United States Environmental Protection Agency
Office of Air Quality Planning and Standards
Research Triangle Park NC 27711
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National Volatile Organic Compound Emission Standards for Architectural Coatings -- Background for Promulgated Standards

EPA-453/R-98-006b

National Volatile Organic Compound Emission Standards for Architectural Coatings

Background for Promulgated Standards

(Architectural Coating Background Information Document)

U.S. Environmental Protection Agency
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

August 1998

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1.0 INTRODUCTION

1.1 SUMMARY OF CHANGES SINCE PROPOSAL

Several changes have been made to the proposed rule as a result of public comments. The significant changes to the proposed rule are presented in this section. All of the changes made to the proposed rule and the rationale for these changes are discussed more fully in responses to comments in chapter 2 of this document.

1.1.1 Applicability and compliance dates

The compliance date for manufacturers and importers of architectural coatings, except coatings registered under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA) (7 USC 136 et seq.) has been extended to 12 months after the date the final rule is published in the Federal Register. The compliance date for coatings registered under FIFRA is 18 months after publication of the final rule.

1.1.2 Definitions

Several changes have been made in the definitions section:

1. Definitions for the following seven new coating categories have been added: calcimine recoaters, concrete curing and sealing compounds, concrete surface retarders, conversion varnishes, faux finishing, stain controllers, and zone markings. These categories are defined in section 2.2.4.2 of this document.

2. A sentence has been added to the definition of lacquer to clarify that lacquer stains must meet the volatile organic compound (VOC) content limit for stains rather than lacquers. Also, a definition for stains, including lacquer stains, has been added.

3. The term "community-based paint exchange" in the definitions section of the rule has been changed to

"paint exchange" to include other paint exchanges besides community-based ones, and the definition has been amended to exclude architectural coating manufacturers and importers.

4. The definition of "industrial maintenance coating" has been revised to reflect that the use of such a coating is intended for extreme environmental conditions in an industrial, commercial, or institutional setting.

5. In the definition of "shellac", nitrocellulose has been excluded because of overlap with lacquers (the lacquer definition in the rule includes cellulosic or synthetic resins).

6. The definition of "extreme high durability coatings" has been expanded to include in this category lower VOC coatings, in addition to fluoropolymer-based coatings, that also meet the weathering requirements of the American Architectural Manufacturer's Association (AAMA) Specification 605.2.

7. The definition of "pigmented" has been expanded to include the following properties of pigments: color, corrosion inhibition, conductivity, fouling resistance, opacity, and improved mechanical properties.

8. The minimum temperature requirement in the definition of "high temperature coating" has been lowered to 400 degrees F. to be consistent with industry practice and existing State architectural coating rules.

9. The definition of "anti-graffiti coating" has been amended to remove the phrase "specifically labeled as an anti-graffiti coating" to be consistent with labeling requirements for other coating categories.

10. A definition of "shop application" has been added to clarify that coatings applied in a shop setting or during a manufacturing process are not subject to the rule.

11. The definition of "coating" has been amended to remove reference to application as a film because the EPA did not intend to limit rule applicability based upon the product thickness as applied. Also, a sentence has been added to further clarify what coatings are regulated. The revised definition follows: "Coating means a material applied onto or impregnated into a substrate for protective, decorative or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealants, inks, maskants, and temporary coatings. Protective, decorative or

functional materials that consist only of solvents, acids, bases, or any combination of these substances are not considered coatings for the purpose of this subpart."

12. The definition of "architectural coating" has been amended to exclude adhesives, coatings recommended solely for shop application, and coatings recommended solely for application to non-stationary structures, such as airplanes, ships, boats and railcars because they were not intended to be covered. Also, definitions of "adhesive" and "shop application" have been added to the rule for further clarification.

13. A definition of "United States" has been added to clarify that the rule applies to the 50 States, the District of Columbia, and United States territories.

14. The definitions of "importer" and "manufacturer" have been amended to clarify that any person who repackages a coating by transferring it from one container to another is excluded from these definitions, provided the coating VOC content is not altered and the coating is not sold or distributed to another party. Also, a sentence has been added in these definitions for further clarification of applicability and a definition of "person" has been added to clarify its use in these definitions.

15. Definitions of "imported" and "manufactured" have been added to clarify the point at which an architectural coating becomes subject to the requirements in the rule.

16. The definition of "graphic arts coating" has been revised to delete the reference to "in shop" since shop applications are not regulated under this rule.

17. In the definition of "floor coating", the word "opaque" has been added to further define these coatings, and a definition of "opaque" has been added to the rule. In addition, the words "in a residential setting" have been added to distinguish coatings meant to be subject to the 400 g/l limit for floor coatings from those floor coatings intended for use in an industrial, institutional, or commercial setting, which would be subject to the 450 g/l limit for industrial maintenance coatings.

18. Although there were no comments on the definition of "sale" in the Definitions section of the proposed rule, the Agency deleted this term because it was unnecessary.

1.1.3 VOC Content Limits

Seven additional categories and associated VOC content limits have been established for the following coatings: (1) calcimine recoaters at 475 g/l; (2) concrete surface retarders at 780 g/l; (3) concrete curing and sealing compounds at 700 g/l; (4) conversion varnishes at 725 g/l; (5) faux finishing/glazing at 700 g/l; (6) zone markings at 450 g/l; and (7) stain controllers at 720 g/l. In addition, the VOC content limits for some of the proposed coating categories have been revised as follows: (1) antifouling from 400 g/l to 450 g/l; (2) nuclear from 420 g/l to 450 g/l; (3) clear shellacs from 650 g/l to 730 g/l; and (4) combined opaque and clear waterproofing sealers and treatments at 600 g/l (opaque was proposed at 400 g/l).

1.1.4 Overlap Concerns

Several changes have been made to address some commenters' concerns that a coating that is developed and designated for a particular use by definition could be subject to a more restrictive limit if the coating is suitable for use in another category with a lower limit. In order to address these overlap concerns, paragraphs (b) and (c)(1)-(c)(7)of § 59.402 have been amended, and new paragraphs (c)(8)-(c)(15) have been added to § 59.402. The new provisions in paragraphs (c)(8)-(c)(15) address overlap concerns in the following categories:

1. Varnishes and conversion varnishes that are recommended for use as floor coatings are only subject to the VOC content limit for varnishes and conversion varnishes, respectively.

2. Anti-graffiti coatings, high temperature coatings, impacted immersion coatings, thermoplastic rubber coatings and mastics, repair and maintenance thermoplastic coatings, and flow coatings that also meet the definition for industrial maintenance coatings are only subject to the VOC content limit for that particular category (i.e., not subject to the industrial maintenance coating VOC content limit).

3. Waterproofing sealers and treatments that also meet the definition for quick-dry sealers are only subject to

the VOC content limit for waterproofing sealers and treatments.

4. Sanding sealers that also meet the definition for quick-dry sealers are only subject to the VOC content limit for sanding sealers.

5. Nonferrous ornamental metal lacquers and surface protectants that also meet the definition for lacquers are only subject to the VOC content limit for nonferrous ornamental metal lacquers and surface protectants.

6. Quick-dry primers, sealers, and undercoaters that also meet the definition for primers and undercoaters are only subject to the VOC content limit for quick-dry primers, sealers, and undercoaters.

7. Antenna coatings that also meet the definition for industrial maintenance coatings or primers are only subject to the VOC content limit for antenna coatings.

8. Bituminous coatings and mastics that are recommended for use as any other architectural coating are subject only to the limit for bituminous coatings and mastics.

1.1.5 Container labeling requirements

1. The proposed labeling requirements were amended to clarify that to meet the labeling requirements for containers of architectural coatings, manufacturers and importers are allowed to use either (1) the VOC content limit for the category with which the product is required to comply and with which it does comply, or (2) the VOC content of the coating. In other words, the manufacturer or importer is not required to provide the actual VOC content of the coating. The labeled VOC content must account for the manufacturer's or importer's thinning recommendation.

2. The proposed requirement for industrial maintenance coatings to be labeled "not for residential use" has been modified to allow flexibility in the wording of the labeling statement.

3. The labeling section of the proposed rule has been modified to allow the date of manufacture or date code to appear on either the container lid, label, or bottom of the can.

1.1.6 Variances provision

The variances provision in the proposed rule was not included in the final rule. The rationale for this change is discussed in section 2.2.8 of this document.

1.1.7 Tonnage Exemption

A VOC tonnage exemption has been included in the final rule, based upon the proposed low-volume exemption. Under this provision, each manufacturer can exempt a total of 23 megagrams (25 tons) of VOC emissions in the time period from the compliance date to December 31, 2000; 18 megagrams (20 tons) in the year 2001; and 9 megagrams (10 tons) in the year 2002 and in each year beyond. The tonnage exemption is discussed in section 2.2.1.2 of this document. This provision is designed to accommodate the needs of small manufacturers, niche markets, and specialty products while effectively limiting the VOC emissions from the exemption. This exemption is needed to help ensure the economic feasibility of the rule.

1.1.8 Exceedance Fee Option

Provisions for an exceedance fee option have been included in the final rule. Under this approach, manufacturers and importers have the option of paying a fee, based on the amount that their coatings exceed the applicable VOC content limits, instead of achieving the VOC content limits listed in the rule. This allows manufacturers and importers to continue to market non-compliant coatings while they develop compliant or new coatings. This provision is a market-based incentive to encourage manufacturers and importers to develop compliant coatings while at the same time recognizing that for some manufacturers of some coatings, additional time is needed.

1.1.9 Recordkeeping and Reporting

Recordkeeping and reporting requirements have been included for manufacturers and importers using the tonnage exemption and exceedance fee option.

1.1.10 Compliance Provisions

A new section has been included in the rule to consolidate the proposed rule's provisions for determining compliance.

Language has been added to clarify the requirements that were proposed regarding determination of VOC content.

1.1.11 Reorganization of Rule Text

The rule text has been reorganized for clarity and ease of understanding.

2.0 SUMMARY OF PUBLIC COMMENTS AND RESPONSES

The U.S. Environmental Protection Agency (EPA) received a total of 243 letters commenting on the proposed standards and the background information document (BID) for the proposed standards. The EPA held a public hearing on July 30, 1996 in Durham, North Carolina, at which 19 commenters presented oral comments. In addition, the EPA held a public meeting on August 13, 1996 in Rosemont, Illinois, in which 77 persons participated. At this public meeting, 18 manufacturers provided company profiles. Some commenters provided more than one comment letter or commented at the public hearing or meeting. Each letter or comment has a separate comment number. Comments are designated as follows:

- IV-D-(number) written comment received during comment period
- IV-F-1(letter) comment received at public hearing
- IV-F-2(letter) comment received at public meeting
- IV-G-(number) comment received after comment period

In this promulgation BID, commenters with multiple comment letters or statements at the hearing or meeting are identified with a slash between comments. For example, if a commenter provided written comments and public hearing comments, the commenter is identified as (IV-D-number/IV-F-1 letter). Copies of comment letters, meeting transcripts, and telecons are located in docket A-92-18. The docket is available for public inspection between 8:00 a.m. and 5:30 p.m., Monday through Friday, at the EPA's Air and Radiation Docket and Information Center (Mail Code 6102), 401 M Street S.W., Washington, DC 20460, or by calling (202) 260-7548. A list of the commenters, their

affiliations, and the EPA docket number assigned to their correspondence is given in table 2-1.

The comments and responses, and therefore the organization of this document, have been categorized under the following topics:

- Method of Regulation;
- Proposed Standards;
- Impacts;
- Exceedance Fee;
- Regulatory Negotiations;
- Future Study;
- Legal Issues; and
- Outreach.

This document contains summaries and responses to comments mainly covering the provisions of the proposed architectural coatings rule. To avoid duplication, most comments that pertain to the EPA's study, Report to Congress, and schedule for regulations under section 183(e) are discussed in a separate comment/response document, Response to Comments on Section 183(e) Study and Report to Congress referred to as the 183-BID.

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE

Docket Number	Commenter and affiliation
IV-D-01	Mr. James E. Thomas, Jr. CEO Jetco, Inc. Post Office Box 11494 Memphis, Tennessee 38111
IV-D-02	Mr. Ned B. Kisner President Triangle Coatings, Inc. 1930 Fairway Drive San Leandro, California 94577
IV-D-03	Mr. Kisuk Cheung Chief, Engineering Division Department of the Army U.S. Army Corps of Engineers Washington, DC 20314-1000
IV-D-04	Mr. Benard R. Appleman Executive Director Steel Structures Painting Council 40 24th Street, 6th Floor Pittsburgh, Pennsylvania 15222-4643
IV-D-05	Mr. William A. Rostine President Rostine Manufacturing and Supply, Inc. Post Office Box 8192 4227C W. Church Springfield, Missouri 65801
IV-D-06	Mr. Ronald B. Child Vice President of Compliance & Reg. Affairs California Products Corporation Post Office Box 390569 Cambridge, Massachusetts 02139-0007
IV-D-07	F.H. McGary Vice President Manufacturing Star Bronze Company, Inc. Post Office Box 2206 Alliance, Ohio 44601-0206
IV-D-08	Mr. Richard Hardy President XIM Products, Inc. 1169 Bassett Road Westlake, Ohio 44145

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-09	Mr. Jim Gardner President Trinity Coatings Company Post Office Box 2488 Fort Worth, Texas 76113-2488
IV-D-10	Mr. James S. Jennison President Jennison Industries 106 Washington Post Office Box 965 Burlington, Iowa 52601
IV-D-11	Mr. Robert E. Mitchell Chairman of the Board Dunn-Edwards Corporation 4885 East 52nd Place Los Angeles, California 90040
IV-D-12	Ms. Susan J. Binder Division Administrator Federal Highway Administration U.S. Department of Transportation State Highway Administration, Maryland Division 711 West 40th Street, Suite 220 Baltimore, Maryland 21211-2187
IV-D-13	Mr. Robert C. Maindelle Environmental Specialist Wilsonart International, Inc. Post Office Box 6110 Temple, Texas 76503-6110
IV-D-14	Mr. Robert E. Mitchell Chairman of the Board Dunn-Edwards Corporation 4885 East 52nd Place Los Angeles, California 90040
IV-D-15	duplicate of Item IV-D-8, removed from docket.
IV-D-16	Mr. James S. Jennison President Jennison Industries Post Office Box 965 Burlington, Iowa 52601

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-17	Mr. Gene Bartlow President and CEO American Wood Preservers Institute 1945 Old Gallows Road, Suite 150 Vienna, Virginia 22182-3931
IV-D-18	Mr. John F. Montle Vice President-Technology Carboline Company 350 Hanley Industrial Court St. Louis, Missouri 63144
IV-D-19	Mr. Benard R. Appleman Executive Director Steel Structures Painting Council 40 24th Street, 6th Floor Pittsburgh, Pennsylvania 15222-4643
IV-D-20	Mr. Ben Gavett Director of Safety & Compliance Golden Artist Colors, Inc. 188 Bell Road New Berlin, New York 13411
IV-D-21	Mr. David Schmetterer Vice President Crawford Laboratories 4165 South Emerald Avenue Chicago, Illinois 60609
IV-D-22	Mr. S. William Becker Executive Director STAPPA/ ALAPCO 444 North Capitol Street, N.W. Washington, DC 20001
IV-D-23	Ms. Linda M. Loreth Environmental, Health, and Safety Manager A.W. Chesterton Company Post Office Box 9101 Stoneham, Massachusetts 02180-9101
IV-D-24	Mr. Christopher L. Runyan Assistant Director of Transportation Policy Ohio Department of Transportation Central Office Post Office Box 899 Columbus, Ohio 43216-0899

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-25	Mr. Robert Senior Wm. Zinsser & Company, Inc. 39 Belmont Drive Somerset, New Jersey 08875-1285
IV-D-26	Mr. Alaistair MacDonald CEO Specialty Coatings & Chemicals, Inc. 7360 Varna Avenue North Hollywood, California 91605
IV-D-27	Mr. T. Leon Everett President & CEO Dan-Tex Paint & Coating Manufacturing Company, Inc. 444 Aston Drive Sunnyvale, Texas 75182
IV-D-28	Mr. Karl R. Schultz Environmental Consultant DuPont Automotive Products Wilmington, Delaware 19898
IV-D-29	Mr. Ned B. Kisner Triangle Coatings, Inc. 1930 Fairway Drive San Leandro, California 94577
IV-D-30	Mr. James G. Stilling Vice President and General Manager W.R. Meadows, Inc. Post Office Box 543 Elgin, Illinois 60121
IV-D-31	Mr. David P. Straub Executive Director Metal Maintenance Industry Association, Inc. 352 Seventh Avenue New York, New York 10001
IV-D-32	Mr. Gregory A. Green Administrator Air Quality Division Oregon Department of Environmental Quality 811 S.W. Sixth Avenue Portland, Oregon 97204-1390

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-33	Ms. Barbara A. Kwetz Director Division of Air Quality Control Commonwealth of Massachusetts Department of Environmental Protection One Winter Street Boston, Massachusetts 02108
IV-D-34	Mr. James M. Lents Executive Officer South Coast Air Quality Management District 21865 E. Copley Drive Diamond Bar, California 91765-4182
IV-D-35	Ms. Linda M. Loreth Environmental, Health and Safety Manager A.W. Chesterton Company 225 Fallon Road Post Office Box 9101 Stoneham, Massachusetts 02180-9101
IV-D-36	Ms. Pamela S. Clark Preservo Paint Manufacturing 2401 Broiller Post Office Box 20125 Houston, Texas 77225
IV-D-37	Mr. Daniel L. Stein and V.B. Winge 3M Traffic Control Materials Division 3M Center Building 582-1-15 St. Paul, Minnesota 55144-1000
IV-D-38	Mr. Jimmy D. Adams American Coatings, Inc. Post Office Box 1426 Tomball, Texas 77377-1426
IV-D-39	Anonymous
IV-D-40	Mr. Darryl E. Durgin Deputy Commissioner Minnesota Department of Transportation Office of Traffic Engineering Mail Stop 725 1500 West County Road B2, Suite 250 Roseville, Minneapolis 55113

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-41	Mr. Don Diller Director Wyoming Department of Transportation Post Office Box 1708 Cheyenne, Wyoming 82003-1708
IV-D-42	Mr. Robert Senior Wm. Zinsser & Company, Inc. 173 Belmont Drive Somerset, New Jersey 08875-1285
IV-D-43	Mr. Robert Senior Wm. Zinsser & Company, Inc. 173 Belmont Drive Somerset, New Jersey 08875-1285
IV-D-44	Mr. J. Anthony Ward, III Sales Representative Farrell-Calhoun Paint 221 E. Carolina Avenue Memphis, Tennessee 38126
IV-D-45	Mr. Richard B. Cunningham President Passonno Paints 500 Broadway Watervliet (Albany), New York 12189
IV-D-46	Mr. Roy Krill Technical Director Masterchem Industries, Inc. Post Office Box 368 Barnhart, Missouri 63012-0368
IV-D-47	Mr. Ron Sorenson President Hardwood Flooring Distributors, Inc. 1024 6th Avenue South Seattle, Washington 98134
IV-D-48	Mr. Vic Fazio and Gary Condit Members of Congress United States House of Representatives 2442 Rayburn Building Washington, DC 20515-0503

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-49	Mr. Edward D. Edwards Owner Dunn-Edwards Corporation 4885 East 52nd Place Los Angeles, California 90040
IV-D-50	Mr. Robert E. Mitchell Chairman of the Board Dunn-Edwards Corporation 4885 East 52nd Place Los Angeles, California 90040
IV-D-51	Mr. Richard B. Cunningham President Passonno Paints 500 Broadway Watervliet, NY 12189
IV-D-52	Mr. William M. Smiland Law Offices Smiland & Khachigian Seventh Floor 601 West Fifth Street Los Angeles, California 90071
IV-D-53	Mr. Peter Lilholt Commissioner of Public Works Sullivan County Department Of Public Works Post Office Box 5012 Monticello, New York 12701-5192
IV-D-54	Mr. Jim Talent Member of Congress United States House of Representatives 2442 Rayburn Building Washington, DC 20515-2502
IV-D-55	Mr. Robert E. Mitchell Chairman of the Board Dunn-Edwards Corporation 4885 East 52nd Place Los Angeles, California 90040
IV-D-56	Mr. Matthew G. Martinez, Michael Bilirakis, Julian C. Dixon, and Lucille Roybal-Allard United States House of Representatives 2442 Rayburn Building Washington, DC 20515

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-57	C.W. Glover Chief Counsel for Advocacy U.S. Small Business Administration Office of Advocacy Washington, DC 20416
IV-D-58	Mr. J. Andrew Doyle President National Paint & Coatings Association 1500 Rhode Island Avenue, N.W. Washington, DC 20005-5597
IV-D-59	Ms. Georgette Sturam Gensler One Rockefeller Plaza, Suite 500 New York, New York 10020
IV-D-60	Mr. John Lahey President Fine Paints of Europe Post Office Box 419 Woodstock, Vermont 05091-0419
IV-D-61	Mr. Howard Berman Senior Vice President The Jefferson Group, Inc. 1341 G Street, N.W., Suite 1100 Washington, DC 20005
IV-D-62	Mr. William M. Smiland Law Offices of Smiland & Khachigian Seventh Floor 601 West Fifth Street Los Angeles, California 90071
IV-D-63	Mr. Mel Turner President Standard Paints, Inc. 1107 West Commerce Street Dallas, Texas 75208
IV-D-64	Mr. Greg N. Manns Project Director Industry Insights, Inc. 1585 Bethel Road Columbus, Ohio 43220

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-65	Mr. Kevin Bromberg U.S. Small Business Administration Office of Advocacy Washington, DC 20416
IV-D-66	Mr. Robert E. Mitchell Chairman of the Board Dunn-Edwards Corporation 4885 East 52nd Place Los Angeles, California 90040
IV-D-67	Mr. Howard Berman Senior Vice President The Jefferson Group, Inc. 1341 G Street, N.W., Suite 1100 Washington, DC 20005
IV-D-68	Mr. Derrick Singleton Environmental Engineer Fosroc, Inc. 150 Carley Court Georgetown, Kentucky 40324
IV-D-69	F.H. McGary Vice President-Manufacturing Star Bronze Company, Inc. Post Office Box 2206 Alliance, Ohio 44601-0206
IV-D-70	Mr. Robert E. Mitchell Chairman of the Board Dunn-Edwards Corporation 4885 East 52nd Place Los Angeles, California 90040
IV-D-71	Mr. David Nordberg Consumer & Commercial Products Specialist Oregon Department of Environmental Quality 2020 S.W. Fourth Avenue, Suite 400 Portland, Oregon 97201-4987
IV-D-72	Mr. Richard B. Cunningham President Passonno Paints 500 Broadway Watervliet, NY 12189

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-73	Mr. Richard B. Cunningham President Passonno Paints 500 Broadway Watervliet, NY 12189
IV-D-74	Joseph Fogel The Garland Company 3800 East 91st Street Cleveland, Ohio 44105-2197
IV-D-75	Mr. Philip Lader Administrator U.S. Small Business Administration Office of the Administrator Washington, DC 20416
IV-D-76	Mr. James G. Ross Regulatory Affairs Director Hillyard Industries, Inc. Post Office Box 909 St. Joseph, Missouri 64502-9964
IV-D-77	Mr. Ned B. Kisner Triangle Coatings, Inc. 1930 Fairway Drive San Leandro, California 94577
IV-D-78	duplicate item, removed from docket
IV-D-79	Mr. Dan Pearson Executive Director Texas Natural Resource Conservation Commission Post Office Box 13087 Austin, Texas 78711-3087
IV-D-80	Mr. Bruce A. Berglund Senior Research Chemist Wacker Silicones Corporation 3301 Sutton Road Adrian, MI 49221-9397
IV-D-81	duplicate item, removed from docket
IV-D-82	Mr. Langely A. Spurlock Vice President Chemstar 1300 Wilson Boulevard Arlington, Virginia 22209

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-83	Mr. Guy Gruenberg Vice President RAE Products and Chemicals Corporation 11630 South Cicero Avenue Alsip, Illinois 60658-2599
IV-D-84	Mr. Bill Maloney Washington Wood Floor Supply, Inc. 15509 NE 90th Redmond, Washington 98052
IV-D-85	Mr. James G. Ross Regulatory Affairs Director Hillyard Industries, Inc. Post Office Box 909 St. Joseph, Missouri 64502-9964
IV-D-86	Mr. Mark S. Horton, CSP Regulatory Affairs Manager Chemrex, Inc. 889 Valley Park Drive Shakopee, Minnesota 55379
IV-D-87	Mr. Tim Vance Vice President Vance Brothers, Inc. 5201 Brighton Kansas City, Missouri 64130
IV-D-88	Mr. Richard R. Blank Managing General Partner Broadway Properties 126 East Fifth Street Michigan City, Indiana 46360
IV-D-89	Mr. Kurt Dayhuff Palo Duro Hardwoods, Inc. 4800 Lima Street Denver, Colorado 80239
IV-D-90	Lynden Henning Owner Henning Painting Company R.Route 3, Box 183 Mattoon, Illinois 61938-9030

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-91	Mr. Laurence G. Starosta President Maintenance Unlimited, Inc. Post Office Box 5 Palos Heights, Illinois 60463-0005
IV-D-92	Mr. David N. Titus President Henning Asphalt Sealing & Striping Company R.Route 3, Box 183 Mattoon, Illinois 61938
IV-D-93	Mr. David Altena President RepcoLite Paints, Inc. 473 West 17th Street Holland, Michigan 49423
IV-D-94	Mr. Craig Connor Palo Duro Hardwoods, Inc. 4800 Lima Street Denver, Colorado 80239
IV-D-95	Mr. Allan J. Rose President Rose Paving & Sealcoating Company 408 West Taft Drive South Holland, Illinois 60473-2028
IV-D-96	Mr. Arthur J. Fossa Director Division of Air Resources New York State Department Of Environmental Conservation 50 Wolf Road Albany, New York 12233-3251
IV-D-97	Mr. Philip Lader Administrator U.S. Small Business Administration Office of the Administrator Washington, DC 20416
IV-D-98	Mr. Jack Schroe Secretary/Treasurer The Bahr Company 1308 Marquette Drive Romeoville, Illinois 60441

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-99	Mr. Dave J. McVey D & M Striping 6437 South Kedvale Chicago, Illinois 60629
IV-D-100	Mr. David Bollinger Cascade Pacific Floor Distributors, Inc. 5021 S.E. 26th Avenue Portland, Oregon 97202
IV-D-101	Mr. Ned B. Kisner President Triangle Coatings, Inc. 1930 Fairway Drive San Leandro, California 94577
IV-D-102	Mr. Patrick Smith Smith Wood Floors, Inc. 40000 Grand River, #108 Novi, Michigan 48375
IV-D-103	Mr. Ralph Lorenz President Ralph's Hardwood Floors 404 West State Street (Hwy.54) Black Creek, Wisconsin 54106
IV-D-104	Ms. Sharilyn McMaster 2173 Mohican Place Boise, Idaho 83709
IV-D-105	Mr. Randy Nash President RR Hardwood, Inc. 5125 W. Gage Street Boise, Idaho 83706
IV-D-106	Mr. Bruce Whisenhunt President Palo Duro Hardwoods, Inc. 4800 Lima Street Denver, Colorado 80239
IV-D-107	Ms. Christine Coates Golden State Flooring Company 449 Littlefield Avenue South San Francisco, California 94080

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-108	Mr. Peter E. Flood President The Flood Company 1212 Barlow Road Post Office Box 2535 Hudson, Ohio 44236-0035
IV-D-109	Mr. Peter W. Harman President Harman Hardwood Flooring Company, Inc. 29 Hebard Street Rochester, New York 14605
IV-D-110	Mr. Maxie E. Quinn President Dyco Paints, Inc. 5850 Ulmerton Road Clearwater, Florida 34620-3989
IV-D-111	Ms. Lynne Schwan Marketing Manager Lockwood Flooring 8249 Brentwood Industrial Drive St. Louis, Missouri 63144
IV-D-112	Mr. Mike Baseman President Baseman Hardwood Floors, Inc. N2926 Jeske Road Appleton, Wisconsin 54915
IV-D-113	Mr. Lawrence Williams Indiana Wood Floors, Inc. 5555 Elmwood Avenue, Suite E Indianapolis, Indiana 46203
IV-D-114	Mr. Mark E. Maxwell Industry Manager Building Materials Industries Dow Corning Corporation Midland, Michigan 48686-0995
IV-D-115	Lon R. Rogers Director Anchor Paint Mfg. Company 6707 East 14th Post Office Box 1305 Tulsa, Oklahoma 74101-1305

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-116	Mr. James E. Siebels Chief Engineer Engineering, Design & Construction Department of Transportation State of Colorado 4201 East Arkansas Avenue Denver, Colorado 80222
IV-D-117	Ms. Susan S.G. Wierman Executive Director MARAMA 711 W 40th Street, Suite 318 Baltimore, Maryland 21211
IV-D-118	Mr. Bruce S. Carhart Executive Director Ozone Transport Commission 444 N. Capitol St. N.W., Suite 638 Washington, DC 20001
IV-D-119	Mr. Jason Grumet Executive Director NESCAUM 129 Portland Street Boston, Massachusetts 02114
IV-D-120	Mr. Leo Hickman Regulatory Affairs Manager Fosroc, Inc. Construction Division 150 Carley Court Georgetown, Kentucky 40324
IV-D-121	Ms. Elsie L. Munsell Deputy Assistant Secretary of the Navy Environment & Safety Department of the Navy Office of the Assistant Secretary 1000 Navy Pentagon Washington, DC 20350-1000
IV-D-122	Mr. Jim Sell National Paint & Coatings Association 1500 Rhode Island Avenue, N.W. Washington, DC 20005-5597

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-123	Mr. Donald V. Ottley Vice President Ottley Floor Company, Inc. 4540 South 200 West Salt Lake City, Utah 84107
IV-D-124	Mr. Steven W. Berlin President Berlin Flooring, Inc. 4451 Wellington Road Boulder, Colorado 80301
IV-D-125	Mr. Michael P. Stock Vice President TK Products Division of Sierra Corporation 11400 West 47th Street Minnetonka, Minnesota 55343
IV-D-126	Mr. Donald F. Theiler Director Bureau of Air Management State of Wisconsin Department of Natural Resources Post Office Box 7921 101 South Webster Street Madison, Wisconsin 53707-7921
IV-D-127	Mr. Fred L. Connatser President Maryland Wood Floors, Inc. 1244 Ritchie Hwy. Arnold, Maryland 21012
IV-D-128	Mr. David D. Hood President Induron Protective Coatings Post Office Box 2371 Birmingham, Alabama 35201-2371
IV-D-129	Mr. Dwayne M. Fuhlhage Environmental & Safety Compliance Officer ProSoCo, Inc. 755 Minnesota Avenue Post Office Box 171677 Kansas City, Kansas 66117

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-130	Mr. William A. Rostine President Rostine Mfg. And Supply, Inc. Post Office Box 8192 4227C W. Church Springfield, Missouri 65801
IV-D-131	Mr. Mike Reinmiller Palo Duro Hardwoods, Inc. 4800 Lima Street Denver, Colorado 80239
IV-D-132	Mr. Albert Salter Palo Duro Hardwoods, Inc. 4800 Lima Street Denver, Colorado 80239
IV-D-133	Mr. Steve Marchetti Palo Duro Hardwoods, Inc. 4800 Lima Street Denver, Colorado 80239
IV-D-134	Mr. Gerald W. Lancour Director Occupational Safety, Health & Environmental Affairs McDonnell Douglas Corporation Post Office Box 516 Saint Louis, Missouri 63166-0516
IV-D-135	Mr. Robert Shepard Lebanon Oak Flooring Company 3110 Roosevelt Avenue Post Office Box 18176 Indianapolis, Indiana 46218-0176
IV-D-136	Mr. Lester Markowitz Niles Color Center, Inc. 7652 North Milwaukee Niles, Illinois 60714
IV-D-137	Mr. Russ Hearing General Manager Preserva-Products, Inc. 12860 Earhart Avenue, Suite 102 Auburn, California 95602

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-138	Mr. Guy Gruenberg Vice President RAE Products and Chemicals Corporation 11630 South Cicero Avenue Alsip, Illinois 60658-2599
IV-D-139	Mr. Alan J. Walters Vice President Fancy Colours and Company 1438 Burgandy Parkway Streamwood, Illinois 60107
IV-D-140	Mr. Jay H. Burrill Environmental Coordinator Grace Construction Products W.R. Grace & Co,-Conn. 62 Whittemore Avenue Cambridge, Massachusetts 02140-1692
IV-D-141	CenterLine Industries, Inc. 5380 Bircher Boulevard Post Office Box 66802 St. Louis, Missouri 63166-6803
IV-D-142	AACCO 5220 N. 125th Street Butler, Wisconsin 53007
IV-D-143	Mr. Lee Neerhof Sales Manager Velvit Products Company Division of Dynamic Development, Corporation Post Office Box 1741 Appleton, Wisconsin 54913
IV-D-144	Erickson Decorating Products, Inc. 6040 North Pulaski Road Chicago, Illinois 60646
IV-D-145	Ms. Janis L. Skidmore Secretary/Treasurer Meyer Skidmore & Company 1333 Yarmouth Avenue, Unit 2 Boulder, Colorado 80304
IV-D-146	duplicate of item IV-D-116

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-147	Mr. David L. Westerman Vice President Carbit Paint Company 927 W. Blackhawk Street Chicago, Illinois 60622-2519
IV-D-148	Ms. Marylin Zaw-Mon Director Air and Radiation Management Administration Maryland Department of the Environment 2500 Broening Hwy Baltimore, Maryland 21224
IV-D-149	Mr. James J. Land President Pavement Systems, Inc. 3020 W. 139th Street Blue Island, Illinois 60406
IV-D-150	Mr. Keith Vander Woude Vice President Perm-A-Seal, Inc. Post Office Box 1216 South Holland, Illinois 60473
IV-D-151	Ms. Lynn P. O'Brien Manager, Regulatory Compliance Keeler & Long, Inc. Post Office Box 460 Watertown, Connecticut 06795
IV-D-152	Mr. Moorman L. Scott Vice President The Euclid Chemical Company 19218 Redwood Road Cleveland, Ohio 44110-2799
IV-D-153	Harrison Paint Corporation Post Office Box 8470 Canton, Ohio 44711
IV-D-154	Mr. James K. Crawford General Manager EDOCO 22039 South Westward Avenue Long Beach, California 90810-1681

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-155	Mr. Robert E. Mitchell Chairman of the Board Dunn-Edwards Corporation 4885 East 52nd Place Los Angeles, California 90040
IV-D-156	Mr. Christopher G. Foster Smiland & Khachigian Seventh Floor 601 West Fifth Street Los Angeles, California 90071
IV-D-157	Ms. Lesa K. McDonald Environmental/Safety Manager Gemini Post Office Box 699 El Reno, Oklahoma 73036
IV-D-158	Mr. Jay A. Haines President/CEO Textured Coatings of America, Inc. 5950 S. Avalon Boulevard Los Angeles, California 90003-1384
IV-D-159	Mr. Robert L. Hawkins, Jr. Senior Vice President Waterlox Coatings Corporation 9808 Meech Avenue Cleveland, Ohio 44105
IV-D-160	Mr. Robert L. Hawkins, Jr. Senior Vice President Waterlox Coatings Corporation 9808 Meech Avenue Cleveland, Ohio 44105
IV-D-161	Ms. Madelyn K. Harding Administrator Product Compliance & Registrations Sherman-Williams Company 101 Prospect Avenue, N.W. Cleveland, Ohio 44115-1075

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-162	Mr. Banard R. Appleman Executive Director Mr. Michael J. Masciale President Steel Structures Painting Council 40 24th Street, 6th Floor Pittsburg, Pennsylvania 15222-4643
IV-D-163	Ms. Barbara A. Kwetz Director Division Air Quality Control Commonwealth of Massachusetts Department of Environmental Protection One Winter Street Boston, Massachusetts 02108
IV-D-164	duplicate of item IV-D-158
IV-D-165	Mr. Richard Hardy President X-I-M Products, Inc. 1169 Bassett Road Westlake, Ohio 44145
IV-D-166	Mr. James S. Jennison President Jennison Industries 106 Washington Post Office Box 965 Burlington, Iowa 52601
IV-D-167	Mr. William M. Tunno Chairman/CEO Hanley Paint Manufacturing Company, Inc. Post Office Box 12130 El Paso, Texas 79913
IV-D-168	Ms. Suzanne C. Beamer Vice President Government Relations & Public Affairs International Sign Association 801 N. Fairfax Street, Suite 205 Alexandria, Virginia 22314
IV-D-169	Mr. Kelley Brandt Director, Regulatory Affairs The Valspar Corporation Post Office Box 1461 Minneapolis, Minnesota 55440

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-170	Mr. Michael P. Stock Vice President TK Products Division of Sierra Corporation 11400 West 47th Street Minnetonka, Minnesota 55343
IV-D-171	Mr. Jay H. Burrill Environmental Coordinator Grace Construction Products W.R. Grace & Company,-Conn. 62 Whittemore Avenue Cambridge, Massachusetts 02140-1692
IV-D-172	Mr. Thomas J. Calautti General Manager Fiberlock Technologies, Inc. 630 Putnam Avenue Post Office Box 390432 Cambridge, Massachusetts 02139-0802
IV-D-173	Mr. Kevin C. Hemenway President Kush Paint Company 19556 Masonic Boulevard Roseville, Michigan 48066
IV-D-174	Mr. Ronald R. Methier Chief Air Protection Branch Georgia Department Of Natural Resources Environmental Protection Division 4244 International Parkway, Suite 120 Atlanta, Georgia 30354
IV-D-175	Mr. Mark Uglem Executive Vice President Hirshfield's Paint Manufacturing, Inc. 4450 Lyndale Avenue No. Minneapolis, Minnesota 55412
IV-D-176	Ms. Holly M. Bartel President Glista 327 South Kenyon Seattle, Washington 98108

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-177	Mr. Edward D. Edwards 5220 Meadville Street Greenwood, Minnesota 55331
IV-D-178	Mr. Ned B. Kisner President Triangle Coatings, Inc. 1930 Fairway Drive San Leandro, California 94577
IV-D-179	Mr. Joe Hundley Martinsville Emulsion Products Company, Inc. Post Office Box 5384 Martinsville, Virginia 24115
IV-D-180	Mr. Alan R. Schuweiler Director of Chemistry Tennant 701 North Lilac Drive Post Office Box 1452 Minneapolis, Minnesota 55440-1452
IV-D-181	Mr. Jim Van Pelt President Roof Coatings Manufacturers Association 6000 Executive Boulevard, Suite 201 Rockville, Maryland 20852-3803
IV-D-182	Mr. Robert B. Walker, Jr. President Rose Talbert Paints Post Office Box 2658 Cayce-West Columbia, South Carolina 29171
IV-D-183	Mr. Richard D. Williamson Vice President G & W Enterprises, Inc. dba Trinity Coatings Company Post Office Box 2488 Fort Worth, Texas 76113-2488
IV-D-184	Mr. S. William Becker STAPPA/ ALAPCO 444 North Capitol Street Washington, DC 20001
IV-D-185	Ms. Nancy S. Bryson Crowell & Moring, LLP 1001 Pennsylvania Avenue, N.W. Washington, DC 20004-2595

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-186	Mr. L.W. Cranford, Jr. Sales Manager Lindau Chemicals, Inc. 731 Rosewood Drive Columbia, South Carolina 29201
IV-D-187	Mr. Mark S. Horton Regulatory Affairs Manager Chemrex, Inc. 889 Valley Park Drive Shakopee, Minnesota 55379
IV-D-188	Mr. Michael P. Kenny Executive Officer California Environmental Protection Agency Air Resources Board 2020 L Street Post Office Box 2815 Sacramento, California 95812-2815
IV-D-189	Mr. Robert J. Nelson Director Environmental Affairs Mr. Jim Sell Senior Counsel National Paint and Coatings Association 1500 Rhode Island Avenue, N.W. Washington, DC 20005
IV-D-190	Mr. Andrew Schlafly President The Clean Air Coalition Foundation 521 Fifth Avenue, 17th Floor New York, New York 10175
IV-D-191	Ms. Linda Waade Executive Director Mr. Tim Carmichael Project Director Coalition for Clean Air Ms. Gail R. Feuer Senior Attorney Mr. David S. Beckman Senior Project Attorney Natural Resources Defense Council 6310 San Vicente Boulevard, Suite 250 Los Angeles, California 90048

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-192	Mr. Richard D. Williamson Senior Vice President G & W Enterprises, Inc. dba Trinity Coatings Company Post Office Box 2488 Fort Worth, Texas 76113-2488
IV-D-193	Mr. Richard Hardy President X-I-M Products, Inc. 1169 Bassett Road Westlake, Ohio 44145
IV-D-194	Mr. Donald A. Eckel President AACCO 5520 N. 125th Street Butler, Wisconsin 53007
IV-D-195	Mr. John C. Hukey Technical Service Manager Dayton Superior Corporation 402 South First Street Oregon, Illinois 61061
IV-D-196	Mr. Larry E. Schwietz CEO L & M Construction Chemicals, Inc. 14851 Calhoun Road Omaha, Nebraska 68152
IV-D-197	Mr. Michael P. Stock Vice President TK Products Division of Sierra Corporation 11400 West 47th Street Minnetonka, Minnesota 55343
IV-D-198	Mr. James K. Crawford General Manager EDOCO 22039 South Westward Avenue Long Beach, California 90810-1681
IV-D-199	Mr. William Miller General Manager Symons Corporation Post Office Box 744 Contralia, Illinois 62801

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-200	Shree Nabar Technical Director Tamms Industries 7405 Production Drive Mentor, Ohio 44060
IV-D-201	Mr. Moorman L. Scott Vice President The Euclid Chemical Company 19218 Redwood Road Cleveland, Ohio 44110-2799
IV-D-202	Mr. Mark S. Horton Regulatory Affairs Manager Chemrex, Inc. 889 Valley Park Drive Shakopee, Minnesota 55379
IV-D-203	Mr. Paul Smith The Spray-Cure Company 300 Edwards Street Madison, Ohio 44057-3112
IV-D-204	Carbit Paint Company 927 W. Blackhawk Street Chicago, Illinois 60622-2519
IV-D-205	RAE Products and Chemicals Corporation 11630 South Cicero Avenue Alsip, Illinois 60658-2599
IV-D-206	Mr. Kent W. Colton Executive Vice President/CEO National Association of Home Builders 1201 15th Street, N.W. Washington, DC 20005-2800
IV-D-207	Mr. Michael P. McCarthy President/COO Harrison Paint Corporation Post Office Box 8470 Canton, Ohio 44711
IV-D-208	Mr. James R. Tucker Director of Corporate Research & Development Armorall Products Corporation 6 Liberty Aliso Viejo, California 92656

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-209	Mr. Sidney Freedman Director Architectural Precst Concrete Services Precast/Prestressed Concrete Institute 175 West Jackson Boulevard Chicago, Illinois 60604-9773
IV-D-210	Mr. Larry E. Schwietz CEO L & M Construction Chemicals, Inc. 14851 Calhoun Road Omaha, Nebraska 68152
IV-D-211	Mr. James A. Westerhaus Regulatory Services Vice President Ecolab, Inc. 370 N. Wabasha Street Saint Paul, Minnesota 55102
IV-D-212	Mr. Bob Mitchell Dunn-Edwards Corporation 4885 East 52nd Place Los Angeles, California 90040
IV-D-213	Mr. Marc Freedman Director of Government Affairs Painting and Decorating Contractors of America 3913 Old Lee Hwy., Suite 33-B Fairfax, Virginia 22030
IV-D-214	Smiland & Khachigian Seventh Floor 601 West Fifth Street Los Angeles, California 90071
IV-D-215	Mr. Bernard K. Zysman Technical Services Specialist OxyChem Post Office Box 344 Niagra Falls, New York 14302-0344
IV-D-216	The Architectural Coatings Regulatory Negotiation Committee ALARM Caucus Post Office Box 2488 Fort Worth, Texas 76113-2488

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-217	Mr. Charles Rushing Chief Chemist Wellborn Paints A Dunn-Edwards Company Post Office Box 25645 Albuquerque, New Mexico 87105-0645
IV-D-218	Mr. Loren A. Plotkin Executive Vice President Lighthouse Products Post Office Box 1253 New Smyrna Beach, Florida 32170
IV-D-219	Mr. Richard B. Cunningham President Passonno Paints 500 Broadway Watervliet, NY 12189
IV-D-220	Mr. Richard B. Cunningham President Passonno Paints 500 Broadway Watervliet, NY 12189
IV-D-221	Mr. Maxie E. Quinn President Dyco Paints, Inc. 5850 Ulmerton Road Clearwater, Florida 34620-3989
IV-D-222	Mr. Bob Cummins President Wellborn Corporation 215 Rossmoor S.W. Albuquerque, New Mexico 87105

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-D-223	Mr.William G. Schauz United States Air Force HQAFCESA/CES 139 Barnes Drive, Suite 1 Tyndall AFB, Florida 32403-5319
IV-D-224	Mr. Jim Duffey Palo Duro Hardwoods, Inc. 4800 Lima Street Denver, Colorado 80239
IV-D-225	Mr. Mike Twining Palo Duro Hardwoods, Inc. 4800 Lima Street Denver, Colorado 80239
IV-D-226	Mr. Fred L. Zupicich, Sales Manager Mr. Raymond Pavlik, Vice President Dampney Company, Inc. 85 Paris Street Everett, Massachusetts 02149
IV-F-01a	Mr. Josie Pradella STAPPA/ALAPCO 444 North Capitol Street Washington, DC 20001
IV-F-01b	Mr. Barry Jenkin Benjamin Moore
IV-F-01c	Mr. Bob Mitchell Dunn-Edwards Corp. 4885 East 52nd Place Los Angeles, California 90040
IV-F-01d	Mr. Howard Berman Wellborn Paint
IV-F-01e	Mr. Mark S. Horton Regulatory Affairs Manager Chemrex, Inc. 889 Valley Park Drive Shakopee, Minnesota 55379

