted to gases by the temperatures that are present in th effluent gas streams. The gaseous emissions would not be detected by the transmissometer, but will recondense and be visible in the atmosphere. For these reasons, continuous monitoring of opacity is not required.

The proposed standards would require continuous recording of the operating temperature which is critical to the effectiveness of the control devices upon which the proposed standards are based. This requirement would apply to the temperature in the combustion zone of an afterburner and to the inlet temperature for a high velocity air filter (HVAF) or an electrostatic precipitator (ESP). If the average temperature over any 6-hour period of operation was below that measured during the performance test for afterburners or above that measured for HVAF's or ESP's, by definition excess emissions would have occurred. The plant owner or operator would have to report the occurrence of excess emissions in a quarterly report. A 6-hour averaging time for temperature was selected because this corresponds to the period of time required for a performance test. Other parameters to be monitored may be specified by the Administrator if the temperature of a control device used to meet the standards is not critical to the performance of the device.

Comments were received from the industry contending that if a performance test on a saturator control device (HVAF or ESP) were run during cold weather, the operating temperature measured may be lower than if the performance test were run in warm weather. The temperature value that is measured during a performance test in which the numerical emission limit is met would be the temperature value used to determine excess emissions that must be reported. If the performance test were run in cold weather, the extra cooling by the ambient air might cause the established temperature to be lower than is actually necessary to meet the proposed emission limit. Further, this temperature value might be impossible to maintain in warm weather. Therefore, a temperature value established in a cold weather performance test may actually be lower than the temperature at which the inlet gases should be maintained to meet the emission limit. The temperature attainable during warm weather may indicate excess emissions when in fact the emission levels are not in excess of the numerical emission limit. For this reason, the proposed standards allow plant owners and operators the option of repeating the performance test to establish a new value for the temperature which indicates the occurrence of excess emissions.

Records of temperature measurements would have to be retained for at least 2 years following the date of the measurements by owners and operators subject to this subpart. This requirement is included under § 60.7(d) of the General Provisions of 40 CFR part 60.

Impacts of Reporting Requirements

The proposed standards would require asphalt processing and asphalt roofing plants to submit reports to the Administrator so that he can ensure compliance with the regulation. The proposed standards would require four types of reports. First, there are notification reports required under the General Provisions that would enable the Agency to keep abreast of facilities subject to the standards of performance. Second, there are reports of performance test results. Third, there are performance evaluations of the temperature monitoring and recording system. Fourth, there are quarterly reports of excess emissions which would permit the Agency to determine whether the emission control system installed to comply with the standards is being properly operated and maintained.

Section 60.7(b) of Part 60 Subpart A of the Code of Federal Regulations (CFR) requires an owner or operator of a plant to maintain records of all startups, shutdowns, or malfunctions of an affected facility. Section 60.7(c) requires submittal of quarterly reports of excess emissions and identification of any periods of excess emissions from any affected facility when startups, shutdowns, and malfunctions occurred. A primary purpose of maintaining records of startups, shutdowns, and malfunctions at a plant is for later use in the quarterly reports identifying the occurrence and duration of excess emissions.

Clarification of what constitutes startup, shutdown, and malfunction as opposed to normal operation in asphalt roofing and asphalt processing plants is necessary to avoid unnecessary and burdensome recordkeeping.

Air blowing of asphalt is usually a batch operation. Saturant and coating asphalts are produced by blowing air through hot asphalt flux in a blowing still. A minimum of four batches will be blown each operating day at a typical asphalt roofing plant. The beginning and ending of a batch is considered to be normal operation and excess emissions are not expected to occur during these times. Therefore, it is not necessary to record the beginning and ending of each batch as startup and shutdown.

The production of saturated felt, roll roofing and shingles is a continuous process. Saturated felt is produced by applying hot saturant asphalt to a felt made of paper. Coating asphalt is then applied to the saturated felt to produce roll roofing. Roll roofing is further processed by adding talc to one side of the felt and mineral aggregate to the other side to produce asphalt shingles. The typical asphalt roofing production line operates 16 hours per day, 5 to 6 days per week, and 50 weeks per year. Breaks in the felt may cause temporary halts in production several times during each operating day. However, the emission control equipment would operate continuously with no increase of emissions to the atmosphere. Since temporary halts in the production line to repair breaks in the felt are considered to be normal operation and would not by themselves result in excess emissions, they do not need to be recorded as startup, shotdown, or malfunction.

The resources needed by the industry to maintain records, to collect data, and to prepare the reports through the first 5 years would be about 3,200 man-hours. These figures are based on the assumption that the proposed standards would cover three new, modified, or reconstructed asphalt roofing manufacturing plants, with blowing stills, through the first 5 years.

Using the growth projections made by industry representatives, the resources needed by the industry to maintain records, to collect data, and to prepare the reports through the first 5 years would be about 30,000 man-hours.

Public Hearing

A public hearing will be held to discuss the proposed standards in accordance with Section 307(d)(5) of the Clean Air Act. Persons wishing to make oral presentations should contact EPA at the address given in the Addresses section of this preamble. Oral presentations will be limited to 15 minutes each. Any member of the public may file a written statement before, during, or within 30 days after the hearing. Written statements should be addressed to the Central Docket Section address given in the Addresses section of this preamble.

A verbatim transcript of the hearing and written statements will be available for public inspection and copying during normal working hours at EPA's Central Docket Section in Washington, D.C. (see Addresses section of this preamble).

Docket

The docket is an organized and complete file of all the information submitted to or otherwise considered in the development of this proposed rulemaking. The principal purposes of the docket are (1) to allow interested parties to readily identify and locate documents so that they can intelligently and effectively participate in the rulemaking process, and (2) to serve as the record in case of judicial review.

Miscellaneous

As prescribed by Section 111, establishment of standards of performance for affected facilities in asphalt roofing plants, asphalt blowing stills and asphalt storage tanks in oil refineries and asphalt processing plants was preceded by the Administrator's determination (40 CFR 60.16, 44 FR 49222, dated August 21, 1979) that these sources contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. In accordance with Section 117 of the Act, publication of this proposal was preceded by consultation with appropriate advisory committees, independent experts, and Federal departments and agencies. The Administrator will welcome comments on all aspects of the proposed regulation, including economic and technological issues, and on the proposed test methods.

Comments are specifically invited on the effects of different crude oils and the catalytic blowing of asphalt on particulate emissions. Any comments submitted to the Administrator on the effects of different crude oils and catalytic blowing of asphalt on particulate emissions should contain emission test data pertinent to an evaluation of the magnitude and severity of its impact and suggested alternative courses of action that would avoid this impact.

It should be noted that standards of performance for new sources established under Section 111 of the Clean Air Act reflect:

> • • • application of the best technological system of continuous emission reduction which (taking into consideration the cost of achieving such emission reduction, and nonair quality health and environmental impact and energy requirements) the Administrator determines has been adequately demonstrated (Section 111(a)(1)).

Although there may be emission control technology available that can reduce emissions below those levels required to comply with standards of performance, this technology might not be selected as the basis of standards of performance due to costs associated with its use. Accordingly, standards of performance should not be viewed as the ultimate in achievable emission control. In fact, the Act requires (or has the potential for requiring) the imposition of a more stringent emission standard in several situations.