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-F-01f	Mr. Marc Freedman Director of Government Affairs Painting and Decorating Contractors of America 3913 Old Lee Hwy., Suite 33-B Fairfax, Virginia 22030
IV-F-01g	Mr. Larry Chapman Inland Coatings Corp.
IV-F-01h	Ms. Lesa K. McDonald Environmental/Safety Manager Gemini Post Office Box 699 El Reno, Oklahoma 73036
IV-F-01i	Mr. Gary Driscoll Basic Coatings, Inc.
IV-F-01j	Ms. Madelyn K. Harding Administrator Product Compliance & Registrations Sherman-Williams Company 101 Prospect Avenue, N.W. Cleveland, Ohio 44115-1075
IV-F-01k	Mr. Don Collier Courtauld Coatings
IV-F-01(l)	Mr. Robert Wendoll Triangle Coatings 1930 Fairway Dr. San Leandro, California 94577
IV-F-01m	Mr. Robert Wendoll El RAP 4885 E. 52nd Pl. Los Angeles, California 90040
IV-F-01n	Mr. Earle Borman Thompson Minwax Co. 8 Shoremame Club Rd. Old Greenwich, Connecticut
IV-F-01o	Mr. Jim Sell National Paint & Coatings Association (NPCA) 1500 Rhode Island Ave., NW Washington, DC 20005

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-F-01p	Mr. Richard Gold Holland & Knight (Outside Environmental Counsel to NPCA)
IV-F-01q	Richard Williamson Textured Coatings of America 4275 Executive Sq., Suite 320 Lajolla, California 92037
IV-F-01r	Mr. Jim Van Pelt President Roof Coatings Manufacturers Association 6000 Executive Boulevard, Suite 201 Rockville, Maryland 20852-3803
IV-F-01s	Mr. Charleds Brush RPM Corp.
IV-F-02gen	Unidentified commenter at public meeting
IV-F-02a	Mr. Richard Cunningham Passono Paints 500 Broadway Waterolier, New York 12189
IV-F-02b	Mr. Jay Haines Textured Coatings of America 4275 Executive Sq., Suite 320 Lajolla, California 92037
IV-F-02c	Mr. Mark Algaier Hillyard Indutries P.O. Box 909 Box 302 N. 4th St. St. Joseph, Missouri 64502
IV-F02d	Mr. Ned B. Kisner Triangle Coatings 1930 Fairway Dr. San Leandro, California 94577
IV-F-02e	Mr. Valery Tokar Conspec Mkg. & M 636 S. 66th Terrace Kansas City, Kansas 66213
IV-F-02f	Mr. Larry Schwietz L&M Construction, Chem., Inc. 14851 alhoun Rd. Omaha, Nebraska 68152

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-F-02g	Mr. D. John Long Keeler & Long, Inc. Box 460 Watertown, Connecticut 06795
IV-F-02h	Mr. Sam Jennison Jennison Ind. Box 965 Burlington, Iowa 52601
IV-F-02i	Mr. Rod Salyer Koch Materials Co. 4900 S. Mason Ave. Chicago, Illinois 60638
IV-F-02j	Mr. Steven Olson Hallman Lindsay Paint 501 S. Bird St. Sun Prairie, Wisconsin 53590
IV-F-02k	Mr. David Westerman Carbit Paint Co. 927 Blackhawk St. Chicago, Illinois 60622
IV-F-02(l)	Mr. Robert L. Hawkins Waterlox Coatings 9808 Meeca Ave. Cleveland, Ohio 44105
IV-F-02m	Ace Coatings
IV-F-02	Mr. Jim Robellaro Valspar Corp. 1191 Wheeling Rd. Whelling, Illinois 60090
IV-F-02o	Mr. Robert Wendoll El Rap 4885 52nd Pl. Los Angeles, California 90040
IV-F-02p	Mr. Michael Stock TK Products 11400 W. 47th St. Minnetonka, Minnesota 55343

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-F-02q	Mr. Max A. Baum Easterday Paint & Chem. Co. 1306 E. Bolivar Ave. St. Francis, Wisconsin 53235
IV-F-02r	Mr. Guy Gruenberg RAE Products 11630 S. Cicero Ave. Alsip, Illinois 60658
IV-G-01	Mr. George Baty President Cresset Chemical Company Post Office Box 367 Weston, Ohio 43569
IV-G-02	Mr. Richard A. Rosvold H.B. Fuller Company Post Office Box 64683 St. Paul, Minnesota 55164-0683
IV-G-03	Mr. Henry S. Shaw CenterLine Industries, Inc. 5380 Bircher Boulevard Post Office Box 66802 St. Louis, Missouri 63166-6802
IV-G-04	Mr. J. Kemp Akzo Nobel Holmbladsgade 70 DK2300 Kobenhaven S Denmark
IV-G-05	Mr. J. Andrew Doyle President National Paint & Coating Association 1500 Rhode Island Avenue, N.W. Washington, DC 20005-5597
IV-G-06	Mr. Larry E. Schwietz CEO L & M Construction Chemicals, Inc. 14851 Calhoun Road Omaha, Nebraska 68152
IV-G-07	Mr. John C. Hukey Technical Service Manager Dayton Superior Corporation 402 South First Street Oregon, Illinois 61061

TABLE 2-1. LIST OF COMMENTERS ON THE PROPOSED NATIONAL ARCHITECTURAL COATINGS RULE (CONTINUED)

Docket Number	Commenter and affiliation
IV-G-08	Mr. Moorman L. Scott Vice President The Euclid Chemical Company 19218 Redwood Road Cleveland, Ohio 44110-2799
IV-G-09	Mr. Michael P. Stock Vice President TK Products Division of Sierra Corporation 11400 West 47th Street Minnetonka, Minnesota 55343
IV-G-10	Mr. Paul Smith The Spray-Cure Company 300 Edwards Street Madison, Ohio 44057-3112
IV-G-11	Mr. Kenneth S. Petersen Director of Sales and Marketing Poly-Wall International, Inc. 8400 Coral Sea Street N.E. #800 Blaine, Minnesota 55449
IV-G-12	Mr. Robert Mitchell Dunn-Edwards Corporation 4885 East 52nd Place Los Angeles, California 90040
IV-G-13	Mr. Thomas R. Wood Stoel Rives, LLP Attorneys Standard Insurance Center 900 S.W. Fifth Avenue Suite 2300 Portland, Oregon 97204-1268
IV-G-14	Ms. Jan C. Winn Edoco 22039 South Westward Avenue Long Beach, California 90810-1681
IV-G-15	Ms. Susan N. Stafford Stoel Rives, LLP Attorneys Standard Insurance Center 900 S.W. Fifth Avenue Suite 2300 Portland, Oregon 97204-1268

2.1 METHOD OF REGULATION

2.1.1 Section 183(e) Requirements

Comment: One commenter (IV-D-02/IV-D-178/IV-F-1K) stated that the objective of a national VOC standard is to reduce ozone formation, not to reduce "in-the-can" VOC content of coatings, which is only one factor affecting ozone formation. The commenter indicated that the EPA must also consider factors such as: (1) emissions per area covered by the coating, (2) use of seasonal control strategies, and (3) whether the coating is applied in a nonattainment area. The commenter also stated that the EPA must consider the relative reactivity of the emissions. The commenter suggested that the EPA use a method for relating emissions per area covered that was presented during the regulatory negotiations (II-E-7). The commenter stated that lowering the VOC content of coatings potentially increases total VOC emissions because the film thickness increases. The commenter contended that lower VOC coatings or substitutes tend to produce a thicker film when applied that results in a smaller surface area being covered with a given amount of a coating. As a result, the commenter contended that more coatings would be required and VOC emissions could increase rather than decrease as a result of the rule. The commenter pointed out that a method for relating emissions per area covered was presented during the architectural coating regulatory negotiations but did not appear in the proposed rule.

Response: The EPA agrees that the primary objective of this rule is to reduce ozone pollution across the country and believes that reduction of the VOC content of coatings is the best approach under section 183(e) of the Clean Air Act (Act) to achieve the reductions. The EPA believes that the commenter's suggestion to consider the emissions per area covered is impractical for architectural coatings. As discussed in section 2.2.6 of this document, the surface area covered by any given coating will vary depending upon a number of factors including the substrate being coated and the climatic conditions

at the time of application. Thus, the EPA has not related VOC emissions to area covered by a volume of a given product.

The EPA believes that the commenter's suggestion to control VOC emissions during only the ozone season is also not appropriate. Restricting the season when end users may apply architectural coatings is not practical to enforce since end users include homeowners and contractors applying coatings at varying times and locations. In addition, section 183(e) of the Act does not provide the EPA with the regulatory authority to regulate end users via a national rule. The nature of architectural coatings as a consumer and commercial product does not allow for control strategies that reduce emissions during only the ozone season. The shelf life and consumption rate of architectural coatings varies greatly, and no one can accurately predict that a certain percentage of a product made with a specified formulation will be consumed and, thus, cause VOC emissions during any particular time period. Because the consumption rate of architectural coatings is variable and unpredictable, achieving reductions during only an ozone season is not a viable control strategy. A rule based upon an ozone season could potentially require manufacturers to produce at least two lines of products (for ozone season and non-season) and to have a reliable means of tracking products. Moreover, determining what would constitute the ozone season for each area across the nation in light of vastly different topographical and meteorological considerations would render a seasonal approach even more complex for the EPA to administer and for regulated entities to comply with. The difficulties with enforcement of such a seasonal rule would also multiply geometrically, and the EPA believes that it would thereby jeopardize the ability of the regulations to achieve the intended VOC emission reductions. The EPA, therefore, concluded that uniform levels on the amount of VOC incorporated into the products would be the most feasible, most effective, and least disruptive control measure.

The EPA also maintains that controlling whether individual coatings are applied in ozone attainment or nonattainment areas

would be impractical. Architectural coatings are easily transportable from one area to another, and therefore, it would be difficult for a manufacturer to predict accurately where they may be applied. The primary objective of rules under section 183(e) is to reduce VOC emissions in ozone nonattainment areas, and the EPA has concluded that the most effective alternative is to implement a nationwide rule, as discussed in section 2.1.2 of this document and in section 2.3.1 of the 183-BID.

The commenter's argument that lowering VOC content limits would increase VOC emissions due to increased film thickness and less coverage is contradictory because a coating with more solids will actually cover a greater surface area. The assertion that lower VOC coatings have smaller coverage area is not consistent with information provided by the manufacturers' Material Safety Data Sheets (MSDS), technical data sheets, and coating can labels. For house paint, for example, this information typically shows that regardless of the solids content by weight, the coverage area of the various coatings is relatively similar. The EPA contends that compliant coatings have a coverage area that is equivalent to or better than higher VOC non-compliant coatings. Hence, it is not expected that a larger quantity of compliant coating will be necessary to cover the same area. The EPA has seen no indication that increased coating usage is required with compliant coatings.

2.1.2 National Rule Versus Other Strategies

Comment: Commenters (IV-D-82, IV-D-120, IV-F-2) argued for VOC controls that apply only in nonattainment areas instead of rules that apply in both nonattainment and attainment areas. One commenter (IV-D-120) asserted that a rule applied only in nonattainment areas would lessen the economic impact on both manufacturers who market coatings nationwide and those who sell products solely in attainment areas. The commenter stated that because manufacturers have already been operating under the patchwork of existing regulatory requirements, complying with the current local and State requirements is likely to be more

cost-effective than complying with a rule that applies to products sold in both nonattainment and attainment areas. The commenter argued that a rule that applied only to nonattainment areas would allow it to produce and sell products in attainment areas that would not be marketable under a rule that applied to both nonattainment and attainment areas. The commenter supported the use of a rule that applied only to nonattainment areas by arguing that the overarching goal of the rule is to reduce VOC emissions in areas with ozone levels that violate the ozone National Ambient Air Quality Standard (NAAQS). Commenters at the small business meeting (IV-F-2) suggested that the EPA consider issuing a national rule that only applies to nonattainment areas. One commenter (IV-F-2) contended that a national rule that applies to nonattainment areas only would reduce the burden on small businesses while increasing consistency in requirements across the country. Another commenter (IV-F-2) argued that a national rule that applied to nonattainment areas only would focus costs on areas which needed control. One commenter (IV-D-82) objected strongly to the use of nationwide VOC content limits in future rules and argued that these limits should only be applied in nonattainment areas.

Six commenters (IV-D-28, IV-D-33, IV-D-161, IV-D-162, IV-D-174, IV-F-1j) opposed the adoption of rules that apply only to nonattainment areas. One commenter (IV-D-161/IV-F-1j) argued that if the VOC regulation for architectural coatings were adopted as a Control Technique Guideline (CTG) that applied only to nonattainment areas, then the cost per ton of emissions reduced would increase significantly because the cost of lower VOC technologies would increase (due to decrease in sales volume). The commenter (IV-D-161) also contended that a CTG would not produce emission reductions equivalent to those of a national rule. The commenter predicted that controlling purchase and use of regulated coating products within a given nonattainment area would be difficult and lead to ineffective and costly enforcement. Additionally, the commenter contended that CTG implementation would result in different requirements in each

nonattainment area. The commenter argued that such different requirements in each nonattainment area would result in multiple, complex compliance burdens for manufacturers. Another commenter (IV-D-33) also stated that a national VOC rule for architectural coatings would be more consistent and cost-effective than a CTG. The commenter stated that, due to the widespread and variable distribution of architectural coatings, a rule that applies only to nonattainment areas is not appropriate.

Response: Section 183(e) of the Act authorizes the EPA to obtain VOC reductions through either regulations or CTG, but includes certain requirements on each option. A CTG, by definition, applies only in nonattainment areas, whereas rules generally apply nationwide. The EPA has discretion to consider a CTG as a regulatory alternative if the CTG will be substantially as effective as a national rule to reduce emissions of VOC in ozone nonattainment areas. For some product categories, a CTG can be substantially as effective as a national regulation. In fact, for some products, a CTG may be significantly more effective because end users can be targeted rather than suppliers of the product and, therefore, emission reductions can be obtained through add-on control technologies, application equipment specifications, and work practice standards. A national rule, on the other hand, is limited to requirements applicable to the manufacturers, processors, wholesale distributors, or importers of consumer or commercial products.

Section 183(e) explicitly authorizes the EPA to include any system of regulation that the EPA deems appropriate. For architectural coatings, which are highly transportable and can be used in any location at any time, the EPA has determined that regulations that target products used solely in nonattainment areas would not be as effective as a national regulation targeting all manufacturers of all the products. Thus, the EPA has concluded that a rule applicable only to nonattainment areas or a CTG would not be the best means to achieve the intended VOC emission reductions for architectural coatings. Architectural coatings are used primarily by homeowners, contractors, and a

wide variety of other types of consumers rather than by a manufacturing facility in a fixed location. Transportability of the products would tend to decrease rule effectiveness for a nonattainment area only regulation due to the likelihood of noncompliant products being bought in attainment areas and used in nonattainment areas. In contrast, a national regulation that applies both in attainment and nonattainment areas will eliminate the potential for transport of products that would negate the intended VOC emission reductions of the rule. A national regulation will help ensure effective enforcement and implementation of VOC controls in all areas.

Comment: Seven commenters (IV-D-02/IV-F-1(l), IV-F-1q, IV-D-16/IV-D-166, IV-D-26, IV-D-73, IV-D-120, IV-D-175) opposed an architectural coating rule that would apply to areas that are in attainment of the NAAQS for ozone. One commenter (IV-D-02/IV-F-1(l)) argued that a rule that applied to both nonattainment and attainment areas would place a reformulation burden on hundreds of small businesses that manufacture and sell coatings only in attainment areas and, therefore, do not contribute to the ozone nonattainment problem. Another commenter (IV-D-26) stated that consumers in attainment areas should not be forced to forego the benefits of lower cost, higher quality coatings in order to reduce ozone in nonattainment areas.

One commenter (IV-D-73) stated that, due to different conditions throughout the nation, such as lower temperatures or higher elevations, a nationwide rule does not make sense. The commenter further stated that, by promoting uniformity, a nationwide rule limits consumer choices. According to the commenter, this helps large manufacturers selling coatings across State lines and hurts small businesses that sell coatings only in attainment areas. Another commenter (IV-F-1q) stated that regulating architectural coatings only in nonattainment areas could open up coating markets where small businesses can compete with large businesses by furnishing a niche product. One commenter (IV-D-175), a manufacturer in Minnesota, sells almost all of its product within a State that is in attainment of the

ozone NAAQS, and questioned why the company should be regulated under this rule.

Seventeen commenters (IV-D-28, IV-D-30, IV-D-32, IV-D-33, IV-D-96, IV-D-117, IV-D-129, IV-D-151, IV-F-1a, IV-F-1b, IV-F-1g, IV-F-1i, IV-F-1j, IV-F-1k, IV-F-1n, IV-F-1p, IV-F-1s) supported a national architectural coating VOC rule. One commenter (IV-F-1a) stated that the United States has a significant ozone problem and cannot afford to overlook or ineffectively regulate any source of ozone precursors. The commenter agreed with the EPA that architectural coatings represent a significant source category (almost 3 percent of all anthropogenic VOC emissions and almost 10 percent of VOC emissions from all consumer and commercial products). Another commenter (IV-D-117) supported establishing a strong national rule for architectural coatings because State-by-State control is an ineffective approach and would not be sufficient to allow nonattainment areas to reach attainment. One of the commenters (IV-D-129) stated that the benefits associated with a national VOC rule for architectural coatings includes decreased workplace exposure to toxic and flammable materials and lower toxicity of waste generated in the manufacturing process. A State agency (IV-D-96) expressed support for a national rule for architectural coatings, especially one that obtains the 25 percent creditable reductions committed to in the 1993 State Implementation Plan (SIP) based on Reasonably Available Control Technology (RACT). According to the commenter, the rule would allow States to implement and enforce architectural coating regulations more effectively, and would help industry to reformulate architectural coatings.

Response: The EPA agrees that some areas of the country may not need reductions in VOC from architectural coatings to attain the ozone NAAQS. However, to achieve effective control of VOC emissions in nonattainment areas from products such as architectural coatings, a nationwide regulation targeting the manufacturers of these products is the most effective and efficient control strategy available to the EPA.
Section 183(e)(4) of the Act authorized the EPA to determine the

most effective system or systems of regulation that the EPA determines is appropriate to obtain reductions of VOC emissions from consumer and commercial products and aid in attainment of the ozone NAAQS. A national rule that focuses on manufacturers and importers is an effective approach for reducing emissions from architectural coatings, which are easily transportable and widely distributed to consumers and contractors for use in various locations from day to day.

Many existing nonattainment areas have identified the control of consumer and commercial products, such as architectural coatings, automobile refinishing coatings, and consumer products, in their strategies to reduce VOC emissions to attain the ozone NAAQS. In fact, the Ozone Transport Assessment Group (OTAG)[1] included in its June 1997 recommendations to the EPA, a recommendation that the EPA continue to develop, adopt, and implement stringent national control measures that meet or exceed emission reduction levels specified by OTAG. In the case of architectural coatings, the group recommended future control requirements in the year 2003 to achieve reductions beyond those expected from this rule.

The EPA has concluded that regulation of architectural coatings in attainment areas may increase the effectiveness of the rule by eliminating the potential for transport of non-compliant products into nonattainment areas. Other reasons for the EPA's determination that a national rule is the appropriate regulatory approach for architectural coatings are discussed below in the remainder of this section. In addition, modeling often indicates high emission reduction targets may be necessary to meet the ozone NAAQS in the nonattainment areas. Some States have run out of effective control activities on the local level. For these States, elimination of the possibility

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[1]OTAG is a group made up of State, Federal, industry organizations and environmental groups charged by the EPA with developing consensus recommendations regarding implementation of the Clean Air Act as amended in 1990 related to ground-level ozone problems in the United States.

for transport of non-compliant products into their jurisdiction will be helpful in their effort to achieve attainment.

With regard to the suggestion that the EPA exempt companies that sell coatings only in attainment areas, the June 25, 1996 proposal requested comment on the number and identity of manufacturers who sell products solely in attainment areas. The EPA made this request to evaluate whether any special provisions for these manufacturers might be warranted. A total of five companies spoke at the small business meeting (IV-F-2) indicating that they sold almost all of their products in attainment areas. Two additional companies (IV-D-73, IV-D-175) submitted letters implying that they also market the majority of their products in attainment areas. The EPA believes that the limited response to this request indicates that there is not sufficient evidence to support providing such an exemption or special provision. Moreover, the EPA notes that section 183(e)(1)(C) explicitly defines regulated entities to include manufacturers or importers who sell or distribute their products in interstate commerce. Even those manufacturers or importers who may not broadly market their products are nonetheless introducing their products into interstate commerce, and thus, are within the scope of the regulations intended by the Act.

Comment: Five commenters (IV-D-129, IV-D-161, IV-F-1b, IV-F-1g, IV-F-1s) supported the EPA's proposal of a nationwide rule that applies to both attainment and nonattainment areas because it will provide a level playing field for all manufacturers. According to one of these commenters (IV-F-1s), many products of small, independent businesses are designed to meet the needs of niche markets for specialized coatings and the manufacturers need access to a wide geographical market to sell the volume or product necessary to make a profit. The commenter noted that these companies find it increasingly difficult to track and comply with different State, county, and city regulations of VOC. Therefore, the commenter argued that small businesses need an architectural coating VOC rule that applies to both attainment and nonattainment areas nationwide to compete

effectively. Another commenter (IV-F-1g) noted that it does not have an in-house sales force and depends on distributors to market its products. The commenter indicated that some distributors are not willing to handle the commenter's products unless they can market them throughout their territory. The commenter noted that ever-changing individual State and local rules can make it difficult for manufacturers to comply. Another commenter (IV-F-1b) argued that a uniform, practical, Federal control measure that applies to attainment and nonattainment areas will allow the sale of high quality coatings to the consumer and will provide a level playing field for manufacturers while achieving meaningful reductions in air pollution.

Response: The EPA agrees that the national rule will be advantageous for coatings manufacturers for the reasons stated by the commenters. During the development of the architectural coating rule, industry representatives expressed concern that differences in State and local requirements for architectural coatings, as could occur under a non-nationwide rule or CTG approach, would disrupt the national distribution network for architectural coatings. The EPA recognizes that for manufacturers who distribute across wider geographical areas, rules that apply to both nonattainment and attainment areas provide the additional benefit of promoting consistency in regulations, thereby making it easier for companies to compete with each other. While promoting national uniformity is one incidental benefit of the implementation of a national rule, the EPA notes that it is but one factor that the EPA has taken into account in determining what system or systems of regulation would be best to achieve the objectives of section 183(e) of the Act.

Comment: Six commenters (IV-D-32, IV-D-129, IV-F-1e, IV-F-1g, IV-F-1n, IV-F-1q) supported a national VOC rule for architectural coatings because it would be more cost-effective than a regulatory approach that could result in different requirements for attainment and nonattainment areas. Four commenters (IV-D-129, IV-F-1e, IV-F-1n, IV-F-1q) agreed that a nationwide VOC regulation for architectural coatings would ease

the burden on manufacturers to keep track of the applicable limits, categories, exemptions, and other requirements for numerous State regulations. One commenter (IV-F-1g), a manufacturer of niche products, supported a national VOC rule for architectural coating because as a small company, the commenter lacks the resources to petition each State for variances. Another commenter (IV-F-1i), a small company that markets in 50 States, stated that its sales volume in any one State is too low to support the potential cost of relabeling, reformulating, etc., to meet various State requirements. A State commenter (IV-D-32) stated that a national architectural coating rule would allow the State of Oregon to retire its local architectural coatings program and apply those resources to other environmental needs. According to one commenter (IV-D-129), the time and expense to comply with the existing patchwork system of State and regional regulations affecting the architectural coating industry could be better spent developing lower VOC products and initiating other pollution prevention programs.

Five commenters (IV-D-30, IV-D-151, IV-D-161, IV-F-1i, IV-F-1j) supported a national architectural coatings VOC rule because it will make compliance easier, and one commenter (IV-F-1a) supported a national rule because it will be easier to implement and enforce. One of these commenters (IV-D-161) supported the national architectural coating VOC rule because it will provide consistency regarding compliance among States for VOC control. The commenter specifically supported a national rule that will help to alleviate the difficulty manufacturers encounter in controlling distribution so that products are not shipped to areas where the product does not meet a local VOC content limit. Another commenter (IV-D-151) stated that a national architectural coatings VOC rule is desirable because it allows manufacturers to sell and distribute products freely among attainment and nonattainment areas. This commenter also supported a national architectural coatings VOC rule because it would simplify recordkeeping. One commenter (IV-D-30) stated a concern that without a national rule, companies would be subject

to several State and Federal requirements that would unduly complicate doing business in the architectural coatings industry. Another commenter (IV-F-1j) faces marketing and logistical problems because of the various architectural coating VOC rules and rule variations across the country.

Response: The EPA agrees that implementation of a national rule will help to minimize the patchwork of potentially diverse regulations across the nation. Several industry representatives have advised the EPA that the cost of producing different product lines for attainment versus nonattainment areas, as could happen under a non-nationwide rule or CTG approach, could be cost prohibitive because of the duplicative effort of labeling, storage, and distribution management. The EPA also recognizes and agrees that an added benefit of uniform national rules is that State resources can be redirected to other local regulatory development efforts to reduce emissions that contribute to ozone or other pollutants within a particular State. Therefore, the EPA agrees that using a national rule to control VOC emissions from architectural coatings may be more cost-effective than other alternatives for specific categories of products like architectural coatings. The EPA notes, however, that even with a national rule for architectural coatings, some areas may choose to impose additional regulations to obtain greater VOC reductions as their circumstances may require, and that section 183(e) of the Act permits this.

Comment: One commenter (IV-D-96) stated that a national VOC rule for architectural coatings will play a role in diminishing the amount of precursor VOC transported from ozone attainment areas into nonattainment areas throughout the country.

Response: The EPA believes that national rules with nationwide applicability may help to mitigate the impact of ozone and ozone precursor transport across some area boundaries. Recent modeling performed by OTAG and others suggests that in some circumstances VOC emitted outside nonattainment area boundaries can contribute to ozone pollution in nonattainment areas -- for example, by traveling relatively short distances

into neighboring nonattainment areas. The EPA has recognized the potential for VOC transport in the December 29, 1997, Guidance for Implementing the 1-hour Ozone and Pre-Existing PM_{10} NAAQS concerning credit for VOC emission reductions towards rate of progress requirements. The guidance indicates that the EPA may give credit for VOC reductions within 100 kilometers of nonattainment areas. In addition, the June 1997 recommendations made by OTAG supported the EPA's use of VOC regulations that apply to both nonattainment and attainment areas to implement section 183(e) of the Act for certain products. The particular product categories OTAG cited for national VOC regulations are automobile refinish coatings, consumer products, and architectural coatings. The EPA believes that regulation of products in attainment areas is necessary to mitigate VOC emissions that have the potential to contribute to ozone nonattainment in accordance with section 183(e) of the Act. The EPA has taken this into account as one of the reasons for selecting a nationwide VOC rule, rather than a regulation or CTG applicable only in nonattainment areas.

Comment: Two commenters (IV-D-32, IV-F-1a) stated that a national architectural coating VOC rule will reduce the potential for consumers or others transporting noncompliant products from attainment areas into nonattainment areas.

Response: The EPA agrees with the point raised by these commenters and maintains that regulating manufacturers' and importers' products in both attainment and nonattainment areas is a more effective approach for reducing emissions from architectural coatings because these products are easily transportable and widely distributed to consumers for use in unlimited locations. The transportability of products tends to decrease rule effectiveness for rules that vary by location due to the likelihood of unregulated, non-compliant products being bought in attainment areas and used in nonattainment areas. For this reason, effective enforcement of a control strategy for an architectural coatings rule that affected nonattainment areas only would be limited. Therefore, the EPA is promulgating the

standards for architectural coatings as a national rule. A national architectural coating VOC rule will eliminate the potential for transport of non-compliant products from attainment areas into nonattainment areas that would negate the effectiveness of the rule to achieve VOC emission reductions.

Comment: One commenter (IV-D-32) argued that a national rule for architectural coatings would help prevent future ozone problems in attainment areas.

Response: The EPA agrees that one incidental benefit of the architectural coatings rule will be reduction of ozone and ozone precursors nationwide including maintenance areas. For areas that previously had been nonattainment areas, States are required to have a plan to demonstrate maintenance of the ozone standard over the long term. Population growth or increased economic prosperity would be expected to lead to additional use of these products, which in turn, could lead to increased VOC emissions. The EPA notes that the purpose of the rule is to obtain VOC emission reductions from products that have the potential to contribute to ozone nonattainment, and this goal is furthered by the final rule. The potential benefits for maintenance areas are incidental to this goal.

Comment: Two commenters (IV-F-1g, IV-F-1o) contended that other provisions in the Act, besides section 183(e), place significant pressures on the States to achieve large reductions of VOC emissions by 1996 and beyond, and inevitably would have subjected architectural coating products directly and indirectly to a host of inconsistent State rules.

Response: The EPA agrees that many existing nonattainment areas have identified architectural coatings as a significant source of VOC emissions in their strategies to reduce emissions to attain the ozone NAAQS. As a result, architectural coatings could be regulated by inconsistent State and local rules. The EPA expects the final rule to reduce the need for such State and local rules and promote uniformity and consistency.

Comment: Nine commenters (IV-D-30, IV-D-117, IV-D-129, IV-F-1g, IV-F-1i, IV-F-1j, IV-F-1n, IV-F-1o, IV-F-1s) supported a

national rule because it will provide uniform regulations throughout the country, minimizing the effects of the current patchwork of architectural coating regulations. According to the commenters, uniform regulations are in the best interest of the entire industry.

Three commenters (IV-D-189, IV-F-1i, IV-F-1o) urged the EPA to utilize its powers under the Act in a way that will promote consistency of regulation. However, one commenter (IV-F-1e) noted that the States will still have the option of reducing the limits further and pointed to California as an example. The commenter asked how the EPA is going to ensure that the States will not use the EPA guidelines as a baseline and reduce VOC content levels further to obtain more reductions. The commenter asked what the economic impact to the industry would be if the States further reduced VOC content levels and stated that the EPA had not addressed this issue.

One commenter (IV-D-30) stated that it is disadvantageous to have different VOC content limits in attainment areas and nonattainment areas. To promote uniformity, the commenter urged the EPA to publish a national architectural coatings VOC rule with VOC content limits that are stringent enough to address the need for VOC reductions for as many States as possible.

One commenter (IV-F-1g) noted that the lack of a national rule for architectural coatings made planning for new coating products, for production, for expansion, and for marketing very difficult if not impossible. Another commenter (IV-F-1i) stated that the most difficult situations for small companies to deal with are a large number of States having different regulations and a regulatory climate that changes frequently. For example, a large number of States have different labeling requirements. The commenter noted that when two States specify different wording for the labels, the manufacturer has to track and have two entirely different sets of labels. The commenter requested a national architectural coating rule that preempts State requirements across the board. At the very least, the commenter requested that States be required to adhere to the Federal

product categories and definitions that are consistent with the national regulations and be prohibited from requiring specific legal language that must appear on the label.

Another commenter (IV-F-1o) noted that several States completed or started architectural coating VOC rulemakings and others have announced that they plan to issue architectural coating rules if the EPA fails to issue a timely national architectural coating rule. This commenter encouraged the EPA to emphasize to the States a preference under section 183(e) of the Act for a uniform national rule. The commenter noted that while acknowledging the authority of the States to act independently, section 183(e) of the Act also requires that they first consult with the EPA before developing rules that differ from the national rule. The commenter contended that Congress wanted the States to deliberate carefully on this and urged the EPA to add language to the preamble of the architectural coating VOC rule to explain this provision. The commenter also asked the EPA to encourage States to make their rules as consistent with the national rule as possible.

Another commenter (IV-D-189) urged the EPA and States to collaborate cooperatively to reconcile any differences between a national rule and any State VOC rules for architectural coatings. The commenter elaborated that State regulations such as "Rule 66" (South Coast Air Quality Management District) should be included within this collaborative effort.

Response: The EPA agrees that the main purpose of rules promulgated under section 183(e) of the Act is to reduce VOC emissions effectively and efficiently in nonattainment areas utilizing "best available controls." An incidental benefit of regulations that apply both in attainment and nonattainment areas, however, is that they promote consistency in regulations, thereby reducing the burden on manufacturers of complying with differing State standards. To date, the EPA believes that consistency has already been promoted because many States that intended to develop their own regulations for architectural coatings have instead relied on the final rule developed by the

EPA. However, the EPA does not expect regulations issued under section 183(e) of the Act to provide complete uniformity in requirements across the country for architectural coatings because some States may continue to need more stringent standards to meet their air quality goals. The consultation provisions of section 183(e)(9) of the Act are designed to promote uniformity in the event that States or local areas need to adopt requirements more stringent than those promulgated by the EPA. This section requires the EPA to maintain and provide relevant information, studies, and regulations proposed and promulgated to any State or local government that requests it. The EPA expects this service to help States consider options for regulation that will be consistent with those existing in other States or local subdivisions. The EPA anticipates that the promulgation of a national rule may minimize the need for additional States to enact architectural coating rules. The EPA does seek to encourage uniformity in regulations nationwide, but recognizes that some areas may continue to need more stringent regulations in order to alleviate ozone nonattainment conditions within their jurisdictions, especially those areas with significant ozone nonattainment problems of long duration. The EPA notes that section 183(e) does not preempt any State regulations and that this reflects the intent of Congress to permit more stringent State rules where deemed necessary by those States.

2.1.3 Miscellaneous

Comment: Two commenters (IV-D-183, IV-F-1q) contended that the best approach for reducing VOC from architectural coatings would be no architectural coating VOC rule at all. One commenter (IV-D-183) asserted that since the 1950s, VOC emissions from paint have continually decreased because technology has improved and consumers demanded water-reducible products. The commenter contended that this decline in emissions will continue given the opportunity and resources without the motivation of VOC limits on coatings. The other commenter (IV-F-1q) expressed concern that a VOC rule for architectural coatings may prohibit development of

new coatings that may contain more VOC but last longer and, therefore, do not require repainting as frequently.

Response: The EPA does not believe that a VOC rule will increase emissions or inhibit development of new technologies. To the contrary, the EPA maintains that such VOC content limits will provide guidance on achievable VOC levels to manufacturers that have not yet reformulated their coatings with currently available resin technology. In fact, the EPA contends that required VOC content limits will encourage the development of alternative technologies, such as the newly emerging reactive diluent technology. Reactive diluent coatings result in lower VOC emissions because most of the organic solvents chemically react to become part of the finished coating rather than evaporating into the ambient air to contribute to ozone pollution problems.

The EPA also believes that the behavior of manufacturers in developing lower VOC coatings and the public's acceptance of those products have occurred in conjunction with, and in part because of, regulatory limits placed on the products in some States. The EPA sees no indication that the market would have moved at the same speed or to the same extent without the impetus of State and local environmental regulations. Thus, the EPA concludes regulating architectural coatings on a national level will help to further direct market forces to lower VOC technology.

Comment: Two commenters (IV-D-129, IV-F-1s) stated that a national VOC rule for architectural coatings will improve the safety of the work environment. One coatings manufacturer (IV-F-1s) stated that his company changed to lower VOC products not because of the VOC rule for architectural coatings but because of customers who wanted to buy products for use in plants without having to install control equipment to meet local work place health and safety regulations. For example, the commenter's customers do not have to buy an emissions control system for their wood furniture manufacturing shop if they can

buy low VOC products that enable them to reduce VOC without additional shop controls.

Response: The EPA agrees that incidental benefits of a national VOC rule for architectural coatings may include improvements in the workplace environment by reducing worker exposure to toxic solvents. The EPA expects that adoption of the national architectural coating VOC rule will sometimes result in solvents with greater toxicity characteristics being replaced with solvents of lower toxicity. For example, the EPA expects the amount of xylene, a toxic solvent, used in coatings to decrease and the amount of water, a non-toxic solvent, used in coatings to increase.

The EPA agrees that the regulatory environment encourages lower VOC technology. However, the architectural coating rule does not apply to coatings applied as part of manufacturing a product such as wood furniture. The EPA has clarified this by excluding shop-applied coatings from the architectural coating definition. This section of the final rule provides that this regulation does not apply to products used in manufacturing facilities. The EPA notes, however, that the availability of products with lower VOC content may aid manufacturers who seek to reduce worker exposures to VOC emissions.

2.2 PROPOSED STANDARDS

2.2.1 Applicability of the Standards

2.2.1.1 General

Comment: One commenter (IV-D-189) strongly endorsed community-based paint exchange programs. However, the commenter stated that there is some ambiguity between the exemption of paint exchanged in these programs and the proposed rule provision that provided VOC credits to manufacturers for recycled coatings. Specifically, the commenter noted that it is unclear whether all of the coatings collected in a community-based paint exchange program that are subsequently recycled by a manufacturer would be entirely exempt or whether these coatings would be subject to the rule provisions relating to recycled coatings.

Response: The exemption for coatings collected at a paint exchange (§ 59.400(c)(4)) is not intended to apply to manufacturers. As described in the proposal preamble:

> Community-based paint exchanges are programs in which the general public may drop off and pick up post-consumer architectural coatings (leftover paint), typically free of charge, and thereby reduce household hazardous waste. The exchanges occur between users and not manufacturers. Even though these coatings may be repackaged and the proposed regulatory definition of "manufacturer" includes repackagers, repackaging that occurs at community-based paint exchanges is specifically excluded from the definition.

The exemption for coatings distributed in a paint exchange is meant to apply to coatings that are not reprocessed by a manufacturer, and therefore, virgin materials such as solvent and resins are not added to the coatings. Consequently, any coatings collected by a manufacturer would be subject to the recycled coating provision detailed in § 59.406. The recycled coatings provision applies to unused coatings that have been previously purchased by a consumer, and are subsequently combined with virgin materials by a manufacturer and are offered for sale as a recycled coating.

To clarify the EPA's intent that the exemption for coatings collected at a paint exchange is not intended to apply to manufacturers, the EPA has modified the definition of community-based paint exchange as follows:

> "Community-based paint exchange means a program in which members of the general public, excluding architectural coating manufacturers and importers, may drop off and pick up usable post consumer architectural coatings in order to reduce household hazardous waste."

Comment: One commenter (DoD Steering Committee representing the Army, Navy and Air Force as well as several DoD components and agencies) (IV-D-121) recommended that an exemption be given to any "paint exchange" activity that actively reduces the hazardous waste stream. For example, the Navy reportedly has been phasing in a Consolidated Hazardous Material Reutilization and Inventory Management Program (CHRIMP), and the other services

reportedly have similar programs. The objective of CHRIMP is to provide life cycle management of hazardous materials with the intent of reducing hazardous waste. Hazardous Minimization Centers (HAZMINCEN) are set up to centrally control all hazardous materials. All work centers within the command or activity, and tenant commands who participate in the program are required to turn in hazardous materials currently held and to use the HAZMINCEN for all future needs. The HAZMINCEN, in turn, responds to customer requests by packaging, repackaging, and/or issuing (or distributing) the quantity of hazardous materials required to perform the task at hand. When the work is completed, the customer will return any unused portion of the hazardous materials, and the original container, to the HAZMINCEN. Center personnel will examine the returned hazardous materials and determine if the unused portion can be retained for reuse by another customer, if it can be recycled, or if it should be disposed of as hazardous waste by the appropriate agency. The commenter did not believe that the EPA intended to regulate such operations and recommended that the second sentence of the definition of "architectural coating manufacturer or manufacturer" be revised to read: "A person who repackages architectural coatings as part of a community or industrial-based paint exchange, and does not produce, package, or repackage any other architectural coatings for sale or distribution in the United States, is excluded from this definition."

Response: The EPA agrees that it did not intend to regulate any paint exchanges such as those described by the DoD representative. Thus, the EPA has amended the second sentence of the definition of manufacturer as follows: "A person who repackages architectural coatings as part of a paint exchange, and does not produce, package, or repackage any other architectural coatings for sale or distribution in the United States, is excluded from this definition...." Along with this change, the EPA has also changed the term "Community-based paint exchange" in the Definitions section of the final rule to "Paint exchange" to accommodate paint exchanges other than community-

based ones and, thus, the definition has been revised as follows: "Paint exchange means a program in which consumers, excluding architectural coating manufacturers and importers, may drop off and pick up usable post-consumer architectural coatings in order to reduce hazardous waste." As discussed in the previous response, the exemption for coatings distributed in a paint exchange is meant to apply to coatings that are not reprocessed by a manufacturer and, therefore, virgin materials such as solvent and resins are not added to the coatings.

Comment: One commenter (DoD Steering Committee representing the Army, Navy and Air Force as well as several DoD components and agencies) (IV-D-121) requested clarification that "manufacturer" in the proposed rule does not include any repackaging and internal distribution activities within the DoD, and that "importer" does not include purely internal distribution activities. The commenter cited the proposed definition of "architectural coating manufacturer or manufacturer as a company, group, or individual that produces, packages, or repackages architectural coatings for sale or distribution in the United States...." The commenter also cited the definition of "repackaging as transfer of an architectural coating from one container to another container for sale or distribution in the final container." The commenter argued that, as proposed, these definitions could lead to the unintended regulation of packaging, repackaging, and distributing activities in both the government and private sector. According to the commenter, the DoD purchases bulk quantities of material (for purposes of economies of scale) and distributes these materials internally through various agencies. These agencies may also transfer materials such as coatings from one container to another (from a large container to a smaller container for immediate use) during these transactions. To exclude these types of activities, the commenter requested that the EPA clarify that "for sale or distribution" does not include such internal transfers within DoD or any other Federal agency even if such transfers include some amount of repackaging and recommended adding the following

definition: "Architectural coating held by a government. An architectural coating that is held by a government for its own use is not held for sale or distribution even if the coating will be repackaged and/or transferred between agencies or other subdivisions of the agency." The commenter noted that a similar clarification was made in the final rule for Excise Tax on Chemicals that Deplete the Ozone Layer and on Products Containing such Chemicals, 26 CFR Parts 52 and 602. The commenter suggested that another approach would be to revise the definition of manufacturer to target the sources to be regulated as formulators and reformulators rather than producers, packagers, and repackagers. Finally, the commenter also recommended adding to the definitions of manufacturer and importer the qualifying phrase "in interstate commerce" as in the statutory definition of regulated entities in section 183(e) to prevent the rule from regulating the DoD as a manufacturer or importer of architectural coatings.

Response: The EPA did not intend that the military or other consumers that perform only repackaging and/or distribution of architectural coatings for internal use be regulated under the architectural coatings rule. Therefore, to clarify that "for sale or distribution" does not include such internal transfers, the definition of manufacturer in the final rule has been amended by adding a third sentence; a fourth sentence has also been added for further clarification of applicability as follows:

> Manufacturer means a person who produces, packages, or repackages architectural coatings for sale or distribution in the United States. A person who repackages architectural coatings as part of a paint exchange, and does not produce, package, or repackage any other architectural coatings for sale or distribution in the United States, is excluded from this definition. A person who repackages a coating by transferring it from one container to another is excluded from this definition, provided the coating VOC content is not altered and the coating is not sold or distributed to another party. For purposes of applying this definition, divisions of a company, subsidiaries, and parent companies are considered to be a single manufacturer.

Similarly, the definition of Importer has been amended as follows:

Importer means a person who brings architectural coatings into the United States for sale or distribution within the United States. This definition does not include any person who repackages a coating by transferring it from one container to another, provided the coating VOC content is not altered and the coating is not sold or distributed to another party. For purposes of applying this definition, divisions of a company, subsidiaries, and parent companies are considered to be a single importer.

The EPA does not believe it is necessary to add the suggested phrase "in interstate commerce" to the definitions of manufacturer and importer in the final rule for further clarification to address this issue.

It should also be noted that EPA is using the term "person" in lieu of "company, group, or individual" in these definitions because the Agency believes this term is more appropriate. A definition of person has been added to the final rule.

Comment: One commenter (IV-G-13) requested clarification in the final rule that after the effective date of the rule, a coating manufacturer could "containerize" products manufactured prior to the effective date. The commenter stated that architectural coatings are frequently manufactured for customers with seasonal needs in advance of when the coatings will be used. The coating is stored in tanks at the manufacturer's premises until needed by customers at which point it is placed into a can, drum, or tote. Frequently, the drums or totes are reusable and the end user might purchase a tank of coating and then return to refill its containers until the tank is depleted. The commenter noted that the proposed rule does not define "manufacturing." In the commenter's opinion, coatings are completely manufactured once they have been formulated and placed into storage. In other words, the commenter believes that if a coating is manufactured prior to the effective date of the architectural coating rule and placed into a properly labeled bulk storage tank, then the coating can be placed into end-use containers after the effective date, regardless of whether the coating meets applicable VOC content limits. The commenter does not believe this approach conflicts with the definition of "manufacturer," since that term

was defined broadly to include all possible parties that could be involved in labeling and distributing coatings. The commenter asserted that defining manufacturing to include all containerization steps would make the rule difficult to implement because a manufacturer would have to close out all of its storage capacity by the effective date and ensure that all product is containerized.