For example, applicable costs do not necessarily play as prominent a role in determining the "lowest achievable emission rate" for new or modified sources located in nonattainment areas, i.e., those areas where statutorily-mandated health and welfare standards are being violated. In this respect, Section 173 of the Act requires that new or modified sources constructed in an area which exceeds the National Ambient Air Quality Standard (NAAQS) must reduce emissions to the level which reflects the "lowest achievable emission rate" (LAER), as defined in Section 171(3). The statute defines LAER as that rate of emissions based on the following, whichever is more stringent:

> 1. The most stringent emission limitation which is contained in the implementation plan of any State for such class or category of source, unless the owner or operator of the proposed source demonstrates that such limitations are not achievable, or
> 2. The most stringent emission limitation which is achieved in practice by such class or category of source.

In no event can the emission rate exceed any applicable new source performance standard (Section 171(3)).

A similar situation may arise under the prevention of significant deterioration of air quality provisions of the Act (Part C). These provisions require that certain sources (referred to in Section 169(1)) employ "best available control technology" (BACT) as defined in Section 169(3) for all pollutants regulated under the Act. Best available control technology must be determined on a case-by-case basis, taking energy, environmental, and economic impacts and other costs into account. In no event may the application of BACT result in emissions of any

pollutants which will exceed the emissions allowed by any applicable standard established pursuant to Section 111 (or 112) of the Act.

In all events, State Implementation Plans (SIP's) approved or promulgated under Section 110 of the Act must provide for the attainment and maintenance of NAAQS designed to protect public health and welfare. For this purpose, SIP's must in some cases require greater emission reduction than those required by standards of performance for new sources.

States are free under Section 116 of the Act to establish even more stringent emission limits than those established under Section 111 or those necessary to attain or maintain the NAAQS under Section 110. Accordingly new sources may in some cases be subject to limitations more stringent than standards of performance under Section 111. Prospective owners and operators of new sources should be aware of this possibility in planning for such facilities.

This regulation will be reviewed four years from the date of promulgation as required by the Clean Air Act. This review will include an assessment of such factors as the need for integration with other programs, the existence of alternative methods, enforceability, improvements in emission control technology, and reporting requirements. The reporting requirements in this regulation will be reviewed as required under EPA's sunset policy for reporting requirements in regulations.

Section 317 of the Clean Air Act requires the Administrator to prepare an economic impact assessment for any new source standard of performance under Section 111(b) of the Act. An economic impact assessment was prepared for the proposed regulations and for other regulatory alternatives. All aspects of the assessment were considered in the formulation of the proposed standards to insure that the proposed standards would represent the best system of emission reduction considering costs. The economic impact assessment is included in the background information document.

Dated: November 10, 1980.

Douglas M. Costle,

Administrator.

References

1. R. C. Cooper, MRI, to D. Byrne, EPA/SDB. July 31, 1980. Minutes of meeting with ARMA representatives. A–79–39. II–E–017.

2. E. P. Shea, MRI, to J. W. Ricketts, V. P. Tamko Products, Inc. July 28, 1980. Telecon to discuss the growth projections made by industry. A–79–39. II–E–013.

3. E. P. Shea, MRI, to A–79–39 docket. August 20, 1980. Memo discussing the contribution of catalysts and the use of different asphalt fluxes in blowing stills to the economic and environmental impacts. A–79–39. II–B–048.

4. E. P. Shea, MRI, to K. Rosinski, Owens-Corning Fiberglas, Corp. August 6, 1980. Telecon to discuss the use of different asphalt fluxes and catalysts in the blowing still. A–79–39. II–E–014.

5. Afterburner System Study. U.S. Environmental Protection Agency. Research Triangle Park, N.C. EPA–R2–72–062. p. 16, 17, 18, 18a and 19. A–79–39. II–I–025. August 1972.

6. R. C. Cooper, MRI, to D. Pymm, HIRT Combustion. August 4, 1980. Telecon to discuss the design of afterburners as applied to blowing stills. A–79–39. II–E–015.

7. J. A. Danielson (Ed.). Air Pollution Engineering Manual. Prepared by the U.S. Environmental Protection Agency. Publication No. AP–40. p. 176. May 1973.

8. R. H. Perry and C. H. Chilton. Chemical Engineers' Handbook. 5th Ed. New York, McGraw-Hill, 1969. p. 9–10.

It is proposed that 40 CFR Part 60 be amended as follows:

1. By adding Subpart UU as follows:

Subpart UU—Standards of Performance for Asphalt Processing and Asphalt Roofing Manufacture

Sec.

60.470 Applicability and designation of affected facilities.
60.471 Definitions.
60.472 Standards for particulate matter.
60.473 Monitoring of operations.
60.474 Test methods and procedures.

Authority: Sec. 111, 301(a), Clean Air Act, as amended, (42 U.S.C. 7411, 7601(a)), and additional authority as noted below.

Subpart UU—Standards of Performance for Asphalt Processing and Asphalt Roofing Manufacture

§ 60.470 Applicability and designation of affected facilities.

(a) The provisions of this subpart are applicable to the following affected facilities: Saturators; mineral handling and storage facilities; asphalt storage tanks; and blowing stills used for asphalt processing and asphalt roofing manufacture.

(b) The provisions of this subpart apply to any affected facility identified in paragraph (a) of this section, the construction or modification of which is begun after ———— (date of publication in the **Fedral Register**).

§ 60.471 Definitions.

As used in this subpart, all terms not defined herein shall have the meaning given them in the Act and in Subpart A of this part.

"Afterburner (A/B)" means an exhaust gas incinerator used to control emissions of particulate matter.

"Asphalt processing" means the storage and blowing of asphalt at asphalt roofing plants, oil refineries, and asphalt processing plants for use in the manufacture of asphalt roofing products.

"Asphalt roofing manufacture" means production of asphalt roofing (shingles, roll roofing, siding, or saturated felt).

"Asphalt storage tank" means any tank used to store hot asphalt for asphalt roofing manufacture or asphalt processing. Storage tanks may be located at asphalt roofing plants, oil refineries, and asphalt processing plants.

"Blowing still" means the equipment in which air is blown through hot asphalt flux to produce different grades of asphalt for the manufacture of asphalt roofing.

"Catalyst" means a substance which, when added to asphalt flux in a blowing still, alters the penetrating-softening point relationship and increases the rate of oxidation of the flux.

"Coating blow" means the process in which air is blown through hot asphalt flux to produce coating asphalt. The coating blow starts when the air is turned on and stops when the air is turned off.

"Electrostatic precipitator (ESP)" means an air pollution control device in which solid or liquid particulates in a gas stream are charged as they pass through an electric field and precipitated on a collection surface.

"High velocity air filter (HVAF)" means an air pollution control filtration device for the removal of sticky, oily, or liquid aerosol particulate matter from exhaust gas streams.

"Mineral handling and storage facility" means the areas in asphalt roofing plants in which minerals are unloaded from a carrier, the conveyor transfer points between the carrier and the storage silos, and the storage silos.

"Saturant blow" means the process in which air is blown through hot asphalt flux to produce saturant asphalt. The saturant blow starts when the air is turned on and stops when the air is turned off.

"Saturator" means the equipment in which asphalt is applied to felt to make asphalt roofing products. The term saturator includes the saturator, wet looper and coater.