Response: The EPA does not intend the rule to prevent the process described by the commenter. The coating manufacturing process includes the mixing or agitation of resins (or binders), solvents, pigments, and other components to form an architectural coating, which is then stored in containers at the manufacturer's premises for sale or distribution. A coating that is manufactured prior to the compliance date (1 year after publication of the rule in the Federal Register) of the architectural coating rule and placed into bulk storage tanks from which customers fill and refill cans, drums, or totes until the tank is depleted would not be subject to the rule. A definition of the term "manufactured" has been added to the rule to clarify the point at which a coating is considered to be manufactured for purposes of this rule. It is when the coating ingredients have been combined and put into containers that have been labeled and made available for sale or distribution. A container is defined in the rule as the individual receptacle that holds the coating for storage and/or distribution. Therefore, if a coating is put into a storage container such as that described by the commenter before the compliance date, then it is not subject to the requirements of the rule. However, the container contents would become subject to the rule with any addition of coating to the container after the compliance date.

Comment: One commenter (IV-G-15) requested clarification in the final rule that after the effective date of the rule, a coatings manufacturer could aggregate coatings manufactured prior to the effective date, agitate the coatings, adjust viscosity, and return the coating to the field for use. According to the commenter, some coatings manufacturers distribute the coatings in

large reusable totes, and sometimes it will be months before a tote is returned for reuse. When totes are returned, they typically contain approximately 30 gallons of coating. The returned coating is normally returned to the manufacturing process and ultimately distributed as new coating. The commenter was concerned that after the effective date of the rule, this procedure will not be permitted. However, the commenter noted that it would be possible to aggregate the coating that is returned and, after agitation and viscosity adjustment, distribute the coating in refilled totes. Otherwise, the commenter noted that the returned coating would be sent to a hazardous waste incinerator with the residue ultimately deposited in a landfill, which does not seem to be in the best interest of the environment. The commenter's concern is that the aggregation of manufactured coatings, agitation of the aggregated coatings, and adjustment of viscosity by adding solvent might be viewed as manufacturing, even though the product has already been manufactured and is essentially only being thinned to allow its use rather than disposal.

Response: The EPA believes that the commenter can continue the process it described by treating the coating as "recycled." After the compliance date of the rule (1 year after the rule is published in the Federal Register), manufacturers or importers of "recycled" architectural coatings can collect, reprocess, and market coatings that contain a percentage of post-consumer coating product. Such use is environmentally beneficial because it reduces the magnitude of waste from architectural coatings. Manufacturers and importers of recycled coatings are given the option of calculating an adjusted VOC content. The adjusted VOC content provides some credit for the amount of post-consumer material contained in the coating. The EPA is providing this credit to encourage recycling of unused paint. The adjusted VOC content is determined by multiplying the percentage of post-consumer content of the coating by the VOC content of the recycled coating, which can then be subtracted from the VOC

content of the recycled coating. An explicit equation for the calculation is in the final rule.

Comment: Two commenters (IV-D-161, IV-D-206) supported the exemption for coatings sold in non-refillable aerosol containers.

Response: The EPA has retained this exemption in the final rule. Aerosol paint is considered a specialty paint product and typically involves a specialized division within a paint company. In addition, it is a complex product category due to the many subcategories of aerosol paint, and the range of options to reformulate include the potential to change propellant formulations. Therefore, the EPA plans to address coatings sold in non-refillable aerosol containers separately under section 183(e) authority.

Comment: One commenter (IV-D-171) maintained that its line of gypsum or cement-based, spray-applied cementitious fire protection products should be exempt from the rule because the products do not meet the definition of a "coating." Specifically, the commenter stated that these products do not meet the definition of a coating because they are not applied in a "film" as that term is used in the paint and coatings industry. The commenter indicated that end users mix these products into a slurry and spray-apply them to steel building surfaces during construction or renovation. These products are applied to specified thicknesses typically from 1/2 to 1-1/2 inches but may range from 5/16 to 3-1/2 inches in unique applications. These products are often necessary for the buildings in which they are applied in order to comply with Federal, State, or local building code requirements. In order for a building to meet the applicable code, the depth specified by architects and engineers is strictly followed. The commenter reasoned that coatings of this thickness are not a film and that their products are, therefore, excluded from the rule.

Response: The EPA disagrees that the coatings, as described by the commenter, should be exempt from the rule. To clarify what is meant by a coating, the EPA has modified the definition of coating in the final rule to read as follows: "Coating means

a material applied onto or impregnated into a substrate for protective, decorative or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealants, inks, maskants, and temporary coatings." The EPA has removed the reference in the definition to application as a film because the EPA did not intend to limit rule applicability based upon the product thickness as applied. Consequently, based on the commenter's description of the line of gypsum or cement-based, spray-applied cementitious fire protection products, these products would fall under the fire-retardant/resistive coating category. These products would be subject to a VOC content limit of 450 grams of VOC per liter of coating thinned to the manufacturer's maximum recommendation excluding the volume of any water, exempt compounds, or colorant added to tint bases.

Comment: Two commenters (IV-D-134, IV-F-2) requested clarification of the rule's applicability to coatings recommended for architectural uses and non-architectural uses. One commenter (IV-D-134) expressed concern that a coating formulation that meets the definition of an architectural coating may also be used by manufacturers of aerospace parts, ships, furniture, or miscellaneous metal parts to meet specific applications in these industries. The commenter stated that industrial users often depend on coating formulations to meet other CTG or National Emission Standard for Hazardous Air Pollutants (NESHAP) requirements that may have higher VOC levels than the limits in the proposed architectural coating rule. The commenter suggested that the EPA clarify that coatings provided for these regulated manufacturing activities are not also subject to the architectural coating rule. According to the commenter, this would ensure that coating suppliers can provide coatings that meet the performance requirements and regulatory levels appropriate to each. The commenter suggested revising § 59.400(c) by adding a new paragraph as follows: "(6) Coatings that are subject to the requirements of a National Emission Standard for Hazardous Air Pollutant or Control Technology Guideline."

One manufacturer (IV-F-2) was concerned about this issue because his company markets the same coating as both a product finish and as an architectural coating. The commenter asked whether the sales of coatings marketed as product finishes are subject to the rule.

Response: As stated in the definition of architectural coatings, the rule applies to coatings recommended for field application to stationary structures and their appurtenances, to portable buildings, to pavements, or to curbs. Therefore, the rule does not apply to coatings that are marketed solely for shop application, such as in a manufacturing setting, or coatings marketed solely for application to non-stationary structures, such as aircraft, ships, boats, and railcars. The definition of architectural coating has been amended in the final rule to clarify this point. A coating that is recommended by the manufacturer or importer for use as an architectural coating is subject to the architectural coatings rule even if the coating is also recommended for non-architectural uses. The fact that a coating regulated by the architectural coatings rule may also be subject to other rules with different requirements does not alter the manufacturer's or importer's obligation to meet the requirements of the architectural coatings rule when it recommends use of the product as an architectural coating. Consequently, the EPA has not added the exemption paragraph suggested by commenter IV-D-134 to the final rule.

Comment: One commenter (IV-D-76) inquired whether solvent-based floor waxes and solvent-based terrazzo seals will be regulated by the architectural coating rule. In a follow-up conversation, the commenter (IV-E-54) described its terrazzo sealer as "a buffable solvent-based coating consisting of 85 to 90 percent solvent and 10 to 15 percent wax that is used as a wear surface and soil retardant for terrazzo floors."

Response: Floor waxes, such as those described by the commenter, are not regulated under the architectural coating rule. Floor waxes are covered under the National Volatile Organic Compound Emission Standards for Consumer Products in the

floor polish or wax category. The definition of "floor coating" in the architectural coatings rule has been modified for the final rule and clarifies that only opaque coatings are included in this category. Since floor waxes are not opaque floor coatings, they are not covered by this rule.

Comment: One commenter (IV-D-76) asked if products sold to institutions, such as schools and municipalities, would be exempt under the architectural coatings rule.

Response: The architectural coating rule does not contain an exemption for coatings that are sold by manufacturers to institutions, such as schools and municipalities. The commenter failed to provide a rationale for adding such an exemption to the final rule. Section 183(e) likewise does not stipulate that there should be any such differentiation.

The EPA based VOC content limits in the rule on the best available control given the performance requirements of the coatings in each coating category. The performance requirements for coatings used in institutions, such as schools and municipalities, are similar to those encountered in other locations, such as private office buildings and Federal office buildings. Therefore, an exemption of coatings sold to institutions cannot be justified on the basis of unique performance requirements.

Negligible emissions.

Comment: Three commenters (IV-D-02/IV-D-178/IV-F-1(l), IV-D-120, IV-F-1m) suggested that the EPA exempt low volume categories that contribute negligibly to VOC emissions. One commenter (IV-D-02/IV-D-178/IV-F-1(l)) stated that small businesses with low volumes of production rely on their suppliers to develop new resin systems that allow the manufacturer to develop lower VOC coatings. As an example, the commenter (IV-D-02, IV-F-1(l)) cited two graphic arts coatings -- bulletin enamels and lettering enamels. The commenter reasoned that such niche products with small markets do not justify the research costs necessary for a replacement product with low VOC emissions. The commenters stated that the EPA should not issue a rule that

might put companies out of business when their relative contribution to the ozone nonattainment problem is small. Several commenters (IV-D-30, IV-D-120, IV-D-209, IV-F-1m, IV-F-2) suggested regulating only the 15 categories that cause 90 to 95 percent of the annual aggregate VOC emissions associated with architectural coatings. The commenters contend that this would still achieve the purpose of the rule while causing less of an economic impact on manufacturers.

Response: The EPA agrees that some categories of architectural coatings are larger contributors than others to both VOC emissions and VOC emission reductions. The 15 largest categories actually represent 88 percent of the emissions, or approximately 494,000 tons, rather than 90 or 95 percent as cited by the commenters. The remaining categories represent 12 percent of the emissions (approximately 67,314 tons) and account for 12,702 tons of the anticipated VOC emission reductions from the architectural coating rule (II-I-8). The EPA considers this a significant amount of VOC emissions and reductions. To put this in perspective, if the EPA combined these categories of coatings into a separate category, that category would rank 16th out of the 21 categories of all consumer and commercial products listed for regulation under section 183(e) (on the basis of tons of VOC emissions per year in nonattainment areas). As with all categories of consumer and commercial products, even if no one product has an enormous amount of VOC emissions, the EPA is concerned with the total aggregate amount of emission reductions. By their very nature, individual consumer and commercial products may not have a large impact on ozone nonattainment, but in the aggregate, their impact is significant. This fact was one of the motivations behind Congress' enactment of section 183(e) of the Act.

In developing the proposed rule, the EPA recognized that it may not be economical for some manufacturers to reformulate certain lower volume products. Rather than exempting these lower volume products, the EPA proposed VOC content limits in the upper range of VOC content limits in existing State rules for these

categories. For categories for which no State standards exist, the EPA included the categories in the architectural coating rule and proposed VOC content limits based on discussions with industry representatives and end user groups, petitions from stakeholders prior to proposal, and public comments from companies providing support for inclusion of the categories and a suggested VOC content limit. Some manufacturers within these niche markets have successfully developed lower VOC coatings in anticipation of VOC requirements. Therefore, rather than exempt these types of products, the final rule includes VOC limits at levels expected to be in the upper range of VOC contents for the particular type of product. The final rule also provides compliance flexibility for these types of low-volume coatings in the form of a tonnage exemption and an exceedance fee. The tonnage exemption is designed to accommodate a limited amount of niche category coatings for which it may not be economical for manufacturers to devote any reformulation efforts. In addition, the exceedance fee provides manufacturers additional time to reformulate their coatings by allowing the manufacturer or importer the option of paying a fee, based on the amount that the VOC content limits are exceeded, instead of achieving the limits in the rule.

Comment: One commenter (IV-D-23) requested an exemption for coatings that are essentially 100 percent solids and have only a negligible VOC content. The composites manufactured by this commenter are used to reinforce or improve the strength of concrete and metal and to improve resistance to abrasion, corrosion, and chemical attack. The commenter stated that regulating these products as coatings creates the compliance burden of testing, labeling, and reporting with no impact on reducing VOC emissions.

Response: The EPA has not created an exemption for coatings that are essentially 100 percent solids and have only a negligible VOC content. The EPA recognizes the concern of the commenter that in some cases a regulatory burden could be imposed on an architectural coating manufacturer that would not result in

any VOC reductions. However, for manufacturers of products that already comply, this burden would be limited to the following two compliance requirements: (1) a one-time initial report identifying the company and the product categories in which the compliant products are marketed, and (2) labeling that reflects the date of manufacture and either the VOC content of the coating or the applicable VOC content in table 1 of the rule with which the coating is required to comply. This limited reporting and labeling burden is necessary to ensure effective enforcement and to limit the need for enforcement personnel to follow-up with manufacturers to obtain additional product information on unlabeled coatings. Testing of the coating is not required in the rule; the manufacturer or importer may use other means for predicting the VOC content of the coating. (However, the Administrator may request that manufacturers and importers demonstrate compliance using Method 24.) Based upon the commenter's representation as to the VOC content of its products, the EPA believes that the commenter will have only a limited burden under the rule.

Comment: One commenter (IV-D-120) argued that coatings that do not meet the definition of any specific category should not be subject to the final rule. The commenter stated that, as proposed, the rule provides that a coating not included in a specific category will default to the category with the most restrictive limit (i.e., the flat or nonflat category depending on its gloss level). According to the commenter, coatings not in any existing category are typically very low-volume specialty coatings with insignificant aggregate amounts of VOC emissions. The commenter argued that if these coatings must be covered by the rule, then they should be subject to the highest VOC content limit permissible under the rule rather than defaulting to the lower limits for the flat or nonflat category..

Response: The EPA disagrees that in the event of ambiguity, there should be no VOC limitation whatsoever for a coating. The EPA has attempted to create appropriate categories with specific category descriptions to avoid situations in which it is unclear

what category a coating falls under. As structured, the rule encourages regulated entities to describe and categorize their coatings accurately and minimizes the incentive for regulated entities to subvert the rule by arguing that specific coatings do not meet any of the definitions and, therefore, are subject to the highest VOC content allowed. If the commenter is correct that the coatings in question comprise only very small volumes of sales or small amounts of VOC emissions, the final rule provides alternative means to address this issue. The manufacturer could use the tonnage exemption or the exceedance fee mechanisms to alleviate potential problems with the situation described. In addition, if the EPA determines that additional categories need to be created in the future, the rule could be modified to add new categories. Such an approach could be appropriate if a category limit in fact imposes undue burden or if the EPA determines that regulated entities are attempting to subvert the rule through abuse of the category descriptions.

Adhesives.

Comment: Two commenters (IV-D-13, IV-D-37) requested that the EPA modify the proposed rule to clarify that adhesives are not regulated under the architectural coating rule. One (IV-D-13) commenter requested confirmation that adhesives used in the application of high pressure decorative laminate (HPDL) counter top products to wood, wood composite, or wood fiber substrates would not be regulated under the proposed rule. The commenter (IV-D-13) stated that the current rule language does not clearly exclude adhesives. Another commenter (IV-D-37) suggested that in order to address ambiguity about adhesives, the EPA should change the definition of traffic marking coating to read as follows: "A coating formulated and recommended for marking and striping streets, highways, and other traffic surfaces including, but not limited to, curbs, driveways, parking lots, and airport runways. It does not include adhesives for traffic marking tape." Alternatively, the latter commenter requested the EPA to use a definition of coating that directly excludes adhesives. The commenter pointed out that many State

and local architectural coating VOC rules already exclude adhesive primers for traffic tapes from architectural coating regulations because they are covered in adhesive rules.

Response: The EPA did not intend to regulate adhesives of any kind in the architectural coating rule. The EPA intends to regulate industrial adhesives as a separate category under section 183(e) authority at a future date. To clarify that adhesives are not covered under the architectural coating rule, the EPA has modified the definition of architectural coating in the final rule to exclude adhesives. In addition, a definition for adhesives has been added to the rule.

Shop vs. field application.

Comment: One commenter (IV-D-17) recommended that the EPA clarify the rule to distinguish between field-applied and factory-applied coatings. The commenter recognized that the definition of architectural coating makes it clear that the rule is applicable only to field applied coatings, but suggested that this distinction should be made more apparent in the rule by changing the title of table 1 to "Field Applied Architectural Coating Volatile Organic Compound Content Levels."

Response: The definition of architectural coating has been modified and a definition for shop application has been added to the final rule to clarify that coatings recommended for application in a shop setting or a manufacturing process are not subject to this rule. Rather than modifying the title of table I as suggested by the commenter, to further clarify the EPA's intent, the following sentence has been added to the definition of architectural coating:

> This definition excludes adhesives and coatings recommended by the manufacturer or importer solely for shop applications or solely for application to non-stationary structures such as airplanes, ships, boats, and railcars.

Comment: One commenter (IV-D-35) requested that the definitions of architectural coating and industrial maintenance coating be clarified to exclude industrial specialty products. The commenter implied that its industrial specialty products do

not fit within the EPA's intended definition of "architectural coating" and, therefore, should not be regulated under the architectural coating rule. The commenter provided the following three examples of such specialty products:

(1) 438 Teflon non-stick dry lubricant - A field-applied suspension of solid lubricant (polytetrafluoroethylene) bound to the surface with a binder (acrylic resin). Used to lubricate and protect smooth, nonporous surfaces to repel water, prevent materials from adhering to surfaces and reduce relubrication. Used on slides, hoppers, bins, chutes, tanks, molds, saw blades, door hinges, etc. Primarily sold in 1 gallon containers, but is also available in aerosol containers for maintenance purposes. Volatile organic compound content = 756 g/l.

(2) 763 Rust transformer - Electrochemically converts iron ions in rust into a receptive base for the application of a primer and topcoat. Consists of phosphoric acid, tannic acid, alcohol, and glycol in a water base. Used on storage tanks, auto or truck bodies, heavy equipment, bridges, transmission line towers, ships, piers, structural steel, anywhere rust is destroying metal. Primarily sold in 5 gallon or 55 gallon drums.

(3) 775 Moisture shield - A field-applied suspension of wax that forms a nonhardening, nondrying film used to shield metal from oxygen and moisture. Contains petrolatum (a petroleum wax, i.e., Vaseline) and a mineral spirit/naphtha-type solvent. Used on electrical equipment, electric motors, and other energized equipment, particularly low voltage equipment. Primarily sold in 1 gallon containers and is also available in pressurized aerosol containers for maintenance purposes. Volatile organic compound content = 678 g/l.

Response: It is not appropriate to exempt all industrial specialty products from the rule. In order for a product to be covered by the architectural coating rule, it must be a coating and it must be recommended for field application to stationary structures and their appurtenances, to portable buildings, to pavements, or to curbs. A coating is defined as a material applied onto or impregnated into a substrate for protective, decorative, or functional purposes. Typically, coatings are made up of resins, solvents, binders, and pigments. The EPA historically has not considered products that contain only

solvents, acids, and or bases to be coatings. This clarification has been made in the definition of coating in the final rule. The EPA also generally does not consider products that function wet and remain a wet film during their entire functional lifetime to be coatings.

The EPA considers the 438 teflon non-stick dry lubricant to be a coating because it is a material applied onto a substrate for protective and functional purposes. The EPA also considers the product to be an architectural coating because it is used on the appurtenances of stationary structures such as hoppers, bins, and tanks. Specifically, the product would be classified in the industrial maintenance coating category, due to its exposure to repeated heavy abrasion, and would be subject to a VOC content limit of 450 g/l.

The EPA does not consider the 763 rust transformer to be a coating because it is composed only of solvents and acids. Therefore, this product would not be covered under the architectural coating rule.

The EPA does not consider the 775 moisture shield to be a coating because it remains wet throughout its functional lifetime. The functionality of this product is similar to that of heavy oils used to protect metal from rust during storage and shipment, which historically have not been considered by the EPA to be coatings for regulatory purposes. Therefore, the determination that the moisture shield is not a coating is consistent with other EPA actions.

Applicability determinations for products not specifically addressed in response to public comments summarized in this document will be made by the EPA Regional Office responsible for implementation and enforcement on a case-by-case basis so that the particular composition and functionality of the product and application involved can be considered.

Comment: One commenter (IV-D-140) questioned the applicability of architectural coating rule requirements to a line of vermiculite products, including MicroLite vermiculite dispersions. The commenter represented MicroLite as an aqueous

dispersion of vermiculite that is a mostly inorganic, non-metallic, naturally occurring mineral. The commenter noted that there may be trace levels of citrate, but no other organic content. The products are not intended for use as architectural coatings and they are not applied directly to architectural structures. However, the products may be applied for fire retardant purposes to textiles that then are used as a mastic or facing material for an architectural structure. Specifically, the commenter inquired whether these products were required to meet architectural coating labeling requirements.

Response: Based on the commenter's description, these products would not be subject to the architectural coating rule requirements since the products are not intended for use as architectural coatings and are not applied directly to architectural structures.

Comment: One commenter (IV-D-76) asked whether the rule will exempt solvents such as acetone and methyl siloxanes.

Response: The architectural coating rule controls emissions of VOC from architectural coatings. The definition of VOC in the rule cross-references the VOC definition in 40 CFR 51.100. The current definition of VOC in 40 CFR 51.100 exempts acetone and methyl siloxanes. Therefore, these compounds are not regulated by the architectural coating rule.

Comment: One commenter (IV-D-189) expressed concern that the proposed rule provided no exemption for coatings that are registered under the FIFRA. The commenter stated that these coatings, to the extent that they are inconsistent with the national rule's requirements, will have to go through another FIFRA registration incorporating the requirements of the national rule. Because of the length of time and complexity of getting FIFRA registration, the commenter recommended that a provision exempting coatings for which a FIFRA registration has been applied be included in the final rule. To accomplish this exemption, the commenter recommended that the following be added as § 50.400(c)(6):

(6) Until an amended registration is complete, the provisions of sections 59.400-407 shall not apply to any coating currently registered under the Federal Insecticide, Fungicide, and Rodenticide Act (7 USC 136 et seq.) for which an amended registration is filed, provided the following conditions are met:

(i) Within 6 months after the promulgation of this rule, the registrant or manufacturer has filed a complete application for an amendment to the registration with all formulation, labeling, and all data requirements necessary to amend the registration and needed to meet the VOC content limits prior to the date the VOC limits become effective.

(ii) Proof of such filing is submitted to the EPA within one month of the date of the filing.

(iii) All responses to the EPA's requests for additional information (or changes to the label or other information requiring another submittal) must be submitted within 90 days of the EPA's request.

This exemption becomes void and the previously exempt products can no longer be manufactured nor imported if the registrant fails to complete all conditions shown above and/or when the EPA turns down the amendment application.

Response: For coatings that are registered under FIFRA for which the manufacturer or importer must obtain an amended FIFRA registration incorporating the requirements of this rule, the final rule provides a compliance period of 18 months after promulgation of the rule; this is six months longer than the compliance period for all other architectural coatings. In the decision to allow the 18-month compliance period, the EPA considered the commenter's suggestion to allow 6 months after promulgation of this rule to submit a completed application for FIFRA registration for coatings subject to FIFRA. The EPA believes that the 18-month compliance period provided for coatings subject to FIFRA allows adequate time for the entire FIFRA submittal and approval process for obtaining an amended registration for these coatings before they become subject to the architectural coatings rule. The manufacturer or importer may be required by enforcement personnel to provide proof that an

application for an amended FIFRA registration is being filed or has been filed.

Import/export.

Comment: One commenter (IV-D-189) was concerned about the proposed wording of the exemption of exported coatings in § 59.400(c)(1) of the rule. The commenter stated that by requiring that the coating be manufactured exclusively for export, the exemption would not apply to situations in which Congress intended it to apply. For example, the commenter asserted that a manufacturer might produce a coating both for export as an architectural coating and for distribution in the United States for a purpose other than that of an architectural coating. The commenter believes that a strict reading of the exemption terms in the proposal would disqualify this product from the exemption. The commenter recommended deleting the word "exclusively" from § 59.400(c)(1) of the proposed rule.

Response: The EPA recognizes the commenter's concern that manufacturers should be able to export a coating for use in architectural coating markets abroad and still market that same coating for alternative purposes in the United States. In recognition of this possible scenario, the EPA has amended the exemption provision in § 59.400(c)(1) of the rule as follows: "(1) A coating that is manufactured for sale or distribution to architectural coating markets outside the United States; such a coating must not be sold or distributed within the United States as an architectural coating."

The EPA does not anticipate that many products will qualify for this disparate treatment abroad and domestically. If the EPA determines that this exemption is abused as a means of subverting the regulation, the EPA will re-examine this question.

Comment: One commenter (IV-D-28) requested that the EPA clarify what is meant by "imported for sale or distribution in the United States." Specifically, the commenter asked how the rule applies to the non-contiguous States, Puerto Rico, Virgin Islands, District of Columbia, Guam, and American Samoa. The commenter pointed out that narrow definitions would leave

loopholes allowing non-compliant products in the United States by circuitous channels.

Response: It is the EPA's intent that the rule will apply not only in the 50 States, but in all the U.S. territories as well. The definition of "State" in section 302(d) of the Act, which provides definitions that are generally applicable in the Act, includes U.S. Territories. To make this clear, a definition of United States has been included in the final rule.

Comment: One commenter (IV-D-21) questioned how the proposed rule affects coatings sold to domestic customers who resell them to other countries. Specifically, the commenter wanted to know if high VOC products could be invoiced and shipped to domestic purchasers as long as they were marked for export. Also, the commenter asked what will be required for export marking.

Response: There are no labeling or certification requirements for architectural coatings that are exported for use outside the United States. However, because enforcement of the architectural coating rule is expected to include shelf checks of coatings, it may be advisable for a manufacturer to label products intended for export as such. This would minimize the paperwork that a manufacturer would have to produce to show that these products are intended for export, if the product were to be checked by an EPA inspector. Similarly, for the situations described by the commenter where a manufacturer invoices and distributes non-compliant products to domestic points for subsequent export, it is advisable to include labeling or at least paperwork identifying these products for export. In this way, enforcement personnel can readily identify that the architectural coating rule does not apply to these products. As stated earlier, if the EPA determines that the exemption in § 59.400(c)(1) of the final rule is abused as a means of subverting the regulations, the EPA will re-examine this question.

Comment: Two commenters (IV-D-28, IV-F-1b) supported provisions that would explicitly exempt stocks of non-compliant

products manufactured prior to final rule promulgation. One commenter (IV-F-1b) favored allowing such products manufactured prior to the compliance date to be sold after the compliance date. The commenter believed there is no real air pollution benefit to outlawing these products and there is a tremendous economic and waste disposal savings by not prohibiting their sale.

Another commenter (IV-D-28) pointed out that the rule may cause certain coatings to become obsolete. In addition, stocks of multi-component non-compliant products may need to be rebalanced (replenished) if more of some components are available than others. The commenter suggested that the rule allow manufacturers to donate obsolete stock to charitable projects and to allow manufacturers to replenish existing non-compliant stock volumes of multi-component products. The commenter suggested that the EPA could implement a procedure for manufacturers to notify the EPA of their intent to replenish stocks of components for non-compliant coatings. To prevent deliberate misuse of such a provision, the commenter suggested that the replenishing could be limited to less than 20 percent of the remaining inventory of such a coating. The commenter pointed out that this provision would be temporary because stocks of components for non-compliant coatings needing replenishing would fall to zero after a few years.

Response: The rule regulates the VOC content of architectural coatings manufactured or imported on or after the compliance date (1 year after publication of the rule in the Federal Register). Any product manufactured prior to the compliance date, whether compliant or non-compliant, can be sold after the compliance date until the stock is depleted. As the commenters stated, allowing non-compliant products manufactured prior to the compliance date to be sold after the compliance date will provide a significant economic and waste disposal savings.

The EPA does not see the need for a specific provision to allow manufacturers to replenish existing non-compliant stock volumes since the particular components needed to replenish

existing stocks of multi-component coatings can be manufactured after the compliance date of the rule using the tonnage exemption or the exceedance fee provision or both. Similarly, obsolete coating system components such as primers can continue to be sold using the tonnage exemption or the exceedance fee or both. The alternatives suggested by the commenter would be difficult to administer or enforce and would have the potential to delay development of compliant coatings.

Comment: One commenter (IV-D-76) requested clarification on whether States will still be able to enforce VOC content limits that are more stringent than those in the architectural coating rule.

Two commenters (IV-D-188, IV-D-191) requested that the EPA expressly state that the Federal rule establishes a minimum national standard that may be strengthened locally where necessary. One commenter (IV-D-191) noted that the rule should represent a national "floor" and not a "ceiling." The commenter explained that preemption would have a profound negative effect in heavily polluted areas where manufacturers have been accustomed to stricter standards. The commenter explained that in some areas of the country, preemption would prevent attainment of Federal air quality standards mandated by the Act. The commenter asserted that if the EPA intends that the rule be preemptive, it must state this clearly and the EPA must then reopen the comment period.

Response: The architectural coating rule sets minimum national requirements. In areas where State or local regulations are in place or are subsequently developed that are more stringent than the national rule, manufacturers and importers must meet these more stringent levels. The final rule has been amended to include provisions in § 59.410, State authority, to clarify that States are not restricted in establishing and enforcing their own standards. Whether or not there are applicable State rules, the Federal rule applies. The EPA notes that section 183(e) does not provide for preemption of State rules.

2.2.1.2 Low-Volume Exemption

Comment: Twenty-one commenters (IV-D-08, IV-D-26, IV-D-28, IV-D-32, IV-D-74, IV-D-93, IV-D-120, IV-D-147, IV-D-151, IV-D-161/IV-F-1j, IV-D-162, IV-D-176, IV-D-189/IV-F-1o, IV-D-209, IV-F-1b, IV-Ff, IV-F-1i, IV-F-1k, IV-F-1m, IV-F-2q, IV-G-2) provided comments on an exemption for coatings produced in low volumes. The EPA described this potential provision and solicited comment on it in the proposal preamble (61 FR 32741). The EPA described this exemption as a compliance option under which "any manufacturer or importer may request an exemption from the VOC levels in table 1 for specialized coating products that are manufactured or imported in quantities less than a specified number of gallons per year." The EPA specifically requested comment on exemptions ranging from 1,000 to 5,000 gallons. The exemption, as described in the proposal, could be used by a manufacturer for multiple products, provided that each product was manufactured in quantities less than the cutoff level. As described in the proposal preamble, the manufacturer would have been required to submit a request for the exemption and document that the product(s) for which the exemption was requested "served a specialized use which cannot be cost-effectively replaced with another, lower VOC product."

Seventeen commenters (IV-D-08, IV-D-26, IV-D-74, IV-D-93, IV-D-120, IV-D-147, IV-D-151, IV-D-162, IV-D-176, IV-D-189/IV-F-1o, IV-D-209, IV-F-1b, IV-F-1f, IV-F-1i, IV-F-1k, IV-F-2q, IV-G-2) supported some form of a low-volume exemption and four commenters (IV-D-28, IV-D-32, IV-D-161/IV-F-1j, IV-F-1m) opposed a low-volume exemption.

Support low-volume exemption. Suggested levels for the low-volume exemption ranged from 100,000 gallons per product to less than 1,000 gallons per product. Specifically, suggestions were distributed as follows:

Suggested Level	Commenters
100,000 gallons per product	IV-D-176

5,000 gallons per product	IV-D-26, IV-D-93, IV-D-120, IV-D-151, IV-D-162, IV-D-209
<2,000 gallons per product	IV-F-1i
1,000 gallons per product	IV-D-74, IV-D-189/IV-F-1o, IV-F-1k, IV-F-1b
Level not specified	IV-F-1f, IV-F-2q

In addition to per-product exemption requests, two commenters (IV-D-08, IV-G-02) requested an exemption level of 5,000 to 10,000 gallons per category (i.e., the exemption would be based on the total gallons of all of the manufacturer's products in a particular category). One commenter (IV-D-147) requested an exemption level of 7,000 gallons per category stating that to reformulate his company's architectural coating products would be a cost burden because they would need to hire new personnel and little if any growth would be expected in the market. Because large manufacturers can better accommodate this burden due to their laboratory staffs and assets devoted to developing new products, the commenter argued that it is imperative that small businesses be offered some exemption from this rule that is commensurate with their production volumes or units sold in various categories. As an alternative to the low-volume exemption per product approach, the commenter suggested that a low-volume exemption for all categories combined should be considered since it would lessen the amount of recordkeeping and streamline reporting.

One commenter (IV-D-08) stated that the low-volume exemption would benefit both large and small businesses producing specialty coatings. The commenter asserted that this exemption would help prevent the elimination of certain specialty products and enable the introduction and development of new solventborne specialty products. One commenter (IV-D-120) supported the incorporation of an exemption that could be used for those products for which reformulation is not economically or technologically feasible. The commenter argued that this exemption would help to level the

playing field between small niche market producers and large companies, and would likely increase compliance with the rule. The commenter stressed that the exemption should apply to all businesses regardless of size.

One commenter (IV-D-151) requested that if the EPA does not create the categories it requested, that either exceedance fees or a 5,000 gallon per product low-volume exemption be provided as an alternative.

Another commenter (IV-D-93) supported a low-volume exemption, of 5,000 gallons or less (per product implied), but also suggested the exemption could be determined as a percentage of the company's total production. The commenter stated that this type of exemption would allow it to focus on reducing the VOC content of larger volume products while continuing to produce the lower volume products for which reformulation would be more costly. The commenter expected that the EPA would phase out the exemption or reduce it over time.

One small company (IV-F-2q) stated that it manufactures coatings in 10 categories for a total volume of approximately 30 to 40 thousand gallons. The commenter's company picks up the low volume (1 to 200 gallon) orders that larger companies are not willing to fill. The commenter stated that a low-volume exemption would help it maintain its position as a marketer of niche products.

One commenter (IV-F-1i) supported the low-volume exemption as the only practical means for keeping particular small volume products available to customers. The commenter stated that it will not be economical to reformulate these products because the cost is spread over so few gallons. At an exemption level of 1,000 gallons per product, the commenter believed that abuse of this category will be self-limiting because the costs of labels, special manufacturing, inventory, and marketing would prevent cheating. The commenter recommended a level no higher than 2,000 gallons per product with severe sanctions for anyone caught cheating.

Another commenter (IV-D-189/IV-F-1o) supported the low-volume exemption because it would allow certain niche needs to be met without having to resort to a variance or amendment to the rule. The commenter stated that a limit of 1,000 gallons per year would be adequate to meet the requirements of industry while at the same time ensuring that the exemption does not become a large source of additional VOC emissions. Three commenters (IV-F-1f, IV-F-1k, IV-G-2) supported the low-volume exemption as an opportunity to make specialized coatings available. Three commenters (IV-D-189, IV-F-1b, IV-F-1k) emphasized that the exemption should be available to all manufacturers irrespective of their size. One commenter (IV-F-1k) cautioned that there may be additional reporting and enforcement problems inherent in this approach.

One commenter (IV-D-176) believed the suggested level of 1,000 to 5,000 gallons was too low because it would include only those one-person or part-time manufacturers who operate out of their homes and by word of mouth. The commenter believed that it fits the EPA's concept of a small, low volume company operating in a niche market because it is considered by industry analysts and competitors to be a small firm in the hardwood floor finish industry, it employs only 10 employees, and over 90 percent of its sales come from four products. The commenter argued that the EPA should increase the low volume level to cover small, niche market firms that will endure great economic hardship because of the architectural coating rule. It suggested that the EPA consider a low-volume exemption level of 100,000 gallons, which would exclude medium and large sized manufacturers but would include small companies that focus on niche markets.

One commenter (IV-F-2gen) asked whether the proposed low-volume exemption would be based on all of a manufacturer's sales or on the sales of only one of a manufacturer's products. If the exemption is on a per product basis, several manufacturers (IV-F-2gen) indicated that there would be some difficulty in defining a "product." One manufacturer (IV-F-2gen) suggested

that a registered formula could be submitted to the EPA as a means of clarifying what constitutes a product.

One commenter (IV-D-209) requested consideration of a cutoff of 5,000 gallons per product per year. The commenter stated that this is an appropriate cutoff to provide some relief for all manufacturers who sell low-volume niche products for which reformulation is not economically or technologically feasible. Without this provision, the commenter stated that some small niche businesses could go out of business.

One commenter (IV-D-74) who sells more than 500,000 gallons of coatings and mastics per year requested a low-volume exemption for two products: a waterproof masonry product with sales of 796 gallons in 1995, and a coating used to paint exterior metal surfaces for roofing applications with sales of less than 400 gallons per year. The commenter implied that products with this sales volume are the ones for which an exemption is appropriate.

Oppose low-volume exemption.

Four commenters (IV-D-28, IV-D-32, IV-D-161/IV-F-1j, IV-F-1m) opposed the low-volume exemption for specialty niche products because they believe it would provide an incentive for companies to develop purportedly "new" specialty products in order to keep selling non-compliant coatings. One commenter (IV-D-161/IV-F-1j) stated that such an exemption would be subject to abuse if each color of a specific product line could be considered a separate low-volume item and separate names could be created for identical coatings. Another commenter (IV-D-32) stated that since many manufacturers produce individual batches of paint for specific users, this provision could encourage the creation of a specialty coating for each end user resulting in categories such as "horizontal lathe paint," "gantry crane coating," or "paper plant paint." In addition, another commenter (IV-D-161/IV-F-1j) stated that the proposed requirement for the manufacturer to verify that "the product serves a specialized need for which a lower VOC product does not exist" is impractical given that each manufacturer considers its products to be special

and few manufacturers are familiar with all of the products offered by all of the other manufacturers. The commenter stated that if the EPA decides to adopt such a low-volume exemption, the cutoff should be set at a level no higher than 500 gallons to minimize the incentive to use the exemption to circumvent the rule. This commenter stated that a 500-gallon cutoff is still high enough to be of practical use to true specialty niche products. The commenter pointed out that volumes of 1,000 to 5,000 gallons are high enough to include many of the lower volume line items sold by large regional and national manufacturers for which the exemption is not appropriate. According to another commenter (IV-D-28), if there is a bonafide need for such specialty coatings, a variance provision or a rule modification would accommodate these products.

Another commenter (IV-F-1m) stated that the low-volume exemption would not provide any significant relief because so few products are manufactured in the range of one to 5,000 gallons annually.

One commenter (IV-D-32) stated the exemption for low-volume coating categories is not needed and would further weaken the effectiveness of the regulation, which the commenter suggested already contains moderate VOC levels.

Response: Based on the arguments presented by commenters about the need for some type of exemption for very low-volume specialty products for which it is not cost-effective for either the manufacturer or the resin supplier to devote time and resources to reformulation, the EPA believes that some form of exemption should be included in the final rule to accommodate these types of products. Although in the proposal preamble, the exemption was described in terms of a per-product exemption at a level between 1,000 and 5,000 gallons, the EPA considered the potential problems highlighted by commenters with this type of provision and developed a variation on the low-volume exemption approach to include in the final rule. Specifically, the EPA has added a VOC tonnage exemption to the final rule. This approach continues to accommodate the needs of small businesses, niche

markets, and specialty products, as did the proposed low-volume exemption; but it more effectively limits the VOC emissions resulting from the exemption.

Under the VOC tonnage exemption, each manufacturer can exempt a total of 23 megagrams (25 tons) of VOC in the period of time from the compliance date through December 31, 2000; 18 megagrams (20 tons) in the year 2001, and 9 megagrams (10 tons) for the year 2002 and for each year thereafter. Since some corporations have multiple companies and/or divisions, an architectural coatings manufacturer or importer is defined in the rule to mean the parent company and not each individual company, subsidiary, or division. Thus, if a corporation (parent company) has several subsidiaries or divisions that manufacture coatings, only one exemption per parent company will be allowed annually. The EPA believes that this is an equitable way of implementing this provision without sacrificing VOC emission reductions or providing any advantage of large manufacturers over small businesses. For the purposes of the tonnage exemption, the manufacturer or importer calculates VOC tonnage by multiplying the total sales volume in liters by the "in the can" VOC content of the coating in grams per liter of coating <u>including</u> any water or exempt compounds. The "in the can" VOC content must include consideration of the maximum thinning recommended by the manufacturer. In the following examples, g/l (or lb/gal) is an abbreviation for grams (or pounds) of VOC per liter (or gallon) of coating including water and exempt compounds at the manufacturer's maximum recommendation for thinning. For example, under this exemption in the first year a manufacturer could exempt 38,300 liters (10,000 gallons) of a 600 g/l (5 lb/gal) coating.

5 lbs/gallon * 10,000 gallons = 50,000 lbs or 25 tons

<u>Alternatively</u>, a manufacturer could exempt 18,939 liters (5,000 gallons) of an 800 g/l (6.67 lb/gal) coating plus

13,731 liters (3,625 gallons) of a 550 g/l (4.58 lb/gal) coating.

$$[(6.67 \text{ lbs/gal} * 5{,}000)+(4.58 \text{ lbs/gal} * 3{,}625)] = 50{,}000 \text{ lbs or } 25 \text{ tons}$$

Basically, any combination of coatings and volumes can be exempted as long as the total emissions from these products do not exceed 23 megagrams (25 tons) in the time period from the compliance date through December 31, 2000; 18 megagrams (20 tons) in the year 2001; and 9 megagrams (10 tons) in the year 2002 and each year thereafter.

The EPA has established the tonnage limits to exempt no more than 1.5 to 2 percent of the total expected emission reductions from architectural coatings in the first year the standard is in effect. The EPA intends the diminishing size of the tonnage exemption to serve a dual purpose of providing an exemption for niche products yet also provide incentive for manufacturers and importers to achieve VOC emission reductions from their products. The EPA expects that the 9 megagrams (10 tons) per year exemption that goes into effect in the year 2002 will provide continued protection for niche products and adequate flexibility for unforeseen future needs, while effectively limiting emissions due to the exemption of limited amounts. The EPA expects the initial tonnage exemption will allow manufacturers and importers to exempt one to three coatings in quantities up to 27,000 liters (7,100 gallons), thereby accomplishing the intended function of the originally proposed low-volume exemption.

This exemption differs from the low-volume exemption in the proposal preamble in the following ways:

(1) The EPA changed the exemption from a per product basis to a per manufacturer basis. This was done to avoid the difficulty of defining a "product" and to avoid the related potential for abuse by manufacturers in designating products for exemption.

(2) The EPA changed the exemption level from gallons of coating to tons of VOC. This change was made for two primary reasons. First, it provides an incentive for

manufacturers to reduce the VOC content of the coatings for which they claim this exemption. For example, with a 5,000 gallon exemption, the manufacturer could exempt 5,000 gallons whether the product was 850 g/l or 200 g/l. With a tonnage exemption, however, the VOC content in each can of coating counts toward the allotted exemption. Therefore, if the manufacturer reduces the VOC content of the coating it wishes to exempt, more gallons of that coating could be sold under the exemption. Second, the choice of VOC tonnage instead of gallons of coating for the exemption alters the exemption from an unknown loss of emission reductions to a cap on tons exempted per manufacturer. Therefore, this change serves to place an upper bound on the emission reductions that are lost through this exemption, which allows the EPA to better estimate its anticipated impact.

(3) The exemption is reduced over time. The ratcheting down of the tonnage exemption from 23 megagrams (25 tons), to 18 megagrams (20 tons), and then to 9 megagrams (10 tons), provides a strong incentive to manufacturers using the exemption to continue to seek ways to reduce the VOC content of their coatings.

In addition to the tonnage exemption, the EPA has also added several new coating categories to the final rule that address specific groups of specialty coatings that were identified through public comment. The EPA notes that section 183(e) expressly authorized the EPA to use any system or systems of regulation that the EPA deems appropriate to achieve the necessary emissions reductions and to do so with consideration of what constitutes best available controls (BAC). The EPA has concluded that a tonnage exemption is appropriate to meet the objectives of section 183(e), while taking into account factors such as economic and technological feasibility.

2.2.1.3. Small Container Exemption

The proposed rule specifically exempted coatings sold in containers with capacities of 1 liter or less from the requirements of the rule. Ten commenters (IV-D-21, IV-D-28, IV-D-32, IV-D-96, IV-D-185/IV-F-1n, IV-D-189, IV-D-206, IV-F-1b, IV-F-1i, IV-F-1j) provided comments on the small container exemption. Seven commenters (IV-D-21, IV-D-28, IV-D-185/IV-F-1n, IV-D-189, IV-D-206, IV-F-1b, IV-F-1j) supported the exemption,

two commenters (IV-D-96, IV-F-1i) opposed the exemption, and one commenter (IV-D-32) supported the exemption but favored a phaseout of the exemption over time.

Support. According to one commenter (IV-D-206), the exemption will allow small quantities of proven products to remain on the market. Two commenters (IV-D-189, IV-D-206) stated that this exemption is not likely to be abused due to the higher prices and inconvenience of using small quantities.

Two commenters (IV-D-185/IV-F-1n, IV-F-1b) strongly supported the small container exemption because it permits certain useful, low-volume specialty products to continue to exist for which it is not cost-effective or technologically feasible to reformulate. One commenter (IV-D-185/IV-F-1n) asserted that products sold in small containers have a minimal impact on air quality. In addition, the commenter stated that all States that have passed their own architectural coating rules offer a small container exemption and have found it to be a workable and enforceable mechanism.

One commenter (IV-D-21) urged that the small container exemption remain in the rule to allow for unrestricted sale of products by the quart. Another commenter (IV-D-28) supported the exemption of small containers but asked the EPA whether the small containers are subject to the labeling requirements.

Opposition. One commenter (IV-D-96) characterized the small container exemption as a loophole that the EPA should remove. The commenter stated that this provision is currently being taken advantage of in many State architectural coating rules to bypass VOC content limits.