§ 60.472 Standards for particulate matter.

(a) On or after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any saturator:

(1) Particulate matter in excess of:

(A) 0.04 kilograms of particulate per megagram of asphalt shingle or mineral-surfaced roll roofing produced, or

(B) 0.4 kilograms per megagram of saturated felt or smooth-surfaced roll roofing produced;

(2) Exhaust gases with opacity greater than 20 percent; and

(3) Any visible emissions from a saturator capture system for more than 20 percent of any period of consecutive valid observations totaling 60 minutes.

(b) On or after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any blowing still:

(1) Particulate matter in excess of 0.67 kilograms of particulate per megagram of asphalt charged to the still when a catalyst is added to the still; and

(2) Particulate matter in excess of 0.71 kilograms of particulate per megagram of asphalt charged to the still when a catalyst is added to the still and when No. 6 fuel oil is fired in the afterburner; and

(3) Particulate matter in excess of 0.60 kilograms of particulate per megagram of asphalt charged to the still during blowing without a catalyst; and

(4) Particulate matter in excess of 0.64 kilograms of particulate per megagram of asphalt charged to the still during blowing without a catalyst and when No. 6 fuel oil is fired in the afterburner; and

(5) Exhaust gases with an opacity greater than 0 percent.

(c) On or after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any asphalt storage tank exhaust gases with opacity greater than 0 percent. If, however, the emissions from any asphalt storage tank(s) are ducted to a control device for a saturator, the combined emissions shall meet the emission limit contained in paragraph (a) of this section during the time the saturator control device is operating. At any other time the asphalt storage tank(s) must meet the 0 percent opacity limit.

(d) On or after the date on which the performance test required to be conducted by § 60.8 is completed, no owner or operator subject to the provisions of this subpart shall cause to be discharged into the atmosphere from any mineral handling and storage facility emissions with opacity greater than 1 percent.

§ 60.473 Monitoring of operations.

(a) The owner or operator subject to the provisions of this subpart, and using either an electrostatic precipitator or a high velocity air filter to meet the emission limit in § 60.472(a)(1) and/or (b)(1) shall continuously monitor and record the temperature of the gas at the inlet of the control device. The temperature monitoring instrument shall have an accuracy of ±5°C over its range.

(b) The owner or operator subject to the provisions of this subpart and using an afterburner to meet the emission limit in § 60.472(a)(1) and/or (b)(1) shall continuously monitor and record the temperature in the combustion zone of the afterburner. The monitoring instrument shall have an accuracy of ±10°C over its range.

(c) An owner or operator subject to the provisions of this subpart and using a control device not mentioned in paragraphs (a) and (b) of this section shall provide to the Administrator information describing the operation of the control device and the process parameter(s) which would indicate proper operation and maintenance of the device. The Administrator may require continuous monitoring and will determine the process parameters to be monitored.

(d) For the purpose of reports required under § 60.7(c), periods of excess emissions that shall be reported are defined as any 6-hour period during which the average temperature measured in accordance with paragraph (a) of this section is above the temperature measured in accordance with § 60.474 (h) or (i) at a time when the emission limits in § 61.472 (a) or (b) were met, or the average temperature measured in accordance with paragraph (b) of this section falls below the temperature measured in accordance with § 60.474 (h) or (i) at a time when the emission limits in § 61.472 (a) or (b) were met. Each excess emission report shall include the value identified for the temperature specified under § 60.474 (h) or (i) and the monitored temperature value.

(Sec. 114, Clean Air Act as amended (42 U.S.C. 7414))

§ 60.474 Test methods and procedures.

(a) Reference methods in Apendix A of this part, except as provided in § 60.8(b), shall be used to determine compliance with the standards prescribed in § 60.472 as follows:

(1) Method 26 for the concentration of particulate matter;

(2) Method 1 for sample and velocity traverses;

(3) Method 2 for velocity and volumetric flow rate;

(4) Method 3 for gas analysis; and

(5) The Administrator will determine compliance with the standards prescribed in § 60.472(a)(3) by using Method 22. During the test run, readings are to be recorded every 15 seconds for a period of consecutive observations during representative conditions (in accordance with § 60.8(c) of the General Provisions) totaling 60 minutes. A performance test shall consist of one run.

(b) For Method 26 the sampling time for each run on a saturator shall be at least 120 minutes, and the sampling volume shall be at least 3 dscm. Method 26 shall be used to measure the emissions from the saturator while the asphalt roofing plant is making 106.6-kg (235-lb) asphalt shingle if the final product is shingle or mineral-surfaced roll roofing or while the asphalt roofing plant is making 6.8-kg (15-lb) saturated felt if the final product is saturated felt or smooth-surfaced roll roofing. Method 26 shall be used to measure emissions from the blowing still for at least 90 minutes or for the duration of the coating blow whichever is greater. If the blowing still is not used to blow coating asphalt, Method 26 shall be used to measure emissions from the blowing still for at least 90 minutes or for the duration of the saturant blow, whichever is greater.

(c) The particulate emission rate, E, shall be computed as follows:

$$E = Q_{sd} \times C_s$$

(1) E is the particulate emission rate (kg/h);

(2) Q_{sd} is the average volumetric flow rate (dscm/h) as determined by Method 2; and

(3) C_s is the average concentration (kg/dscm) of particulate matter as determined by Method 26.

(d) The asphalt roofing production rate, P (Mg/h), shall be determined by dividing the weight in megagrams (Mg) of roofing produced on the shingle or saturated felt process lines during the performance test by the number of hours required to conduct the performance test. The roofing production shall be obtained by direct measurement.

(e) The production rate of asphalt from the blowing still, P_s (Mg/h), shall be determined by dividing the weight of asphalt charged to the still by the time required for the performance test during a coating asphalt blow. The weight of asphalt charged to the still shall be determined at the starting temperature of the coating blow. The weight of asphalt shall be converted from the volume measurement as follows:

M=Vd/c
M=weight of asphalt in megagram
V=volume of asphalt in cubic meters
d=density of asphalt in kilograms per cubic meter
c=conversion factor 1,000 kilograms per megagram

The density of asphalt at any measured temperature is calculated by using the following equation:

$d=1056.1-0.6176\times°C$

The method of measurement shall have an accuracy of ±10 percent.

(f) The saturator emission rate shall be computed as follows:

$R=E/P$

(g) The blowing still emission rate shall be computed as follows:

$R_s=E/P_s$

where:

(1) R is the saturator emission rate (kg/Mg);
(2) R_s is the blowing still emission rate (kg/Mg);
(3) E is the particulate emission rate (kg/hr) from paragraph (c) of this section;
(4) P is the asphalt roofing production rate (Mg/h); and
(5) P_s is the asphalt charging rate (Mg/h).

(h) Temperature shall be measured and continuously recorded with the monitor required under § 60.473 (a) or (b) during the measurement of particulate by Method 26.

(i) If at a later date the owner or operator believes the emission limits in § 60.472 (a) and (b) are being met even though the temperature measured in accordance with § 60.473 paragraphs (a) or (b) is exceeding that measured during the performance test, he may submit a written request to the Administrator to repeat the performance test and procedure outlined in paragraph (h) of this section.