Another commenter (IV-F-1i) stated that the small container exemption will not primarily benefit small businesses since small containers are sold by large retail coating manufacturers. Moreover, this commenter asserted that efficient filling and labeling of small containers tends to be a capital intensive operation that is not really suitable for small businesses and that it is primarily used by large manufacturers.

Sunset provision. One commenter (IV-D-32), in a State (Oregon) with an architectural coating rule, encouraged the EPA to include a future date (e.g., 2002) after which the small container exemption would no longer apply. The suggestion for a "sunset" provision is based on the commenter's observation that small containers of non-compliant coatings are purchased to recover and repair surfaces coated with non-compliant coatings and that in time surfaces will be replaced with compliant coatings so that the need for the non-compliant coating will decrease to zero.

Response: The EPA has retained the small container exemption in the final rule to provide compliance flexibility to manufacturers. The EPA anticipates that the exemption will allow some coatings to be offered for sale that do not meet the VOC content limits in table 1. Coatings that fall under the small container exemption are not subject to labeling or any other requirement in the architectural coating rule. By not including a "sunset" provision in the rule for the small container exemption, the national rule is more compatible with State rules, which should help coating manufacturers with regulatory planning and compliance. The EPA believes that abuse of the exemption is unlikely due to the higher cost and inconvenience to consumers of using smaller containers. If the EPA determines that the exemption is being abused, the EPA may revisit the issue and modify or remove the exemption from the national rule. Likewise, an individual State may choose to be more stringent and modify its rule to not allow this exemption in areas where there is a need for additional VOC emission reductions.

2.2.2 Processors as Regulated Entities

Comment: In the proposal preamble (61 FR 32737), the EPA requested comment on the possible inclusion of "processors" as a regulated entity. The EPA suggested that "processor" could be defined as "an individual who adds organic thinner to the coating in a commercial/industrial setting at the point of application." This would allow the regulation to prohibit an applicator from using organic solvents to thin a coating beyond the

manufacturer's recommendation, thereby negating some of the emission reductions expected to be achieved by the rule. Eight commenters (IV-D-28, IV-D-32, IV-D-120, IV-D-161, IV-D-162, IV-D-189, IV-D-206, IV-D-213/IV-F-1f) stated that the rule should not regulate processors. One commenter (IV-D-33) supported the inclusion of processors as a regulated entity.

Oppose. Four commenters (IV-D-28, IV-D-162, IV-D-206, IV-D-213/IV-F-1f) stated that it would be difficult to verify or enforce this provision. One commenter (IV-D-206) believed regulation of applicators is unnecessary because thinning is not as widespread as believed. Based on the commenter's experience, most coatings are used directly from the can because most painters are uncertain how products will perform after thinning and do not know how thinning will affect the uniformity of color over large areas. One commenter (IV-D-161) believed that at the proposed VOC content limits, excessive thinning in the field will not occur.

One commenter (IV-D-213/IV-F-1f) stated that the only way a contractor can continue to meet the demands of customers is to have the flexibility of thinning a coating on-site when necessary. The commenter stated that a painting contractor's job is to apply a coating at the optimum consistency. By restricting thinning practices, the commenter asserted that contractors would potentially be exposed to legal liability for non-performance under a contract. In addition, the commenter stated that a decision about which application method to use is oftentimes made at the site considering variables such as temperatures and humidity. It may be necessary to thin the product on-site in order to create an optimum application.

Two commenters (IV-F-1f, IV-F-1m) supported California's position that permits the thinning of coatings in the field under abnormal environmental and application conditions. One commenter (IV-F-1m) stated that the provision was specifically introduced to provide applicators with the ability to apply these coatings under a range of environmental conditions that are not necessarily optimal at all times. One commenter (IV-D-32) noted

that a national rule aimed at controlling VOC at the manufacturing level would minimize the need to regulate downstream parties such as retailers and commercial painters.

One commenter (IV-D-189) recommended that the regulation of end users be handled through State regulations and that the EPA could encourage regulation through its State Implementation Plan approval process. According to another commenter (IV-D-120), large processors, for example, are often regulated by air permits that evaluate the processor's VOC emitting operation and consider whether the surrounding area is nonattainment or attainment. The commenter asserted that small processors are often regulated in nonattainment areas under State or local regulations. For example, independent air quality management districts of California require processors to record VOC emitted during application.

Five commenters (IV-D-28, IV-D-121, IV-D-189, IV-D-206, IV-D-213/IV-F-1f) questioned the legal basis for regulation of end users or applicators ("processors"), stating that section 183(e) of the Act does not apply to end users or applicators as regulated entities. Two commenters (IV-D-189, IV-D-213/IV-F-1f) stated that Congress intended the term "processors" to mean entities that repackage coating materials or further enhance finished products before they are offered for sale to end users. In support of a similar argument, another commenter (IV-D-213/IV-F-1f) presented the following quote from the House Energy and Commerce Committee report: "The administrator may apply the regulations under this subsection only at the level of the manufacturer, processor, wholesale distributor or importer." The commenter stated that the term "processor" is used in a context that relates to those who are manufacturing or distributing the product but not to those who are using it in the field.

Support. One commenter (IV-D-33) supported expanding the rule's applicability to include large commercial or industrial applicators of architectural coatings ("processors") to guard

against over-thinning with organic solvents and thus exceeding the applicable regulatory limit.

Response: The EPA considered regulating individuals who add organic thinner to the coating in a commercial or industrial setting at the point of application as processors as a means to guard against thinning beyond manufacturers' recommendations. However, the EPA agrees that enforcement of such a provision would be difficult because these coatings are applied at such a wide variety of locations (i.e., not at any set emission points where the EPA can routinely send enforcement personnel). Consequently, the EPA believes that regulation of "processors" will not add significantly to the effectiveness of the rule and, thus, did not include them as regulated entities for the final rule. The EPA notes that in choosing the best system or systems of regulation that is appropriate to achieve reductions, the EPA has examined the capability of enforcement as one factor. The EPA believes that setting appropriate VOC content limits for products is the most feasible means to achieve the objectives of the statute.

In response to commenters' concerns about the need for applicators to be able to add solvent to the coating at the application site, it should be noted that the EPA's rule regulates the VOC content of a coating including any VOC from thinning instructions recommended by the manufacturer. In other words, the rule already allows and accounts for VOC added by applicators in accordance with the coating manufacturer's thinning instructions. It is thinning beyond any manufacturer's recommendation that the EPA was considering devising a mechanism to address. Given the inherent difficulties of policing coating thinning, the EPA concluded that it is better to anticipate thinning and set limits that take into account foreseeable added emissions. However, as noted by commenters, the EPA believes that most users will not over-thin products because it may have adverse product performance effects. In the event that some areas like California need additional controls and assurances,

they may choose to continue to impose their own additional regulations on users.

2.2.3 Definitions

2.2.3.1 General

Comment: One commenter (IV-D-101) asked if coatings used on billboard structures fall in the category of industrial maintenance, graphic arts, flat or nonflat coatings, or some other category.

Response: As stated in the definition of architectural coatings, the rule only applies to coatings "recommended for field application to stationary structures and their appurtenances, to portable buildings, to pavements, or to curbs." This definition excludes adhesives and coatings recommended by the manufacturer or importer solely for shop applications or solely for application to non-stationary structures, such as airplanes, ships, boats, and railcars." Consequently, steel beams or other structural components coated in a shop or manufacturing setting are not subject to this regulation. However, if the coating is applied outside of a shop setting (e.g., to an erected billboard), the paint used to create the billboard or sign itself would be classified as a graphic arts coating. Because the graphic arts coating category specifically excludes coatings used on structural components, the paint used to coat the structural components of the billboard (e.g., the steel beams that support the billboard or sign) would be classified as an industrial maintenance coating. These coatings are high performance coatings used on exterior metal structures and structural components and, therefore, meet the rule's definition of an industrial maintenance coating.

Comment: One commenter (IV-D-101) requested that the EPA identify the category that the following products would fall into: paints for yard furniture, paints for children's metal or wooden wagons, craft paints, and correction fluid (white-out).

Response: Because the rule applies to coatings used on "stationary structures and their appurtenances," coatings applied to yard furniture and wagons would not be covered under the rule

because furniture and wagons are not stationary structures. However, because these types of coatings are rarely marketed for such a limited application and instead may be intended for more general uses (i.e., coating exterior metal surfaces), it is likely that consumers purchasing coatings for these applications would choose a coating for general use on steel or wood. The more general usage coating purchased by the consumer for these applications would likely fall into categories such as rust-preventative, flat, or nonflat coating.

Craft paints and correction fluid are not included in the definition of architectural coatings because these are applied to paper products rather than to stationary structures and, therefore, are not subject to the rule. In addition, containers of coatings that are 1 liter or less and aerosol spray paints are not subject to this rule.

2.2.3.2 Pigmented

Comment: One commenter (IV-D-162) stated that in addition to imparting color, pigments are used to provide corrosion inhibition, conductivity, fouling resistance, opacity, and to improve mechanical properties.

Response: The EPA has expanded the definition of pigmented to include the additional properties of pigments identified by the commenter. Therefore, the definition in §59.401 of the final rule now reads as follows: "Pigmented means containing finely ground insoluble powder used to provide one or more of the following properties: color; corrosion inhibition; conductivity; fouling resistance; opacity; or improved mechanical properties."

2.2.3.3 Lacquers

Comment: One commenter (IV-D-189) suggested eliminating the word "wood" from the definition of lacquer. The commenter explained that limiting this category to only lacquers formulated for use on wood substrates is unnecessary. In fact, the commenter noted that lacquers are used on a variety of substrates where a fast drying, clear, high gloss protective finish is desired. Another commenter (IV-F-1) also asked why the definition of lacquer is specifically limited to wood finishes.

Response: Although the EPA recognizes that lacquers are used on a variety of substrates, the EPA purposefully limited the definition of lacquers to wood coatings because applications on other substrates are covered by other categories. The VOC content limits for the other categories reflect consideration of the need for lacquer application to the non-wood substrates. For example, a lacquer coating used on concrete would need to comply with the VOC content limit for the category that relates to that application (e.g., the concrete curing and sealing category) rather than its resin type (e.g., a lacquer). Consequently, the EPA did not alter the definition of lacquer in the final rule as suggested by these commenters.

Comment: One commenter (IV-D-161) asserted that nonferrous ornamental metal lacquers are a subcategory of lacquers. The commenter proposed reformatting table 1 and showing nonferrous ornamental metal lacquers as a subcategory of the lacquer category.

Response: The EPA does not agree that table 1 should be reformatted to show nonferrous ornamental metal lacquers as a subcategory of lacquers because the category of lacquers is limited to applications to wood. However, to address potential overlap for coatings that meet the definitions of both the nonferrous ornamental lacquers category and another category (e.g., the industrial maintenance category), § 59.402(c) of the final rule has been amended to clarify that the limit for nonferrous ornamental lacquers is meant to apply.

Comment: One commenter (IV-D-161) advocated that the EPA clarify the definitions of lacquers and lacquer stains. The commenter pointed out that although the preamble (61 FR 32739) states that lacquer stains would meet the stain VOC content limit (550 g/l) rather than the lacquer limit (680 g/l), current State regulations require lacquer stains and lacquer sealers to meet the VOC content limit for the lacquers category rather than the VOC content limit for the stain or sealer category.

Response: The EPA included lacquer sanding sealers in the lacquers category because these coatings perform more like

lacquers, whereas lacquer stains function more like semi-transparent stains and, thus, they are regulated under the clear and semitransparent stains category. This is consistent with at least one State's regulation of lacquer stains (A-92-18, II-D-185, IV-E-36). In addition, only one State (Kentucky) architectural coatings rule has a lacquer stain category with a VOC content limit of 550 g/l, which is the same limit as the clear and semi-transparent stain category in the final rule. Therefore, the EPA has added a sentence to the definition of lacquer to clarify that lacquer stains must meet the VOC requirements for stains rather than lacquers.

2.2.3.4 Quick-dry Enamel

Comment: Two commenters (IV-D-189, IV-F-2) recommended that the EPA modify the definition for "quick-dry enamel" by removing the requirement that the dry film must have a gloss of 70 or above on a 60 degree meter (measures the specular reflectance of the paint at a 60-degree angle). One commenter (IV-D-189) argued that the primary criterion for a coating to be considered a quick-dry enamel is that it is a nonflat coating which meets a specific dry time and, therefore, the gloss requirement is unnecessary.

One manufacturer (IV-F-2) was concerned because it has a low-VOC quick-dry enamel that does not have a gloss of 70 or higher as required in the quick-dry enamel definition. Another commenter (IV-F-2) stated that the gloss restriction had been removed from State regulations. The commenter asked the EPA to explain why it included this restriction in the proposed rule.

Response: The EPA has not removed the 70 or above gloss restriction in the definition of "quick-dry enamel" as requested by the commenters. Because this category is expected to be used by manufacturers to sell nonflat enamels that do not meet the 380 g/l VOC content limit for general nonflat coatings, the EPA asserts that it is important to limit the quick-dry category to coatings meeting both high-gloss and quick-dry criteria to restrict the use of the category to situations where the consumer desires both of these properties. The proposed definition is

consistent with all but one of the existing State architectural coating regulations that the EPA reviewed that recognize this category. During a recent analysis of a 1995 paint characterization study conducted by Harlan and Associates (IV-J-16), the nonflat coatings portion of the study showed that most coatings labeled as quick-dry enamels really did not meet the dry times according to ASTM D1640 and other performance tests. However, recent resin development work has resulted in high quality, acrylic, high-gloss coatings with quick dry times (IV-J-16). Coatings that do not meet the film gloss of 70 or more would be subject to the nonflat coating VOC content limit of 380 g/l.

2.2.3.5 Traffic Marking Coating

Comment: One commenter (IV-D-189) pointed out that the addition of a zone marking category would necessitate removing references to driveways and parking lots from the definition of traffic marking coating.

Response: The references to driveways and parking lots have not been deleted from the definition of traffic marking coatings because traffic marking coatings sold in containers of more than 5 gallons would be subject to the traffic marking VOC content limit of 150 g/l. The EPA has established a separate category for zone markings and the following definition has been added to the definitions section of the final rule: "Zone marking coating means a coating formulated and recommended for marking and striping driveways, parking lots, sidewalks, curbs, or airport runways, and sold or distributed in a container with a volume of 19 liters (5 gallons) or less." Zone marking coatings are restricted to a VOC content of 450 g/l. Coatings for airport runways, driveways, parking lots, sidewalks, and curbs can be either zone marking coatings (if they are sold in containers with a volume of 19 liters (5 gallons) or less) or traffic marking coatings (if the container is larger than 19 liters); so the reference to these areas still appears in the traffic marking coating definition.

2.2.3.6 Sealer

Comment: One commenter (IV-D-161) stated that the proposed definition of "sealer" precludes the use of a sealer as the final coating in a coating system. The commenter supplied two instances where a sealer would be applied as a final coat over other coatings: (1) waterproofing sealers can be the only coating applied to the substrate, and yet by definition these are sealers; and (2) horizontal surfaces like decks, patios, and walkways can be stained and then have a sealer applied to protect the stained substrate from wear. The commenter mentioned a line of semi-transparent stains for concrete patios, sidewalks, and similar surfaces where a sealer is recommended to protect the concrete from damage, wear, and water penetration. The commenter designated this final coat as a sealer. The commenter contended that without a sealer, surfaces will wear unevenly and need reapplication of other coatings. The commenter stated that these coatings are not generally considered varnishes since performance characteristics are a result of the penetration of the material into the stained substrate. The commenter recommended that the definition of sealer be amended to include such uses by adding the phrase "to prevent harm or damage to porous substrates."

Response: It was not the EPA's intent to preclude the use of a sealer as the final or only coating of the system, and the EPA does not believe that the proposed definition suggested this. Therefore, the EPA does not believe it is necessary to add the suggested phrase to the definition of sealer in the final rule.

2.2.3.7 Industrial Maintenance Coatings

Comment: One commenter (IV-D-158) stated that the industrial maintenance coatings category, as proposed, limits industrial maintenance coatings to industrial, commercial, or institutional applications. The commenter maintained that the purpose of this category should be to allow a high performance coating to prevent substrates from degradation when exposed to extreme environmental conditions. Therefore, the commenter suggested changing the industrial maintenance coatings definition so that "acute or chronic exposure to corrosive, caustic, or

acidic agents, or to chemicals, chemical fumes, or chemical mixtures or solutions" and "in industrial, commercial, or institutional situations" are not part of the definition.

Another commenter (IV-D-189/IV-F-10) stated that the reference to industrial, commercial, or institutional situations in the industrial maintenance coatings definition implies that use should be limited to these situations. Instead, the commenter asserted that the use of industrial maintenance coatings should be allowed whenever a substrate needs protection from extreme conditions, regardless of setting. The commenter argued that the preamble and §59.403(b) of the proposal demonstrated that it is not the intent of the EPA to limit the use of industrial maintenance coatings to industrial, commercial, or institutional situations. In addition, the commenter noted that some of the extreme environmental conditions the EPA listed in the definition do not properly represent the conditions for which these high performance coatings have been formulated. Specifically, the commenter recommended that the EPA modify the definition of industrial maintenance coatings as follows to eliminate references to setting and to properly represent conditions for use:

> "Industrial maintenance coatings" means high performance coatings, including primers, sealers, undercoaters, and intermediate and top coats, formulated and recommended to protect substrates from degradation when exposed to one or more of the following conditions:

(revised) 1. Frequent scrubbing or abrading including mechanical wear and repeated cleaning with industrial agents and/or disinfectants;

(new) 2. Steam;

(revised) 3. Continuous or repeated exposure to temperature above 200 ^{o}F;

(revised) 4. Immersion in water or wastewater or chronic exposure of surfaces to moisture condensation;

(revised) 5. Exposure to chemicals such as acids, alkalies, organic solvents, oxidizing or reducing agents, salt spray, or other corrosive materials or

mixtures, including exposure by immersions, splash, spill, or fumes; or

(no change) 6. Exterior exposure of metal structures and structural components.

One commenter (IV-D-183) expressed concern that the industrial maintenance coating category definition is too easy to misinterpret. The commenter added that it is too easy to change one word in the category definition and ban these products from places where they might be needed. However, the commenter was not specific and did not recommend any changes.

Another commenter (IV-D-85) requested that the EPA better define the coating categories and minimize overlap. In particular, the commenter recommended adding: "not to include schools and public buildings" to the definition of industrial maintenance coatings to eliminate any loopholes.

Response: The EPA's intent is to limit the use of these higher VOC coatings to extreme environmental conditions as provided in the definition of industrial maintenance coatings (§59.401) and in §59.405(b). The EPA has therefore maintained the reference to "industrial, commercial, or institutional situations" because these are the settings under which these types of extreme conditions listed in the definition of industrial maintenance coatings are typically found and the commenters did not provide information to the contrary. The EPA intentionally set the proposed VOC content limit for industrial maintenance coatings based on more rigorous performance specifications than those typically needed for residential applications. However, the use of industrial maintenance coatings is not prohibited in residential areas. At proposal, the EPA noted (61 FR 32742) in the discussion of the labeling requirements for containers of industrial maintenance coatings that the use of industrial maintenance coatings was not prohibited in residential settings where extreme environmental conditions are present and for which an industrial maintenance coating would provide the most viable protection. The EPA has amended the industrial maintenance coating labeling requirement

in the final rule to allow greater flexibility. The manufacturer or importer can select from the following statements to comply with the industrial maintenance labeling requirements.

1. "For industrial use only";

2. "For professional use only";

3. "Not for residential use" or "Not intended for residential use"; and

4. "This product is intended for use under the following conditions: (list of conditions from the industrial maintenance coating definition that apply)".

The EPA has reviewed the suggested revision of the industrial maintenance coatings definition that one of the commenters suggested more properly represents the conditions for which these high performance coatings have been formulated. However, the suggested addition of steam as one of the extreme conditions could be interpreted to include bathrooms in residential settings, which the EPA does not intend to include. Also, the extreme environmental conditions listed in paragraph 5 of the suggested revision appear to expand greatly the conditions listed in paragraph 2 of the proposed definition without any technical basis. The suggested revision to the definition includes a change in temperature conditions for application from 250 °F to 200 °F. However, since 200 °F is a temperature condition that may be able to be met by a wide variety of coating types including some interior flat latex paints (A-92-18, Item II-D-165), the EPA believes that this change would not reflect the extreme conditions for which this category was intended. Moreover, the EPA has not added the suggested phrase to exclude schools and public buildings from the definition of industrial maintenance coatings because the EPA believes that schools and public buildings may require the use of higher performance coatings than those typically needed for residential applications. For these reasons, the EPA has determined that no further changes to the industrial maintenance coatings definition are necessary.

2.2.3.8 High Temperature Coating

Comment: One commenter (IV-D-189) suggested that the EPA lower the minimum temperature requirement for the high temperature coating category from 500 °F to 400 °F. The commenter reported that this is the minimum temperature requirement specified in all current State architectural coating rules. The commenter also stated that the current requirement of 500 °F does not reflect current industry consensus on what constitutes a high temperature coating.

Response: The EPA agrees that the minimum temperature requirement for the high temperature coating category should be 400 °F to reflect industry usage and to be consistent with existing State rules and, therefore, has modified the definition of high temperature coating accordingly in the final rule. This change will enhance the compatibility between the national rule and State regulations that should help coating manufacturers with regulatory planning and compliance.

2.2.3.9 Extreme High Durability Coating

Comment: One commenter (IV-D-101) pointed out that the definition of extreme high durability coating at 800 g/l includes only fluoropolymer-based coatings meeting AAMA specification 605.2. The commenter also stated that this excludes other coatings that meet AAMA 605.2, which requires 5 years of south Florida exposure, and have VOC contents in the range of 500 g/l. The commenter also noted that the resin for manufacturing the flouropolymer-based coating is exclusively licensed to three large multi-national paint manufacturers and is unavailable to small companies.

Response: The EPA agrees that other coatings, in addition to fluoropolymer-based coatings, that also meet the weathering requirements of AAMA 605.2, should be classified as extreme high durability coatings. According to follow-up information (IV-E-44), these coatings are used only for touch-up of metal panels that are precoated in a factory setting. During transition from the factory to the field for assembly, the panels are sometimes scratched or chipped and, thus, on-site touch-up is

needed. Therefore, the EPA has expanded the definition of extreme high durability coating in the final rule to include these coatings, as follows: "Extreme high durability coating means an air dry coating, including a fluoropolymer-based coating, that is formulated and recommended for touch-up of precoated architectural aluminum extrusions and panels to ensure the protection of architectural subsections and that meets the weathering requirements of American Architectural Manufacturer's Association specification 605.2, section 7.9."

2.2.3.10 Swimming Pool Coatings

Comment: One commenter (IV-D-101) asked the EPA whether swimming pool coatings could be used on other surfaces. The commenter informed the EPA that the monkey cages at University of California, Davis have been painted with swimming pool paint because they are washed down regularly and are subject to harsh chemicals.

Response: The architectural coatings rule applies to manufacturers and importers of coatings. The manufacturer or importer would determine the applicable VOC content limit for a coating by comparing the recommended uses of the coating to the definitions of the various coating categories in the rule. If the coating is recommended for use on swimming pools and is not recommended for use in other categories, the VOC content limit would be the limit specified for the swimming pool category (i.e., 600 g/l). There is nothing in the rule that would preclude someone from using this coating on other surfaces with similar performance requirements.

2.2.3.11 Reformulation

Comment: One commenter (IV-D-101), who attended the public meeting on August 13, 1996, requested that the EPA clarify the term "reformulation" used during the meeting. To the commenter, reformulation meant adjusting a formula by changing additives, solvents, or pigmentation but using the same resin. In contrast, the commenter believes that any definition of reformulation that contemplates requirements that result in switching resins in the formula constitutes a product ban.

Response: The EPA does not specify a definition of reformulation in the regulation since that term is not used in the regulation. Reformulation can consist of minor adjustments in coating VOC contents or larger adjustments involving a change in resin technology. For purposes of the cost analysis, "reformulation" also includes activities required to place the compliant product on the market, such as: product testing, modifying labels, or changing marketing materials. The adjustments to formulas that are necessary to comply with the VOC content limits for categories in the rule would still result in products that would meet the end use requirements of the categories; therefore, they would not constitute product bans.

2.2.3.12 Shellac

Comment: One commenter (IV-D-25/IV-F-1s) pointed out that the proposed shellac category allows manufacturers to have broader formulation latitude than the traditional definition of shellac. The commenter argued that the broad definition of shellac would enable manufacturers to create and extend the volume of coatings containing alcohol to shellac markets and other end uses. The commenter requested that the proposed definition of shellac be changed to the traditional definition to avoid any VOC emission loopholes. The traditional definition of shellac defines the base resin used in both clear and pigmented shellac formulas as "formulated solely with the resinous secretion of the lac beetle (laccifer lacca), thinned with alcohol, and forms a film by solvent evaporation without chemical reaction." The commenter stated that several States use the traditional shellac definition and several have allowed the use of additional natural resins. The commenter stated that the shellac category was created because its existence was self-defining and self-limiting. The commenter explained that use of the non-traditional definition would result in additional VOC emissions and create market confusion because shellac has been a definable product class for decades. The commenter explained that VOC emissions from shellac remain at constant levels because shellac is available only from a limited

geographic area in Southeast Asia which makes the supply limited, keeps the price high, and limits the uses to odor control, storm sealing, knot and sap streak sealing, and fire damage restoration. If the definition is not changed, the commenter requested that the shellac category be retitled to "Natural resin/alcohol formulations" to avoid label and marketplace confusion.

Response: Although the EPA recognizes the commenter's concern that the definition of shellac in the proposed rule is broader than the traditional definition and, therefore, allows additional natural resins, the EPA has decided to retain the broader definition of shellac in the final rule (with the exception of nitrocellulose resins as noted below). The EPA believes that consumers can evaluate which natural resins (i.e., products that compete with the resinous secretions of the lac beetle) are preferable for specific applications.

The commenter is correct that several States use the traditional shellac definition, but the majority of the State rules reviewed define shellac broadly as a coating "formulated with natural resins." The review of the State rules also revealed that nitrocellulose resins were excluded from several State rules; some State rules also excluded gum resins. The EPA has revised the shellac definition to exclude nitrocellulose resins to avoid overlap with the Lacquer category. As to the commenter's concern that the use of the broader definition would result in additional VOC emissions, the EPA believes that there will be no significant emission increase because many States already use the broader definition for the shellac category.

The commenter also requested that if the shellac definition was not changed, that the category be retitled to "natural resin/alcohol formulations" to avoid label and marketplace confusion. Even though the requested traditional definition of shellac is not being used, the EPA has not retitled the Shellac category. The EPA maintains that "shellac" is the most appropriate term to use to define the category, which includes the resinous secretions of the lac beetle as well as other

natural resins, because this category name is consistent with many State architectural coating regulations. In addition, the term "shellac," in the broader sense of the definition, is so commonly recognized by both homeowners and professional users that the EPA maintains that it may be more confusing to use any other term.

2.2.3.13 Flow Coating

Comment: One commenter (IV-D-26) suggested that the definition of flow coating be expanded to include other forms of flow coatings, such as coatings that are applied to glass windows in cars, residential buildings, and commercial buildings using a flow machine. The commenter noted that window flow coatings are used for the following purposes: (1) reduction of glare, (2) reduction of heat-load on the room/vehicle, (3) reduction of fabric fading, and (4) decorative appearance as these coatings are frequently tinted.

Response: The EPA's flow coating category was created for coatings used by electric power companies to coat the surface of transformer radiators and protect the utility transformer units from corrosion. These coatings must be extensively thinned to allow them to flow down into the radiator and create an even film. Thus, this limited-use category requires a high VOC content level and there is no substitute for this product. The type of coatings described by the commenter, thus, would not be considered a flow coating under this definition. Follow-up information received from the commenter (IV-E-9) revealed that their flow coating is predominantly field-applied to glass windows (including building and automobile windows) by a flow machine, but is sometimes applied in a shop environment. These coatings are translucent liquid coatings used to provide reduction of fabric fading, glare, and heat-load, as well as a decorative appearance (tinted). Later follow-up information (IV-E-9) revealed that very limited quantities are sold in some regulated areas under the small container exemption of State rules. Also, the commenter is currently developing a waterborne formulation and believes it will have a compliant product soon.

Because of different performance requirements and uses for the two types of coatings, the EPA has not expanded the definition of flow coating as suggested.

The architectural coating rule only applies to coatings recommended for application to stationary structures outside of a shop setting and consequently, would not cover coatings intended solely for glass on automobiles or any applications in a shop setting. However, coatings recommended for application to building windows on-site would be considered architectural coatings. These coatings would fall under either the flat or nonflat coatings category with a VOC content limit of 250 g/l or 380 g/l, respectively, or the industrial maintenance category.

Comment: One commenter (I-F-1i) expressed that in the definition of VOC content, the "Ws" term should be defined as "weight of volatiles in grams," not "weight of the VOC in grams."

Response: The definition of VOC content was corrected in the proposed rule on September 3, 1996 (61 FR 46410); the correction notice defines the "Ws" term as "weight of volatiles, in grams." The final rule includes this correction.

2.2.3.14 Overlap Issues

Flow coatings.

Comment: A small manufacturer (IV-F-2g) of flow coatings suggested adding a statement in the final rule that industrial maintenance coatings sold as flow coatings are subject to the limit for flow coatings.

Another commenter (IV-D-151) reported that most flow coatings are industrial maintenance coatings that are thinned by adding 0.5 to 1.5 gallons of solvent per gallon of product and meet the VOC content of 450 g/l based on maximum recommended thinning for spray, airless spray, brush, and roller applications. The commenter explained that once the flow coating category designation is made, the coating is no longer in compliance because the most restrictive VOC content limit applies. The commenter proposed that an exemption be made so that industrial maintenance coatings used as flow coatings would

be subject to the VOC content limit for flow coatings rather than the lower VOC limit for industrial maintenance coatings.

A third commenter (IV-D-162) suggested that maintenance coatings used for flow coatings be subject to the VOC content limit for flow coatings (650 g/l) rather than the limit for industrial maintenance coatings (450 g/l). The commenter explained that extra thinner is necessary to impart required flow properties.

Response: As stated in a previous response, the flow coating category was created specifically to include coatings used by electric power companies to maintain protective coating systems on utility transformer units. Therefore, the EPA intended that flow coatings manufactured for this purpose be subject to the 650 g/l VOC content limit. Therefore, to avoid an overlap of applicability for this category, the final rule clarifies in §59.402(c) that flow coatings that also meet the definition for industrial maintenance coatings are subject only to the VOC content limit for flow coatings.

Antenna coatings.

Comment: One commenter (IV-D-101) asked if primers formulated and recommended for application on antennas were considered to be antenna coatings or primer coatings for purposes of VOC requirements. The commenter explained that some primers are specifically formulated to be transparent to the radio frequency in use. The commenter implied that most of the primers used on antennas that are manufactured by the commenter's company have VOC contents below 530 g/l (the EPA's proposed limit for antenna coatings) but would not meet the general primer category VOC content limit (350 g/l) or the limit for industrial maintenance coatings (450 g/l). Another commenter (IV-F-2) also inquired about primers used on antennas and stated that their antenna primer coatings cannot meet the limits for the primer, sealer, and undercoater categories.

Response: The EPA considers primers specifically formulated and recommended for application to antennas to be subject to the VOC content limit of 530 g/l for antenna coatings because the

specialty needs that antenna coatings have apply to primer and top coat applications. For clarification, the EPA has added the following to the list of exceptions to the most restrictive requirement under §59.402(c): "Antenna coatings that also meet the definition for industrial maintenance coatings or primers are subject only to the VOC content limit in table 1 for antenna coatings."

Floor coatings and varnishes.

Comment: Several commenters (IV-D-07, IV-D-69, IV-D-76, IV-D-85, IV-D-93, IV-D-180, IV-F-1i, IV-F-2 [two public meeting commenters]) requested clarification regarding products included in the varnishes and floor coatings categories and the associated VOC content limits. One commenter (IV-D-85) suggested that the EPA remove the floor coating category and keep all varnishes at the 450 g/l limit in order to eliminate confusion and maintain consistency. The commenter was perplexed that varnishes used as floor coatings would be required to meet a lower VOC content limit than varnishes used in other applications since floor finishes require more abrasion resistance and would be easier to develop within the 450 g/l level.

One commenter (IV-D-76) that produces wood gym floor finishes stated that based on table 1 of the rule, several different coating categories and VOC content limits could apply to its product. The commenter requested the EPA make a determination on the appropriate controls for that product.

Two commenters (IV-D-85, IV-D-93) requested clarification on whether the floor coating category includes clear floor finishes, such as those used on gym floors, or paint (opaque), or both. One commenter (IV-D-93) asserted that only paints could be made to comply with the proposed VOC content limit of 400 g/l for floor coatings.

Another commenter (IV-D-07) indicated that the proposed VOC limit for wood varnishes should be 450 g/l as provided in several State regulations including New Jersey, Texas, Massachusetts, and Metropolitan New York, and that they have developed a new formula accordingly. Two commenters (IV-D-07, IV-D-69) referred to the

clause in the proposed rule requiring a coating marketed in more than one category to comply with the category with the lowest VOC content limit, which would mean that varnishes used on floors need to comply with the limit for floor finishes (400 g/l). The commenters noted that lacquers are given an exemption even though they are used on floors and have a higher VOC content. The commenters suggested either giving varnishes an exemption or inserting the word "opaque" in the floor coating definition to correct the situation.

A small coatings manufacturer (IV-F-2) requested clarification on whether the VOC content limit for floor varnishes will be 400 g/l or 450 g/l. This company stated that it would have a great deal of testing to do if the level is 400 g/l. The commenter indicated that it has marketed a 350 g/l product in California but it was not commercially successful. The commenter stated that a 350 g/l product requires two coats on a refinished floor to get the same gloss and performance as one coat of the 450 g/l product, and that 450 to 500 g/l products provide the best performance. Another manufacturer (IV-F-2) noted that at the 400 g/l level, floor coatings can be applied in coats that are too thick, resulting in coating "skin" and underlying coating that never dries.

Four commenters (IV-D-153, IV-D-161, IV-D-185 and IV-D-189/IV-F-1o) recommended that the EPA modify the rule to clarify that the varnish coating category is meant to apply in situations where a varnish is applied to a floor. As proposed, one commenter (IV-D-189) noted that varnishes recommended for use on floors could be interpreted to be floor coatings and thereby subject to the more stringent floor coating VOC content limit. The commenter stated that the floor coating category, which was created during the regulatory negotiation, was never intended to cover varnishes used on floors. Another commenter (IV-D-161) pointed out that the floor coating category was developed during negotiations as a high performance coating to be used in residential settings in lieu of an industrial maintenance coating, not to encompass all coatings that can possibly be used

on floor surfaces. Another commenter (IV-D-185) stated that varnishes used on floors still need to provide the performance characteristics of other varnishes but with a higher degree of abrasion resistance. The commenter maintained that the current definition of floor coating lacks sufficient specificity and does not address the potential for overlap between floor coatings and varnishes. This problem only became apparent in subsequent State rulemakings, such as in Kentucky, Oregon, and Washington where it has been effectively addressed. According to the commenter, in order to clarify the definition, Kentucky added the word "opaque" to the definition. Alternatively, Oregon and Washington added an exemption paragraph to clarify that the most restrictive limit does not apply to varnishes used as floor coatings.

One commenter (IV-F-2) stated that the rule affects approximately three-quarters of the gym floor products it manufactures. Its products are floor varnishes that under the proposed rule must meet the floor coatings VOC content limit of 400 g/l. The manufacturer stated that this coating should instead be subject to the limit for varnishes, which is 450 g/l.

Two commenters (IV-D-153, IV-D-207) recommended that the definition of varnishes include floor varnishes in the 450 g/l category so the tough, abrasion-resistant varnishes designed for use on floors are not subject to the 400 g/l limit of the floor coating category. One commenter (IV-D-207) stated that a floor varnish must be low enough in viscosity for successful application. Another commenter (IV-D-161) recommended adding the following to §59.402(b): "Varnishes that may be recommended for use as floor coatings shall only be subject to the VOC limit in table 1 for varnishes." The commenter stressed that this recommendation conforms with the rule interpretations industry has been subject to throughout the country.

Four commenters (IV-F-2) suggested adding the term "opaque" to the definition of floor coating. One of the commenters suggested that if this change were made it would no longer apply to clear floor varnishes. One of the commenters suggested that the change would clarify whether a gloss floor paint would be

classified as a floor coating. Two other commenters (IV-D-185, IV-D-189) suggested inserting the word "opaque" into the definition of floor coating and/or adding varnish to the list of exceptions in §59.402(c) in order to eliminate confusion.

One commenter (IV-D-189) also suggested editorially revising the proposed floor coating definition by moving and inserting the phrase "with a high degree of abrasion resistance" after opaque coating. The definition would then read as follows: "Floor coating means an opaque coating with a high degree of abrasion resistance that is formulated and recommended for the application to flooring, including but not limited to decks, porches, and steps."

Another commenter (IV-D-169) recommended that opaque floor paint be regulated at 400 g/l level and varnishes including those used on floors should be regulated at 450 g/l and enamels at 380 g/l. The commenter pointed out that the word "gloss" may be in the name "gloss floor varnish" so it should not be regulated as a nonflat coating at 380 g/l.

Response: The EPA agrees that the floor coating category was not intended to cover varnishes used on floors. Rather, the EPA intended floor varnishes to be subject to the limit for the varnish category. To clarify this intent, varnishes have been added to the list of exceptions to the most restrictive requirement under §59.402(c) as follows: "Varnishes and conversion varnishes that are recommended for use as floor coatings are subject only to the VOC content limit in table 1 for varnishes and conversion varnishes, respectively." Also, the editorial suggestion to move the phrase "with a high degree of abrasion resistance" in the definition of floor coating has been made. In addition, the EPA has added the term opaque to the floor coating definition to further resolve the overlap concerns. With regard to the comments on wood gym floor finishes, these coatings would be subject to the varnishes category with a VOC content limit of 450 g/l.

Anti-graffiti coating.

Comment: One commenter (IV-D-189) recommended that the EPA remove the phrase "specifically labeled as an anti-graffiti coating" from the definition of anti-graffiti coating. Two commenters (IV-D-161, IV-D-189) requested that the EPA add anti-graffiti coating to the list of coatings under § 59.402(b) that are exempt from the most restrictive use provision. One commenter (IV-D-189) pointed out that requiring containers of any architectural coating to be specifically labeled with their architectural coating category designation is redundant. If a coating's use description recommends it for application to a substrate to deter adhesion of graffiti and to resist repeated scrubbing and exposure to harsh solvents, cleaners or scouring agents used to remove graffiti, the use information by itself identifies the coating as an anti-graffiti coating. Consequently, the commenter argued that there is no need to label it as an anti-graffiti coating.

Response: The EPA agrees with the commenter that the phrase "specifically labeled as an anti-graffiti coating" should be removed from the definition of anti-graffiti coating to be consistent with labeling requirements for other coating categories and has revised the final rule to reflect this change. Also, to resolve any overlap issues in categorizing anti-graffiti coatings used as industrial maintenance coatings, the EPA has added anti-graffiti coatings to the list of exceptions to the most restrictive requirement paragraph. This paragraph was added because the EPA did not intend the more restrictive industrial maintenance limit to apply to an anti-graffiti coating that otherwise meets the definition of an industrial maintenance coating.

Comment: Two commenters (IV-D-161, IV-D-189) expressed concern about products that fall into more than one category and, therefore, are subject to more than one VOC content limit. One commenter (IV-F-2b) suggested, for coatings that fall into two categories, that the manufacturer be allowed the option to market the coating in the category with the higher limit. Two

commenters (IV-D-161, IV-D-189) maintained that there is a problem with the proposed wording in §59.402(b). This section stated that the lower VOC content limit applies if "any representation is made that the coating may be suitable for use in more than one of the coating categories...." [emphasis added]. The commenters maintained that this implies the issue of categorization is controlled by "suitability for use" rather than which definition the coating meets. The commenters explained that a coating designated for a particular use could be subject to a more restrictive limit associated with another coating if it is suitable for another use with a lower VOC content requirement. One commenter (IV-D-161) specifically mentioned that a coating could be suitable for use on floor surfaces, but not meet the floor coating definition. For example, a deck stain is categorized as a stain rather than as a floor coating, since the stain does not meet the definition for a floor coating, not having sufficient film build to produce a high degree of abrasion resistance. However, the wording of proposed subsection (b) implies that a deck stain would need to meet the floor coating limit. The commenters (IV-D-161, IV-D-189) recommended the following change to §59.402(b): "...any representation is made that the coating meets the definition of more than one of the coating categories...." The commenters added that each of the exceptions to the most restrictive limit provisions in §59.402(b)(1)-(7) also provides "suitable for use" as the criteria for the exception. The commenters suggested that each of these provisions state either of the following: "...that may also be recommended for use as...," or "...that may also meet the definition for the particular category."

The commenters believed that these changes would alleviate any misunderstanding of the intention of this section and of the interpretation of the appropriate limits for a particular coating.

Response: The EPA's intent is for the coating category definitions to be used to determine which category and VOC content limit is applicable for a given coating. The EPA agrees

that clarification is needed in the proposed § 59.402(b) and has made the following change: "...any representation is made that indicates that the coating meets the definition of more than one of the coating categories listed in table 1 of this subpart, then the most restrictive VOC content limit shall apply." This change clarifies that categorization and the appropriate VOC content limit are controlled by category definition, rather than its "suitability for use" in more than one category. Also, as suggested by the commenter, the wording for the exceptions to the most restrictive limit provision which provides "suitable for use" as the criteria for the exception in § 59.402(c)(1)-(7) of the final rule has been revised accordingly to use more effective language to read "...that meets the definition of ..." or "...that are recommended for use as..." These changes are being made because, as pointed out by the commenters, a coating may be recommended for a particular use, but it may not meet the category definition. For example, varnishes may be recommended for use as floor coatings but they do not meet the final definition of floor coatings (i.e., they are not opaque).

Comment: Four commenters (IV-D-161, IV-D-181, IV-D-189, IV-F-1r) provided comments on categories that overlap. For example, three commenters (IV-D-181, IV-D-189, IV-F-1r) cited the following case where categories overlap and provided the following for §59.402(b) of the rule:

> Bituminous coatings and mastics that may be recommended for use as primers or undercoaters shall only be subject to the VOC level in table 1 for bituminous coatings and mastics.

Two commenters (IV-D-181, IV-F-1r) stated that certain roof surface preparation products, known as "bituminous primers," require a lower viscosity than regular bituminous coatings in order to fill the irregularities of the surface. These commenters requested that the rule clarify that these bituminous roofing products are not regulated under the primers and undercoaters category. One commenter (IV-D-181) cited three reasons for the clarification: (1) roof coatings and metallic pigmented coatings are both defined as "non-bituminous"

materials, (2) bituminous primers was identified as a possible subcategory of bituminous coatings during the regulatory negotiations, and (3) there is no chance that this clarification would be susceptible to abuse because of the nature of bituminous products. Another commenter (IV-F-1r) added that if bituminous primers are classified under the more stringent primer and undercoater limitations, their use would be prohibited. Also, the use of a bituminous primer improves adhesion of the bituminous and other materials placed on top of the primer. This commenter believed that the EPA intended to include all bituminous coatings in their own category and also urged the EPA to add a bituminous "exception" under § 59.402(b).

Another commenter (IV-D-161) provided a list of categories which overlap with the industrial maintenance category when used in industrial, commercial, or institutional settings. The commenter recommended inserting an exception paragraph in § 59.402(b) of the final rule for the following categories: antenna coating, bituminous coatings, high temperature coatings, impacted immersion coatings, thermoplastic rubber coatings and mastics, repair and maintenance thermoplastic coatings, and pretreatment wash primers. The commenter maintained that reformatting table 1 to reflect a subcategorization of the industrial maintenance category will not work since they may be legitimately recommended for use in residential as well as industrial, institutional, or commercial settings. The commenter recommended amending § 59.402(b) as follows:

> Antenna coatings that also meet the definition for industrial maintenance coatings or primers shall only be subject to the VOC level in table 1 for antenna coatings.

The commenter recommended adding clauses for the other overlapping categories except for pretreatment wash primers for which the commenter recommends amending paragraph (b)(6) as follows:

> Pretreatment wash primers that may be recommended for use as primers or that meet the definition for industrial

maintenance coatings shall only be subject to the VOC level in table 1 for pretreatment wash primers.

Response: The EPA agrees that the most restrictive VOC content limit was not meant to apply to these coating categories that were developed for more specific applications in industrial, commercial, or institutional settings (i.e., when a coating meets both the industrial maintenance coating definition and one of the more specific category definitions). Therefore, the EPA has included language in the final rule to clarify its intent. First, the commenter's suggestion for pretreatment wash primers has been incorporated. Second, the EPA has added a new paragraph in §59.402(c)(8) for varnishes to address additional situations where a particular coating is recommended for more than one end use. Third, the EPA has added an exception paragraph (c)(9) for the following categories, which overlap with the industrial maintenance category when used in industrial, commercial, or institutional settings: anti-graffiti coatings, high temperature coatings, impacted immersion coatings, thermoplastic rubber coatings and mastics, repair and maintenance thermoplastic coatings, and flow coatings. (As discussed in a previous response on flow coatings, the Agency has added flow coatings to this paragraph to avoid any possible overlap.) Although not requested by the industry, the Agency has added flow coatings to this paragraph to avoid any possible overlap. Paragraph (c)(9) of § 59.402 in the final rule reads as follows:

> Anti-graffiti coatings, high temperature coatings, impacted immersion coatings, thermoplastic rubber coatings and mastics, repair and maintenance thermoplastic coatings, and flow coatings that also meet the definition for industrial maintenance coatings are subject only to the VOC content limit in table 1 for their respective categories (i.e., they are not subject to the industrial maintenance coatings VOC content limit in table 1).

As discussed in the next comment and response, a separate paragraph has been added in the rule for bituminous coatings and mastics that are recommended for use as any other architectural coating, including primers and undercoaters. Therefore, the commenter's recommended changes for bituminous coatings and

mastics have not been made. As discussed previously, a separate exception paragraph has been added in § 59.402(c) for antenna coatings that overlap with industrial maintenance coatings and primers.

Comment: One commenter (IV-D-161) recommended that the rule clearly state that shellacs, lacquers, and bituminous coatings are shellacs, lacquers, and bituminous coatings by definition and that the VOC content limit for these chemically defined categories should apply rather than any other coating category for which they might also meet the definition. The commenter noted that the definitions for lacquers, shellacs, and bituminous coatings are based on their chemistry while most other definitions are performance, use, and property oriented. Thus, the commenter contended that these categories can essentially overlap all categories because they can perform some specific function such as primers, sealers, quick-dry sealers, roof coating, undercoaters, nonflats, flats, stains, etc.

The commenter argued that reformulation would affect performance of the products and, therefore, they should not have to meet the limits of other categories. The commenter recommended revising § 59.402(b)(2) to read: "Lacquer coatings that may be recommended for use as any other architectural coating shall only be subject to the VOC level in table 1 for lacquers." The commenter suggested that § 59.402(b)(4) be changed similarly. The commenter also recommended adding paragraph (b)(8) to read as follows: "Bituminous coating and mastics that may be recommended for use as any other architectural coating shall only be subject to the VOC level in table 1 for bituminous coatings and mastics."

A third commenter (IV-F-1j) stated that lacquers overlap with other categories such as flats, nonflats, primers, and stains. Another commenter (IV-F-2) also pointed out that lacquers potentially overlap several categories.

Response: The EPA agrees with the commenters that in general the definitions for lacquers, shellacs, and bituminous categories are based on the chemistry of these coatings and can

overlap many other categories in terms of their uses. Therefore, the EPA has revised § 59.402(c)(4) for shellacs as recommended. For lacquers, paragraph (c)(2) has been amended as follows: "Lacquer coatings (including lacquer sanding sealers) that are also recommended for use in other architectural coating applications to wood, except as stains, are subject only to the VOC content limit in table 1 for lacquers." As explained earlier in this section, the EPA has concluded that lacquers used as stains should meet the stain VOC content limit. Exception paragraph (c)(15) has been added to § 59.402 for bituminous coatings and mastics that are recommended for use as any other architectural coating.

Comment: Two commenters (IV-D-161, IV-D-189) were concerned about category overlap when industrial maintenance coatings are recommended for application as floor coatings in an industrial, institutional, or commercial setting. According to one commenter (IV-D-161), the floor coating category was developed during the regulatory negotiation as a high performance category to be used in residential settings in case the industrial maintenance coatings were precluded from use in such settings. To resolve the overlap, one of the commenters (IV-D-189) recommended that the definition of floor coating be amended by adding "in residential situations" in the following manner: "Floor coating means a coating with a high degree of abrasion resistance that is formulated and recommended for application to flooring including, but not limited to decks, porches, and steps in residential situations." The commenter also recommended resolving the overlap by amending proposed paragraph (b)(7) in § 59.402 to read "Industrial maintenance coatings that may also be recommended for use as primers or floor coatings shall only be subject to the VOC level in table 1 for industrial maintenance coatings."

One commenter (IV-D-161) also addressed the overlap issue in the case where an industrial maintenance coating is recommended to cover holes or cracks in an industrial, institutional, or commercial application. This use potentially overlaps coatings in the mastic texture coating category. To resolve this overlap,

the commenter suggested amending paragraph (b)(7) in § 59.402 as follows: "(7) Industrial maintenance coatings that may also be recommended for use as primers or mastic texture coatings or floor coatings shall only be subject to the VOC level in table 1 for industrial maintenance coatings."

Response: Similar to varnishes used as floor coatings, the EPA did not intend that industrial maintenance coatings used as floor coatings be subject to the more restrictive floor coatings VOC content limit. For coatings intended for use in industrial maintenance situations, the higher industrial maintenance coating limit of 450 g/l applies, due to higher performance requirements. The same is true for industrial maintenance coatings intended for use as mastic textured coatings. For industrial maintenance coatings used as floor coatings, the overlap has been resolved as suggested by the commenter by revising the definition of "floor coating" to mean a coating with a high degree of abrasion resistance that is formulated and recommended for application to flooring including, but not limited to decks, porches, and steps in residential situations. For mastic textured coatings, the overlap has been resolved as suggested by amending the exception paragraph as follows in § 59.402(c) of the final rule: "(7) Industrial maintenance coatings that are also recommended for use as primers, sealers, undercoaters, or mastic texture coatings are subject only to the VOC content limit in table 1 for industrial maintenance coatings."

Comment: One commenter (IV-D-171) inquired about the applicable category for a line of concrete waterproofing products that it markets as primers that are applied to a substrate prior to application of self-adhesive waterproofing membranes. This product is typically applied to sub-grade concrete structures and functions as a primer. The commenter explained that the waterproof primers condition the chalky surface of the concrete by coalescing concrete dust prior to application of the membranes. According to the commenter, these primers do not precede subsequent coatings since the waterproof membranes are not coatings. In addition, these primers do not block

efflorescence. The commenter asserted that the definition of sealer is most appropriate based on the function of these waterproofing primers as a surface conditioner.

Response: The information provided by the commenter indicates that these products function as sealers because the coatings fulfill one of the purposes of a sealer listed in the definition, "to condition chalky surfaces," and therefore, appear to be subject to the VOC content limit of 400 g/l for sealers.

Comment: One commenter (IV-D-161) requested that quick-dry sanding sealers that meet the quick-dry primers, sealers and undercoaters category level of 450 g/l be allowed to meet the sanding sealers limit of 550 g/l. According to the commenter, an overlap occurs because sanding sealers usually dry quickly to allow complete surface preparation in the shortest time possible. The commenter recommended the addition of a new paragraph in § 59.402(b) to resolve any possible overlap: "Sanding sealers that also meet the definition for quick-dry sealers shall only be subject to the VOC level in table 1 for sanding sealers."

Response: The EPA agrees that sanding sealers that dry quickly and therefore meet the definition for quick-dry sealers should only be subject to the VOC content limit for sanding sealers at 550 g/l because the sanding sealer category is a specific application for which a higher VOC content is allowed. Therefore, § 59.402(c) has been amended by adding an exception paragraph for sanding sealers to avoid this unintended overlap.

Comment: One commenter (IV-D-161) was concerned that some waterproofing (treatment) sealers may not dry quickly enough to meet the definition requirement for quick-dry sealers and, thus, would be subject to the lower limits. The commenter stated that this is unreasonable since the quick drying characteristic does not reduce the need for the higher VOC content level associated with the waterproofing (treatment) sealer category. The commenter submitted the following new paragraph for § 59.402(b) as a possible solution: "Clear waterproofing (treatment) sealers that also meet the definition for quick-dry sealers shall only be

subject to the VOC level in table 1 for clear waterproofing (treatment) sealers."

The commenter also requested an exception to the most restrictive level for quick-dry primers, sealers, and undercoaters that meet the definition for primers and undercoaters.

Response: The EPA agrees that the most restrictive limits should not apply in situations where a coating is formulated for a specific use, but unintentionally meets the definition of another coating with a more restrictive limit. Therefore, the EPA has amended § 59.402(c) to add exception paragraphs for waterproofing sealers and treatments that also meet the definition for quick-dry sealers; and for quick-dry primers, sealers, and undercoaters that also meet the definition for primers and undercoaters, as recommended by the commenter.

Comment: Two commenters (IV-D-04, IV-D-11) stated that the EPA should publish the proposed coating definitions in the Federal Register and extend the public comment deadline since the proposed rulemaking did not include definitions for the 55 categories of coatings identified for regulation. As a former regulatory negotiation committee member, one commenter (IV-D-04) attested that significant issues surrounded definitions of categories. Another commenter (IV-D-11) stated that different definitions in existing State rules and the proposed rule's categories creates confusion as to what coatings are to be included in a particular category.

Response: At proposal in June 1996, the EPA made the definitions for the coating categories available to the public through the EPA's Technology Transfer Network (TTN) (a network of electronic bulletin boards developed and operated to provide information in air pollution control) and the architectural coating rule docket. Then, on September 3, 1996 (61 FR 46410), the EPA published the proposed regulatory text, including the definitions and on October 8, 1996 (61 FR 52735) extended the public comment period from the original closing date of August 30 to November 4, 1996. The EPA believes that this process gave

notice to all interested parties of the types of issues and concerns the EPA had in developing appropriate categories and definitions. Based on public comments received on the proposed rule, the EPA has revised several definitions in the final rule for clarification. To the extent possible, the EPA has included architectural coating definitions that are consistent with existing State rules.

2.2.4 Coating Categories and VOC Content Limits

The EPA received a variety of comments on the VOC content limits in the proposed rule. The bulk of the commenters targeted specific categories. Some commenters requested that new categories be added to the rule to accommodate specific coatings. In most cases, this type of request was based on the manufacturer's determination that the coating did not fit into one of the proposed coating categories, or the proposed VOC content limit for the category in which the coating fell was not achievable by the particular coating. These comments are summarized in section 2.2.4.2, Requests for New Categories. In addition, some commenters stated that specific categories in the proposed rule should have either lower or higher VOC content limits. These comments are summarized in section 2.2.4.3, Comments on Existing Categories.

In addition to category-specific comments, the EPA received many comments that were more general. These commenters stated in broader terms that the proposed VOC content limits were either (1) appropriate, (2) too stringent, or (3) too lenient. One of these commenters provided an alternative table of VOC limits for 1997 and a table of VOC limits for 2002. These comments are summarized in section 2.2.4.1. Another commenter (IV-D-216) also provided an alternative table of VOC limits for 24 coating categories, which contained two phases, one for implementation nationwide 3 years after promulgation of the rule and another for implementation only in designated ozone nonattainment areas 6 years after promulgation of the rule.

2.2.4.1 General

Comment:

Introduction. Many commenters provided general comments on the overall stringency of the VOC content limits in the proposed rule. Seven commenters (IV-D-28, IV-D-181, IV-D-189, IV-D-206, IV-D-213/IV-F-1f, IV-F-1k, IV-D-185/IV-F-1n) stated that the proposed limits were reasonable and achievable. Thirteen commenters (IV-D-22/IV-F-1a, IV-D-33, IV-D-34, IV-D-96, IV-D-117, IV-D-118, IV-D-119, IV-D-126, IV-D-174, IV-D-188, IV-D-190, IV-D-191, IV-D-215) stated that they did not support the rule because the proposed limits were too lenient and should be made more stringent. Eight commenters (IV-D-12, IV-D-44, IV-D-110, IV-D-115, IV-D-158, IV-D-180, IV-D-192, IV-F-2a) stated that the proposed limits were too restrictive and should be made less stringent. One commenter (IV-D-216) argued that their table of alternative VOC limits represented the most environmentally beneficial, cost-effective, and technologically and economically feasible method for regulating architectural coatings consistent with the requirements of section 183(e) of the Act.

General comments in support of the proposed rule. Seven commenters (IV-D-28, IV-D-181, IV-D-189, IV-D-206, IV-D-213/IV-F-1f, IV-F-1k, IV-D-185/IV-F-1n) stated that the limits in the proposed rule were reasonable and achievable.

Two of the commenters (IV-D-28, IV-D-185/IV-F-1n) stated that the proposed VOC limits represented best available controls (BAC). One of the commenters (IV-D-28), a supplier of industrial maintenance coatings and certain other categories of coatings listed in the proposed rule, pointed out that the EPA has selected BAC based on all available data, State rules, information from the regulatory negotiation, industry inputs, and the EPA's own expertise. The commenter recommended that the EPA maintain the proposed VOC content limits since they were developed using the best available data, given the time and cost restrictions.

One commenter (IV-D-185/IV-F-1n) voiced strong support for the proposed rule. The commenter stated that, for stains,

varnishes, and waterproofing sealers, the proposed VOC content limits would achieve maximum feasible reductions in VOC emissions that are both technologically and economically feasible. The commenter stated that the standards for these categories were tough, but fair, and will allow the industry to continue to produce quality products and to continue to formulate and sell effective products that can provide satisfactory performance. The commenter stated that the proposal struck an excellent balance between the competing perspectives that have been expressed about the feasibility of achieving VOC reductions.

One commenter (IV-D-189), a national trade association representing approximately 500 paint and coatings manufacturers, raw material suppliers, and distributors, stated that the proposal is fundamentally consistent with its position that a national rule must be economically and technologically feasible. The commenter stated that the rule strikes a fair balance between environmental concerns and the need to maintain the economic viability of the industry. The commenter stated that, for the most part, the proposed coating categories are consistent with the recommendations that the organization submitted to the EPA in April 1995. Also, the commenter stated that it appreciated the EPA's proposal of VOC requirements which recognize the need for (and allow the continued use of) solventborne coatings in certain specialty areas, as well as in some more general usage categories such as industrial maintenance, floor coatings, rust preventative coatings, concrete protective coatings, and nonflat coatings. The commenter stated that the rule adequately addresses the fact that the same architectural coating must be able to perform in all regions and climates of the United States.

Another commenter (IV-D-213/IV-F-1f), representing a national association of coating users, stated that the proposed table of standards would not be disruptive for the majority of the coatings its members are using. The commenter stated that the organization has a membership of over 3,000 professional coating contractors and that every coating that is on the market is used by some of its members. The commenter stated that the

proposed table of standards fit squarely within current technologies and is consistent with various existing State regulations. The commenter stated that further reductions in the VOC content limits would adversely affect coating performance and could ultimately result in more VOC emissions due to a shorter coating lifetime.

One commenter (IV-D-206), representing a national trade association with a membership of over 180,000 architectural coating users, stated that the proposed table of VOC content limits will not significantly increase construction costs and will not appreciably reduce coating performance. The commenter maintained that the limits for interior and exterior nonflat alkyd trim paint, and many other coatings, are as low as they can be without adversely affecting performance.

General comments opposing the proposed rule -- too lenient. Thirteen commenters (IV-D-22/IV-F-1a, IV-D-33, IV-D-34, IV-D-96, IV-D-117, IV-D-118, IV-D-119, IV-D-126, IV-D-174, IV-D-188, IV-D-190, IV-D-191, IV-D-215) stated that they did not support the proposed rule because the VOC content limits were too lenient and, therefore, do not represent BAC.

One commenter (IV-D-190) explained that the EPA's determination of BAC does not reflect the substantial developments in paint and coatings technology since 1990. The commenter quoted public hearing comments indicating that raw material suppliers and large paint companies have developed new low-VOC technologies and maintained that the EPA has not asked these companies exactly what their capabilities are. The commenter stated that the dominant companies are abandoning low-VOC coating development since existing products already comfortably satisfy the proposed VOC content limits. The commenter asserted that the Act imposes a duty on the EPA to identify systematically these lower-VOC technologies. Another commenter (IV-D-191) stated that the data the EPA used to determine BAC is outdated. The commenter stated that cost-effective technologies currently exist in just about every category that have significantly lower-VOC contents than those

proposed by the EPA. Both commenters (IV-D-190, IV-D-191) pointed out that the EPA stated in the preamble to the proposal that "EPA was aware of numerous examples of low VOC systems which perform better than the traditional higher VOC systems."

Two commenters (IV-D-33, IV-D-215) claimed that the proposed rule reflects the status quo, and manufacturers will merely continue to produce and sell products at existing VOC content.

Nine of the commenters (IV-D-22/IV-F-1a, IV-D-33, IV-D-34, IV-D-96, IV-D-126, IV-D-174, IV-D-188, IV-D-190, IV-D-191) cited the existence of more stringent State and local architectural coating regulations that have been in place for many years as evidence that the proposed limits are not BAC. One commenter (IV-D-22/IV-F-1a) noted that over 170 manufacturers are already meeting tighter standards that have been in effect for almost a decade in most metropolitan areas of California, as well as several other States [no reference cited]. One commenter (IV-D-34) pointed out that the technology assessments published for the 1989 Suggested Control Measure (SCM) by the California Air Resources Board (CARB) and the California Air Pollution Control Officers Association (CAPCOA) indicated the availability of coatings in various categories that are below the proposed limits. One commenter (IV-D-33) pointed out that several air quality management districts in California have stricter limits and manufacturers have complied with these limits for years.

One commenter (IV-D-191) stated that the proposed rule represents a "least common denominator" approach to rulemaking and fails to set standards at levels that will move the industry forward sufficiently to reduce the VOC content of coatings.

Several commenters (IV-D-22/IV-F-1a, IV-D-96, IV-D-174) stated that the rule does not obtain the VOC reductions that are achievable, falls short of State VOC reduction goals, and may result in States adopting more stringent control measures for this source category. One commenter (IV-D-22/IV-F-1a) stated that State rules may have differing requirements, leading to the administrative, technical, and marketing problems the EPA hoped to avoid with a Federal rule. Two commenters (IV-D-22/IV-F-1a,

IV-D-174) added that because the rule is less stringent than existing State regulations, it may force them to seek VOC controls on other source categories that may not be as cost-effective.

One commenter (IV-D-22/IV-F-1a) provided an alternative table of VOC content limits with more stringent limits for several categories that would achieve a 30 percent reduction on a solids basis. The commenter stated that the more stringent VOC limits were based on the 1989 CARB Suggested Control Measure. The commenter also omitted several specialty coating categories that it deemed to have unenforceable definitions and readily available low-VOC alternatives. The commenter stated that the more stringent levels represent BAC and, therefore, should be reflected in the rule. (The commenter also suggested a second phase of VOC limits that would take effect in the future. For comments and responses regarding the suggested second phase of VOC limits see section 2.6). Six commenters (IV-D-33, IV-D-34, IV-D-117, IV-D-118, IV-D-126, IV-D-215) supported the more stringent VOC limits presented by commenter IV-D-22/IV-F-1a and stated that they are a fair and responsible compromise based on achievable limits. The commenter (IV-D-22/IV-F-1a) stated that if the EPA adopts the proposed standards in table 1 of the rule, almost all State and local agencies will accept the national rule as a sufficient level of control rather than seeking more stringent limits.

General Comments Opposing The Proposed Rule -- Too Stringent. Nine commenters (IV-D-12, IV-D-44, IV-D-110, IV-D-115, IV-D-158, IV-D-175, IV-D-180, IV-D-192, IV-F-2a) stated that the VOC content limits in the proposed rule were too restrictive and should be made less stringent. These commenters stated that the limits should be raised because low-VOC products (i.e., products meeting the proposed standards) do not perform as well as higher (non-compliant) VOC products.

One commenter (IV-D-110) stated that raw material suppliers are working diligently to provide new technology to paint manufacturers to re-develop products. However, at this point,

the commenter claimed that it has not been able to achieve the quality, durability and pricing to replace these products. Another commenter (IV-D-115) concurred that available paint raw materials are not adequate to reformulate every non-compliant coating the paint industry offers and still meet performance requirements. The commenter expressed concern that emission limits on high-quality protective coatings that are too strict would prohibit their production and use. The commenters (IV-D-110, IV-D-115) did not cite any specific coating categories for which reformulation was not achievable or adequate to meet performance needs, but rather argued their points in general terms.

Two commenters (IV-D-12, IV-D-110) questioned the performance characteristics of low-VOC coatings. One commenter (IV-D-12) recommended that the coatings industry conduct further performance studies. The commenter indicated that its laboratory experience with low-VOC coatings shows that they are usually thick and that the formulas would require considerable thinning to apply. The commenter further maintained that over-thinning is a frequent problem with many contractors, which can have several consequences: coatings that dry too fast, increased runs and drips, shortened shelf life due to the settling of heavier pigments, effects on opacity, and may cause polymerization. The commenter recommended that the rule require manufacturers to produce paint that is pre-thinned and ready to apply to solve issues associated with over-thinning. Also, the commenter explained that using low-VOC coatings would be counterproductive if the use of the coatings result in more emissions due to more coatings applied, more thinners needed, and more frequent applications required. Another commenter (IV-D-180) added that when establishing VOC content limits, the EPA should consider that higher-VOC coatings that only require a single application could result in less total VOC emissions than using a low-VOC coating that does not perform as well.

A small coatings manufacturer (IV-F-2a) with 13 employees and $6 million in sales stated that they do not know how they

could reformulate the 40 percent of their coatings that do not meet the proposed limits since any changes they make will affect the coating performance. Currently the coatings they sell in areas with architectural coatings regulations (e.g., regulated areas of New York and New Jersey) do not perform as well as their other coatings and contain more long oil alkyds with poor gloss properties.

One commenter (IV-D-158) stated that the proposed rule would require a massive reformulation of products in the paint and coating industry. The commenter claimed that some organizations were supporting lower limits based on improper data or based on environmental conditions which do not represent circumstances in other areas.

One commenter (IV-D-216), representing an organization of local and regional coating manufacturers, submitted an alternative national rule for architectural coatings, which included a table of VOC content limits for 24 coating categories. The table contained one phase of VOC content limits for nationwide implementation 3 years after promulgation of the regulation and another phase for implementation only in designated ozone nonattainment areas 6 years after promulgation of the regulation. The commenter stated that its approach would treat people equally, address the demands of section 183(e) of the Act, and allow the forces of supply and demand to run the market. The commenter argued that implementing its first phase of VOC content limits would reduce VOC emissions from architectural coatings nationwide by 18 percent, and implementing the second phase would reduce emissions in designated nonattainment areas by 32 percent. The commenter asserted that its approach promoted reformulation, rather than substitution, and therefore, it is the most effective system for obtaining VOC emission reductions. The commenter maintained that its approach addressed the substitution problem by establishing emission limits that are achievable through reformulation using current technology.

Response: The EPA believes that the final rule represents best available controls (BAC). The Act defines "best available controls" as "the degree of emissions reduction that the Administrator determines on the basis of technological and economic feasibility, health, and energy impacts, is achievable." The statute thus explicitly authorizes the EPA to take into consideration various factors and to exercise its discretion to choose achievable VOC content limits. In developing the rule, the EPA considered many factors in evaluating the economic and technological feasibility of different VOC content levels and different degrees of product reformulation. These factors included:

- Limits in State/local regulations
- VOC content and sales information
- Performance considerations
- Cost considerations
- Market impacts

The sources of information for these factors included:

- Pre-proposal letters
- The 1992 industry survey (collected 1990 data)
- Public comments on the proposed rule
- Follow-up discussions with commenters to gather additional technical information
- EPA expertise
- State/local regulations and pre-proposal discussions with State/local regulators
- Input from coating manufacturers and other stakeholders

Considering all these factors, the EPA concluded that the VOC content limits in table 1 of the rule, along with the exceedance fee provisions and the tonnage exemption, represent BAC for architectural coatings. The EPA's process for developing BAC was described in the proposal preamble (61 FR 32737).

Technical feasibility and coating performance issues. Throughout this rulemaking, there has been debate over the degree to which VOC content levels in architectural coatings can be reduced and on the performance characteristics of low-VOC coatings. The term "performance" means the coating qualities

that are acceptable to consumers and that maximize the interval required between recoating. Performance is particularly difficult to assess. As discussed in the preamble to the proposed rule (61 FR 32738), these acceptable qualities can vary significantly depending on the consumer and the coating category. There is no consensus within the architectural coatings industry on standards by which to evaluate acceptable coating performance. Therefore, the EPA requested comment on the technical feasibility of the limits in the proposed table of standards and on performance issues. The proposal requested documentation, tests, and factual evidence to support or refute claims about performance and the technical feasibility of low-VOC systems.

The EPA evaluated all information that was submitted by commenters pertaining to the feasibility of the rule and sought additional information that was reasonably available. In evaluating the degree of emission reduction that represents BAC, the EPA took into consideration that these requirements would apply to all areas of the country and to all manufacturers of architectural coatings within a specific time frame (i.e., approximately 1 year from promulgation). Based on the public comments received, a number of changes were made to the proposed rule. These changes are discussed in section 2.2.4 (Coating Categories and VOC Content Limits) of this document. In some cases, commenters claimed that the proposed limits in the rule were not feasible or did not represent BAC, but provided no data to support the general claim. In such cases, the EPA sought additional information that was reasonably available and considered the comments in the context of the overall BAC determination, but often found no basis for making substantive changes to the proposed rule.

Relationship of BAC to State regulations. State and local regulations were one of the factors used by the EPA to develop BAC. As stated in the proposal preamble (61 FR 32737), State and local architectural coating requirements were used prior to proposal as a starting point in determining "what categories and associated VOC levels might constitute the degree of emissions

reduction that represents BAC." After proposal, the EPA used State and local architectural coating requirements as a factor in the evaluation of public comments on VOC content limits.

However, the EPA does not agree with commenters who believe that at a minimum BAC for the national rule should be equivalent to or more stringent than the lowest emission limits that exist in any State regulation (as presented in a table of standards by one commenter). In the development of a national rule under section 183(e), the EPA has the obligation to determine that the emission limits are technologically and economically feasible on a national scale. State and local VOC limits are based on coating performance under the local meteorological conditions and patterns of coating demand, some of which may be very different than in other locations. Moreover, based on local air quality and existing regulatory programs, a State or local agency may set rules based on a balancing of technological, economic, and environmental factors that might differ from the balance appropriate for a national rule.

Therefore, the EPA departed from the State and local requirements where other factors, such as information on VOC content and sales, performance, costs, and market effects, indicated that the limits were not technologically or economically feasible on a national scale.

The role of the exceedance fee and tonnage exemption in BAC. While the EPA believes that the technology exists to meet the limits in table 1, some manufacturers may need more time to obtain the necessary technology for some coatings. Still other manufacturers may choose not to reformulate some of their specialty products that are produced in low volume. The exceedance fee and tonnage exemptions were adopted into the final rule, in part, to minimize impacts on the supply of coating products. The exceedance fee (discussed in section 2.4) is intended to allow manufacturers and importers additional time to develop low-VOC formulations while providing appropriate economic incentives for most manufacturers ultimately to comply with the VOC limits of the rule. The tonnage exemption (see

section 2.2.1.2) is intended to allow manufacturers and importers the flexibility to continue to market certain low-volume product lines where reformulation of a specialty product used for unique applications may not be cost-effective. The EPA believes that all available data indicate that the system of regulation adopted in the final rule, consisting of VOC content limits, an exceedance fee provision, and a tonnage exemption, reflects BAC for the architectural coatings category.

Consideration of new low-VOC coatings. The EPA recognizes that the 1992 industry survey that the EPA used as one of the factors for developing BAC collected 1990 data. Although the data in this survey is now 8 years old, it still represents the most complete survey of the architectural coating industry (it captured approximately 75 percent of the coating volume). In addition, the industry survey was only one of the many factors used in determining BAC. Information on advances since 1990 were obtained from over 300 preproposal letters, over 200 public comment letters, over 40 follow-up telephone calls, and information obtained from State regulatory agencies. The EPA believes that the final rule represents BAC based on the survey database and other data available to the EPA.

The EPA acknowledges that there are coating technologies in existence with VOC contents lower than those listed in table 1. However, section 183(e) of the Act does not require the EPA to set BAC at the level of the lowest-VOC product. It requires that the EPA determine BAC based on "the degree of emissions reduction that the Administrator determines on the basis of technological and economic feasibility, health, and energy impacts, is achievable." The statute thus directs the EPA to consider and balance a number of factors in establishing the appropriate controls. To determine whether a more stringent rule would meet the criteria for BAC in the future, the EPA would need to undertake additional study of the architectural coatings category. See section 2.6 for discussion of such a study.

Comment: Two commenters (IV-D-119, IV-D-191) criticized the rule as being too lenient. Both recommended setting more

stringent emission limits that are more technology-forcing and using innovative mechanisms (e.g., emissions trading and emission fees) to allow needed flexibility. One commenter (IV-D-191) stated that innovative mechanisms such as persuasive emission fees and other new approaches were absent from the proposed rule. Another commenter (IV-D-119) believed that the EPA is giving up an opportunity to hold sources to strict standards while allowing flexibility through the use of market-based programs, such as the EPA's draft Open Market Trading Rule. The commenter suggested an alternative format of strict limits with the opportunity and flexibility of emissions trading. The commenter argued that emissions trading provides incentives for sources that have lower compliance costs to over-control and sell the excess reduction credits to sources with higher compliance costs. This allows for cost-effective controls and alleviates the need to set standards to accommodate the "lowest common denominator."

Response: Under section 183(e), the EPA has the obligation to demonstrate that the architectural coating rule is achievable, considering technological and economic feasibility and other factors. The EPA has set the VOC content limits at what it believes to be sufficiently stringent levels, taking into consideration these factors. In doing so, the EPA has also provided appropriate mechanisms to make the limits achievable. The exceedance fee provision and the tonnage exemption provide the necessary flexibility for the level of the emission limits in the rule.

The exceedance fee allows more time for manufacturers to develop new product formulations and provides a less costly compliance approach for manufacturers selling low volume products for which it is not cost-effective to reformulate. The EPA believes that the fee rate is sufficiently persuasive to encourage manufacturers ultimately to reformulate to the levels of the rule. The fee rate is at the upper end of the range of incremental VOC reduction costs imposed by regulations on other industries. At this time, the EPA does not believe that providing any additional flexibility (through emissions trading

or other approaches) justifies more stringent emission levels in the rule.

Several alternative market-based approaches were considered. The emission fee was considered the most appropriate due to simplicity, and it would be less complex and burdensome for this industry than emission trading schemes, due to the changing nature of the product lines and the complexity of the recordkeeping that would be required for emission trading.

Comment: One commenter (IV-D-96) stated that, were a State to repeal its more stringent rule in place of the national rule, it might trigger a legal challenge that the rule encourages backsliding, which contravenes provisions in the Act.

Response: Promulgation of a Federal architectural coatings rule in no way forces a State to repeal any regulation that requires more stringent VOC emission limits. The Act expressly preserves the right of States to adopt regulations that are more stringent than Federal rules. Any State, therefore, that chooses to relax its regulations following promulgation of today's Federal rule, does so at its own choice. The commenter is correct that "no backsliding" provisions under the Act prohibit relaxation of VOC emission limits that result in an increase in emissions in certain nonattainment areas. If existing regulations for architectural coatings are relaxed in such areas, the backsliding provisions would require contemporaneous emission reductions from other sources to balance the emission increase from architectural coatings. Some States have laws that prohibit their emission standards from being more stringent than the Federal rules. The backsliding requirements, where applicable, would apply in these circumstances as well.

Comment: One commenter (IV-D-191) stated that the negotiated approach to rulemaking had produced a significantly stronger standard which the EPA has ignored in the proposed rule.

Response: The EPA attempted to use the regulatory negotiation procedure to develop the basis of the proposed rule (see section IV.B of the proposal preamble). During the negotiations, stakeholder groups proposed a number of standards

with varying levels of stringency. Based on these proposals, the facilitator and the EPA prepared a number of different options for the potential regulation. In the end, the negotiating committee could not reach agreement on a rule, and the regulatory negotiations concluded without consensus. Therefore, the commenter is not correct that the negotiated approach produced a stronger standard.

Comment: Three commenters (IV-D-22, IV-D-33, IV-D-34) expressed concern that the less stringent limits in the Federal rule would undermine local rulemaking efforts.

Response: Because of the severity of their ozone problem, some areas may need more emission reductions than provided in the architectural coatings rule in order to meet the national ambient air quality standard for ozone. The Federal rule does not prohibit the adoption of more stringent State rules.

The Federal rule represents best available controls on a national basis. The EPA believes that the rule represents a control level that is reasonable under the range of technological, environmental, and economic conditions that exist nationwide. In developing their own rules, States consider only local conditions and do not have to account for national patterns of consumer demand, varying weather and atmospheric conditions, or other technological or economic factors that affect the reasonableness of controls. At the State level, therefore, local circumstances may lead to different conclusions as to the degree of control that is appropriate for some coatings. The Federal rule should not be interpreted as signifying that more stringent levels of control are not feasible under some circumstances.

Comment: One commenter (IV-D-190) stated that the BAC determination methodology was flawed because the EPA did not perform an independent survey of the coatings industry.

Response: The survey of coatings manufacturers was only one of several factors considered in developing the final rule. The survey was conducted during the regulatory negotiation. The questionnaire was developed by the EPA and the committee. The survey was distributed and compiled by the National Paint and

Coatings Association (NPCA). The NPCA hired an independent contractor to compile and summarize the responses to protect the confidentiality of certain information in the survey.

The EPA has no reason to believe that the information from the survey is flawed. The EPA believes that the survey represents the best compilation of coatings data available today. The Act does not require that all data used in a rulemaking be collected by the EPA. The EPA can utilize any data that are deemed by reasonable judgment to be accurate and representative of the industry.

Comment: According to one commenter (IV-D-190), the regulatory development process was merely a discussion between the EPA and the National Paint and Coatings Association (NPCA), which represents manufacturers pushing for lenient limits. The commenter stated that no labor, environmental, or consumer groups had submitted comments or evidence.

Response: The EPA encouraged participation of all interested parties throughout the rulemaking process. In developing the proposed rule, the EPA met with many stakeholders and shared drafts of the rule with a number of representatives of industry, environmental groups (e.g., Natural Resources Defense Council), consumer groups, labor organizations, and health organizations. After proposal, the EPA notified these same groups about the Federal Register notice to ensure their opportunity to comment. More than 200 comment letters were received in response to the proposed rule. All significant comments were evaluated and treated as equally important.

Comment: Regarding the availability of alternative compliance systems, one commenter (IV-F-1e) listed three suppliers who offer low- or no-HAP solvents that are still 100 percent VOC. The products have a vapor pressure limit that meets the requirements for the consumer product adhesive regulations but not the architectural coating VOC rule. One commenter (IV-D-32) listed several circumstances where low-VOC coatings have been introduced since 1990 with favorable consumer response. These products include low and no-solvent

flat and non-flat interior coatings, no-VOC exterior coatings, and industrial maintenance coating category products. According to the commenter, the dominant view within the resin manufacturing and coating manufacturing industries is that new technical advances permit dramatic further reductions in the VOC content of architectural coatings with no appreciable loss of performance. Another commenter (IV-D-73) added that tremendous VOC reductions have been made with the market shifting to latex paints. One commenter (IV-D-175) stated that the coatings industry is doing a relatively good job moving to non-solvent base latex coatings. The commenter also stated that recent technological advances and market forces are driving the industry to latex waterborne systems. The commenter stated that only about 15 percent of the products produced by the company are solvent-based.

Response: The comments support the EPA's position that many low- and no-VOC coatings are available and that additional ones are being developed that can meet performance needs as well as the requirements of the rule. Based on other available information and comments received, the EPA believes that it is technologically feasible to achieve the VOC content limits for coating categories required in the final rule, and these comments provide further support.

Comment: One commenter (IV-D-45) stated that one problem with the proposed regulation is that the architectural coating industry is not all single purpose market type sales and implied that the proposed rule should accommodate coatings that could be classified under multiple categories.

Response: The EPA acknowledges that many architectural coatings are used for multiple purposes. In the final rule, the EPA accommodates many multiple-use coatings in § 59.402(b) by exempting those type coatings from the most restrictive VOC content limit if that limit was not intended to apply. In fact, the EPA has greatly expanded that section in the final rule in response to comments regarding category overlap issues.

Comment: One commenter (IV-D-02/IV-F-1[l]) maintained that the EPA should incorporate the concept of different standards for different seasons into the rule. The commenter pointed out that VOC emissions contribute to ozone formation primarily in late summer and early fall. The commenter suggested that the EPA allow higher VOC coatings during the non-ozone seasons. The commenter maintained that this would allow small businesses selling into high-VOC niche markets to continue to operate. The commenter (IV-F-1[l]) also stated that failures of low VOC-coatings are more prevalent in the winter season, when ozone exceedances rarely, if ever, occur.

Response: Although the EPA appreciates the reasoning behind this comment, it would be neither practical nor enforceable to set different standards for different seasons. The architectural coating rule sets standards for coating manufacturers' sales and distribution of coatings rather than end users' application of these coatings. The rule has no mechanism to constrain when end users can apply these coatings. In addition, such a provision would not be practical to apply to the end users in the architectural coating sector since these end users include homeowners and a variety of contractors applying coatings at a variety of locations throughout the year. Enforcement of a provision limiting coating application to non-ozone seasons would require monitoring of these types of applications and locations, which would not be practical. Use of an ozone season approach would also be very burdensome for manufacturers and importers because they would have to produce different lines of products for the ozone season and non-ozone season, and begin tracking products to insure that they were only distributed and sold during the appropriate season at the given locale. The EPA does not believe that such burdens, especially for small businesses, would be insignificant.

Comment: One commenter (IV-D-28) requested that the EPA make two changes to Table 1 - Architectural Coating VOC Content Level. First, the commenter suggested that the EPA should adjust the figures on the table to two significant figures because the

method used to determine compliance (Method 24 of appendix A of part 60) is only reliable up to two significant figures. Second, the commenter suggested the EPA should add a second column to the VOC content table to list the VOC content limits in non-metric form.

Response: Based on the commenter's suggestion, the EPA has added a column for non-metric (English) units to table 1. The metric units will be used for enforcement. The EPA is using two significant figures in table 1 of the final rule for the VOC content limits, the same as in the proposed rule.

Comment: One commenter (IV-D-28) suggested an alternative control approach whereby each manufacturer would reduce its overall VOC emissions by 20 percent from a 1990 baseline by July 1, 1996, by making reductions in products chosen by the manufacturer. The commenter suggested that this would foster cost-effectiveness, and an annual certification of product mix and end-use VOC content could provide regulators with an adequate verification and enforcement mechanism. According to the commenter, any increase in sales volume that had the effect of raising emissions over the 20 percent reduction during 1 year would have to be compensated by a lower VOC product mix the following year.

Response: The EPA appreciates the commenter's suggestion. However, a similar approach was explored during the regulatory negotiation, and it became clear that too many problems made the approach unworkable, such as establishing a proper baseline, the potential inequities between small and large businesses, and significant administrative burdens.

Comment: One commenter (IV-F-1e) stated that in order to warranty the effectiveness of their water-based products, they recommend the product be applied at ambient temperatures of 50 ^{o}F or higher and under stringent humidity conditions. (The commenter did not cite a specific example.) The commenter pointed out that construction does not stop in the northern U.S. during the winter when temperatures are at 30 ^{o}F or less. The commenter asserted that this issue needs to be addressed.

Response: The EPA agrees that certain coatings, particularly waterborne products, must be applied within a certain temperature range and that humidity can also be a consideration. In fact, those were considerations in the EPA's decision to create two new coating categories: zone marking and concrete curing and sealing compounds. In general, however, coating manufacturers need to assess these factors and make the coating users aware of any special requirements to ensure successful application of the coating product. Moreover, the EPA notes that solventborne coatings also have limitations in use under severe conditions.

2.2.4.2 Requests for New Categories

Lead-based paint encapsulant and asbestos encapsulation.

Comment: One commenter (IV-D-172) requested that the EPA create a new category for lead-based paint encapsulant and asbestos encapsulation products with a 350 g/l VOC content limit. However, in follow-up information (IV-G-26), the commenter revised their position to request that the EPA establish a VOC content limit of 250 g/l for these two types of products. The company's primary lead-based encapsulant has a VOC content of 141 g/l. The commenter stressed that there may be performance limitations for water-based coatings below 250 g/l for specific end-use encapsulation problems such as for floor coatings. The commenter explained that these water-based products have special coalescent, wet-edge, freeze-thaw, and viscosity properties. The commenter implied that these formulations will prevent asbestos dust and aged lead paints from contaminating the environment. The commenter mentioned that the products are in nationwide use and that the EPA has recently published guidelines for the use and application of lead-based paint encapsulant.

Response: In follow-up information (IV-G-26), the commenter stated that the company had been successful in reformulating its lead-based paint encapsulant and asbestos encapsulation products to meet a VOC content level of 250 g/l, therefore the EPA sees no benefit to creating a separate category for these two product

types. In the absence of a specific category, these products are subject to the flat or nonflat category (depending on the gloss level of the coating). For flat coatings, the VOC content limit is 250 g/l and for nonflat coatings, the VOC content limit is 380 g/l. The EPA obtained follow-up information from another manufacturer (IV-E-60) that indicated that low-VOC encapsulation products are available. Also, according to a September 1993 article on asbestos encapsulants (IV-B-4), one company has successfully recoated old siding containing asbestos with a system that meets the most stringent regulations for VOC. The system consists of water blasting, spot priming bare metal with an epoxy mastic, applying a full coat of a waterborne acrylic, and topcoating with a high-solids polyurethane. A stadium was recoated using this system. In response to the commenter's concern about encapsulation paints used on floors, if these products are recommended by the manufacturer solely for application to floors and the product meets the definition of a floor coating, the product would be subject to the VOC content limit of 400 g/l for floor coatings.

Alkali-resistant primers.

Comment: Three commenters (IV-D-189, IV-F-1g, IV-F-1k) requested that the EPA recognize an alkali-resistant primers category at 550 g/l VOC. One commenter (IV-D-189) requested the category be defined as follows: primers formulated to resist reaction with alkaline materials such as lime, cement, soap, etc. One commenter (IV-F-1k) did not agree with the statement in the proposal preamble that latex coatings can perform the function of alkali-resistant primers under the most difficult conditions.

Response: The EPA reviewed its basis for not creating this category and, since no new information was presented to justify establishing a category for alkali-resistant primers, the basis for the EPA's decision not to create this category is the same as stated in the proposal preamble (61 FR 32739, June 25, 1996, third column). That is, significant overlap between alkali-resistant primers and the more general primer category is apparent, and comments were received before proposal regarding

the ability of lower-VOC latex coatings to perform the function of alkali-resistant primers (61 FR 32739). In addition, only one State architectural coating rule contains a category for alkali-resistant primers, with a VOC content limit of 560 g/l. In the final rule, these coatings are subject to the primers and undercoaters category VOC content limit of 350 g/l.

Oil-modified urethane.

Comment: One commenter (IV-D-21) requested a separate coating category for oil-modified urethane with a VOC content limit of 520 g/l that would not be superseded by other categories having lower limits, such as the floor coatings category (400 g/l). The commenter stated that its product line has VOC contents ranging from 477 to 519 g/l. Oil-modified urethane coatings are used for finishing and refinishing residential hardwood floors, gymnasium floors, and other sports floors. The commenter stated that despite 6 years of effort, the company has been unable to reformulate its oil-modified urethane products to the proposed 400 g/l content limit for floor coatings. The commenter cited problems with failure to cure properly and to perform satisfactorily at a level below 477 g/l. Waterborne urethane/acrylic coatings are being used (mostly in California); however, the commenter stated that these coatings do not result in the same appearance, durability and life to floors as the oil-modified urethane and that more coats of waterborne coatings are needed for floors. As proposed, the commenter stated that the rule would cause its company to lose most of its business for that market, which represents over 11 percent of annual sales ($698,000). The commenter requested an exceedance fee as an alternative compliance option if the EPA does not create a separate coating category.

Another commenter (IV-D-211) also recommended adding a new specialty category, "Clear coatings for sports floors" using oil-modified urethane and water dispersed formulations. The commenter requested a higher VOC content limit of 550 g/l. In follow-up information (IV-E-6), the commenter stated that its oil-modified urethane products have a VOC content between 500 and

550 g/l, and these products are not sold in regulated areas. According to the commenter, this new category fits the concept of high performance coatings that the EPA considered but did not propose as a general category. These are clear or semi-transparent coatings formulated to provide a durable, solid protective film for wood floors used for sports and are not intended for residential use. According to follow-up information (IV-E-6), as the solvent content of oil-modified urethane is reduced, there are problems such as reduced flowability, more chance of ridges of excess product, and increased drying time. The commenter cited the demanding performance requirements of these coatings, which are developed specifically to work with maple and its characteristics of porosity, hardness, and dimensional changes with moisture and temperature. The commenter referred to the results of a survey conducted by the Maple Flooring Manufacturing Association in 1993 regarding problems with water reducible urethane used on hardwood floors, including gym floors. The problems included panelization or splitting, excessive scuffing, and slipperiness. In follow-up information (IV-E-6), the commenter noted that its company does sell a water dispersed formulation compliant product in regulated areas, but there are application and performance problems associated with this product. The commenter also indicated that this company is the largest direct marketer of sports floor coatings (IV-E-6). The commenter maintained that the creation of a separate category would obviate the need for extensive reformulation in this small category at this time.

Response: After review and evaluation of these comments and follow-up information, the EPA has determined that the 450 g/l VOC content limit is appropriate and that a separate coating category for oil-modified urethane is not warranted. Due to the change being made in the floor coating definition in the final rule, the commenters would be subject to the varnishes coating category with a VOC content limit of 450 g/l, rather than the 400 g/l limit proposed for floor coatings. Two commenters after proposal of the rule (IV-D-69, IV-D-207) indicated that a VOC

content limit of 450 g/l is achievable for varnishes used on wood floors, and manufacturers at the public meeting held on August 13, 1996 (IV-F-02) requested a VOC content limit of 450 g/l for the varnish category. Before proposal, one manufacturer (II-E-47) commented that the 450 g/l limit seems to be the lowest practical limit for polyurethane varnishes. Prior to proposal, another commenter (II-D-195) stated that the most commonly used varnish for wood floors is polyurethane and that this product cannot be manufactured at a VOC content of less than 450 g/l and meet performance needs. Also, one commenter (IV-D-85), a manufacturer of gym floor finishes, suggested the EPA keep the 450 g/l limit for all varnishes (floors, walls, cabinets etc.). In addition to these comments, the EPA considered that all of the State rules reviewed have a VOC content limit of 450 g/l or less for varnishes, except Texas (540 g/l) and one county in California (650 g/l).