(Sec. 114, Clean Air Act as amended (42 U.S.C. 7414))

2. By adding Method 26 and Method 22 to Appendix A as follows:

Appendix A—Reference Methods

* * * * *

Method 26—Determination of Particulate Emissions From the Asphalt Processing and Asphalt Roofing Industry

1. *Applicability and Principle.*

1.1 *Applicability.* This method applies to the determination of particulate emissions from asphalt roofing industry process saturators, blowing stills, and other sources as specified in the regulations.

1.2 *Principle.* Particulate matter is withdrawn isokinetically from the source and collected on a glass fiber filter maintained at a temperature no greater than 52° C (126° F). The particulate mass, which includes any material that condenses at or above the filtration temperature, is determined gravimetrically after removal of uncombined water.

2. *Apparatus.*

2.1 *Sampling Train.* The sampling train configuration is the same as shown in Figure 5–1 of Method 5, except a precollector cyclone is added between the probe and the heated filter and is located in the heated section of the train. The sampling train consists of the following components:

2.1.1 *Probe Nozzle, Pitot Tube, Differential Pressure Gauge, Filter Holder, Condenser, Metering System, Barometer, and Gas Density Determination Equipment.* Same as Method 5, Sections 2.1.1, 2.1.3 to 2.1.5, and 2.1.7 to 2.1.10, respectively.

2.1.2 *Probe Liner.* Same as in Reference Method 5, Section 2.1.2, with the note that at high stack gas temperatures [greater than 250° C (480° F)], water-cooled probes may be required to control the probe exit temperature to no greater than about 52° C (126° F).

2.1.3 *Precollector Cyclone.* Borosilicate glass following the construction details shown in APTD–0581.

Note.— The tester shall use the cyclone when the stack gas moisture is greater than 10 percent or when the stack gas oil concentration is high enough to cause oil to seep through the glass mat filter. The tester need not use the precollector cyclone or glass wool under other, less severe test conditions.

2.1.4 *Filter Heating System.* Any heating (or cooling) system capable of maintaining a sample gas temperature at the exit end of the filter holder during sampling of no greater than 52° C (126° F). Install a temperature gauge capable of measuring temperature to within 3° C (5.4° F) at the exit end of the filter holder so that the sample gas temperature can be regulated and monitored during sampling. The tester may use systems other than the one shown in APTD–0581.

2.2 *Sample Recovery.* The equipment required for sample recovery is as follows:

2.2.1 *Probe-Liner and Probe-Nozzle Brushes, Graduated Cylinder and/or Balance, Plastic Storage Containers, and Funnel and Rubber Policeman.* Same as Method 5, Sections 2.2.1, 2.2.5, 2.2.6, and 2.2.7, respectively.

2.2.2 *Wash Bottles.* Glass.

2.2.3 *Sample Storage Containers.* Chemically resistant, borosilicate glass bottles, with rubber-backed Teflon screw cap liners or caps that are constructed so as to be leak-free and resistant to chemical attack by 1,1,1-trichloroethane (TCE), 500-ml or 1000-ml. (Narrow mouth glass bottles have been found to be less prone to leakage.)

2.2.4 *Petri Dishes.* Glass, unless otherwise specified by the Administrator.

2.2.5 *Funnel.* Glass.

2.3 *Analysis.* For analysis, the following equipment is needed:

2.3.1 *Glass Weighing Dishes, Desiccator, Analytical Balance, Balance, Hygrometer, and Temperature Gauge.* Same as Method 5, Sections 2.3.1 to 2.3.4, 2.3.6, and 2.3.7, respectively.

2.3.2 *Beakers.* Glass, 250-ml and 500-ml.

2.3.3 *Separatory Funnel.* 100-ml or greater.

3. *Reagents.*

3.1 *Sampling.* The reagents used in sampling are as follows:

3.1.1 *Filters, Silica Gel, and Crushed Ice.* Same as Method 5, Sections 3.1.1, 3.1.2, and 3.1.4, respectively.

3.1.2 *Precollector Glass Wool.* No. 7220, Pyrex brand or equivalent.

3.1.3 *Stopcock Grease.* TCE-insoluble, heat-stable grease (if available). This is not necessary if screw-on connectors with Teflon sleeves, or similar, are used.

3.2. *Sample Recovery.* Reagent grade 1,1,1-trichloroethane (TCE), ≦0.001 percent residue, and stored in glass bottles is required. Run TCE blanks prior to field use and use only TCE with low blank values (≦0.001 percent). The tester shall in no case subtract a blank value of greater than 0.001 percent of the weight of TCE used from the sample weight.

3.3 *Analysis.* Two reagents are required for the analysis:

3.3.1 *TCE.* Same as 3.2.

3.3.2 *Desiccant.* Same as Method 5, Section 3.3.2.

4. *Procedure.*

4.1 *Sampling Train Operation.* The complexity of this method is such that, in order to obtain reliable results, testers should be trained and experienced with Method 5 test procedures.

4.1.1 *Pretest Preparation.* Maintain and calibrate all the components according to the procedure described in APTD–0576, unless otherwise specified herein.

Prepare probe liners and sampling nozzles as needed for use. Thoroughly clean each component with soap and water, followed by a minimum of three TCE rinses. Use the probe and nozzle brushes during at least one of the TCE rinses (refer to Section 4.2 for rinsing techniques). Cap or seal the open ends of the probe liners and nozzles to prevent contamination during shipping.

Prepare silica gel portions and glass filters as specified in Method 5, Section 4.1.1.

Prepare cyclone precollector systems for use as follows: Desiccate or oven-dry plugs of glass wool as needed and weigh these to a constant weight (use techniques similar to those described above for glass fiber filters). Place each tared glass wool plug in a labeled petri dish. Next, thoroughly clean equal numbers of glass cyclones and 125-ml Erlenmeyer flasks, using soap and water, followed by several TCE rinses. Pair each cyclone with a flask and identify (mark or label) each piece of glassware. Determine the tare weight of each glass cyclone to the nearest 0.1 mg. Seal the open ends of each flask and cyclone to prevent contamination during transport.

4.1.2 *Preliminary Determinations.* Select the sampling site, probe nozzle, and probe length as specified in Method 5, Section 4.1.2.

Select a total sampling time greater than or equal to the minimum total sampling time specified in the test procedures section of the applicable regulation. Follow the guidelines outlined in Method 5, Section 4.1.2, for sampling time per point and total sample volume collected.

4.1.3 *Preparation of Collection Train.* Prepare the collection train as specified in Method 5, Section 4.1.3 with the addition of the following.

If a precollector cyclone is to be used with a tared glass wool plug (see note in Section 2.1.2), prepare this by placing the glass wool plug into the inlet section of the cyclone near the top. Loosely pack the glass wool so as to

avoid high pressure drops in the sampling train. See Figure 26–1. Connect the cyclone to the correpsonding 125-ml Erlenmeyer flask.

Set up the sampling train as shown in Figure 5–1 of Method 5 with the addition of the precollector cyclone, if used, between the probe and filter holder. Use no stopcock grease on ground glass joints unless the grease is insoluble in TCE.

4.1.4 *Leak Check Procedures.* Follow the procedures given in Method 5, Sections 4.1.4.1 (Pretest Leak Check), 4.1.4.2 (Leak Check During Sample Run), and 4.1.4.3 (Post-Test Leak Check).