Although the EPA has not raised the VOC content limit as requested by the commenter, the EPA has provided alternative mechanisms supported by the commenter. An exceedance fee provision and a tonnage exemption are included in the final rule for compliance flexibility. These provisions could allow the commenters to maintain sales from this product line until the product can be reformulated to meet the 450 g/l VOC content limit.

Porcelain repair coatings.

Comment: One commenter (IV-D-26) recommended adding a category to define porcelain repair coatings. These coatings are used to repair and maintain bathroom and kitchen fixtures such as sinks, bathtubs, and shower enclosures. The company stated that the VOC content of the coatings is 600 g/l and, therefore, it cannot meet the proposed VOC content limit of 450 g/l for industrial maintenance coatings. Follow-up information provided by the commenter (IV-E-9) noted that reformulation attempts have not been successful because the required technology is not yet available from resin manufacturers. The commenter obtained a

small-container (1 liter) exemption (available to all companies in commenter's area) for these products and, thus, they are currently sold in a local regulated area in California. The commenter estimates growth for this category to be about 2-3 percent per year depending on the aging of hotels/motels and housing, and the ratio of rebuilding versus refurbishment.

Response: After review and evaluation of the information, the EPA has determined that a separate category for "porcelain repair coatings" is not warranted. According to one State agency (IV-E-28), there are several manufacturers of compliant porcelain repair coatings that meet a 420 g/l VOC content limit. Therefore, the EPA concludes that the need for this type of coating can be met through the industrial maintenance coating category with a VOC content limit of 450 g/l. Although the industry-wide annual sales volume is not available, it is expected that these would likely be considered low-volume coatings relative to other coatings covered by the rule. Thus, the tonnage exemption in the final rule could offer compliance flexibility. Even though the majority of end uses for these coatings are in industrial and commercial situations, there are some residential uses of these coatings, such as ceramic fixture repair. Similar to existing local regulations, the final architectural coating rule includes a small-container (1 liter or less) exemption that also provides flexibility to continue to market these coatings and to satisfy existing and future customer needs.

Zinc-rich coatings.

Comment: One commenter (IV-D-18) suggested that the EPA create a zinc-rich coatings category with a VOC content limit of 350 g/l instead of including these coatings in the metallic pigmented coating category with a VOC content limit of 500 g/l. The commenter suggested defining a new category of metallic pigmented coatings as zinc-rich coatings, which are those materials where at least 50 percent by weight of the dry film is zinc metal. These coatings are routinely applied in both shop applications and in the field to protect against corrosion.

According to the commenter, steel members for highway bridges are always at least coated with a corrosion-resistant primer in the shop and are frequently or normally completely coated with primer, intermediate coat, and topcoat in a fabrication shop before shipping to the field to be erected. These shop applications are regulated under requirements (e.g., CTG) for miscellaneous metal parts. The commenter referenced and attached an article entitled "Environmental Exposure Testing of Low VOC Coatings for Steel Bridges" by John Peart of the Federal Highway Administration and Robert Kogler, Jr. of Ocean City Research Corporation which was published in the Journal Of Protective Coatings & Linings in January 1994. According to the commenter, the study, which included 3 to 4 years of exterior marine exposure of a variety of coatings, concluded that the performance of several low-VOC test systems (using a zinc-rich primer) meet or exceed that of the best performing traditionally high-VOC systems. Furthermore, the author states that several companies have marketed products meeting 350 g/l for five to ten years and offered a list of waterborne and solventborne zinc-rich coatings that are commercially available.

Response: The EPA appreciates the identification of these lower-VOC content zinc-rich coatings with a VOC content at or below 350 g/l that showed performance that meets or exceeds that of conventional higher-VOC content coatings during steel bridges exposure testing. However, due to the potential broadness of the category to applications outside of those highlighted by the commenter, the EPA did not create a new category for zinc-rich coatings. Specifically, other comments (II-D-75, II-D-156) received before proposal indicated that there are major differences between types and uses of zinc coatings and that it may not be feasible or correct to apply VOC content levels designed for one technology to completely different technology. For example, one commenter (II-D-156) manufactures an ultra-high performance coating that contains 95 percent zinc in the dried film with a VOC content of 385 g/l. It is a one-component product based on an organic binding system, which the commenter

argued makes it highly effective in field locations where the following specifications exist: (1) high performance cannot be compromised, (2) near perfect surface preparation cannot be attained and (3) mixing of two or more components is impractical. The commenter stated that a typical application of this product might be a structural steel frame for a large, multi-story building. The commenter also referred to the 1994 study cited by commenter IV-D-18 and noted that it concluded that low-VOC waterbased zinc coatings do not work in a field environment.

Other comments (II-D-75, II-D-79, II-D-111) received before proposal specifically requested that zinc-rich coatings be classified in the category of metallic pigmented coatings: (1) due to the difference in allowable limits between metallic pigmented coatings and industrial maintenance coatings (420-450 g/l)(this limit would ban the production of metallic zinc coatings) (IV-D-75, IV-D-79, IV-D-111), and (2) because reformulation efforts have been unsuccessful (II-D-75). In addition, California Air Quality Management Districts (Sacramento and South Coast), New York City Metropolitan area, New Jersey, Kentucky, Massachusetts, Rhode Island, and Oregon architectural coating regulations have a category for metallic pigmented coatings at 500 g/l that are defined the same as or similar to the proposed category definition in the architectural coating rule. Metallic pigmented coatings are exempt in the counties of Butte and El Dorado in California and in Maricopa County in Arizona. There are no State regulations specifically for zinc-rich coatings.

Faux finishing/Glazing.

Comment: One commenter (IV-D-20) suggested that the EPA create a "Faux finishing/glazing" category with a VOC content limit assigned based on formulation "including water" because the company could not meet the proposed VOC content limit of 380 g/l for nonflat interior coatings. Based on formulation including water, the calculated VOC content of the colors can range up to 340 g/l. However, because the products are waterborne, the VOC "less water" calculation results in a range up to 700 g/l. The

VOC content limit for a similar category (Japan/faux finishing coatings) has been proposed by California's South Coast Air Quality Management District at 700 g/l. This category would address waterborne acrylic finishes and other waterborne products with miscible VOC that are designed to retard drying time. The commenter stated that these products provide open time required for wet-in-wet decoration techniques, such as faux wood grain, faux marble and simulated aging, which require the finish to remain wet for an extended period of time. The commenter stated that, to date, there has not been an identifiable way to reformulate these products to achieve a lower VOC content while maintaining the characteristics required for acceptable use. The commenter suggested that this specialty category be defined as follows: "Faux finishing/glazing is used for wet-in-wet techniques, such as faux wood grain, faux marble, and simulated aging, which require the finish to remain wet for an extended period of time." The commenter stated that the "do-it-yourself" market is more confined than the professional market to sales in pint and quart sizes, and this market comprises the majority of sales (Docket Item IV-E-7). Larger quantities, a gallon or above, are generally used by professionals who are coating large spaces.

Response: Upon review and evaluation of available information, the EPA has determined that creating a separate category for faux finishing/glazing with a VOC content level of 700 g/l is warranted. The faux finishing/glazing category is defined in the final rule as suggested by the commenter. This is a specialized, limited use category. According to the commenter, there are no competing compliant products on the market, and despite 2 years of reformulation efforts, this coating cannot meet the proposed VOC content limit of 380 g/l for nonflat interior coatings. Waterborne technology is an emerging market for these products.

The California-South Coast AQMD has recently amended its rule for this category from 350 g/l to 700 g/l because the lower VOC content limit could not be achieved. The South Coast AQMD

VOC content limit will be reduced again to 350 g/l on January 1, 1999 if this level is achievable.

The commenter stated that the majority of these products are sold in containers that are less than 1 liter in size. Therefore, the majority of the faux finishing/glazing sales will not be subject to the architectural coatings rules since it does not apply to coatings sold in containers of 1 liter or less.

Stain controllers.

Comment: One commenter (IV-D-185) requested that the EPA clarify the coating category of "sealers" by excluding "stain controllers" from that category. In follow-up information (IV-E-Cohagan), the commenter asserted that these products cannot achieve the proposed 400 g/l content limit for sealers based on three years of unsuccessful reformulation efforts. According to the commenter, it is technologically infeasible to reformulate stain controllers to achieve the proposed 400 g/l VOC content limit. The current VOC content of these products is 714 g/l. The 400 g/l limit for sealers would force a very high solids content, which would make these products unfit for use as prestains. "Stain controllers" (also called "wood conditioners" or "prestains") are coatings that are applied to soft woods before applying a stain to prevent uneven penetration or blotching of the stain by filling those pores where excess penetration would occur. The commenter asserted that in order to be effective, stain controllers must have a very low solids content because excessive solids will overload the texture of the substrate so that the wood will not properly accept the stain. Water cannot be added to these products because they are used almost exclusively to treat interior fine wood and contact with water would produce an undesirable grain-raising effect in the wood. According to the commenter, stain controllers are low-volume, specialized products that are important to the consumer and have a minimal effect on air quality. The commenter defined a "stain controller" as "a conditioner or pretreatment product formulated and recommended for application to wood prior to the application of a stain in order to prevent uneven penetration of

the stain." In follow-up information (IV-E-Cohagan), the commenter revealed that about 97 percent of total sales for these coatings are exempt under the small container exemption in regulated areas.

Response: After review and evaluation of these comments and the follow-up information, the EPA has determined that a new category for stain controllers with a VOC content limit of 720 g/l is warranted. As suggested by the commenter, the category of stain controllers is defined as "conditioners or pretreatment products formulated and recommended for application to wood prior to the application of a stain in order to prevent uneven penetration of the stain." According to the commenter, reformulation attempts during the last 3 years have been unsuccessful, and the commenter considers it technologically infeasible to reformulate stain controllers at the proposed VOC content limit of 400 g/l for sealers (the category the commenter would be subject to under the proposed rule). According to the commenter, there are competing compliant waterbased coatings on the market, but there are performance problems with these coatings. The EPA believes that this is an example of a low-volume, specialty niche coating for which it may not be cost-effective for the manufacturer to continue reformulation attempts. Therefore, the EPA has created a separate category for stain controllers.

Concrete/masonry conditioners.

Comment: Three commenters (IV-D-06, IV-D-172, IV-D-189) requested that the EPA create a concrete/masonry conditioners category with a VOC content limit of 780 g/l. One commenter (IV-D-189) provided the following definition: "A low-solids lacquer which is formulated and marketed specifically for use as a conditioner or sealer of concrete and masonry surfaces." The commenter pointed out that this category and definition is in the Massachusetts architectural coating rule with a VOC content limit of 780 g/l. The commenter explained that concrete masonry conditioners are required to tie up and bond to a concrete surface any loose material before topcoating. This conditioner

is needed in order to apply a latex finish directly to a concrete surface that cannot be power washed. Two commenters (IV-D-06, IV-D-172) stated that any attempt to apply latex finishes directly over these loose particles will result in catastrophic disbondment failure. The commenters argued that the use of the conditioner allows for a greater use of lower-VOC latex coating as topcoats on masonry surfaces. One commenter (IV-D-172) advised that these products are presently in nationwide use. This commenter claimed that the proposed rule bans these products which cannot be formulated under 250 g/l VOC. Two of the commenters (IV-D-06, IV-D-172) stated that the use of the masonry/concrete conditioners extends the life of the latex top coat resulting in reduced VOC emissions and reduced costs when compared to use of latex paint without the conditioner.

Two commenters (IV-D-06, IV-D-172) also claimed that repeated research projects have shown that waterborne, low-VOC trial masonry conditioners cannot achieve the success of the low-solids solvent acrylic coatings.

Response: Based upon an evaluation of these comments and follow-up information (IV-E-38), the EPA has determined that a new coating category for concrete/masonry conditioners at 780 g/l is not warranted. This product will be subject to the sealers category with a VOC content limit of 400 g/l. The EPA believes that establishing this category would create overlap with the sealers category. The new category would allow higher VOC content coatings where sealer products at or below 400 g/l VOC content can perform the coating function because the EPA's definition of the sealer category includes coatings used to "condition chalky surfaces." According to a follow-up discussion (IV-E-38) with the National Concrete Masonry Association (NCMA), the term "conditioner" is not typically used when referring to coatings used on concrete masonry walls or concrete blocks. The NCMA stated that acrylic, latex or cement-based paints are used on concrete masonry as water repellents and no conditioner is needed or used before these coatings are applied. The NCMA provided a copy of its specifications for these applications,

which included the types of water repellents and general guidelines for application of surface treatments. The commenters' (IV-D-06, IV-D-172) comparison, that the lifetime cost and VOC emissions of latex paint without the conditioner are much greater than if a conditioner is used, would be true for most coatings that use a primer. The final rule contains compliance flexibility such as the tonnage exemption for low volumes of production and/or the exceedance fee. These provisions could be used by the commenters for the continued manufacture of this coating.

Calcimine recoater.

Comment: Three commenters (IV-D-06, IV-D-172, IV-D-189) recommended that the EPA add a "calcimine recoater" category to the final rule. These coatings are formulated to repaint ceilings painted with calcimine. Two commenters (IV-D-06, IV-D-189) suggested a VOC content limit of 475 g/l, and the other commenter (IV-D-172) made no recommendation on the VOC content level. The commenters explained that water soluble calcimine paints were used in Victorian and Early American houses, especially on ceilings. Calcimine recoater products are made with limed vegetable oils and are light, puffy and gel-like. Due to their low density, they do not disbond calcimine ceiling coatings. One commenter (IV-D-189) indicated that the coating is a specialized, low-volume usage coating for which a category is currently included in the Massachusetts architectural coating rule. The other commenter (IV-D-172) gave typical VOC content levels of 450-465 g/l for the company's products and stated that calcimine recoaters are the only economical way to handle the repainting of calcimine coated surfaces. The commenter explained that conventional (250 g/l VOC) high-solids flat alkyd paints do not level well or dry properly and eventually cause calcimine ceiling paint to peel in sheets. The commenter presented two ways to handle the repainting of calcimine: to soften and scrape off all the calcimine and repaint the ceiling, or to use a coating formulated for calcimine recoating. The first method, the commenter explained, is labor intensive and costly. Thus,

the commenter concluded that the lack of a calcimine recoater category will create a significant hardship for owners of early American and Victorian houses. The commenter asserted that the proposed rule would essentially ban this coating which cannot be reformulated under 250 g/l (the VOC content limit for interior flat coatings).

Response: Upon review and evaluation of this information, the EPA has determined that a separate category should be established for calcimine recoaters with a VOC content limit of 475 g/l, the same limit as the Massachusetts rule requires for this category. The EPA amended the final rule to include this category with the following definition: "Calcimine recoater means a flat solventborne coating formulated and marketed specifically for recoating calcimine-painted ceilings and other calcimine-painted substrates." This definition is nearly the same as used in the Massachusetts rule. This is a low volume, specialized coating used in limited, specific circumstances. These products reportedly cannot be reformulated to meet the 250 g/l content limit for interior flat coatings. The composition of calcimine recoaters is unique and there is no substitute for the function of these coatings.

Adhesion promoters.

Comment: Two commenters (IV-D-08, IV-D-189) requested that the EPA create a category for "adhesion promoters" with a VOC content limit of 680 g/l. One commenter (IV-D-189) offered a definition of adhesion promoter as:

> "a high performance coating specifically formulated and recommended for the thin film application to difficult to paint, hard, glossy surfaces (including, but not limited to plastics, fiberglass, polished metal such as door locks and ceramics) to provide improved adhesion of subsequent coats."

The commenters asserted that these are specially formulated coatings used to improve the adhesion of coatings to surfaces that are hard and glossy such as polished metal, ceramics, plastics, and fiberglass. They are applied in very thin films just prior to the topcoating of the surface. The commenters stated that these unique coatings are clear or contain very low

levels of pigmentation and in order to obtain the thin film thickness, the solids content of these coatings must be kept low. Therefore, the VOC content of the products is relatively high. One commenter (IV-D-08) noted that new alternative water-based formulas have performance limitations due to water sensitivity on hard, glossy surfaces. Both of the commenters noted that several State automotive refinishing rules as well as the proposed national rule for automobile refinish coatings set a precedent for a special category of adhesion promoters. One commenter (IV-D-189) maintained that although formulations are somewhat different, the need and rationale for applying a thin film of adhesion promoting material to a difficult-to-paint surface is the same.

One commenter (IV-D-08) maintained that the imposition of lower VOC content limits would result in an adverse economic impact on the small business manufacturers, users, and applicators of these coatings. Based on their actual experience dealing with the State rules, they quoted a reformulation cost of over $80,000. In addition, the commenter estimated that the additional amount of VOC that would result from the creation of this category would be less than 200 tons per year in the architectural coating market. Follow-up information (IV-E-23) from this commenter revealed that its company manufactures other primers and these primers can be reformulated to meet the VOC content limit of 350 g/l. Competitors make thicker primers that meet the VOC content limit of 350 g/l. However, the commenter stated that adhesion promoters require 680 g/l for thin-film applications on substrates such as glazed porcelain tile and formica cabinets and paneling refinishing (surfaces that were not intended to be painted). The commenter estimates growth for these coatings to be 10 percent over the next 5 years. Currently, the commenter sells this coating in small containers in regulated areas. If a category is not established for adhesion promoters, this commenter (IV-D-08) requested a small-volume exemption of 5,000 to 10,000 gallons.

Response: Based upon consideration of these comments and follow-up information obtained from the commenter (IV-E-23), the EPA has not established a separate category for adhesion promoters in the final rule. Without this separate category, these coatings are subject to the primers and undercoaters VOC content limit of 350 g/l. Similar to alkali-resistant primers, there is significant overlap between adhesion promoters and the general primers and undercoaters category due to the broadness of the definition for adhesion promoters. The EPA believes that creating this category would allow the use of higher-VOC content coatings for which lower-VOC content coatings would be acceptable. The commenter could continue the sale of adhesion promoters in small containers (1 liter or less), which are not regulated under this rule, while continuing reformulation efforts. The tonnage exemption and exceedance fee provisions of the rule could also provide additional compliance flexibility.

Marine/architectural coatings.

Comment: One commenter (IV-D-173) suggested that the EPA establish a category for marine/architectural coatings for hulls and decks of yachts, fishing boats, and working ships. The commenter stated that these coatings are also used on steel, wood, and concrete block structures painted between October and May when the weather is freezing and rainy. The commenter explained that waterborne coatings have not been developed as a viable substitute, and high-solids coatings would be difficult to spread and would not dry quickly enough due to dew, frost, and rain.

Similarly, the commenter supported the use of solventborne marine/industrial deep color alkyd enamels that provide rust prevention on old metal surfaces on seawalls in Michigan. The commenter explained that seawalls are best painted in the winter because during the summer, boats in the wells splash water on the surfaces causing the paint to run into the water. The commenter also stated that compliant waterborne and high solids coatings would not last as long and that painting more frequently would put more solvent in the air. The commenter concluded that the

EPA was moving hastily and that the use of existing paints should be allowed until quality compliant paints can be formulated and tested. No definition or VOC content limit was suggested for marine coatings.

Response: The architectural coating rule only applies to coatings used on stationary structures and, therefore, the rule would not cover the coating or recoating of yachts and boats. Based on consideration of the limited information submitted by the commenter, including follow-up information (IV-E-12), the EPA has determined that a separate specialty category for marine/architectural coatings used on stationary structures, such as seawalls, is not warranted. The commenter's description of the coatings indicates that they would fall under the industrial maintenance category with a VOC content limit of 450 g/l. In follow-up information (IV-E-12), the commenter did not recommend a specific VOC content limit or specify a definition for these coatings and did not know the VOC content of its existing marine coatings. The commenter estimated that the company's total annual production of all products is 15,000-20,000 gallons. The commenter could consider the tonnage exemption and/or exceedance fee in the final rule, while continuing reformulation efforts.

Concrete curing and sealing compounds.

Comment: Seven commenters (IV-D-86, IV-D-187/IV-F-1e, IV-D-152, IV-D-154, IV-D-170, IV-D-210, IV-F-2e, IV-G-17) requested that the EPA create a new category for "concrete curing and sealing compounds" with a VOC content limit of 700 g/l. Two of the commenters (IV-D-86, IV-D-152) suggested the following definition for concrete curing and sealing compounds: "A liquid membrane-forming compound marketed and sold solely for application to concrete surfaces to reduce the loss of water during the hardening process and which seals old and new concrete providing resistance against alkalis, acids, and UV light, and providing adhesion promoting qualities." Another commenter (IV-D-154) recommended that the EPA include in the definition the requirement that the coating meet the recently-developed American Society for Testing and Materials (ASTM) C1315-95 standard to

provide a clear distinction between high performance, permanent sealers and those materials designed principally as curing compounds with some sealing characteristics. Without a separate category, the commenters would be subject to the proposed concrete curing compounds category VOC content limit of 350 g/l.

A follow-up discussion with one of the commenters (IV-E-13) clarified that concrete curing and sealing compounds are typically used on buildings, while concrete curing compounds are used on highways. The commenter added that the 1990 VOC Emissions Inventory Survey under-represented these coatings and concrete form release compounds because they are not made by paint manufacturers; they are made by the construction industry. Specifically, two commenters (IV-D-170, IV-D-210) noted that the survey of coating manufacturers and the EPA failed to recognize the concrete curing and sealing compounds industry and stated that over 10 million gallons of concrete curing and sealing compounds are produced annually, much higher than the 331,000 gallons of concrete curing compounds accounted for in the survey. One of the commenters (IV-D-152) distinguished curing compounds as having the single function of providing moisture retention for curing to produce design strength and other desired properties. In comparison, curing and sealing compounds function as longer term sealers that provide protection, aesthetics, and durability in addition to curing. The EPA contacted all of the commenters for clarifications and follow-up. In follow-up discussions (IV-E-13, IV-E-15, IV-E-16, IV-E-17, IV-E-18, IV-E-37, IV-E-49, IV-E-50), the commenters asserted that the proposed VOC content limit of 350 g/l is not technologically feasible for the concrete curing and sealing compounds category and, if applied to this category, will force the use of waterbased technology with inadequate performance. Based on sales and VOC content information submitted by the commenters, about 25 percent of the current production of concrete curing and sealing compounds have VOC content levels ranging from 751-850 g/l, while slightly more than half of the total production is in the 701-750 g/l range. According to one of the

commenters (IV-D-152), the requirements of aesthetics and longevity coupled with the need for applications over wide temperature and humidity ranges can only be met with solvent-based systems.

One commenter (IV-D-170) pointed out that ASTM recognizes a separate category for concrete curing and sealing and that current specifications from the Department of Transportation and the Corps of Engineers cannot be satisfied with current waterborne technology. On the other hand, one of the commenters (IV-D-154) indicated that States with VOC standards in place, such as California and New Jersey, have not seen the need for making a distinction between "concrete curing" and "concrete curing and sealing" because waterborne products are available to meet both requirements. However, the commenter elaborated that drawbacks of waterborne formulations are low-temperature performance and low-temperature stability. This commenter asserted that a VOC content limit of 675 to 700 g/l will permit effective concrete curing and sealing compounds to be marketed. Another commenter (IV-D-170) argued that California and New Jersey are not influenced by the weather conditions of other states such as Minnesota, North Dakota, South Dakota, Wisconsin, and Nebraska. Moreover, in a follow-up discussion with one commenter (IV-E-37), it was again pointed out that one of the main problems with waterborne coatings is that they will not coalesce at temperatures below 50 ^{o}F. The commenter stated that solventborne products can be used at temperatures as low as 30 ^{o}F. Another commenter (IV-D-170) cited several other drawbacks to the use of waterborne technology such as shrinkage cracks due to late saw cutting and curling of slabs caused by different water content between the top and bottom of the slab. In addition, the winter and freeze/thaw cycles have deleterious effects on uncured/sealed concrete. One commenter (IV-D-210), a small family-owned business that produces coatings for the concrete industry, referred to the ongoing development of waterborne cure/sealer coatings since 1989, but to date the

business has been unable to develop a waterborne cure/sealer that will perform as effectively as the solventbased coatings.

One commenter (IV-D-152) stated that specifying a VOC content limit of 700 g/l for the concrete curing and sealing category would allow formulations with solids in the 25 to 30 percent range. The commenter pointed out that a formulation with solids over 30 percent is impractical due to technical limitations, and most curing and sealing compounds sold today fall into the 10 to 15 percent solids range with a VOC content greater than 800 g/l. Two of the commenters (IV-D-86, IV-D-170) argued that the EPA would see a 33 to 39 percent VOC emission reduction as a result of the combination of increased coverage (through use of higher solids) and the recommended VOC content limit of 700 g/l if all the curing and sealing market converts to higher solids formulations (i.e., 25 to 30 percent solids). Follow-up discussions with several manufacturers (IV-E-37, IV-E-17, IV-E-15, IV-E-18) confirmed that the limiting factor on lower-VOC solventborne products is the solids content. The manufacturers stated that the highest possible solids content is 30 percent (VOC content of 650 g/l); and the use of higher solids presents application problems, they do not bond well, and they wear more quickly.

A small business that manufactures (IV-F-2e) concrete sealers and concrete curing compounds stated that there is no such thing as a true waterbased concrete coating because there are always coalescing problems. The commenter stated that waterbased concrete curing and sealing coatings do not work and recommended that the EPA make a distinction in the rule between a concrete curing and sealing coating versus a concrete curing compound.

Response: Based on review and evaluation of information submitted by the commenters and follow-up information provided by six manufacturers of concrete curing and sealing compounds (IV-E-13, IV-E-15, IV-E-17, IV-E-18, IV-E-37, IV-E-50), the EPA has determined that a separate category for concrete curing and sealing compounds should be established with a VOC content limit

of 700 g/l, as recommended by the commenters. The definition is as follows:

> Concrete curing and sealing compound means a liquid membrane-forming compound marketed and sold solely for application to concrete surfaces to reduce the loss of water during the hardening process and to seal old and new concrete providing resistance against alkalis, acids, and ultraviolet light, and provide adhesion promotion qualities. The coating must meet the requirements of ASTM C1315-95, Standard Specification for Liquid Membrane Forming Compounds Having Special Properties for Curing and Sealing Concrete.

There are several reasons for establishing this category. Manufacturers of coatings for the concrete industry were not fully represented in the VOC Emissions Inventory Survey and, therefore, insufficient data were collected to evaluate concrete curing products in the proposed rule. Based on comments received on the proposal, the EPA has determined that the categories of "concrete curing" and "concrete curing and sealing" have different performance characteristics; i.e, concrete curing and sealing compounds function as longer term sealers that provide protection, aesthetics, and durability in addition to curing. There are two separate ASTM methods available for each of these categories because ASTM Committee experts as well as the Department of Transportation and Army Corps of Engineers consider them separate, distinct categories with different performance requirements. The VOC content limit of 350 g/l for concrete curing reportedly cannot be achieved by the concrete curing and sealing industry for all applications. Although waterborne products are available that meet the VOC content limit of 350 g/l, commenters cited several drawbacks such as low-temperature performance and low-temperature stability.

Although the commenters stated that most curing and sealing compounds fall into the 10 to 15 percent solids range with a VOC content greater than 800 g/l, the information the commenters provided to the EPA (table 2-2) shows that the products with VOC contents ranging between 701 and 750 g/l had the largest sales volume (about 53 percent). Also, based on this information, the EPA has determined that a VOC content limit of 700 g/l for the

concrete curing and sealing category is technologically feasible, allowing formulations with 25 to 30 percent solids, which is reportedly an acceptable range to meet performance requirements. Based on analysis of information provided and as requested by nearly all of the commenters, the EPA believes a VOC content limit of 700 g/l is appropriate for this category. This limit will reduce VOC emissions from this category by an estimated 28 percent.

Concrete surface retarders.

Comment: Two commenters from the same company (IV-D-68, IV-D-120) and another commenter (IV-D-209) maintained that concrete surface retarders should not be covered by the architectural coating rule on the grounds that these products do not meet the proposed definition of a coating. Two commenters (IV-D-68, IV-D-120) stated that concrete surface retarders are used in the production of exposed aggregate finishes for architectural precast concrete panels for buildings that last more than 30 years. These commenters explained that surface retarders effectively disrupt the chemistry of freshly poured concrete by altering cement hydration. This causes the surface to not harden to a specified depth known as "depth of etch."

Table 2-2. CONCRETE CURING AND SEALING DATA

VOC Range (g/l)	N	Sales/ Production Volume (gal)	Sales (%)	Sales Weighted Average VOC (g/l)	Sales Weighted Average VOC (lb/gal)	Actual VOC Emissions (lbs)	VOC (%)
0-199	5	21,596	0.73	136	1.13	24,423	0.14
200-299	8	114,244	3.86	239	1.99	227,663	1.34
300-399	7	82,075	2.77	349	2.91	238,937	1.41
400-599	0	0	0	0	0	0	0
600-649	5	228,447	7.72	642	5.35	1,222,301	7.19
650-699	13	252,240	8.53	669	5.57	1,405,696	8.27
700-749	23	1,568,961	53.03	722	6.01	9,433,598	55.51
750-849	16	690,934	23.35	771	6.43	4,440,599	26.13
Totals	77	2,958,497	100.00	689	5.74	16,993,225	100.00

N = the number of products

References: IV-D-170, IV-D-87, IV-D-195 to IV-D-203, IV-D-210, IV-G-06 to IV-G-10

Concrete surface retarders are formulated to control etch thereby giving various options to precasters for different job applications. Both commenters (IV-D-68, IV-D-120) explained that after application, concrete surface retarders are given 14-72 hours to affect the concrete system, after which time the non-hardened cement surface (and the concrete surface retarder) is either brushed, blown, or washed away to give an architecturally pleasing surface of exposed aggregate. Both commenters explained that the concrete surface retarder does not form a coating, but interacts chemically with the cement to prevent hardening where the concrete surface retarder is applied, allowing the retarded matrix of cement and sand at the surface to be washed away to create an exposed aggregate finish typically requiring no further treatment. All of the commenters pointed out that New Jersey and Texas do not regulate concrete surface retarders because they do not meet their definition of a coating and are, therefore, exempt from their architectural coating rules.

Two commenters (IV-D-120, IV-D-209) challenged the legal, technical, and environmental basis for regulating concrete surface retarders since emissions from this category were not addressed in the EPA survey. If an exemption is not granted on the basis that these products do not meet the definition of a coating, the commenters requested an exemption be granted on the basis of a categorical or low-volume specialty niche. The commenters base their request on data from the National Paint and Coatings Association (NPCA) and the Precast/Prestressed Concrete Institute (IV-D-209) that illustrates that concrete surface retarders constitute less than 0.03 percent of the architectural coatings market.

If the EPA decides that concrete surface retarders are considered to be coatings, the commenters requested that a new category be created similar to the masonry/concrete conditioner category and VOC content limit of 780 g/l used in the Massachusetts rule and suggested the following definition: "Concrete surface retarder means a low-solids coating which is

formulated and marketed specifically for use as a conditioner of concrete surfaces to achieve an exposed aggregate finish". Two commenters (IV-D-120, IV-D-209) discussed the progress in resin technology with regard to VOC reductions from concrete surface retarders and concluded that the VOC content of retarders cannot readily be reduced through resin technology. According to these commenters, current technology has yet to provide a low-VOC content concrete surface retarder that effectively performs to necessary field requirements in all applications. They stated that water-based concrete surface retarders have been developed, but do not perform nearly as well as solvent-based concrete surface retarders in terms of application, usage and performance. According to one commenter (IV-D-120), concrete surface retarders are used in a unique and specific application and constitute merely 0.01 percent (150,000 gallons) of the total coatings sold by the coating industry and less than 0.03 percent of architectural coatings sold.

According to follow-up information from the largest manufacturer of retarders (IV-E-24), the volume of their concrete retarders used "on-site" (in the field) is not anticipated to exceed 5,000 gallons (less than 2 percent of their total production) per year. The commenter stated that concrete retarders are generally used in a manufacturing setting at a precast facility. The commenter stated that there are approximately 400 precast plants in the U.S. that employ about 18,500 people. If these plants are required to meet the proposed VOC content limit, the commenter asserted that precasters would not have available an effective, alternative product and some plants would be forced out of business. According to the commenter, establishing a VOC content limit of 780 g/l would not cause a significant contribution to air pollution nationally because emissions from concrete surface retarders evidently were not significant enough to include them as part of the coatings emissions study when the proposed regulation was being developed.

Response: First, the EPA notes that when concrete surface retarders are recommended solely for use in the production of

exposed aggregate finishes for architectural precast concrete panels in a manufacturing setting at a precast facility, which is the typical situation, they are not subject to this rule. Second, the EPA has considered the argument that these products are not coatings and has concluded that concrete surface retarders contain resins and solvents and serve a functional purpose (retarders are applied to the surface and then washed away to achieve an exposed aggregate finish) and, thus, meet the rule's definition of a coating. The architectural coating rule defines a coating as follows:

> Coating means a material applied onto or impregnated into a substrate for protective, decorative or functional purposes. Such materials include, but are not limited to, paints, varnishes, sealants, inks, maskants, and temporary coatings. Protective, decorative, or functional materials that consist only of solvents, acids, bases, or any combination of these substances are not considered coatings for the purpose of this subpart.

Consequently, these products are subject to the architectural coating rule. Third, concrete surface retarders that are used in the field at the actual job location are subject to the rule, and the EPA has created a new category for concrete surface retarders with a VOC content limit of 780 g/l. This limit is based on information provided by the commenters that indicates it is technologically and economically feasible. No information was available to the EPA to support a lower limit. In the final rule, concrete surface retarder is defined as

> "a mixture of retarding ingredients such as extender pigments, primary pigments, resin, and solvent that interact chemically with cement to prevent hardening on the surface where the retarder is applied, allowing the retarded mix of cement and sand at the surface to be washed away to create an exposed aggregate finish."

Based on information received from one large manufacturer (IV-E-24) of these products, the volume of retarders used in the field or "on-site" is relatively low (less than 5,000 gallons per year). These products reportedly cannot be reformulated to meet the VOC content limit of 250 g/l for interior flat coatings, which the products would be subject to in the absence of a

specific category of concrete surface retarders. The composition of concrete surface retarders is unique and there is no lower-VOC content substitute for the function of these products in all applications. Therefore, the EPA has created this low-volume, specialty niche category with a VOC content limit of 780 g/l in the final rule.

Low solids coatings.

Comment: Two commenters (IV-D-185, IV-D-189) urged the EPA to provide a "low-solids" subcategory for all types of architectural and industrial maintenance coatings and to include in these subcategories those products that have less than one pound of solids per gallon of coating. The commenters pointed out that this would be similar to the low-solids subcategory in the proposed rule under stains and wood preservatives. One commenter (IV-D-185) recommended that the references to low-solids stains and low-solids wood preservatives in §§ 59.402(c) and 59.403(a)(3) of the proposed rule should then be changed to "low-solids coatings." The commenter stated that the concept of a low-solids coatings category is beneficial because it ensures a minimal VOC content that benefits both consumers and the environment. The commenter stated that low-solids coatings are applied on a volume, not solids, basis. Therefore, the VOC content should be calculated including water and exempt solvent in order to avoid delaying or preventing the introduction of innovative products that can significantly reduce VOC emissions. One commenter (IV-D-189) defined low-solids subcategories in part as containing 1 pound or less of solids per gallon (0.12 kg solids/l) of coating materials and for which at least half of the volatile component is water.

Response: The EPA has no data or information upon which to base a VOC content limit for low-solids coatings in architectural coating categories other than stains and wood preservatives. For stains and wood preservatives, it is clear that at a very low level of solids content, the coating coverage is dependent on volume rather than the amount of solids in the coating. For other applications that have very low solids (e.g., lacquers for

metal), the solids content still dictates the amount of coating used (rather than volume) and for this type of coating more gallons would be needed to achieve the same coverage as a higher-solids coating. Consequently, the EPA has not added a general low-solids coatings category to the final rule.

Tung oil finishes.

Comment: Forty percent of one commenter's (IV-F-2(1)) products are specialty tung oil finishes (an oil varnish or sealer) for wood. Follow-up information provided by the commenter (IV-E-14) indicates that some tung oil finishes are clear and some are opaque. The commenter stated that the VOC content ranges from 600 to 700 g/l for its tung oil finishes. This product is used on floors, furniture, and paneling. The commenter has developed some waterborne products for other applications but not for wood because waterborne products tend to raise the wood grain. The commenter argued that the VOC content of these products must be high for penetration. The commenter stated that reformulation attempts have not been successful. Because these tung oil finishes cannot be reformulated and still meet performance needs, the commenter requested that these products either be exempted from the regulation or be placed in a specialty category. The commenter did not suggest a definition for this category.

Response: Based upon review and evaluation of these comments, follow-up information from the commenter and other tung oil manufacturers, and State architectural coating rules, the EPA has determined that a separate category for tung oil finishes is not warranted. Tung oil finishes would be subject to the varnishes category or the waterproofing sealers category with a VOC content limit of 450 g/l or 600 g/l, respectively, depending on how the coating is marketed and sold. In follow-up information (IV-E-14), the commenter revealed that a compliant product (335 g/l VOC content) is sold in regulated areas for limited purposes. Moreover, the EPA is not aware of any State architectural coating rules that have a separate category for tung oil finishes.

According to follow-up information from one coating manufacturer (IV-E-45), the term "tung oil" is used generically within the industry and it could be 100 percent vegetable oil, or a varnish for furniture and floors, or a waterproofing sealer, depending upon its recommended use. This manufacturer markets a similar product as a waterproofing sealer and submitted comments (IV-D-169) on the VOC content limit for waterproofing sealers that were marked confidential. In addition, follow-up information obtained from another manufacturer (IV-E-46) revealed that it markets tung oil as a rubbing finish topcoat, which is sold as a varnish. This manufacturer stated that this product must be applied extremely thin and, thus, a high VOC content of 650 g/l is needed for this varnish; however, this manufacturer did not request a higher VOC content limit for varnishes than the proposed limit of 450 g/l. According to a publication on floor finishes (IV-J-1), many oil varnishes, in the past, were domestic versions of marine products (such as spar varnish).

The EPA believes that a separate category for tung oil finishes is not appropriate since the VOC content of these products depends on the intended use, which is regulated through the limits established for the various usage categories (e.g., varnishes and waterproofing sealers). The EPA notes that the final rule provides compliance flexibility through the exceedance fee and tonnage exemption, if needed, that would allow the commenter to continue to market this specialty coating to meet customer needs.

Lacquer stains.

Comment: Three commenters (IV-D-09/IV-D-183, IV-D-189, IV-F-1q) requested that the EPA create a new category for lacquer stains because they are an integral part of a fine wood finishing system which includes clear lacquer finishes and lacquer sanding sealers. Two of the commenters (IV-D-183, IV-D-189) suggested a VOC content limit of 780 g/l for the new category and recommended the following definition: "Lacquer stains: Semi-transparent stains formulated and recommended specifically for use in

conjunction with clear lacquer finishes and lacquer sanding sealers."

Two of the commenters (IV-D-09/IV-D-183, IV-D-189) explained that lacquer stains: (1) provide highlighting and minimal coloring to unfinished wood surfaces; (2) enhance the natural beauty of wood; and (3) bring out the natural wood grain by coloring primarily the softer portion of the grain. These commenters also stated that lacquer stains provide no protection for the substrate and, therefore, must be top coated with a clear coat. Two commenters (IV-D-183, IV-D-189) explained that the primary use for lacquer stains is in new construction by professional painters. Lacquer stains are applied via spraying to bare wood and are primarily used when wood (cabinets, molding, and paneling) is finished on site for the first time. The same commenters stated that lacquer stains are a productivity tool for the painting contractor because they dry quickly, are compatible with lacquer sealers and topcoats, and can allow many finishing jobs to be completed within the same day. One commenter (IV-D-183) argued that without lacquer stains to color and enhance the wood there will be little use for clear lacquer finishes. According to this commenter, the other stain categories in the proposed architectural coating rule are finish coat products that perform very similarly to an exterior paint and are not useable in producing the furniture-like finish that is produced with lacquer stains and finishes. The commenter does not recommend oil-based wiping stains as a replacement for lacquer stains because: (1) 90 percent or more of the wiping stain must be wiped from the surface being stained, creating waste that becomes a spontaneous combustion problem and (2) inter-coat adhesion problems cause film failure of the finished product. In addition, oil wiping stains require hand wiping and at least overnight drying before the lacquer sealer and topcoat may be applied. According to another commenter (IV-D-189), waterbased stains present drying problems, but also have additional problems of grain raising and "blushing" of the lacquer topcoat which is caused by the retention of water in the

wood. Another commenter (IV-F-1q) added that lacquer stains are made with cellulose, which is compatible with the wood, and with the same resin used in the sealer and topcoat, which eliminates intercoat adhesion problems between lacquer stain and a lacquer sealer. Two of the commenters (IV-D-09/IV-D-183, IV-D-189) maintained that the semi-transparent and opaque stains for which categories were established in the proposed rule are finish coat products, whereas lacquer stains are not finish coats.

Response: The EPA has carefully reviewed the information submitted by the commenters and has determined that a separate category for lacquer stains with a VOC content limit of 780 g/l is not warranted. The lacquer stains specialty category was one of the categories considered for inclusion in the proposed rule based on requests from some manufacturers (61 FR 32739, June 25, 1996). It was excluded because the EPA was concerned that the overlap between lacquer stains and the more general stain categories would allow higher VOC content lacquer stains for uses in which lower VOC content stains would be acceptable substitutes. The EPA does not agree with the commenters' reasoning that a category of lacquer stains is warranted based on their representation that the other stain categories are "finish" products. Neither the definition of opaque stains (350 g/l) nor the definition of clear and semi-transparent stains (550 g/l) indicate that these stain categories are limited to finish products. Similar to lacquer stains, the proposed stains categories do not provide protection for the substrate and generally must be coated with a top clear coat. A review of State architectural coating rules showed that only Kentucky has a category for lacquer stains with a VOC content limit of 550 g/l; no other States have a separate category for lacquer stains. Moreover, this VOC content limit of 550 g/l for lacquer stains is the same as the EPA's proposed VOC content limit for semi-transparent stains. In addition, at least one State regulatory agency (California-South Coast) regulates lacquer stains as stains. Therefore, the EPA believes that it is appropriate to regulate lacquer stains in the more general

category of stains. As stated in a previous response in section 2.2.3 of this document, §59.402(b)(2) of the final rule has been amended to clarify that lacquer stains would be classified in the general stains categories.

Zone marking coatings.

Comment: Twenty-three commenters, including coating manufacturers, distributors, contractors, the Department of Defense, and one national trade association submitted comments on zone marking coatings. Nine of these commenters, including four coating manufacturers (IV-D-45, IV-D-63, IV-D-153/IV-D-207, IV-D-183), two distributors (IV-D-87, IV-D-139), one user (IV-D-88), and one national trade association (IV-D-189) requested that the EPA create a separate category for zone marking coatings. The commenters indicated that the proposed VOC content limit of 150 g/l for traffic marking coatings would essentially ban the use of solventborne zone marking coatings and force the use of water-based coatings. One commenter (IV-F-2) does not believe that parking lot marking coatings that will achieve the proposed VOC content limit are available. Another commenter (IV-D-73) stated that its zone marking coatings do not meet the proposed limit for traffic marking coatings at 150 g/l, but the commenter did not provide any basis for this statement. Two commenters (IV-D-183, IV-D-207) suggested that the EPA establish a VOC content limit of 450 g/l for the category. One commenter (IV-D-63) suggested that the EPA create a category for coatings for privately owned parking areas classified as a low-volume coating with a VOC content limit of 425 g/l and labeled for use on parking lots only. Alternatively, the commenter suggested that parking lot coatings could be considered a niche market because it is such a small percentage of total coating volume when compared to coatings used on highways; this manufacturer makes less than 1500 gallons per week. The commenter stated that the proposed VOC content limit for traffic marking coatings was much lower than limits for other categories, which was unfair. This commenter added that the use of acetone

as a solvent as a means to achieve the proposed limit would be entirely too dangerous due to its high flammability.

Commenters also suggested definitions for the new category they sought. The commenters proposed the following zone marking definitions: "Coatings formulated and recommended for marking or striping curbs, driveways, parking lots, and sidewalks" (IV-D-183); and "Coatings formulated and recommended for marking and striping airport runways, parking lots, curbs, driveways, and industrial traffic patterns" (IV-D-153/IV-D-207). This commenter added that these areas must be marked for safety whenever the need arises, without regard to temperature.

A Department of Defense (DOD) Steering Committee (IV-D-03, IV-D-121), representing the Navy, Air Force, and Army, as well as several DOD components and agencies, requested that for emergency airfield marking operations, the EPA exempt traffic marking coatings used on airfields and other military facilities under cold weather conditions. One of the commenters (IV-D-121) argued that existing waterborne airfield coatings cannot be successfully applied at temperatures below 55°F. The commenter stated that the typical VOC content of its solventborne coatings is 350 g/l to 400 g/l. The commenter explained that when airfield markings become obscured, they no longer provide visual cues for safe operation of aircraft and support vehicles and, therefore, must be remarked immediately, regardless of temperature. The commenter stated that in northern climates, operations could be terminated or severely degraded if solvent-based materials are not available for use at lower temperatures.