BILLING CODE 6560-26-M

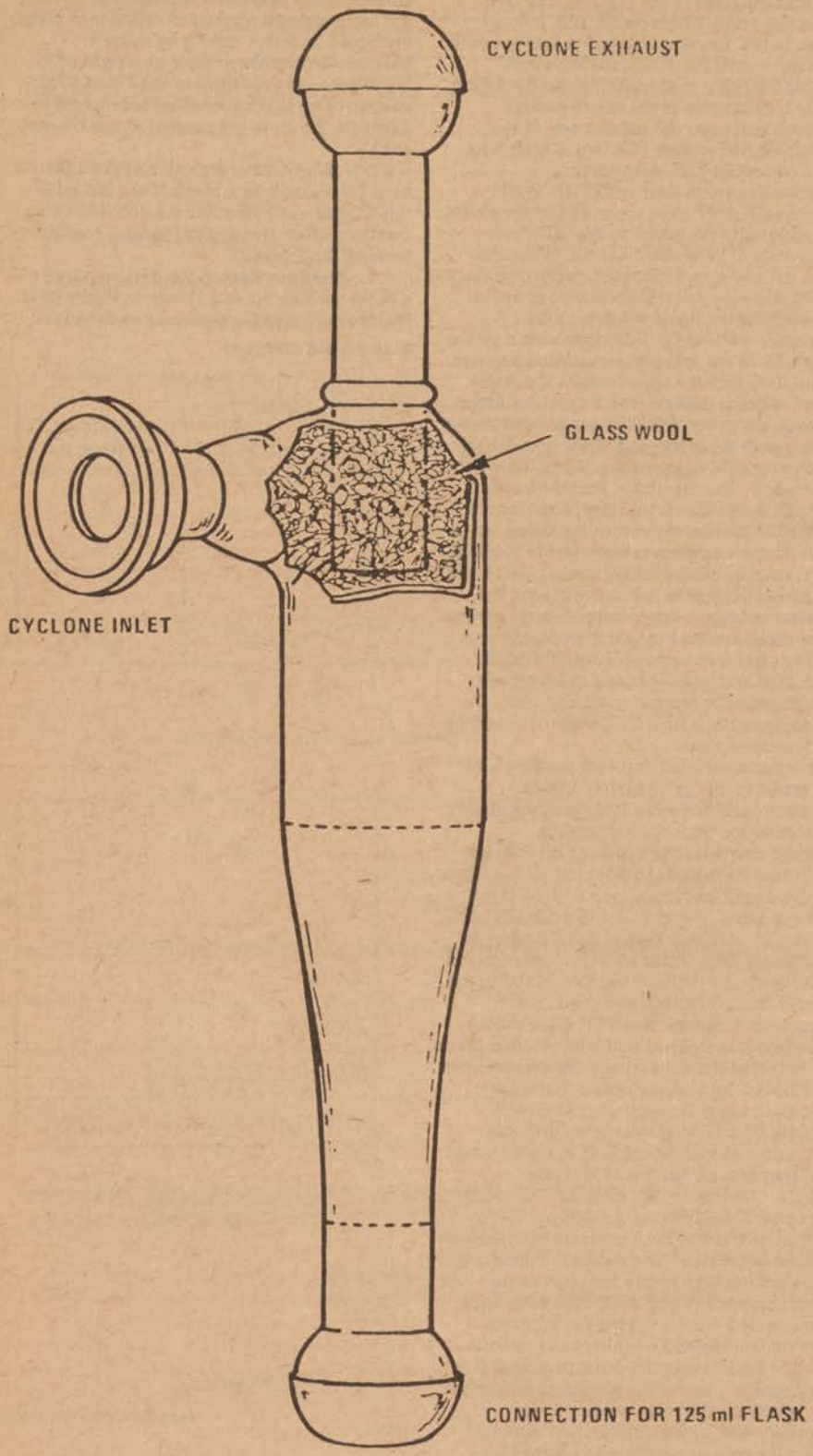


Figure 26-1. Precollector cyclone with glass wool plug.

BILLING CODE 6560-26-C

4.1.5 *Particulate Train Operation.* Operate the sampling train as described in Method 5, Section 4.1.5, except maintain the gas temperature exiting the filter at no greater than 52°C (126°F).

4.1.6 *Calculation of Percent Isokinetic.* Same as in Method 5, Section 4.1.6.

4.2 *Sample Recovery.* Begin proper cleanup procedure as soon as the probe is removed from the stack at the end of the sampling period. Allow the probe to cool. When the probe can be safely handled, wipe off all external particulate matter near the tip of the probe nozzle and place a cap over it to prevent losing or gaining particulate matter. Do not cap off the probe tip tightly while the sampling train is cooling as this would create a vacuum in the filter holder, thus drawing water from the impingers into the filter holder.

Before moving the sampling train to the cleanup site, remove the probe from the sampling train, wipe off the stopcock grease, and cap the open outlet of the probe. Be careful not to lose any condensate that might be present. Wipe off the stopcock grease from the filter inlet where the probe was fastened and cap it. Remove the umbilical cord from the last impinger and cap the impinger. If a flexible line is used between the first impinger or condenser and the filter holder, disconnect the line at the filter holder and let any condensed water or liquid drain into the impingers or condenser. After wiping off the stopcock grease, cap off the filter holder outlet and impinger inlet. The tester may use either ground-glass stoppers, plastic caps, or serum caps to close these openings.

Transfer the probe and filter-impinger assembly to a cleanup area which is clean and protected from the wind so that the chances of contaminating or losing the sample will be minimized.

Inspect the train prior to and during disassembly and note any abnormal conditions. Treat the samples as follows:

4.2.1. *Container No. 1 (Filter).* Carefully remove the filter from the filter holder and place it in its identified petri dish container.

Use a pair of tweezers and/or clean disposable surgical gloves to handle the filter. If it is necessary to fold the filter, do so such that the film of oil is inside the fold. Carefully transfer to the petri dish any particulate matter and/or filter fibers which adhere to the filter holder gasket, by using a dry nylon bristle brush and/or a sharp-edged blade. Seal the container.

4.2.2 *Container No. 2 (Cyclone).* Remove the Erlenmeyer flask from the cyclone. Using glass or other nonreactive caps, seal the ends of the cyclone and store for shipment to the laboratory. Do not remove the glass wool plug from the cyclone.

4.2.3 *Container No. 3 (Probe to Filter Holder).* Taking care to see that material on the outside of the probe or other exterior surfaces does not get into the sample, quantitatively recover particulate matter or any condensate from the probe nozzle, probe fitting, probe liner, cyclone collector flask, and front half of the filter holder by washing these components with TCE and placing the wash in a glass container. Carefully measure the total amount of TCE used in the rinses. Perform the TCE rinses as follows:

Carefully remove the probe nozzle and rinse the inside surface with TCE from a wash bottle. Brush with a nylon bristle brush and rinse until the TCE rinse shows no visible particles or discoloration, after which, make a final rinse of the inside surface.

Brush and rinse the inside parts of the Swagelok fitting with TCE in a similar way until no visible particles remain.

Rinse the probe liner with TCE. While squirting TCE into the upper end of the probe, tilt and rotate the probe so that all inside surfaces will be wetted. Let the TCE drain from the lower end into the sample container. The tester may use a glass funnel to aid in transferring the liquid washes to the container. Follow the TCE rinse with a probe brush. Hold the probe in an inclined position, squirt TCE into the upper end as the probe brush is being pushed with a twisting action through the probe, hold the sample container underneath the lower end of the probe, and catch any TCE and particulate matter which is brushed from the probe. Run the brush through the probe three times or more until no visible particulate matter is carried out or until no discoloration is observed in the TCE. With stainles steel or other metal probes, run the brush through in the above prescribed manner at least six times, since metal probes have small crevices in which particulate matter can be entrapped. Rinse the brush with TCE and quantitatively collect these washings in the sample container. After the brushing, make a final TCE rinse of the probe as described above.

It is recommended that two people clean the probe to minimize sample losses. Between sampling runs, keep brushes clean and protected from contamination.

Brush and rinse the inside of the cyclone collection flask and the front half of the filter holder. Brush and rinse each surface three times or more, if necessary, to remove visible particulate. Make a final rinse of the brush and filter holder. After all TCE washings and particulate matter have been collected in the sample container, tighten the lid on the sample container so that TCE will not leak out when it is shipped to the laboratory. Mark the height of the fluid level to determine later whether or not leakage occurred during transport. Label the container to clearly identify its contents. Whenever possible, containers should be shipped in such a way that they remain upright at all times.

4.2.4. *Container No. 4 (Silica Gel).* Note the color of the indicating silica gel to determine if it has been completely spent and make a notation of its condition. Transfer the silica gel from the fourth impinger to its original container and seal. The tester may use as aids a funnel to pour the silica gel without spilling and a rubber policeman to remove the silica gel from the impinger. It is not necessary to remove the small amount of dust particles that may adhere to the impinger wall and are difficult to remove. Since the gain in weight is to be used for moisture calculations, do not use any water or other liquids to transfer the silica gel. If a balance is available in the field, follow the procedure for Container No. 4 in Section 4.3.4.

4.2.5 *Impinger Water.* Treat the impingers as follows: Make a notation of any color or film in the liquid catch. Measure the liquid volume in the first three impingers to within ±1 ml by using a graduated cylinder or weigh the liquid to within ±0.5 g by using a balance. Record the volume or weight of liquid present, then discard the liquid. (This volume or weight information is required to calculate the moisture content of the effluent gas.)

4.2.6 *Blank.* Save a portion of the TCE used for cleanup as a blank. Take 200 ml of this TCE directly from the wash bottle being used and place it in a glass sample container labeled "TCE blank."

4.3 *Analysis.* Record the data required on a sheet such as the one shown in Figure 26–2. Handle each sample container as follows:

BILLING CODE 6560-26-M

Plant: _____

Date: _____

Run No.: _____

Filter No.: _____

Amount liquid lost during transport: _____

TCE blank volume, ml: _____

TCE wash volume, ml: _____

TCE blank concentration, mg/mg (equation 4): _____

TCE wash blank, mg (equation 5): _____

CONTAINER NUMBER	WEIGHT OF PARTICULATE COLLECTED, mg		
	FINAL WEIGHT	TARE WEIGHT	WEIGHT GAIN
1			
2			
3			
Total			
Less TCE blank			
Weight of particulate matter			

	VOLUME OF LIQUID WATER COLLECTED		
	IMPINGER VOLUME, ml	SILICA GEL WEIGHT, g	
FINAL			
INITIAL			
LIQUID COLLECTED			
TOTAL VOLUME COLLECTED		g *	ml

*CONVERT WEIGHT OF WATER TO VOLUME BY DIVIDING TOTAL WEIGHT INCREASE BY DENSITY OF WATER (1g/ml).

$$\frac{\text{INCREASE, g}}{\text{1g/ml}} = \text{VOLUME WATER, ml}$$

Figure 26-2. Analytical data.

BILLING CODE 6560-26-C

4.3.1 *Container No. 1 (Filter).* Transfer the filter from the sample container to a tared glass weighing dish and desiccate for 24 hours in a desiccator containing anhydrous calcium sulfate. Rinse Container No. 1 with a measured amount of TCE and analyze this rinse with the contents of Container No. 3. Weigh the filter to a constant weight. For the purpose of Section 4.3, the term "constant weight" means a difference of no more than 10 percent or 2 mg (whichever is greater) between two consecutive weighings made 24 hours apart. Report the "final weight" to the nearest 0.1 mg as the average of these two values.

4.3.2 *Container No. 2 (Cyclone).* Clean the outside of the cyclone, remove the caps, and desiccate for 24 hours or until any condensed water has evaporated. Weigh the cyclone plus contents (glass wool plug and oil). Determine the weight of the oil by subtracting out the combined tare weight of the cyclone plus glass wool. Transfer the glass wool and cyclone catch into a tared weighing dish; use TCE to aid in the transfer process. Desiccate the cleaned cyclone for 24 hours and reweigh the cyclone. If the final weight of the clean cyclone is within 10 mg of its initial tare weight, report the calculated oil weight. However, if the weight difference is greater, extract the oil from the glass wool (use measured amount of TCE) and analyze this oil solution with Container No. 3. Be careful not to include any of the glass wool fibers.

4.3.3 *Container No. 3 (Probe to Filter Holder).* Before adding either the rinse from Container No. 1 or the TCE-oil mixture from the glass wool extraction to Container No. 3, note the level of liquid in the container and confirm on analysis sheet whether or not leakage occurred during transport. If noticeable leakage occurred, either void the sample or take steps, subject to the approval of the Administrator, to correct the final results.

Measure the liquid in this container either volumetrically to ± ml or gravimetrically to ±0.5 g. Check to see if there is any appreciable quantity or condensed water present in the TCE rinse (look for a boundary layer or phase separation). If the volume of condensed water appears larger than 5 ml, separate the oil-TCE fraction from the water fraction using a separatory funnel. Measure the volume of the water phase to the nearest ml; adjust the stack gas moisture content, if necessary (see Sections 6.4 and 6.5). Next, extract the water phase with several 25-ml portions of TCE until, by visual observation, the TCE does not remove any additional organic material. Evaporate the remaining water fraction to dryness at 93°C (200°F), desiccate for 24 hours, and weigh to the nearest 0.1 mg.

Treat the total TCE fraction (including TCE from filter container rinse, water phase extractions, and glass wool extraction, if applicable) as follows: Transfer the TCE and oil to a tared beaker and evaporate at ambient temperature and pressure. The evaporation of TCE from the solution may take several days. Do not desiccate the sample until the solution reaches an apparent constant volume or until the odor of TCE is not detected. When it appears that the TCE has evaporated, desiccate the sample and weigh it at 24 hour intervals to obtain a "constant weight" (as defined for Container No. 1 above). The "total weight" for Container No. 3 is the sum of the evaporated particulate weight of the TCE-oil and water phase fractions. Report the results to the nearest 0.1 mg.

4.3.4 *Container No. 4 (Silica Gel).* This step may be conducted in the field. Weigh the spent silica gel (or silica gel plus impinger) to the nearest 0.5 using a balance.

4.3.5 *"TCE Blank" Container.* Measure TCE in this container either volumetrically or gravimetrically. Transfer the TCE to a tared 250-ml beaker and evaporate to dryness at ambient temperature and pressure. Desiccate for 24 hours and weigh to a constant weight. Report the results to the nearest 0.1 mg.