Three coating manufacturers (IV-D-44, IV-D-45, IV-D-93) stated that oil-based zone marking paint could not be manufactured at a VOC content of 150 g/l. One commenter (IV-D-45) stated that fast drying, medium oil alkyds are the only available medium for the high level of pigment in the coatings. According to this commenter, customers have deemed latex coatings unacceptable when used on crosswalks and high traffic parking lots. Another commenter (IV-D-93) suggested that the EPA consider an exceedance fee mechanism and small quantity exemption

based on 5,000 gallons, or as a percentage of the company's total production in the final rule.

Three commenters (IV-D-87, IV-D-88, IV-D-139) were concerned that the quality and durability of the proposed lower-VOC content traffic marking coatings have not been proven in parking lot applications, especially over pavement coatings such as coal tar and asphalt emulsion sealers. They suggested that coating manufacturers conduct more testing and product improvement.

Seven parking lot striping contractors (IV-D-90, IV-D-91, IV-D-92, IV-D-95, IV-D-99, IV-D-149, IV-D-150) argued that the proposed regulation would be extremely detrimental to small private sector parking lot striping contractors who would no longer be able to operate and requested that these small businesses be exempted from the regulation for several reasons. First, individuals and small businesses cannot afford the cost of waterborne coating application equipment, estimated at $12,000 by one commenter (IV-D-90) and ranging from $25,000 to $40,000 by another commenter (IV-D-149), not including any work force retraining costs. Two other commenters (IV-D-87, IV-D-139) expressed concern that small businesses would need to purchase at least $4,000 of new equipment in order to switch from solvent-based to water-based coatings. Second, the commenters claimed the work season in northern climates will be reduced by about two months each year, thereby greatly reducing a small business's ability to keep a competent work force and stay financially viable (IV-D-139, IV-D-149, IV-D-150). Third, the commenters questioned the compatibility of the proposed coatings with coal tar and asphalt emulsion sealers (IV-D-87, IV-D-88, IV-D-139, IV-D-149). Fourth, use of the proposed coatings for work done at night and in parking garages in a constantly changing climate, frequently when the temperature is below 50 ^{o}F, was also questioned (IV-D-149). Fifth, commenters asserted that waterbased coatings used in previous applications have not lasted, resulting in marketing, warranty, and customer education problems (IV-D-91, IV-D-99, IV-D-149).

Three commenters (IV-D-93, IV-D-189, IV-D-207) explained that the marking and striping of curbs, driveways, and sidewalks; and parking lots, fire lanes, and handicap zones in commercial areas (supermarkets, banks, shopping centers, etc.) present unique application requirements because much of this marking must be done at night when these areas are not in service. At night, humidity is less than ideal. Therefore, these products must dry extremely quickly. The commenters asserted that waterborne products do not perform well in these applications because of the dry time constraints and adverse conditions under which these products are sometimes applied. One commenter (IV-D-207) argued that these products are not intended for use as traffic marking coatings and should be given a separate category. The commenter maintained that these products are needed for the small independent striping contractor to survive and traffic marking coatings meeting the proposed VOC content limits do not work for zone marking. Two other commenters (IV-D-63, IV-F-1q) also maintained that higher humidity and lower temperatures would prevent water-based paints from curing properly. One commenter (IV-D-63) argued that waterbased coatings must be applied in temperatures above 45 ^{o}F with humidity lower than 75 percent to produce a satisfactory film.

One distributor selling to small contractors (IV-D-87) and four small businesses (IV-D-63, IV-D-183, IV-D-207, IV-F-1q) were also concerned that the rule would cause small businesses to cut jobs or close because the proposed VOC content limit would force applicators to use water-based coatings. One commenter (IV-D-63) explained that most large government contractors have sophisticated equipment that uses heat to accelerate dry time and glass bead technology; however, small companies cannot afford such equipment.

Another distributor (IV-D-83) who sells coatings to over 500 small and medium-sized contractors recommended a total exemption of traffic and zone marking coatings that are used for private sector work that could be implemented based on a label change and container size of 5 gallons. The commenter gave the

following reasons for this request: (1) contractors do not have the equipment necessary for the new coatings; (2) waterborne coatings show signs of premature wear as early as 60 days after application which could lead to accidents; (3) many contractors are part-time and could be put out of business by the higher cost of material and required equipment; and (4) private sector applications generate more wear than public roadways due to less structured and more frequent traffic patterns.

Response: The EPA has carefully evaluated the reasons presented in the comments and agrees that a separate category for zone marking coatings should be established in the final rule with a VOC content limit of 450 g/l, as suggested by several commenters. The EPA is limiting the zone marking coating category to coatings sold in containers of 5 gallons or less. Available information (IV-E-20) reveals that State Departments of Transportation buy traffic marking coatings in larger than 5-gallon containers, and the military airfields typically purchase coatings in 5-gallon containers and transfer the coatings to 1-gallon or 1-quart containers. The EPA believes that this size restriction will discourage the use of zone marking coatings in large-scale applications such as those for general traffic markings intended for public roads and highways. Also, according to available information (IV-6-5), only about 10 percent of traffic marking coatings are used in areas such as parking lots and garages. Thus, creation of this category will result in only a limited amount of additional VOC emissions. The category is defined in the final rule as follows: "Zone marking coating means a coating formulated and recommended for marking and striping driveways, parking lots, sidewalks, curbs, or airport runways, and sold or distributed in a container with a volume of 19 liters (5 gallons) or less."

The EPA established this category to satisfy both economic concerns of small applicators as well as performance considerations for coatings used on airport runways, particularly emergency airfield markings, and commercial service areas during cold and very humid weather conditions. The commenters argued

that higher humidity and lower temperatures at night prevent waterborne coatings from curing properly in commercial service areas. Continued availability of solventborne coatings for use in these special situations will ensure safe airport operations and eliminate the drying time constraints under which waterborne coatings are sometimes applied.

The decision to allow the use of solventborne coatings at a VOC content limit of 450 g/l in zone marking applications eliminates the need for small business applicators to purchase new application equipment that would have been required for waterborne coatings.

Conversion varnishes.

Comment: Twenty-eight commenters (IV-D-47, IV-D-84, IV-D-89, IV-D-94, IV-D-98, IV-D-100, IV-D-102 to IV-D-107, IV-D-109, IV-D-111 to IV-D-113, IV-D-123, IV-D-124, IV-D-127, IV-D-131 to IV-D-133, IV-D-135, IV-D-136, IV-D-144, IV-D-145, IV-D-176, [six of these are from the same company], IV-G-04) expressed concern over the effect of the architectural coating rule on the availability of two specialty top coats, known as "Swedish Finishes", used in the hardwood floor finish industry. The commenters asserted that the proposed VOC content limits for floor coatings (400 g/l) and varnishes (450 g/l) cannot be achieved by their niche market, specialty conversion varnishes due to substantial chemical, application, and performance differences. The two top coats are manufactured in Sweden and, according to the manufacturer, these coatings cannot be reformulated to become VOC compliant because of their chemical makeup(IV-D-105, IV-D-109, IV-D-124, IV-D-144, IV-D-176, IV-G-04). The current VOC contents range from 535 g/l (IV-G-04) to 725 g/l (IV-D-176) and, according to the manufacturers, any efforts to reformulate the top coats would affect their performance and their ability to compete in the specialty conversion varnish coatings niche market. Several commenters made recommendations to the EPA about how to modify the rule to accommodate these coatings. Eleven commenters (IV-D-89, IV-D-94, IV-D-103, IV-D-105, IV-D-106, IV-D-107, IV-D-131, IV-D-132,

IV-D-133, IV-D-145, IV-D-176) argued that the EPA should consider an exemption for low-volume, specialty niche products such as specialty conversion varnish coatings. One commenter (IV-D-113) suggested that coatings serving a specialty market and for which there is no equivalent replacement be exempted from the regulation. This commenter also suggested that the EPA consider exemptions for products that are sold in low volumes. Ten other commenters (IV-D-47, IV-D-84, IV-D-98, IV-D-102, IV-D-109, IV-D-111, IV-D-123, IV-D-135, IV-D-136, IV-D-144) requested that specialty conversion varnish coatings be exempted from the rule.

Three commenters (IV-D-47, IV-D-104, IV-D-127) expressed concern that these types of specialty conversion varnish coatings will no longer be available in sizes larger than 1 liter (such as 1- and 5-gallon sizes). One commenter (IV-D-104) expressed additional concern that limiting specialty conversion varnish coatings to 1-quart containers would result in more wasted finish and more containers in landfills, negating the intent of the proposed rule. Twelve commenters (IV-D-84, IV-D-98, IV-D-103, IV-D-105, IV-D-107, IV-D-111, IV-D-112, IV-D-113, IV-D-124, IV-D-135, IV-D-136, IV-D-144) expressed concern that the proposed rule would eliminate specialty conversion varnish coatings altogether.

One commenter (IV-D-176) recommended that the EPA establish a new category for conversion varnishes with a VOC content limit of 725 g/l due to the differences in chemical make-up and performance between wood floor finishes and conversion varnish top coats and provided the following definition for this unique niche market: "Specialty conversion varnish coating means a clear acid-curing coating with a polyvinyl butyryl resin blended with amino resins and supplied as a single-component product. It produces a hard, durable clear finish designed for professional application to wood flooring." As stated previously, the commenter argued that these coatings cannot be reformulated due to their chemical make-up. Any reformulation of the two top coats would reportedly affect their unique performance

capabilities and their ability to compete in the specialty conversion varnish coatings niche market.

Another commenter (IV-G-04) also requested that the EPA create a new category for conversion varnishes for the same reasons stated in the previous comment (chemical and performance differences), but requested a VOC content limit of 560 g/l. This commenter stated that they have received approval from the State of Oregon to sell their existing coatings (with VOC contents ranging from 535 g/l to 560 g/l) to professional users until January 1, 1998. For this commenter's conversion varnishes, urea resins are combined with alkyd resins which produces a finish of relatively high solids content with a short drying time. This coating is used as both a sealer and finish coat, so no special sanding sealer with high VOC content is necessary. The commenter stated that reformulation efforts with suppliers of alkyds and urea resins are ongoing and will continue. The commenter stated that oil-modified urethanes that comply with the proposed rule also exist, but these coatings still have some limitations and are very expensive. The commenter estimated that a total of only about 200,000 gallons of this type of conversion varnish coating (urea-alkyd resin) is used in the United States per year, which they estimated to be less than 5 percent of the floor finishing market nationwide. According to this commenter, without this coating, which would be banned at the proposed VOC content limit of 450 g/l for varnishes, hundreds of contractors will lose the businesses on which they have built their reputation for the past 25 years.

Performance characteristics. According to commenters, these specialty conversion varnish coatings have unique performance capabilities which make them more desirable than competitive coatings (IV-D-89, IV-D-94, IV-D-102, IV-D-105, IV-D-106, IV-D-107, IV-D-109, IV-D-111, IV-D-112, IV-D-113, IV-D-123, IV-D-131, IV-D-132, IV-D-133). First, the coatings can be applied in 24 hours or less versus 2 days for waterborne coatings (IV-D-103, IV-D-176). Second, according to the commenters, the coatings are more durable (IV-D-47, IV-D-84, IV-D-89, IV-D-94,

IV-D-100, IV-D-102, IV-D-103, IV-D-106, IV-D-107, IV-D-109, IV-D-111, IV-D-112, IV-D-113, IV-D-123, IV-D-124, IV-D-131, IV-D-132, IV-D-133, IV-D-127, IV-D-144, IV-D-145, IV-D-176) and flexible (IV-D-100, IV-D-102, IV-D-104, IV-D-107, IV-D-109, IV-D-144, IV-D-145, IV-D-176) and have a crystal clear appearance that makes the hardwood floor more attractive (IV-D-102, IV-D-103, IV-D-111, IV-D-123, IV-D-144, IV-D-176). The commenters claimed that these finishes require less maintenance because they are less likely to scratch, peel, or chip (IV-D-47, IV-D-84, IV-D-112, IV-D-176). When small scratches and light wear occur, the commenters asserted that they are easily repaired without the need for sanding and recoating (IV-D-47, IV-D-84, IV-D-102, IV-D-107, IV-D-145, IV-D-176). Typical finishes using specialty conversion varnish coatings reportedly last over 10 years versus 2 to 3 years for waterborne finishes (IV-D-47, IV-D-84, IV-D-89, IV-D-94, IV-D-105, IV-D-106, IV-D-131, IV-D-132, IV-D-133, IV-D-176).

In addition, one commenter (IV-D-112) requested that the EPA consider the durability and maintenance requirements of a coating when establishing VOC content limits. Several commenters (IV-D-47, IV-D-89, IV-D-94, IV-D-100, IV-D-103, IV-D-105, IV-D-106, IV-D-111, IV-D-127, IV-D-131, IV-D-132, IV-D-133, IV-D-145) stressed that using a specialty conversion varnish coating requires fewer coats than when using comparable waterborne finishes. Specifically, the commenters stated that the specialty conversion varnish coating requires one coat of sanding sealer and one coat of finish versus three to five coats for other types of finishes. The commenters claimed that this equates to lower overall VOC exposure over the floor's lifetime.

Economic impact. Two conversion varnish top coats are marketed and sold by a small company (IV-D-176) of 10 employees. Over 90 percent of the company's sales revenue comes from these two coatings that are used in conjunction with one of the company's compliant sanding sealers. Thus, if these coatings are not exempted from the proposed rule, the company stated that they will be put out of business.

Twelve other commenters (IV-D-47, IV-D-98, IV-D-100, IV-D-102, IV-D-103, IV-D-111, IV-D-113, IV-D-123, IV-D-135, IV-D-136, IV-D-144, IV-D-145) stated that the proposed rule would cause them a loss in sales or business if these coatings were no longer available. Five commenters (IV-D-98, IV-D-100, IV-D-103, IV-D-109, IV-D-112) expressed concern that the unavailability of these coatings would adversely affect their business or cause them economic hardship or financial difficulty. Two commenters (IV-D-84, IV-D-103) argued that the proposed rule would cause them or their clients to lose their competitive advantage. One commenter (IV-D-145) claimed that the majority of their business depends on their ability to provide these coatings.

Eleven commenters (IV-D-84, IV-D-89, IV-D-94, IV-D-102, IV-D-106, IV-D-111, IV-D-127, IV-D-131, IV-D-132, IV-D-133, IV-D-144) argued that the proposed rule would be a hardship on contractors who use specialty conversion varnish coatings and have built their reputation on these coatings. One commenter (IV-D-103) expressed concern that it would be unable to compete in outlying areas due to increased prices resulting from the additional travel costs incurred because waterborne finishes require an extra day to apply. Also, three commenters (IV-D-84, IV-D-100, IV-D-105) expressed concern that contractor employees would need to be retrained resulting in burdensome costs for the contractor. One commenter (IV-D-145) argued that the proposed rule would be a hardship on employees because the need for employee retraining could result in employees losing their jobs.

Four commenters (IV-D-104, IV-D-107, IV-D-109, IV-D-112) specifically discussed the loyal and dedicated following that these conversion varnishes have among many contractors and consumers and how consumers would continue to demand the high performance and quality provided by these coatings. Another commenter (IV-D-105) expressed concern over the loss to the consumer that will occur if these coatings become unavailable. Finally, one commenter (IV-D-123) expressed concern that the lack of these coatings could result in consumers choosing floor coverings other than wood. Another commenter (IV-D-104) pointed

out that there are medical benefits provided by hardwood floors over carpeting, citing an example in which a child's asthma virtually disappeared after a change from carpet to hardwood floors.

Three commenters (IV-D-111, IV-D-112, IV-D-113) also raised several economic issues regarding the regulatory development process. One commenter (IV-D-111) suggested that the EPA consider the impact that regulations will have on coatings and companies that depend on those coatings. The commenters recommended that the EPA consider such questions as: (1) What coatings will be eliminated? (2) What companies will be damaged or put out of business? (3) How many independent flooring contractors will lose business when the finish system they built their reputation on is no longer available? Two of the commenters (IV-D-124, IV-D-127) requested that the EPA review the impact of the proposed rule on small flooring businesses.

One commenter (IV-D-113) maintained that it is unfair for the EPA to apply VOC content limits to an entire industry without considering the distinctions between coatings and applications. The commenter argued that high-volume coatings can afford to reformulate. On the other hand, the commenter believed that low-volume specialty coatings should be considered separately. One commenter (IV-D-102) stated that including specialty conversion varnish coatings in a "one rule fits all" type of regulation, with no consideration of coating performance and uniqueness, is a great injustice to the contractors who use them and the homeowners who rely on them.

Chemical differences. One commenter (IV-D-176) recommended that more detailed definitions for wood floor finishes be included in the rule because the company's two conversion varnish top coats do not fit into the definitions provided by the EPA. The commenter based this recommendation on (1) chemical differences between specialty conversion varnish coatings and the definitions in the proposed rule for floor coatings and varnishes, (2) the inability to reformulate specialty conversion varnish coatings within the next 3 years, and (3) the niche

market that these types of floor finishes serve. The commenter claimed that specialty conversion varnish coatings are more sophisticated forms of conversion varnishes. According to the commenter, there are clear chemical differences between a varnish and a conversion varnish, and there are also clear chemical differences between a conversion varnish and a specialty conversion varnish coating.

First, the commenter explained that specialty conversion varnish coatings use a combination of polyvinyl butyryl and amino resins and rely on an acid catalyst to initiate the reaction. However, specialty conversion varnish coatings are delivered in a pre-catalyzed, single package system. This single package system is accomplished by stabilizing or blocking the reaction with the solvent system. Because specialty conversion varnish coatings use a system of ionic bonding between two very different resins (polyvinyl butyryl and amino resins), they also provide a much tougher coating than one that cures through oxidation.

In defense of adding a definition for specialty conversion varnish coatings based on the unique chemistry of these coatings, the commenter (IV-D-176) cited the precedent established by the EPA in categorizing coatings that often reflect chemical differences and unique specialty products.

Second, because specialty conversion varnish coatings use polyvinyl butyryl resin, the commenter argued that they cannot be reformulated with current technology to become compliant at the proposed VOC content limits. There are three strategies that the commenter has tried unsuccessfully for reducing the VOC content: reformulation with acetone, reformulation with a lower viscosity resin, and emulsification of the coating made at very high viscosity (low VOC) in water. The commenter presented the details of problems associated with the unsuccessful attempts at reformulation in these areas.

Third, due to its chemical differences, which lead to significant differences in performance and quality, specialty conversion varnish coatings serve a niche market in the hardwood floor finish industry (IV-D-47, IV-D-84, IV-D-100, IV-D-102,

IV-D-103, IV-D-105, IV-D-107, IV-D-111, IV-D-124, IV-D-127, IV-D-135, IV-D-136, IV-D-145, IV-D-176). According to one commenter (IV-D-176), there are only three companies that compete in this small sector of the industry and, according to its trade publications, their total coatings account for only 3 percent of the hardwood floor finish market. This commenter stated that all of these specialty conversion varnish coatings are marketed and sold only to licensed professional wood flooring contractors.

Low-volume limit. One commenter (IV-D-176) regarded the suggested potential exemption level of 1,000 to 5,000 gallons as too low because it would include only those one-person or part-time manufacturers who operate out of their homes and by word of mouth. The commenter contended that these manufacturers fit the EPA's concept of a small, low-volume company operating in a niche market because they are considered by industry analysts and competitors to be a small firm in the hardwood floor finish industry, they employ only ten employees, and over 90 percent of their sales come from four products. The commenter maintained that the low-volume level should be increased to cover small, niche market firms that will endure great economic hardship because of the architectural coating rule. The commenter suggested that the EPA consider a low-volume level of 100,000 gallons, which would exclude medium- and large-sized manufacturers but would include small companies that focus on niche markets.

Exceedance fees. Several commenters (IV-D-105, IV-D-107, IV-D-176) also supported an exceedance fee as an option for maintaining the availability of specialty conversion varnish coatings. One commenter (IV-D-176) argued that a reasonably priced exceedance fee provides a way for relatively small, low-volume companies to survive new stricter VOC laws. According to the commenter, it also provides a way for unique, niche market coatings that cannot currently be reformulated to meet the VOC content limits and maintain performance characteristics to survive.

Variances. One commenter (IV-D-176) asserted that a variance as currently proposed by the EPA would not be useful for specialty conversion varnish coatings. These coatings have a unique chemical makeup that has not been successfully reformulated and the development of resin technology in the next few years that could make reformulation successful is improbable. The commenter argued that a variance would only extend the time available to continue research, which would likely fail to produce a comparable compliant product.

Response: After evaluation of available information, the EPA has determined that a new category for conversion varnishes is warranted. The EPA has established the category with a VOC content limit of 725 g/l, as suggested. The following definition, which was suggested by two of the three manufacturers (IV-E-39), is included in the final rule: "Conversion varnish means a clear acid curing coating with an alkyd or other resin blended with amino resins and supplied as a single-component or 2-component product. Conversion varnishes produce a hard, durable, clear finish designed for professional application to wood flooring. The film formation is the result of an acid-catalyzed condensation reaction, affecting a transetherification at the reactive ethers of the amino resins."

This category has been created for several reasons. This coating category represents a niche market that has chemical differences that can be specified to distinguish it from the broad category of varnishes and ensure that this category is limited to the applications for which it is intended. Three manufacturers market these coatings. Due to the chemical makeup of conversion varnishes, these manufacturers have reportedly been unable to reformulate these coatings to meet the 450 g/l VOC content limit for varnishes. The information available to the EPA indicates that there is no lower-VOC substitute for this type of coating and that it is not technologically feasible to reformulate it at this time. Only three companies compete in this niche market and, according to its trade publications, these coatings represent a small portion (about 3 percent) of the total

national hardwood floor finishing market. As such, the EPA believes that no significant increase in VOC emissions will result from providing a higher VOC content limit for this specialty niche category and that it is important to preserve this market for the hardwood floor finishing industry.

Elastomeric high performance industrial finishes.

Comment: One commenter (IV-G-02) requested that the EPA establish a new category to encompass approximately 10 different coatings under the company's product line with the following definition: "Elastomeric high performance industrial finishes means a coating formulated and recommended to provide a weather, moisture, or abuse barrier on top of insulated piping and tanks on cold work systems as a component of insulation systems with moisture permeance less than 0.10 U.S. perms." The commenter proposed that this category have a VOC content limit of 650 g/l. The commenter argued that this limit would allow this specialized category of coatings to continue to be available for nationwide use.

The commenter argued that this product line would fall into either the flat or nonflat coatings category in the proposed rule, with a VOC content limit of either 250 g/l or 380 g/l (specular gloss testing has not been done on these coatings). This product line has VOC contents much higher than allowed under either the flat or nonflat categories.

According to the commenter, these coatings consist primarily of solvent and Hypalon with VOC contents ranging from 495 to 635 g/l of coating. These coatings function as a weather, moisture, and abuse barrier on top of insulated piping and tanks on cold work systems. For example, these coatings are used over insulation on a liquid nitrogen tank and the associated piping system. By adding to the insulating properties, these coatings also function as an energy conservation coating to the insulation system. These systems typically operate at a temperature range of -40 ^{o}F to +250 ^{o}F. Also, the materials in the insulated system have a temperature range of -250 ^{o}F to +32 ^{o}F.

The commenter claimed that these specialized coatings differ from other coatings in the following ways:

1. Offer the best chemical resistance available against many industrial chemicals;

2. Display unmatched long-term weatherability;

3. Exhibit unmatched toughness, resisting punctures by hail, dropped tools, etc.;

4. Function in a service temperature range of -40 ^{o}F to +250 ^{o}F; and

5. Have a very low moisture vapor permeability, which is very necessary for cryogenic work.

The commenter sells these products in small quantities (less than 5,000 gallons) nationwide and in larger quantities internationally. If a new category is not established for these coatings, the commenter supported the inclusion of a low-volume category exemption of 5,000 to 10,000 gallons in the final rule.

Response: After review and careful consideration of this request, the EPA has determined that a new category for elastomeric high performance industrial finishes is not warranted. As described by the commenter, these coatings function as a weather, moisture, and abuse barrier on top of insulated piping and tanks on cold work systems. As such, these coatings would fall in the industrial maintenance coatings category, which includes high performance industrial coatings that are exposed to one or more extreme environmental conditions such as those described by the commenter. The industrial maintenance coatings category has a VOC content limit of 450 g/l. Moreover, none of the State architectural rules reviewed have a category for elastomeric high performance industrial finishes. Since these products are sold in quantities of less than 5,000 gallons in the United States, the commenter could consider using the tonnage exemption and/or the exceedance fee in the final rule as alternative compliance options. These provisions could allow the continued sale of these coatings.

Thermoplastic (treatment) sealer.

Comment: One commenter (IV-G-11/IV-E-25) requested that the EPA establish a new category for thermoplastic treatment sealers with a VOC content limit of 630 g/l. The commenter argued that these coatings cannot be reformulated to meet the proposed VOC content limit of 400 g/l for opaque waterproof treatment sealers. The commenter explained that the opaque waterproof treatment sealer VOC content limit applies because the coatings are used for waterproofing basements and foundations, and currently, on a trial basis, in one municipal swimming pool. Since these coatings seal surfaces and reduce microbial adhesion, the commenter stated that they are also useful for providing more sanitary environments for food, animals and water containers. In follow-up information, the commenter (IV-E-DeZurik) maintained that the thermoplastic rubber coatings and mastics category definition in the proposal does not apply because the commenter's products are hard thermoplastic coatings that contain less than 15 percent by weight of thermoplastic rubbers in the total resin solids. The commenter (IV-E-25) suggested the following new category definition: "Thermoplastic (treatment) sealer means a coating applied to porous surfaces. This coating comprises a styrene-containing binder resin dissolved in organic solvent wherein styrene constitutes at least 85 percent by weight of the binder resin and forms a hard coating with minimal deformation that binds securely to concrete."

The commenter implied that the durability of the coatings would justify a VOC content higher than 400g/l. The commenter estimated that the coating material would last 150 years; however, the company does not have data on the lifetime of its coatings since this is a new coating technology. The commenter claimed that its coatings will outlast most other coatings, including tar, which is a competing foundation coating. Furthermore, the commenter asserted that there may be unfavorable characteristics from competing products: tar may leach into the ground and water and has associated health hazards, and epoxies may require replacement for repair. This is the only coating

manufactured and marketed by this small business. The commenter (IV-E-25) stated that the company's annual production of this coating is 85,000 gallons, with a cost of $8 to $10 per gallon. Although the commenter claimed that the coating cannot be manufactured to meet the 400 g/l VOC content limit for opaque waterproofing treatment sealers with current technology without reducing performance and durability, the company has developed a coating which complies with California's Rule 66 (at a VOC content of 420 g/l). This coating is more expensive to produce because the raw materials cost more.

Response: The EPA has carefully evaluated the information presented by the commenter and has determined that a new category for thermoplastic (treatment) sealers with a VOC content limit of 630 g/l is not warranted. As described, thermoplastic sealers are used for waterproofing basements and foundations and, thus, would be classified under the category of waterproofing sealers and treatments. However, as discussed in section 2.2.4.3 of this document, in the final rule, the EPA has combined the clear and opaque waterproofing treatment sealer categories into one category with a VOC content limit of 600 g/l. The decision to combine the categories is consistent with State architectural coating rules. Based on evaluation of information provided by the commenter, the EPA's decision to combine opaque and clear waterproofing treatment sealers into one category with a VOC content limit of 600 g/l, and considering the compliance flexibility in the final rule (the exceedance fee and tonnage exemption provisions), the EPA believes that the commenter can continue to manufacture the coating in a competitive manner without affecting its performance and durability. The EPA notes that the commenter has successfully developed a lower VOC product for use in California. The EPA supports the development of such lower VOC products. The rule includes a tonnage exemption and an exceedance fee provision that will assist the commenter.

2.2.4.3 Proposed Categories

Antifouling coatings.

Comment: Two commenters (IV-D-173, IV-D-189) requested a higher VOC content limit for the antifouling category. One commenter (IV-D-189) suggested that the EPA increase the VOC content limit for the antifouling category to 450 g/l and the other commenter did not specify a level. The commenter that requested the 450 g/l limit explained that the coating industry deemed the 400 g/l limit too low to allow for adequate application and use as an architectural coating. The commenter maintained that it is inappropriate to apply the same VOC level as provided in the Shipbuilding and Ship Repair (Surface Coating) Operations NESHAP to architectural coatings without recognizing the significant differences between the two end uses: (1) antifouling architectural coatings are generally not applied at fixed manufacturing/repair facilities where painting conditions are more easily controlled, and (2) the shipbuilding rule explicitly provides a cold weather thinning exemption to its limit of 400 g/l, which allows a facility to thin the regulated coating so that the VOC content is higher than the limit specified during cold weather coating operations. This is a feature the commenter considered essential for architectural coatings as well. The other commenter (IV-D-173) explained that antifouling marine coatings save enough fuel to offset emissions from the paint. The commenter explained that antifouling marine coatings are subject to naval specifications so reformulation and approval are expensive and time consuming. The commenter stated that if the 400 g/l VOC content limit were retained in the final rule, the commenter's estimated lost sales would be $70,000 for the antifouling category, in addition to expected sales losses for other products.

Response: The antifouling coating category in the architectural coating rule includes coatings used on stationary structures, such as docks, sea walls, boat slips, etc. These coatings are similar, and perhaps the same in some cases, as those used to coat ships. After consideration of the comments,

the EPA agrees that these architectural coatings may need extra thinning in cold weather situations and, therefore, has raised the VOC content limit for antifouling coatings to 450 g/l in the final rule to allow for such cold-weather thinning. Also, similar to nuclear coatings, these coatings are subject to some of the same extreme environmental conditions as industrial maintenance coatings and must meet other rigorous requirements, such as those under the FIFRA. Moreover, this is one of 17 specialty coating categories that did not appear in existing State architectural coating rules, and no data were collected in the 1990 VOC Emissions Inventory Survey. Therefore, the EPA believes that a low volume of coatings will be affected by this change.

Bituminous coatings and mastics.

Comment: One commenter (IV-D-181), a national trade association comprised of 60 roof coating manufacturers and their suppliers, supported the proposed VOC content limits for roof coatings, bituminous coatings and mastics, and metallic pigmented coatings, and the inclusion of all bituminous coatings in the bituminous coatings and mastics category. Two commenters (IV-D-30, IV-D-114) suggested reducing the proposed VOC content limit of 500 g/l for bituminous coatings and mastics. One commenter (IV-D-30) stated that existing technology permitted the manufacture of bituminous coatings at a VOC content limit of 350 g/l. The other commenter (IV-D-114) recommended adopting one roof coating category that includes bituminous materials at a VOC content limit of 300 g/l for several reasons. The commenter pointed out that the proposed Federal regulation, unlike State rules, classifies competing roofing products into different categories with significantly different VOC content limits. The commenter notes, for example, that bituminous materials and other roof coatings are subject to the same VOC content limit (300 g/l) in both the California Bay Area Air Quality Management District and the South Coast Air Quality Management District regulations. In the proposed rule, the commenter complained that bituminous materials (500 g/l) used for roof coating would be granted a VOC

content limit that is twice the limit for non-bituminous roof coatings (250 g/l). The commenter maintained that this would create a large cost advantage for bituminous manufacturers and would allow them to continue to pollute. Furthermore, at the proposed VOC content limit, the commenters claimed that manufacturers of non-bituminous roof coatings that reformulated to meet State (300 g/l) VOC regulations would need to reformulate again to meet the lower Federal VOC content limit (250 g/l). The commenter reportedly already spent several thousand dollars to reformulate to 300 g/l to meet the roof coating VOC content limit in the State rule.

The commenter stated that the background documents for the proposed Federal regulation provide no justification for separate categories for bituminous and roof coatings or the reduction of the State VOC content limit of 300 g/l to 250 g/l for roof coatings. The commenter maintained that allowing a higher VOC content for bituminous roof coatings and restricting non-bituminous roof coatings below the VOC control level found in existing State rules puts non-bituminous roof coating manufacturers at a competitive disadvantage.

Response: The EPA has reviewed its basis for establishing the proposed category for bituminous coatings and mastics and VOC content limit of 500 g/l and has decided to retain this category and limit in the final rule. The EPA reviewed information submitted by the National Roof Coatings Manufacturers Association (comprised of 60 bituminous and nonbituminous coating manufacturers and suppliers), before proposal (II-D-56), regarding the composition, specialized manufacture, performance, and use limitations of these coatings. According to this information, a significant portion of these coatings are needed for repair and maintenance of existing roofs, as well as for installing new roofing systems. The trade association claimed that waterborne bituminous coatings and mastics are not practical in many of the applications where solventborne bituminous coatings and mastics are used and that coating performance comparisons between waterborne and solventborne bituminous

coatings and mastics range from good to very poor, depending on conditions. In particular, before proposal the national Roofing Contractors Association (also II-D-56), which has over 3,500 members represented in all 50 States, argued that there is no viable alternative in many circumstances and pointed to bituminous primers as an example of this. According to this trade association, if the VOC content level were reduced by any significant amount in these primers, the adhesion properties, the application process, and the life of the roof will suffer dramatically.

Before proposal, one coatings manufacturer (II-D-125) argued that the average VOC content for bituminous coatings is 400 g/l. Currently, the State of Arizona and the California-South Coast Air Quality Management District have a VOC content limit of 420 g/l for bituminous coatings and mastics. In addition, after proposal the national Roof Coatings Manufacturers Association (IV-D-181) supported the proposed VOC content limit of 500 g/l for bituminous coatings and mastics. In order to satisfy performance requirements of bituminous coatings and mastics nationwide, the EPA has retained this category with a VOC content limit of 500 g/l in the final rule.

The EPA disagrees that the roof coating category limit should be raised from 250 g/l to 300 g/l. Although there are several State architectural coating rules that have a VOC content limit of 300 g/l for roof coatings, the EPA believes that the national Roof Coatings Manufacturers Association's support (IV-D-181) of the proposed VOC content limit for roof coatings at 250 g/l provides convincing evidence that this limit is being achieved nationwide. Therefore, the EPA has retained this limit in the final rule.

Roof coatings.

Comment: One commenter (IV-D-74) produces less than 400 gallons per year of a roof coating with VOC content levels ranging from 453 g/l to 509 g/l. The commenter requested a variance for roof coatings (a VOC content limit of 250 g/l was proposed and this limit was retained in the final rule).

Response: As discussed in section 2.2.8 of this document, the proposed variance provisions have not been retained in the final rule. However, the final rule includes a VOC tonnage exemption that could be used for low-volume products such as those described by the commenter.

Dry fog coatings.

Comment: Three commenters (IV-D-44, IV-D-182, IV-F-2m) stated that the proposed VOC content limits for dry fog coatings should be raised. None of the commenters recommended a specific VOC content limit. One commenter (IV-F-2m) stated that the 400 g/l limit was impossible to meet. Two commenters (IV-D-44, IV-D-182) stated that the limit would affect performance characteristics. One commenter (IV-D-44) specified that dry fog coatings at 400 g/l VOC content would have increased drying time, poor leveling properties, and poor durability. The commenter stated that drying time is a critical performance characteristic for several coatings including dry fog coatings. The commenter stated that two options to reduce VOC content exist: increase solids or reduce solvents. According to the commenter, both options increase drying time. Both commenters stated that they did not have documentation that could be made public to support their arguments.

Response: The EPA has retained the proposed VOC content limit of 400 g/l for dry fog coatings based on consideration of the 1990 VOC Emissions Inventory Survey and requirements in State architectural coating rules. According to the 1990 VOC Emissions Inventory Survey, approximately 84 percent of waterborne and solventborne dry fog coatings sales were manufactured at or below 400 g/l. Also, a review of existing State architectural coating rules reveals several States, including Arizona, Kentucky, New York, New Jersey, Massachusetts, Rhode Island, and California-South Coast and Sacramento, have rules that contain a 400 g/l VOC content limit for dry fog coatings. Therefore, the survey data and existing State regulations suggest that dry fog coatings formulated at or below 400 g/l VOC content perform at an acceptable level.

Flat coatings.

Comment: One commenter (IV-D-191) stated that the proposed flat coatings category VOC content limit of 250 g/l was not stringent enough. The commenter recommended a 100 g/l VOC content limit for 1997 and a 0 g/l limit for 2000. The commenter reported obtaining and successfully using zero- and low-VOC flat coatings. Therefore, the commenter concluded that a zero-VOC limit for 2000 is technologically and economically feasible. The commenter referred to California-South Coast's November 8, 1996, proposal to phase in a 100 g/l VOC content limit for the flat coating category in 2001 and 50 g/l in 2008. The commenter maintained that the California South Coast limits were also too weak given the time for compliance, although they are more stringent then the limits in the proposed national rule. The commenter reported that 40 percent of the flat coatings on the market in Southern California meet the 100 g/l limit and 12 percent meet the 50 g/l limit. The commenter maintained that these coatings are cleaner and safer and that the EPA did not calculate the cost savings resulting from workers not having to leave the building during painting operations with these coatings.

Response: The EPA has retained the VOC content limit of 250 g/l for flat coatings in the final rule rather than lowering the level as the commenter requested. The 1990 VOC Emission Inventory Survey revealed that 45 percent of exterior flat coatings and 49 percent of interior flat coatings sold were between the 100 g/l limit the commenter requested and the proposed limit of 250 g/l. In addition, all of the State regulations reviewed, including those for California Air Quality Management Districts, Kentucky, Rhode Island, Massachusetts, New York, New Jersey, and Texas, have VOC content limits of 250 g/l for flat coatings.

Although the EPA acknowledges the use of low-VOC coatings in Southern California as well as many lower and no-VOC flat coatings marketed across the country, the EPA has retained the 250 g/l VOC content limit based on survey data and State

architectural coating rules. As discussed in several responses in this document, the VOC content limits in the final rule reflect BAC and were selected after consideration of a variety of factors on a nationwide basis. Local areas may find it appropriate to require more stringent limits based on local conditions, but the EPA must base national rules on achievability in all areas of the country under many different conditions.

Graphic arts coatings.

Comment: Two commenters (IV-D-02/IV-D-178/IV-F-01(1), IV-D-168) were concerned about the performance of graphic arts coatings at the proposed VOC content limit of 500 g/l. Neither of the commenters suggested an alternative VOC content limit. One commenter (IV-D-168) envisioned that the decrease in the VOC content of graphic arts coatings will affect their suitability for use in the sign industry. The commenter offered some potential impacts on the sign coatings industry, including difficulty in achieving variation in gloss levels, varying drying times in the drying room (implying shop-applied coatings), need for greater application amounts, and higher costs. The other commenter (IV-D-02/IV-D-178/IV-F-01(1)) explained that graphic arts coatings are formulated to address specific performance needs. For example, lettering enamels are designed to cover in one brush stroke and maintain a sharp edge. To reduce artist fatigue when painting billboards 8 hours a day, bulletin enamels were developed with sufficient slip to reduce draft. The commenter mentioned that graphic arts coatings are exempt in the California-Bay Area regulation and urged the EPA to reevaluate the proposal because they did not know if reformulation attempts would succeed. Moreover, the commenter pointed to the graphic arts category as an example of a niche market where a replacement system was unavailable because the small demand does not justify expenditures required for raw material suppliers to develop a new resin. The commenter manufactures 30 different graphics arts coatings that would be banned by the rule.

Response: Graphic arts coatings recommended by the manufacturer solely for shop applications are not required to meet the 500 g/l VOC content limit. To clarify this, the definition of graphic arts coating has been modified by removing the reference to in-shop coatings, and the definition of architectural coating has been revised to clarify that coatings recommended by the manufacturer solely for shop application are not subject to the rule. In addition, a definition of shop application has been added to the final rule. Although the commenters asserted that the proposed VOC content limit of 500 g/l will cause poor performance, they did not recommend an alternative level. The EPA has determined that the 500 g/l limit for field-applied graphic arts coatings is achievable, based on survey data and State architectural coating rules. A review of existing State regulations revealed several States with lower VOC limits: Massachusetts, New York, New Jersey, and Rhode Island at 450 g/l, and some at 500 g/l (Kentucky and California-Sacramento and South Coast). However, the category (including shop-applied coatings) is exempt in several California counties (Batte, Calusa, El Dorado, and Feather) and Arizona (Maricopa County). Based on the 1990 VOC Emissions Inventory Survey, approximately 96 percent of these coatings were manufactured with VOC contents at or below 500 g/l.

Industrial maintenance coatings.

Comment: One commenter (IV-D-18) recommended that the VOC content limit for the industrial maintenance coatings category (450 g/l) be reduced to 350 g/l. The commenter argued that the same coatings are applied to miscellaneous metal parts for which a Control Techniques Guideline (CTG) document has specified a VOC content limit of 340 g/l as reasonably available control technology. According to the commenter, many of the same coatings are routinely used, regardless of whether the structure is field-coated or coated in a fabrication shop. Another commenter (IV-D-45) stated that industrial maintenance products can be reformulated and manufactured to meet the proposed limits. The commenter expressed concern about product performance at the

450 g/l level, but he did not believe the changes would jeopardize his business.

Response: As discussed elsewhere in this document, the rule does not apply to shop-applied coatings (see definition of shop application). Industrial maintenance coatings is a broad category that includes many different coatings with a wide range of end uses and end users. The CTG for coating of miscellaneous metal parts applies to coatings that are used in a shop setting under controlled conditions and for products that are being manufactured, often with the use of coating curing ovens. Industrial maintenance coatings covered by the architectural coatings rule, on the other hand, are field applied under many different climatic conditions and are air-dried. Thus, it is not appropriate to assume that they can achieve the same VOC content levels as shop-applied coatings, although some individual coatings may be able to. Although the EPA recognizes that there are many individual industrial maintenance coatings that have VOC content levels below the proposed VOC content limit of 450 g/l, the EPA has decided to retain this limit for industrial maintenance coatings as a whole since it is consistent with existing State architectural coating rules and survey data. A review of existing State regulations revealed several States with the same or similar levels, including Kentucky, New Jersey, Massachusetts, Rhode Island and New York at 450 g/l; and California-Sacramento, Bay Area, and South Coast at 420 g/l. In addition, the 1990 VOC Emissions Inventory Survey indicated that 50 percent of industrial maintenance coatings were sold in the 350-450 g/l VOC content range in 1990, indicating that a large portion of coatings in this category are in compliance with the limit.

Metallic pigmented coatings.

Comment: One commenter (IV-D-18) suggested that the EPA reduce the VOC content limit for metallic pigmented coatings from 500 g/l to 350 g/l. Similar to industrial maintenance coatings, the commenter stated that many of the same coatings are applied both in shops and in the field. The commenter also noted that

these applications are regulated under the CTG for miscellaneous metal parts at a VOC content limit of 340 g/l. Another commenter (IV-D-2) argued that they cannot meet the 500 g/l limit, but offered no basis for this statement. One commenter (IV-D-181), a national trade association, supported the proposed VOC content limit for metallic pigmented coatings.

Response: As discussed previously, the rule does not apply to shop-applied coatings. Although metallic pigmented coatings are available with VOC contents below 350 g/l, the EPA has decided to retain the proposed limit (500 g/l) based on consideration of existing State architectural coating rules as well as available survey data on the VOC content of metallic pigmented coatings and due to the broadness of this category, which includes applications outside of those highlighted by the commenter. For example, other comments (II-D-75, II-D-156) received before proposal indicated that there are major differences between types and uses of zinc coatings, which are included in the metallic pigmented coatings category, and that it may not be feasible to apply VOC content limits designed for one technology to a completely different technology. A typical application of zinc-rich coatings would be a structural steel frame for a large, multi-story building. The performance requirements for such an application would be different than those for miscellaneous metal parts, particularly in view of the fact that these metal parts are routinely coating in fabrication shops as described by one commenter (IV-D-18).

A review of existing State regulations revealed several States with a 500 g/l limit, including Kentucky, New York, New Jersey, Massachusetts, Rhode Island, and California-Sacramento, Bay Area, and South Coast. Furthermore, approximately 90 percent of all metallic pigmented coatings represented in the 1990 VOC Emissions Inventory Survey data had VOC contents in the 350-500 g/l range.

Nonflat exterior.

Comment: One commenter (IV-D-45) requested a VOC content limit higher than the proposed limit of 380 g/l for exterior

nonflat coatings. The commenter explained that house trim paints are nonflat exterior coatings that consist of a mixture of high-gloss enamel and house paint. The enamel creates desirable hardness and glossiness that prevent color deterioration. The commenter stated that the company manufactured 1,150 gallons of exterior nonflat coatings (four house trim colors) in 1994 and 710 gallons in 1995 with VOC contents ranging from 422-449 g/l. According to the commenter, the industry has shifted to latex systems, but these systems have limitations. Specifically, the commenter stated that application is limited by cold weather, and conversion to latex systems is expensive because it requires two coats plus a primer.

Response: The EPA has decided to retain the proposed VOC content limit for exterior nonflat coatings of 380 g/l based on available survey data on the VOC content of nonflat exterior coatings, existing State architectural coating rules, and performance studies of low-VOC coatings (IV-B-4). The 1990 VOC Emissions Inventory Survey indicated that about 87 percent of exterior nonflat coatings were sold at or below the proposed limit in 1990. In addition, several existing State regulations, including Kentucky, Massachusetts, California-Bay Area, Rhode Island, New York and New Jersey, limit the VOC content of nonflat coatings to 380 g/l. Also, according to studies conducted on the weathering performance of several different finishes used to coat aspen siding exposed outdoors on fences in the States of Wisconsin, Mississippi, and Washington, the best finishes were acrylic latex coatings. Even after 10 years of exposure at the three locations, the studies indicated that two coats of acrylic latex over an acrylic latex or oil-based primer provided very good protection and appearance. The EPA notes that these are subjective considerations, but the studies confirm that lower VOC coatings can be effective in this category. The EPA, therefore, believes that the available information indicates that a limit of 380 g/l is appropriate. The EPA notes that the final rule contains a tonnage exemption and an exceedance fee mechanism that may provide flexibility for the commenter.