5. *Calibration.*

Calibrate the sampling train components according to the indicated sections of Method 5: Probe Nozzle (5.1), Pitot Tube Assembly (5.2), Metering System (5.3), Probe Heater (5.4), Temperature Gauges (5.5), Leak Check of Metering System (5.6), and Barometer (5.7).

6. *Calculations.*

6.1 *Nomenclature.* Same as in Reference Method 5, Section 6.1, with the following additions:

C_t = TCE blank residue concentration, mg/g.
M_t = Mass of residue of TCE after evaporation, mg.
V_{pc} = Volume of water collected in precollector, ml.
V_t = Volume of TCE blank, ml.
V_{tw} = Volume of TCE used in wash, ml.
W_t = Weight of residue in TCE wash, mg.
P_t = Density of TCE, mg/ml (see label on bottle).

6.2 *Dry Gas Meter Temperature and Orifice Pressure Drop.* Using the data obtained in this test, calculate the average dry gas meter temperature and average orifice pressure drop (see Figure 5–2 of Method 5).

6.3 *Dry Gas Volume.* Using the data from this test, calculate $V_{m(std)}$ by using Equation 5–1 of Method 5. If necessary, adjust the volume for leakages.

6.4 *Volume of Water Vapor.*

$$V_{w(std)} = K_1 (V_{lc} + V_{pc}) \quad \text{Eq. 26–1}$$

Where:

$K_1 = 0.00133\ m^3/ml$ for metric units.
$= 0.04707\ ft^3/ml$ for English units.

6.5 *Moisture Content.*

$$B_{ws} = V_{w(std)} / V_{m(std)} + V_{w(std)} \quad \text{Eq. 26–2}$$

Note.—In saturated or water droplet-laden gas streams, two calculations of the moisture content of the stack gas shall be made, one from the impinger and precollector analysis (Equations 26–1 and 26–2) and a second from the assumption of saturated conditions. The lower of the two values of moisture content shall be considered correct. The procedure for determining the moisture content based upon assumption of saturated conditions is given in the note of Section 1.2 of Reference Method 4. For the purpose of this method, the average stack gas temperature from Figure 2 may be used to make this determination, provided that the accuracy of the in-stack temperature sensor is within ±1°C (2°F).

6.6 *TCE Blank Concentration.*

$$c_t = M_t / V_t P_t \quad \text{Eq. 26–3}$$

6.7 *TCE Wash Blank.*

$$W_t = (C_t)(V_{tw})(P_t) \quad \text{Eq. 26–4.}$$

6.8 *Total Particulate Weight.* Determine the total particulate catch from the sum of the weights obtained from Containers 1, 2, and 3 less the TCE blank.

6.9 *Particulate Concentration.*

$$C_s = K_2 M_n / V_{m(std)} \quad \text{Eq. 26–5}$$

Where:

$K_2 = 0.001$ g/mg.

6.10 *Isokinetic Variation and Acceptable Results.* Method 5, Sections 6.11 and 6.12, respectively.

7. *Bibliography.*

The bibliography for Reference Method 26 is the same as for Method 5, Section 7.

Method 22—Visual Determination of Fugitive Emissions From Material Processing Sources

1. *Introduction.*

This method involves the visual determination of fugitive emissions; i.e., emissions not emitted directly from a process stack or duct. Fugitive emissions inlcude emissions that: (1) Escape capture by process equipment exhaust hoods; (2) are emitted during material transfer; (3) are emitted from buildings housing material processing or handling equipment; (4) are emitted directly from process equipment.

This method determines the amount of time that any visible emissions occur during the observation period; i.e., the accumulated emission time. This method does not require that the opacity of emissions be determined. Since this procedure requires only the determination of whether a visible emission occurs and does not require the determination of opacity levels, observer certification according to the procedures of Reference Test Method 9 are not required. However, it is necessary that the observer is educated on the general procedures for determining the level of visible emissions. As a minimum the observer should be trained regarding the effects on the visibility of emissions caused by background contrast, ambient lighting, observer position relative to lighting, wind, and the presence of uncombined water (condensing water vapor).

2. *Applicability and Principle.*

2.1 Applicability. This method applies to the determination of the frequency of fugitive emissions from stationary sources (located indoors or outdoors) when specified as the test method for determining compliance with new source performance standards.

2.2 Principle. Fugitive emissions produced during material processing, handling, and transfer operations are visibly determined by an observer without the aid of instruments.

3. *Definitions.*

3.1 Emission Frequency. Percentage of time that emissions are visible during the observation period.

3.2 Emission Time. Accumulated amount of time that emissions are visible during the observation period.

3.3 Fugitive Emission. Pollutant generated by an affected facility which is not collected by a capture system and is released to the atmosphere.

3.4 Observation Period. Accumulated time period during which observations are conducted, not to be less than 6 minutes.

4. *Equipment.*

4.1 Stopwatches. Accumulative type, with a sweep second hand and unit divisions of at least 0.5 second; two required.

4.2 Light Meter. Light meter capable of measuring illuminance in the 50- to 200-lux range; required for indoor observations only.

5. *Procedure.*

5.1 Position. Survey the affected facility or building or structure housing the process unit to be observed and determine the locations of potential emissions. If the affected facility is located inside a building, determine an observation location that is consistent with the requirements of the applicable regulation (i.e., outside observation of emissions escaping the building/structure or inside observation of emissions directly emitted from the affected facility process unit).

Then select a position that enables a clear view of the potential emission point(s) of the affected facility or of the building or structure housing the affected facility, as appropriate for the applicable subpart. A position of at least 15 feet but not more than 0.25 mile from the emission source is recommended. For outdoor locations, the observer should be positioned so that the sun is not directly in the observer's eyes.

5.2 Field Records.

5.2.1 Outdoor Location. Record the following information on the field data sheet (Figure 22–1): company name, industry, process unit, observer's name, observer's affiliation, and date. Record also the estimated wind speed, wind direction, and sky condition. Sketch the process unit being observed and note observer location relative to the source and the sun. Indicate the potential and actual fugitive emission points on the sketch.

BILLING CODE 6560–26–M

FUGITIVE EMISSION INSPECTION
OUTDOOR LOCATION

Company _____	Observer _____
Location _____	Affiliation _____
Company representative _____	Date _____
Sky conditions _____	Wind direction _____
Precipitation _____	Wind speed _____
Industry _____	Process unit _____

Sketch process unit; indicate observer position relative to source and sun; indicate potential emission points and/or actual emission points.

OBSERVATIONS

	Clock time	Observation period duration, min:sec	Accumulated emission time, min:sec
Begin observation	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
End observation	_____		

Figure 22-1

BILLING CODE 6560-26-C

5.2.2 Indoor Location. Record the following information on the field data sheet (Figure 22–2): company name, industry, process unit, observer's name, observer's affiliation, and date. Record, as appropriate, the type, location, and intensity of lighting on the data sheet. Sketch the process unit being observed and note observer location relative to the source. Indicate the potential and actual fugitive emission points on the sketch.

5.3 Indoor Lighting Requirements. For indoor locations, use a light meter to measure the level of illumination at a location as close to the emission source(s) as is feasible. An illumination of greater than 100 lux (10 foot candles) is considered necessary for proper application of this method.

5.4 Observations. Record the clock time when observations begin. Use one stopwatch to monitor the duration of the observation period; start this stopwatch when the observation period begins. If the observation period is divided into two or more segments by process shutdowns or observer rest breaks, stop the stopwatch when a break begins and restart it without resetting when the break ends. Stop the stopwatch at the end of the observation period. The accumulated time indicated by this stopwatch is the duration of the observation period. When the observation period is completed, record the clock time.

BILLING CODE 6560-26-M

FUGITIVE EMISSION INSPECTION
INDOOR LOCATION

Company _____	Observer _____
Location _____	Affiliaton _____
Company representative _____	Date _____
Industry _____	Process unit _____

Light type (flourescent, incandescent, natural) _____

Light location (overhead, behind observer, etc.) _____

Illuminance (lux or footcandles) _____

Sketch process unit; indicate observer position relative to source; incicate potential emission points and/or actual emission points.

OBSERVATIONS

	Clock time	Observation period duration, min:sec	Accumulated emission time, min:sec
Begin observation	_____		
		_____	_____
	_____		
		_____	_____
	_____		
		_____	_____
	_____		
		_____	_____
	_____		
		_____	_____
	_____		
		_____	_____
	_____		
		_____	_____
End observation	_____		

Figure 22-2

BILLING CODE 6560-26-C

During the observation period, continuously watch the emission source. Upon observing an emission (condensed water vapor is not considered an emission), start the second accumulative stopwatch; stop the watch when the emission stops. Continue this procedure for the entire observation period. The accumulated elapsed time on this stopwatch is the total time emissions were visible during the observation period i.e., the emission time.

5.4.1 Observation Period. Choose an observation period of sufficient length to meet the requirements for determining compliance with the emission regulation in the applicable subpart. When the length of the observation period is specifically stated in the applicable subpart, it may not be necessary to observe the source for this entire period if the emission time required to indicate noncompliance (based on the specified observation period) is observed in a shorter time period. In other words, if the regulation prohibits emissions for more than 6 minutes in any hour, then observations may (optional) be stopped after an emission time of 6 minutes is exceeded. Similarly, when the regulation is expressed as an emission frequency and the regulation prohibits emissions for greater than 10 percent of the time in any hour, then observations may (optional) be terminated after 6 minutes of emissions are observed since 6 minutes is 10 percent of an hour. In any case, the observation period shall not be less than 6 minutes in duration. In some cases, the process operation may be intermittent or cyclic. In such cases, it may be convenient for the observation period to coincide with the length of the process cycle.

5.4.2 Observer Rest Breaks. Do not observe emissions continuously for a period of more than 15 to 20 minutes without taking a rest break. For sources requiring observation periods of greater than 20 minutes, the observer shall take a break of not less than 5 minutes and not more than 10 minutes after every 15 to 20 minutes of observation. If continuous observations are desired for extended time periods, two observers can alternate between making observations and taking breaks.

5.4.3 Visual Interference. Occasionally, fugitive emissions from sources other than the affected facility (e.g., road dust) may prevent a clear view of the affected facility (e.g., road dust) may prevent a clear view of the affected facility. This may particularly be a problem during periods of high wind. If the view of the potential emission points is obscured to such a degree that the observer questions the validity of continuing observations, then the observations are terminated and the observer clearly notes this fact on the data form.

5.5 Recording Observations. Record the accumulated time of the observation period on the data sheet as the observation period duration. Record the accumulated time emissions were observed on the data sheet as the emission time. Record the clock time the observation period began and ended, as well as the clock time any observer breaks began and ended.

6. *Calculations.*

If the applicable subpart requires that the emission rate be expressed as an emission frequency (in percent), determine this value as follows: Divide the accumulated emission time (in seconds) by the duration of the observation period (in seconds) or by any minimum observation period required in the applicable subpart if the actual observation period is less than the required period and multiply this quotient by 100.

[FR Doc. 80-35905 Filed 11-17-80; 8:45 am]
BILLING CODE 6560-26-M

---

40 CFR Part 60

[AD FRL-1505-7a]

Standards of Performance for new Stationary Sources; Priority List

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed amendment.

SUMMARY: Studies of the asphalt processing and roofing industry have revealed that asphalt is processed at oil refineries and asphalt processing plants as well as at asphalt roofing plants. These locations were not specifically included in the asphalt roofing source category included in the priority list for regulation of new sources under Section 111 of the Clean Air Act, promulgated on August 21, 1979. Therefore, the Administrator is proposing to amend the priority list to specifically include asphalt processing locations in the source category currently listed as asphalt roofing plants. The proposed amendment to the priority list is based on the Administrator's judgment that asphalt blowing stills and storage tanks at asphalt processing facilities and oil refineries contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare.

DATES: *Comments.* Comments must be received on or before January 19, 1981.

Public Hearing. A public hearing will be held, if requested. Persons wishing to request a public hearing must contact EPA by December 8, 1981. If a hearing is requested, an announcement of the date and place will appear in a separate **Federal Register** notice.

ADDRESSES: *Comments.* Comments should be submitted (in duplicate if possible) to: Central Docket Section (A-130), Attention: Docket No. OAQPS A-79-39, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460

Public Hearing. Persons wishing to request a public hearing should notify Ms. Deanna B. Tilley, Emission Standards and Engineering Division (MD-13), U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone (919) 541-5477.

Background Information Document. Background Information on the emissions from the asphalt processing and roofing manufacturing industry may be obtained from the U.S. EPA Library (MD-35), Research Triangle Park, North Carolina 27711, telephone (919) 541-2777. Please refer to "Asphalt Roofing Manufacturing Industry, Background Information for Proposed Standards," EPA-450/3-80-021a.

Docket. A docket, number OAQPS A-79-39, containing information used by EPA in development of the standards of performance for the asphalt processing and roofing manufacturing industry, is available for public inspection between 8:00 a.m. and 4:00 p.m. Monday through Friday, at EPA's Central Docket Section (A-130), West Tower Lobby, Gallery 1, Waterside Mall, 401 M Street, SW., Washington, D.C. 20460.

FOR FURTHER INFORMATION CONTACT: Ms. Susan R. Wyatt, Emission Standards and Engineering Division (MD-13), Environmental Protection Agency, Research Triangle Park, North Carolina 27711, telephone (919) 541-5477.

SUPPLEMENTARY INFORMATION:

Proposal To Amend Priority List

The Clean Air Act of 1970 established a program under Section 111 to develop standards of performance for new stationary sources which the Administrator determines may contribute significantly to air pollution which may reasonably be anticipated to endanger public health or welfare. Section 111 of the Clean Air Act Amendments of 1977 requires that the Administrator publish, and from time to time revise, a list of categories of major stationary sources for which standards of performance for new sources are to be promulgated.

In developing priorities, Section 111 specifies that the Administrator consider (1) the quantity of emissions from each source category, (2) the extent to which each pollutant endangers public health or welfare, and (3) the mobility and competitive nature of each stationary source category.

The priority list, which identifies major source categories in order of priority for development of regulations, was proposed on August 31, 1978 and promulgated, after revisions, on August 21, 1979 (40 CFR 60.16, 44 FR 49222). Of the 59 source categories on the list, asphalt roofing plants are listed as number 45.

Source categories are intended to be broad enough in scope to include all processes associated with the particular