Nonflat interior.

Comment: One commenter declared in two letters (IV-D-153/IV-D-207) that the interior nonflat category should be divided into water-based (380 g/l) and solvent-based (500 g/l) categories. According to the commenter, the proposed 380 g/l VOC content limit can be met by water-based products; however, there are still applications where the solvent-based product will outperform its latex counterpart. The commenter (IV-D-153) provided the example that two coats of a solvent-based enamel prevents old lead paint from becoming an environmental problem. The commenter argued that formulating solvent-based coatings with VOC contents lower than 500 g/l causes deficiencies in color retention, gloss retention, viscosity, and application characteristics and may result in increased solvent use for thinning. On the other hand, two commenters (IV-D-172, IV-E-60) that manufacture encapsulants for lead-based paint indicated that their products meet the limit for flat coatings (250 g/l) or for nonflat coatings (380 g/l). (These coatings are subject to the limits for the flat or nonflat category, depending on the gloss level of the coating.)

One commenter (IV-F-2j) stated that the nonflat coatings limit should be around 500 g/l or in the high 400's to accommodate gloss enamels, rather than at 380 g/l, but they did not provide any supporting documentation. One commenter (IV-D-206), a national trade association, stated that the VOC content limits for interior and exterior nonflat alkyd trim paint and many other coatings are as low as they can go without adversely affecting performance.

Response: The EPA has decided to retain the proposed VOC content limit at 380 g/l for both solventborne and waterborne nonflat interior coatings. Approximately 84 percent of the total nonflat coatings sales in the 1990 VOC Emission Inventory Survey met this limit, and approximately 40 percent of the solventborne nonflat coatings surveyed were at or below this limit. Also, a review of existing State architectural coating rules showed only one State (Texas) with a VOC content limit higher than the

proposed limit of 380 g/l for this category. Support for the proposed limit was provided by several of the commenters mentioned above as well as by a preproposal commenter (II-D-10) who specified that 350 g/l would allow superior alkyd semi-gloss coatings. In addition, according to a recent study on the performance of nonflat coatings (IV-B-4), a VOC-free multiphase latex gloss enamel was compared to several commercially available conventional VOC latex gloss enamels, and it achieved gloss and block resistance equal to or better than conventional coatings.

Multi-colored coatings.

Comment: One commenter (IV-D-191) argued that the VOC content limit proposed for multi-colored coatings (580 g/l) is too high. The commenter suggested lower limits of 150 g/l for 1997 and 0 g/l for 2000 for this category. The commenter cited the November 8, 1996, California-South Coast proposed limit of 420 g/l for this category as additional support for his claim that the EPA's proposed limit is too lenient. The commenter believes the proposed national standard is too lenient because one manufacturer with 70 percent of the Southern California market already sells multi-colored coatings that meet the 150 g/l standard. The commenter did not provide any basis for the suggested 0 g/l level for 2000 for this category.

Response: The EPA has decided to retain the VOC content limit of 580 g/l for multi-colored coatings based on existing State architectural coating rules and available survey data on the VOC content of multi-colored coatings. A review of existing State regulations revealed limits on VOC content ranging from 250 g/l (California-South Coast rule effective January 1, 1998) to 600 g/l (Kentucky, New York, New Jersey, Massachusetts, and Rhode Island regulations). Thus, the EPA has concluded that the 580 g/l limit is appropriate for the range of conditions covered by the national rule. Lower limits may be appropriate for local areas that must achieve a different balance of considerations for determining VOC controls than for a rule that applies nationwide.

Nuclear coatings category.

Comment: Four commenters (IV-D-18, IV-D-151/IV-F-2g, IV-D-162, IV-D-189) suggested that a higher VOC content limit is needed for the nuclear coating category. Three commenters (IV-D-18, IV-D-162, IV-D-189) specifically recommended raising the VOC content limit for nuclear coatings from 400 g/l to 450 g/l. Two commenters (IV-D-18, IV-D-151/IV-F-2g) pointed out that having the nuclear coating limit more stringent than for industrial maintenance coatings is illogical since coatings used at nuclear facilities are subject to specific rigorous requirements for use at nuclear facilities. One commenter (IV-D-189) argued that the only justification the EPA provided in the proposal preamble for the nuclear coating category VOC content limit was that it was consistent with the nuclear category in the Shipbuilding and Ship Repair NESHAP. The commenter stated that the VOC limits for nuclear coatings in the Shipbuilding and Ship Repair (Surface Coating) Operations NESHAP were lower than levels that had been identified by the coatings industry as necessary for adequate application and use as architectural coatings. The commenter argued that it was inappropriate to apply the VOC content limits of the Shipbulding and Repair NESHAP to architectural coatings without recognizing the significant differences between the two end uses: (1) a field-applied coating has to be capable of application in a variety of different settings which cannot be planned for, as opposed to shipbuilding and ship repair coatings applied at fixed facilities under generally controlled conditions, and (2) the Shipbuilding and Ship Repair NESHAP provides VOC content flexibility (i.e., a thinning exemption) for coatings applied in cold weather. In comparison, the proposed architectural coatings rule offered no flexibility for cold weather thinning for field-applied coatings. Thus, the commenter recommended increasing the VOC content limit for nuclear coatings to 450 g/l.

At the public hearing, one commenter (IV-D-151/IV-F-2g) requested that coatings used in Level 1 containment areas be exempt from the rule or be subject to a higher limit.

Specifically, the company's nuclear enamel coating at a VOC content of 540 g/l does not meet the proposed limit for nuclear coatings. The commenter (IV-D-151/IV-F-2g) suggested the following subcategories and VOC content limits for nuclear coatings: (1) concrete curing compounds (660 g/l); (2) primers/surfacers (420 g/l); and (3) finish coatings (540 g/l). The commenter claimed that these VOC content limits are based on existing coatings already approved for use in nuclear facilities for Level I and Level II use. Based on the EPA proposal, the commenter explained that they would have to reformulate, retest, and recertify their nuclear products. According to the commenter, testing would cost more than $30,000 per reformulation and require 6-8 months. The commenter (IV-D-151) stated that the company's nuclear coatings have been tested in accordance with required specifications ANSI N101.2 and N5.12 for use in nuclear plants and that the product must be manufactured in compliance with a quality assurance program that complies with appendix B, 10 CFR 50 and 10 CFR 21. Each shipment must be accompanied by a Certificate of Analysis assuring the coating has the same characteristics as original batches. In addition to the testing, the commenter (IV-D-151) mentioned that their customers must submit a 10 CFR 5059 review to the Nuclear Regulatory Commission (NRC) in order to modify their license and that submittal is a long and costly process. As an alternative to reformulation, the commenter (IV-D-151/IV-F-2g) suggested the low-volume exemption or exceedance fee. The commenter calculated that the exceedance fee would increase the current cost of their $75 per gallon coatings by about $0.40 per gallon (IV-F-2g) or $0.50 per gallon (IV-D-151).

Response: The EPA agrees that the nuclear coatings category VOC content limit should not be more stringent than the limit for industrial maintenance coatings because nuclear coatings are subject to some of the same extreme environmental conditions as industrial maintenance coatings as well as other rigorous requirements. Also, as pointed out by the commenters, nuclear coatings must meet further specifications of the NRC. For these

reasons, the EPA concurs that a higher VOC content limit is justified. Thus, the EPA has decided to raise the VOC content limit for nuclear coatings to 450 g/l which is the same as the level prescribed for industrial maintenance coatings and also provides allowance for extra thinning during cold weather conditions. The EPA expects that a limited amount of nuclear coatings will be affected by this change due to the various testing requirements and limited number of nuclear facilities. Also, as pointed out in the proposal preamble (61 FR 32739), this is one of 17 specialty coating categories that did not appear in existing State architectural coating rules, and no data were collected in the 1990 VOC Emissions Inventory Survey.

In addition, the EPA has considered the suggestion to subcategorize the nuclear coating category into three subcategories with different VOC content limits: concrete curing compounds (660 g/l), primers/surfacers (420 g/l), and finish coatings (540 g/l). The nuclear coatings category is intended to include coatings manufactured specifically for use at nuclear facilities to ensure operational safety and the definition requires that these coatings meet various requirements. Therefore, if these coatings meet the nuclear coating category definition, they would be classified as nuclear coatings under this rule and subject to the VOC content limit of 450 g/l. Therefore, the EPA does not believe it is necessary or appropriate to subcategorize the nuclear coating category with different limits as suggested. The final rule includes a tonnage exemption and exceedance fee option for additional compliance flexibility if needed.

Nonferrous ornamental metal lacquers and surface protectants.

Comment: One commenter (IV-D-31) contended that it is necessary to retain the proposed VOC content limit for nonferrous ornamental metal lacquers and surface protectants. The commenter argued that none of the lower VOC coatings that have been tested demonstrate the essential performance characteristics for this

category such as fast drying time, easy removal, and prevention of oxidation, corrosion, and surface degradation.

Response: The EPA has retained the proposed VOC content limit of 870 g/l for nonferrous ornamental metal lacquers and surface protectants in the final rule. The EPA's review of existing State architectural coating rules and information provided by commenters indicates that this limit is appropriate.

Opaque stains.

Comment: Three commenters (IV-D-45, IV-D-93, IV-F-2) asserted that opaque stains that are thin flat oil paints with wood preservative chemicals could not be made to meet the proposed VOC content limit of 350 g/l. Another commenter (IV-F-2) requested that the limit for opaque stains be raised to 450 g/l. One commenter (IV-D-45) said that acrylic flat latex paints can replace lighter colored stains with better color retention but have limited application in cold weather. However, this commenter asserted that darker stains needed for outbuildings, fences, decks, and picnic tables cannot be produced at the 350 g/l VOC content level. The commenter's company produced less than 6,000 gallons of opaque stains in 1995. Another commenter (IV-D-93) asserted that reformulation would result in uneven sheen over the variety of substrate conditions found on stained buildings and that oil-based stains are still needed for older weathered surfaces. The commenter argued that the lowest practical VOC content for opaque stains would be 425 g/l. This commenter produced 7,950 gallons of opaque stains in 1995 and 5,000 gallons through August 1996. Another commenter (IV-F-2) stated that opaque stains with a VOC content of 350 g/l have drying problems and too much film build. Raising the solids content defeats the purpose of the stain (i.e., penetration without coating the surface), and waterborne products do not perform well. The commenter stated that the complaint rate for their waterborne stains is much higher than for their solventborne stains.

On the other hand, another commenter (IV-D-185) maintained that the proposed limits for stains are technologically and

economically feasible to achieve and yield significant emission reductions.

Response: The EPA has not revised the 350 g/l VOC content limit for opaque stains for the following reasons. The 1990 VOC Emissions Inventory Survey showed that over 14 percent of solventborne opaque stains were manufactured with VOC contents at or below 350 g/l, and all of the waterborne coatings, which represent 46 percent of the total sales from this category, were below 200 g/l. Therefore, 60 percent of all coatings being manufactured are compliant. Also, except for one county in California, the State architectural coating rules reviewed, including Arizona, California, Kentucky, Massachusetts, New Jersey, New York, and Rhode Island, have had a VOC content limit of 350 g/l for opaque stains for several years over a wide range of conditions. The EPA thus believes that because a significant portion of the products in this category already meet the proposed limit, it is appropriate to maintain the limit. The prevalence of products that meet the limit and the selection of this limit by States indicates that the it is technologically and economically feasible. The commenters producing low volumes of stains that are not compliant may want to consider the tonnage exemption and exceedance fee provisions.

Stains - clear and semi-transparent.

Comment: Four commenters (IV-D-45, IV-D-93, IV-D-175, IV-F-2) stated that clear and semi-transparent stains have poor performance at the proposed 550 g/l VOC content limit. One commenter (IV-D-45) indicated that high solids stain formulations meet the VOC requirements but result in a higher rate of consumer complaints for lap marks and shiny spots. Furthermore, the commenters claimed that acrylic latex paint does not penetrate wood, penetrate the color white, or allow application of a very thin film which would prevent peeling. One commenter (IV-D-93) indicated that it has an interior wood stain that will have to be discontinued because it cannot meet the 550 g/l limit, thus leading to lost sales in related products such as varnishes and lacquers. The commenter stated that based on early

investigations there seems to be no way to reformulate this core product to meet the 550 g/l limit and maintain the performance properties of the product. Additionally, the commenter reported that it produced 6,645 gallons of this interior wood stain in 1995 and 3,965 gallons through August of 1996.

Another commenter (IV-D-175) stated that waterborne stain systems cannot replace certain solventborne products. The commenter explained that the company had poor results when replacing solventborne interior wood stains and varnishes with waterborne products. The company manufactures over 10,000 gallons of these products per year.

One commenter (IV-F-01h) that manufactures stains, varnishes, lacquers, and wood preservatives stated that reformulation would result in flow problems during spray application. The commenter explained that they sell products to furniture makers and cabinet shops.

One commenter (IV-F-2) stated that stains with a VOC content of 500 g/l look great in laboratory tests, but consumers tend to double coat the product, resulting in "shiners" in the siding or flashing. They requested that the EPA raise the limit to 650 or 700 g/l.

Another commenter (IV-F-2) stated that the company cannot meet the proposed VOC content limit of 550 g/l, but offered no basis for this statement.

Response: The EPA has retained the VOC content limit of 550 g/l for clear and semi-transparent stains. In reviewing the VOC content survey data, the EPA noted that there are several peaks in the 1990 VOC Emissions Inventory Survey sales data for solventborne semi-transparent stains, which include interior and exterior stains: 301 to 350 g/l, 501 to 550 g/l, and 601 to 700 g/l VOC content. The highest percentage of coating sales (21.5 percent) in the survey for these stains was in the 501 to 550 g/l range. Nearly all of the State architectural coating rules the EPA reviewed have a VOC content limit of 550 g/l for this category, except California-South Coast, which has a limit of 350 g/l. Thus, products complying with the 550 g/l limit are

being used across the country. The prevalence of products that comply with this limit indicates that it is technologically and economically feasible.

Although one commenter mentions products sold to furniture makers and cabinet shops, it is important to note that coatings applied in shop settings, such as these applications, are not subject to the rule. As stated at the beginning of this section, the definition of "architectural coating" has been amended to specifically exclude shop-applied coatings because they were not intended to be covered.

Pretreatment wash primers.

Comment: One commenter (IV-D-162) noted that the proposed VOC content limit of 780 g/l for pretreatment wash primers is consistent with the Shipbuilding and Ship Repair NESHAP and then revealed that their data shows most products are formulated at less than a 650 g/l VOC content, implying that lower-VOC content coatings are available.

Response: The EPA has retained the VOC content limit of 780 g/l for pretreatment wash primers. In follow-up information (IV-E-Liston), the commenter did not provide the requested VOC content data to support the assertion that most products are produced at 650 g/l. Also there are no known State architectural coating rules with a VOC content limit below 780 g/l for these products. In addition, the commenter is correct that the limit of 780 g/l for pretreatment wash primers in the architectural coating rule is consistent with the final Shipbuilding and Ship Repair NESHAP (60 FR 64330; December 15, 1995) and the final Control Techniques Guidelines (CTG) published on August 27, 1996 (61 FR 44050). A similar coating is used in both industries.

Quick-dry primers, sealers, and undercoaters.

Comment: Five commenters (IV-D-30, IV-D-43, IV-D-44, IV-D-46, IV-D-182) provided comments on quick-dry primers, sealers, and undercoaters. Two commenters (IV-D-30, IV-D-43) indicated that a lower VOC content limit of 350 g/l (proposed 450 g/l) for quick-dry primers, sealers, and undercoaters can be

achieved by existing technology and products. Two commenters (IV-D-44, IV-D-182) argued that the proposed VOC content limit for quick-dry primers, sealers, and undercoaters was too stringent and would affect performance or eliminate these products. Specifically, these commenters cited increased drying time, poor leveling properties, and poor durability. These commenters did not provide any support for this claim or recommend an alternative limit.

One commenter (IV-D-43) referred to effective 350 g/l solventborne coatings that are higher in solids and slightly more costly than current options. The commenter presented their own products as market evidence that a 350 g/l VOC content limit for quick-dry primers, sealers, and undercoaters is attainable.

One commenter (IV-D-46) requested that a white pigmented sealer-primer-stainblocker called "Kilz" be classified under the quick-dry primers, sealers, and undercoaters category with a VOC content limit of 450 g/l. According to the commenter, this product has been marketed as a quick drying product since its inception. Specifically, it meets the American Society for Testing and Materials (ASTM) specification D1640 for drying to touch in one-half hour and can be recoated in two hours. This commenter indicated that the product complies with a 450 g/l limit for this category in the State architectural coating rules adopted by Kentucky, Oregon, and Washington within the last year.

Response: The EPA has retained the 450 g/l VOC content limit for quick-dry primers, sealers, and undercoaters based on consideration of survey data and State architectural coating rule requirements. Three of the commenters argued that a VOC content limit of 350 g/l or below is achievable with existing technology. However, based on the 1990 VOC Emissions Inventory Survey, the EPA notes that 81 percent of these coatings had VOC contents between 451 and 500 g/l. Only 5 percent of quick-dry primers, sealers, and undercoaters were manufactured with VOC contents at or below 350 g/l. In addition, as noted by one of the commenters (IV-D-46), several State architectural coating rules have a VOC content limit of 450 g/l; Massachusetts has a limit of 500 g/l.

Thus, reduction of the VOC content limit is not appropriate. Similarly, the EPA notes that the prevalence of products that can meet the limit and the existence of similar State limits confirms that the proposed limit should not be raised. Those manufacturers or importers whose products are above the limit may take advantage of the tonnage exemption and the exceedance fee.

In regard to the request that a white pigmented sealer-primer-stainblocker called "Kilz" be classified under the quick-dry primer, sealer, and undercoater category, the EPA agrees that as described by the commenter, this coating meets the definition for this category and would be subject to the VOC content limit of 450 g/l.

Quick-dry enamels.

Comment: Two commenters (IV-D-44, IV-D-182) argued that the VOC content limit of 450 g/l for quick-dry enamels was too harsh and would affect performance or may eliminate these coatings. Specifically, the commenters cited increased drying time, poor leveling, and poor durability as characteristics of low VOC quick-dry enamels. The commenters did not currently have documentation to support this claim.

Response: The EPA has retained the 450 g/l VOC content limit for quick-dry enamels based on consideration of survey data and State architectural rule requirements. The 1990 VOC Emission Inventory Survey shows that 46 percent of solventborne coating sales are at or below a VOC content of 450 g/l. In addition, several State architectural coating rules are at or below 450 g/l VOC for quick-dry enamels: Arizona, Oregon, and California (Bay Area, Sacramento, South Coast, and the counties of Colusa, El Dorado, and Feather). The EPA believes that this confirms that coatings of this type are technologically and economically feasible at the proposed limit.

Waterproofing sealers and treatments.

Comment: Nine commenters (IV-D-74, IV-D-80, IV-D-114, IV-D-158, IV-D-185, IV-D-208, IV-F-2 (three commenters) provided assessments of the achievability of the proposed VOC content limit for waterproofing sealers and treatments. Four commenters

(IV-D-80, IV-D-158, IV-F-2 (two commenters)) suggested that the EPA raise the VOC content limit and two commenters (IV-D-114, IV-D-208) suggested that the EPA lower the limit. One commenter (IV-D-158) proposed a limit of 700 g/l for all waterproofing sealers and explained that this would still require reformulation of existing technologies yet would allow higher performance solventborne systems. This commenter explained that a large volume of waterproofing sealers are used on concrete structures to prevent substances from penetrating the concrete and causing corrosion around the imbedded steel. This commenter argued that there are several disadvantages of low-VOC (silane and siloxane) waterproofing sealers that use water as a reactive diluent: reduced depth of penetration on dense substrates, field mixing, limited shelf life, and increased application frequency. In addition, the commenter maintained that there was no need to distinguish between clear and opaque waterproofing sealers and treatments (600 g/l and 400 g/l, respectively) since many opaque sealers penetrate the substrate and perform the same objective as clear sealers. Another commenter (IV-D-74) manufactures less than 1,000 gallons annually of a waterproofing sealer with a VOC content of 750 g/l. This commenter also produces a waterborne product, but it is reportedly not as effective as the solventborne product because it does not last as long.

One commenter (IV-F-2) argued that manufacturing a waterproofing sealer with a VOC content of 600 g/l is not possible. This commenter reportedly has spent several hundred thousand dollars trying to develop a waterborne waterproofing sealer and was not successful. The commenter asserted that a high-solids product will not work because a coating with too much solids builds a film on the wood. Another commenter (IV-F-2) tried to develop a low-VOC sealer but it had mildew problems. One commenter (IV-F-2) manufactures waterproofing sealers in the 700 g/l VOC content range, but it cannot meet the 600 g/l limit.

One commenter (IV-D-80) suggested a higher VOC content limit of 700 g/l for water repellent products for 2 to 3 years to allow protection of architectural structures while completing

development and testing of low-VOC waterborne products. The commenter elaborated on long-term testing requirements for new water repellents: testing typically takes 2 to 3 years for the Department of Transportation (DOT) market, formulators for the do-it-yourself market require a minimum of 1-year exposure data, and parameters in commercial markets require track records that may take years to establish. The commenter reportedly has invested significant research and development resources in lower-VOC technology.

On the other hand, one manufacturer (IV-D-185) maintained that the VOC content limits proposed for waterproofing sealers are technologically and economically feasible to achieve.

One commenter (IV-D-208) strongly encouraged the EPA to adopt a VOC content limit applicable to waterproofing sealers and treatments, both clear and opaque, of 350 g/l rather than the proposed limits of 600 and 400 g/l, for clear and opaque, respectively. The commenter does not believe the proposed limits for waterproofing sealers and treatments go far enough to push replacement of obsolete petroleum distillate-based technologies with low-VOC alternatives already in national production and distribution. The commenter referred to their clear waterproofing sealer and treatment with a VOC content of less than 160 g/l that is currently in the consumer marketplace. According to the commenter, any concern expressed about the January 1, 1998 timing to implement new technologies to comply with a 350 g/l VOC content limit for waterproofing sealers and treatments is inconsistent with the coatings which meet this proposed limit and are currently available in most home center stores and mass merchants throughout the country. Another commenter (IV-D-114) manufactures a high performance waterproofing sealer with extremely low emissions (<100 g/l) as an alternative to solvent-based pigmented waterproof coatings which typically emit 400 g/l.

Response: Based on evaluation of the comments and a review of survey data and State architectural coating regulations, the EPA has combined the clear and opaque waterproofing treatment

sealer categories into one category with a VOC content limit of 600 g/l. After review and evaluation of the comments, the EPA agrees that there is no need to distinguish between clear and opaque waterproofing sealers and treatments since many opaque sealers penetrate the substrate and perform the same function as clear sealers. Furthermore, before proposal, industry representatives (II-D-188) argued that multipurpose waterproofing sealers with a VOC content of 400 g/l do not meet minimum performance criteria for clear waterproofing sealers (that is, 60 percent water repellency for wood and 1 percent or less water absorption for brick). The representatives argued that most of the multipurpose waterproofing sealers at 400 g/l VOC content are high solids coatings that leave an oily residue or cause darkening of the surfaces to which they are applied. This change is consistent with existing State architectural coating rules and survey data, which do not divide the category into clear and opaque waterproofing sealers and treatments. The State limits reviewed for waterproofing sealers and treatments are either 400 g/l (for example, California and Arizona) or 600 g/l (Massachusetts, Kentucky, New Jersey, New York, and Rhode Island). Thus, the EPA believes that setting the VOC content limit at the higher end of the range (600 g/l) represented in the State rules will provide the flexibility to ensure that performance requirements for this entire category will be met on a nationwide basis, although there may be individual coatings that can achieve lower limits for some applications. If additional time is needed to test low-VOC waterborne coatings, the final rule offers compliance flexibility through the exceedance fee and tonnage exemption provisions.

Shellac - clear.

Comment: Two commenters from the same company (IV-D-42, IV-F-1s) requested that the VOC content limit for clear shellac be raised from 650 g/l to 730 g/l. The commenter (IV-D-42) explained that the proposed rule would not change the product as sold (i.e., the coating is below 650 g/l as sold), but would instead require that the thinning instructions be taken off the

1 gallon and 5 gallon packages. The commenter believed that lowering the VOC contents and removing thinning instructions would result in less informed consumers because thinning is advantageous in a variety of applications.

Response: Based on a review of State architectural coating rule requirements, the EPA has raised the VOC content limit for clear shellac from 650 g/l to 730 g/l to include thinning considerations. All of the State rules reviewed have a VOC content limit of 730 g/l for clear shellac. The use of shellac is not expected to increase in the future and, therefore, this change is not likely to result in a significant emissions increase. According to information provided by the commenter in a separate comment letter (IV-D-25), the elevated cost and limited availability of shellac (referring to secretions of the lac beetle) minimizes the potential use for this category of product as a fast dry prime coat, general purpose primer and clear wood finish. Certain applications of shellac require thinning to meet customer needs. Therefore, in order to satisfy the performance requirements and consistent with State rules, the EPA maintains that the higher limit of 730 g/l for clear shellac, which allows for thinning, appropriately reflects achievable levels.

Wood preservatives - clear and semi-transparent.

Comment: One commenter (IV-D-93) argued that 600 g/l is the lowest practical VOC content limit for clear and semi-transparent wood preservatives. The commenter explained that these products are designed to penetrate rather than leave a film on the surface. The commenter noted that the company's coatings are formulated with a VOC content of 620 g/l and they still get complaints about residue on the surface. The commenter added that their small company had produced 1,967 gallons of clear and semi-transparent wood preservatives in 1995 and 1,729 through August of 1996, and that they would have to discontinue production since they cannot meet the proposed VOC content limit of 550 g/l for these products.

One commenter (IV-F-01h) that manufacturers wood preservatives and other coatings stated that reformulation would result in flow problems during spray application. The commenter explained that they sell coatings to furniture makers and cabinet shops.

Response: As discussed elsewhere in this document, shop-applied coatings are not subject to the rule. The definition of architectural coating specifically excludes coatings recommended solely for shop application. The EPA has considered these comments and has decided to retain the VOC content limit of 550 g/l for this category based on a review of State architectural coating regulations. A review of several State architectural coating rules revealed that several States (Kentucky, Massachusetts, New Jersey, New York, and Rhode Island) have a 550 g/l limit, while other States (California, except one county, and Arizona) have a more stringent VOC content limit of 350 g/l for clear and semi-transparent wood preservatives. Thus, the EPA believes that the State rules provide evidence that the 550 g/l VOC content limit is achievable and performance needs are being met. Since the commenter manufactures low volumes of these coatings, the tonnage exemption or exceedance fee should be considered as compliance alternatives.

Swimming pool coatings.

Comment: One commenter (IV-D-189), representing a national trade association, requested that the EPA recognize a special thinning requirement for swimming pool coatings (the proposed VOC content limit was 600 g/l). The commenter asserted that the first coat applied to bare concrete requires a VOC content of 850 g/l in order to ensure adequate penetration of the initial coating into the concrete surface.

Response: The EPA disagrees that it is necessary to allow for special thinning for swimming pool coatings. In the 1990 VOC Emission Inventory Survey, 93 percent of total swimming pool coating sales were for solventborne coatings ranging from 501 to 600 g/l VOC content, as applied, which included maximum thinning. Some existing State architectural coating rules reviewed

(Massachusetts, New Jersey, and New York) have a VOC content limit of 600 g/l; Kentucky and California have a limit of 650 g/l. In addition, the EPA is not aware of any State rules that allow a special thinning requirement for the initial coating of the pool's surface. Therefore, the EPA has not made any change in the VOC content limit for the swimming pool coating category to allow for special thinning.

Varnishes.

Comment: One commenter (IV-D-173), a small manufacturer, requested a higher VOC content limit for varnishes (proposed at 450 g/l), but did not request a specific limit. The commenter argued that these coatings have solids of 30 to 40 percent and would be extremely difficult to make above 60 percent. The commenter also argued that this is a low-volume product for its company. The commenter maintained that waterborne varnishes are not good enough for exterior use because they lift up under wet conditions. The commenter elaborated that these coatings are applied outside on wood structures, boats, and floors.

One commenter (IV-D-175) stated that its company had poor results when attempting to replace solventborne varnishes with waterborne systems. Another commenter (IV-D-73) stated that its varnishes do not meet the proposed VOC content limit for varnishes, but the commenter did not provide any basis for this statement.

One commenter (IV-F-01h) that manufactures varnishes as well as stains, lacquers, and wood preservatives, stated that reformulation would result in flow problems during spray application. The commenter explained that it sells coatings to furniture makers and cabinet shops.

On the other hand, one manufacturer (IV-D-185) maintained that the proposed VOC content limit of 450 g/l for varnishes was technologically and economically feasible to achieve. In addition, several manufacturers (IV-D-69, IV-D-85, IV-D-185, IV-D-207) have argued that the 450 g/l VOC content limit for varnishes is achievable.

Response: The architectural coating rule does not apply to the coating of non-stationary structures such as boats or to coatings recommended solely for shop application. The definition of "architectural coating" has been revised to exclude more explicitly shop-applied coatings and coatings applied to non-stationary structures, such as airplanes, ships, boats, and railcars, because they were not intended to be covered. The EPA has evaluated these comments and decided to retain the VOC content limit of 450 g/l for varnishes based on a review of State architectural coating regulations, available survey data, and other comments that argue that the proposed limit is achievable. Several existing State architectural coating rules (Kentucky, Massachusetts, New Jersey, New York, and Rhode Island) have a VOC content limit of 450 g/l for varnishes, other rules (Arizona and California, except 1 county) have a more stringent limit of 350 g/l; and one rule (Texas) has a higher limit of 540 g/l. This review indicates that compliant varnishes meeting performance needs are currently being sold in many areas of the country. Also, the 1990 VOC Emission Inventory Survey showed that 30 percent of the sales for varnishes had VOC contents at or below 450 g/l.

Floor coatings.

One commenter (IV-D-93) requested clarification of whether the floor coating category included clear floor finishes or paint (opaque) or both. The commenter argued that only paints could comply with the proposed VOC content limit of 400 g/l.

Another commenter (IV-D-180) suggested that floor coatings either be classified under industrial maintenance coatings (450 g/l) or have their VOC content limit raised to 450 g/l. The commenter manufactures coatings used exclusively on concrete or wood floors and believes that these high performance floor coatings are better covered by the 450 g/l VOC content limit proposed for industrial maintenance coatings, rather than the lower-VOC content limit of 400 g/l proposed for floor coatings. The commenter stated that the company has developed coatings in the 400 to 450 g/l range to replace most of their very high VOC

industrial floor coatings. Although they have lower performing systems that meet the 400 g/l level, like industrial maintenance coatings, they are not always acceptable for all applications. The commenter provided several examples where it claimed that low VOC products cannot be successfully applied. The commenter concluded that there are still applications that require coatings in the 400 to 450 g/l range and for some very high chemical resistant applications the systems are above 500 g/l, regardless of the advances made in low VOC coatings.

One commenter (IV-D-169) recommended that opaque floor paint be regulated at a VOC limit of 400 g/l.

Response: The EPA has retained the floor coating category and VOC content limit of 400 g/l. The floor coatings category is intended to include coatings that have a high degree of abrasion resistance that are formulated for application to flooring including, but not limited to, decks, porches, and steps in a residential situation. Industrial maintenance coatings recommended for use as floor coatings in industrial, commercial, or institutional settings are subject to the industrial maintenance coatings category and its VOC content limit of 450 g/l. The classification of opaque floor coatings would be included in the floor coatings category and subject to the 400 g/l limit, which two commenters agreed is achievable. For clarification, the word "opaque" has been added to the floor coating definition and has been defined in the final rule. However, varnishes or industrial maintenance coatings that are recommended for use as floor coatings outside of a residential setting are subject to the VOC content limit of 450 g/l for varnishes or industrial maintenance coatings (see discussion under Overlap Issues, in section 2.2.3.14 of this document).

Lacquers.

Comment: Two commenters (IV-D-32, IV-D-191) provided comments on the lacquers category. One commenter (IV-D-32) maintained that the lacquers category has a relatively high proposed VOC content limit of 680 g/l which may provide incentive for painters currently using a lower-VOC alkyd coating to switch

to the higher-VOC lacquer category. This commenter found evidence of this migration in their State (Oregon), which included the same category in its rule. The commenter recommended closer investigation of this category after promulgation of the rule. If significant growth is seen in this category, the commenter recommended that it be removed from the rule.

Another commenter (IV-D-191) indicated that the proposed VOC content limit for lacquers (680 g/l) should be lowered (i.e., made more stringent) to 275 g/l for 1997 and 50 g/l for the year 2000. The commenter explained that the proposed VOC content limit of 680 g/l is currently in place in Southern California and that more stringent VOC content limits of 550 g/l for 1998 and 275 g/l for the year 2005 are planned. The commenter argued that because there are five lacquers on the market that have VOC contents less than 50 g/l, the EPA's limit for lacquers is not stringent enough.

Response: The EPA has considered these comments and maintains that the lacquers VOC content limit of 680 g/l is appropriate for the following reasons. The 1990 VOC Inventory Survey showed that 75 percent of solventborne coating sales were in the 651 to 700 g/l VOC content range. All of the existing State architectural coating regulations currently have a VOC content limit of 680 g/l for lacquers, except California-South Coast and one county in California. According to information received from the industry (III-B-1), reformulation of lacquers may adversely affect performance characteristics such as drying time and film hardness. The EPA recognizes that some progress has been made to reduce the VOC content of these coatings and that other types of coatings may be able to serve the customers' application needs. However, the EPA believes that a VOC content limit of 680 g/l is necessary to satisfy performance needs for lacquer applications nationwide as evidenced by the State architectural coating rules.

Form release compounds and high temperature coatings.

Comment: Three commenters (IV-D-05, IV-D-30, IV-G-01) commented on the achievability of the proposed VOC content limit of 450 g/l for the form release compound category. Two commenters (IV-D-05, IV-D-30) argued that although technology exists for coatings to comply with the proposed limit for this category, it is double the cost of the conventional product. Another commenter (IV-D-05) also expressed concerns about the performance of coatings reformulated to meet the proposed limit. According to the commenter, the best performing coatings have VOC contents between 550 and 750 g/l and provide greater coverage in a thin coat. Thin coat applications allow the user to get the concrete loose from the form. According to the commenter, lower-VOC coatings demonstrate a higher viscosity that results in a decrease in coverage rate. Also, this commenter argued that lower VOC coatings are not able to achieve the release of the concrete form without applying a thicker film to the form. Both commenters (IV-D-05, IV-D-30) argued that coatings under the 450 g/l VOC content level increase user costs due to increases in the quantity applied and in associated cleaning costs. In addition, both commenters (IV-D-5, IV-D-30) estimate that the raw materials for the low-VOC formulation (450 g/l) will cost 80 cents more per gallon, which is significant in the concrete industry. Both commenters believe that the combination of increased raw material cost and the decrease in coverage rate (at the 450 g/l limit) will double the price for the consumer. Commenter IV-D-30 stated that waterborne formulas perform poorly and have a short shelf-life. Also, in order to cut costs, the commenter suggested that concrete producers may thin the lower VOC compounds in the field with diesel fuel or mineral spirits in order to make a higher VOC content coating that works better, thereby costing this commenter sales (about $200,000 per year) because the commenter's company cannot make and sell the higher VOC content coatings.

On the other hand, one commenter (IV-G-01), a coating manufacturer, recommended that the EPA tighten the proposed limit

of 450 g/l for form release compounds to 250 g/l, which the commenter stated is California-CARB's VOC content limit for this category. The commenter believes it would help prevent confusion and lower costs if there is one VOC content limit for the whole country. The commenter stated that although its lower VOC coatings sell for about twice the price per gallon of the cheaper higher VOC content form release compounds, when the lower VOC coatings are properly applied, the cost per square foot is about 20 percent of the cost of diesel oil-based products (870 g/l). According to the commenter, the cost savings is due to using less of the lower VOC coating when properly applied.

One commenter (IV-D-226), representing a small business, asserted that there was no legitimate technical or economic reason for the proposed high-temperature coating VOC content limit to be set above 420 g/l (a limit of 650 g/l was proposed). All of the company's high temperature coatings, used in the refining, petrochemical, cogeneration, primary metal, pulp and paper, and utility industries, have complied with the proposed 650 g/l limit for the last 25 years. The commenter noted that a number of other recognized companies also manufacture a wide variety of low VOC high temperature coatings that meet a limit of 420 g/l. The commenter asserted that reformulation costs should not be the basis for establishing a limit higher than 420 g/l for this coatings category and cited his own company as an example of one of the smallest coating manufacturers in the country who is successfully incurring reformulation costs. The commenter added that a VOC content limit of 420 g/l was consistent with State and regional regulations, and the commenter supported the limit of 420 g/l for high temperature coatings proposed by STAPPA/ALAPCO. The commenter suggested the use of the proposed variance procedure for any company in need of additional compliance time for this category in lieu of undermining the gains already made in emission reductions at the regional and local levels for this category.

Response: The EPA has retained the VOC content limit of 450 g/l for form release compounds and 650 g/l for high-

temperature coatings. As stated in the proposal preamble (61 FR 32739), VOC content limits for 14 low volume categories, including form release compounds and high-temperature coatings, are found in existing State architectural coating rules. The proposed VOC content limits for these categories are in the upper range of the VOC content limits found in existing State rules. During regulatory negotiations, the industry argued that these coatings are used in relatively low volumes and represent unique compositions and specialized uses, and the imposition of lower VOC content limits on these categories would probably result in an adverse economic impact. Even though lower VOC technology is available in some cases, the EPA believes that there is not enough performance information and sales data to conclude that the suggested lower VOC levels are appropriate for these coatings on a nationwide basis.

Bond breakers.

Comment: One commenter (IV-G-14) requested that the bond breaker category VOC content limit be set at 700 g/l (a limit of 600 g/l was proposed) for the following reasons: (1) the original specifications recognized the need to allow a higher VOC content for bond breakers than for concrete curing and sealing; (2) a bond breaker is actually used as a curing compound in the first coat operation; (3) bond breaker costs are applied at an extended coverage rate; and (4) a coating with a VOC content of 600 g/l is extremely difficult to work with in cold temperatures.

Response: The EPA has retained the VOC content limit of 600 g/l for the bond breakers category. As indicated in the previous response, the EPA proposed 14 low volume categories, including bond breakers. These coatings are found in existing State architectural coating rules, and the proposed VOC content limits for these categories are in the upper range of the VOC content limits found in existing State rules. During the regulatory negotiation, the industry argued that these coatings are used in relatively low volumes and represent specialized uses. The commenter did not provide any information to support consideration of a higher VOC content limit for this category.

In addition, a review of the existing State architectural coating rules showed that none of these rules have a VOC content limit above 600 g/l for bond breakers. Thus, the EPA believes that the 600 g/l limit for bond breakers is appropriate for this category.

Concrete protective coating.

Comment: One commenter (IV-D-76) manufactures a concrete/seal finish that, according to the commenter, could be classified as a concrete protective coating or extreme high durability coating. The commenter wanted to know what category/VOC content limit this coating would be required to meet.

Response: The commenter did not provide any details regarding the concrete/seal finish being manufactured. However, the coating may be in the concrete protective coating category with a VOC content limit of 400 g/l. Also, the final rule includes a new category for concrete curing and sealing compounds with a VOC content limit of 700 g/l. The commenter should review both of these category definitions before making a determination as to the appropriate category and VOC content limit.

Comment: One commenter (IV-D-30) argued that the proposed VOC content limit of 400 g/l for concrete protective coatings cannot be met by existing industry technology, and the commenter requested that the limit for this category be raised to 850 g/l. According to the commenter, there are waterborne alternatives to these solventborne systems, but there are significant disadvantages to them. The commenter did not elaborate on the disadvantages of waterborne alternatives.

Response: The EPA has retained the VOC content limit of 400 g/l for concrete protective coatings in the final rule. The concrete protective coatings category was one of 14 specialty coating categories proposed because discussions during regulatory negotiations and/or petitions from individual companies provided support for inclusion of these categories and an associated VOC content limit. These limits were separate from the broader category and limit to which the coatings otherwise would have been assigned. No data were collected in the VOC Emissions

Inventory Survey and, in this case, only a couple of State rules (Oregon and Kentucky) have this category. The VOC content limit for this category is 400 g/l in both of these State rules. The EPA believes that the exceedance fee option and tonnage exemption in the final rule offer sufficient compliance flexibility to allow the commenter to continue manufacturing and marketing this product while continuing reformulation efforts.

Concrete curing compounds.

Comment: Several commenters (IV-D-30, IV-D-85, IV-D-152/ IV-E-17, IV-E-15, IV-E-16, IV-D-154, IV-D-179, IV-D-187, IV-F-1e, IV-G-01) commented on the proposed VOC content limit of 350 g/l for the concrete curing compounds category, which is used predominantly in highway construction. Seven commenters (IV-D-30, IV-D-152/IV-E-17, IV-D-154, IV-D-179, IV-E-15, IV-E-16, IV-G-01) argued that the proposed limit is achievable. One commenter (IV-D-30) argued that the proposed VOC content limit for this category could easily be met with existing industry technology and could even be lowered from 350 to 300 g/l. Another commenter (IV-D-154) asserted that no new technology is needed to produce, market, or apply coatings with the proposed VOC content. This commenter indicated that parts of the country have been operating under similar rules for several years. The commenter added that raw material suppliers have been offering ingredients specifically designed for use in low-VOC coatings for several years and concluded that small businesses would find those suppliers to be a good source for assistance in formulating coatings to meet the VOC content limit of 350 g/l. Another commenter (IV-D-179) informed the EPA of several completely VOC-free concrete curing compounds which have pending patents. The commenter supported implementing the proposed rule as soon as possible. This commenter stated that raw material costs for the clear and pigmented concrete curing coatings are $.65 and $.85-per gallon, respectively. In addition, the raw materials for these coatings are non-hazardous and the finished coating does not have any detectable VOC at 280°F. The commenter argued that moisture loss of 0.28 kilogram per square meter is normal

with some testing as low as 0.07 kilogram per square meter. These coatings are manufactured to meet a number of specifications of the American Society for Testing and Materials, including ASTM C-309, Type 1, 1D, and 2; Class A.

One commenter (IV-G-01) provided a table summarizing VOC emissions from their waterborne concrete curing compounds which comply with the EPA's proposed rule and meet California's architectural coating regulations. The commenter produces these waterborne curing compounds in the range of 250-350 g/l. The commenter was disappointed that other manufacturers and States do not promote proper curing in highway construction and, therefore, his company does not compete for business in that area.

Another commenter (IV-D-152/IV-E-17) stated that the proposed 350 g/l VOC content limit for concrete curing compounds is technologically practical and that compliant waterbased coatings with adequate performance are available to meet the needs of the concrete curing industry. This commenter explained that the concrete curing compounds category has been used as an umbrella for all products with the capability of performing as curing compounds. However, according to the commenter, these products may be designed as curing compounds only or as curing and sealing compounds. The difference is that curing compounds have the single function of providing moisture retention for curing. Curing and sealing compounds, however, function as longer term sealers that provide protection, aesthetics, and durability in addition to curing; and, according to the commenter, cannot meet the proposed 350 g/l VOC content limit. The commenter argued that these were two totally distinct categories.

On the other hand, one commenter (IV-D-85) suggested a VOC content limit of 625 g/l for the category. The commenter believes the proposed limit eliminates most concrete curing membranes from the market and stated that many companies do not sell curing compounds in States which have the 350 g/l limit. This commenter is not convinced that the track record of the waterborne systems has been proven to properly cure concrete and

argued that improper curing sacrifices concrete strength which may cause collapses in high-rise buildings and bridge constructions. Also, the 350 g/l VOC content formulations that the commenter has seen typically fail the ASTM C-309 moisture retention test.

Response: Based upon consideration of these comments, the EPA has concluded that the technology does exist to achieve the VOC content limit of 350 g/l for concrete curing compounds. The EPA has retained the 350 g/l VOC content limit for this category in the final rule. All of the commenters, except one, argued that the proposed limit is achievable. In addition, several States, including California, Arizona, Massachusetts, New Jersey, and New York, have had a VOC content limit of 350 g/l for this category for several years. Concrete curing compounds are most commonly used in road construction. Since roads are not generally paved in the winter, the lower VOC technology (350 g/l) for concrete curing compounds can be used even in cold weather States, such as Minnesota. If specific applications necessitate the manufacture and use of coatings with VOC contents higher than 350 g/l for concrete curing compounds, the final rule provides a tonnage exemption and/or exceedance fee option. These options could provide additional flexibility to manufacturers.

Regarding the commenter's point about the differences between concrete curing compounds and concrete curing and sealing compounds, the EPA has established a separate coating category in the final rule for concrete curing and sealing compounds (see discussion in section 2.2.4.2 of this document).

Primers and undercoaters.

Comment: One commenter (IV-D-153/IV-D-207, same company) recommended that all primers and undercoaters be allowed a 450 g/l VOC content limit instead of the proposed 350 g/l VOC content limit in order to ensure the continuing availability of quality coatings. The commenter argued that the prime coat affects the integrity of all succeeding coats. The commenter argued that high solids alkyd primers and undercoaters that would be required to meet the lower level are difficult to apply and do

not have the positive drying characteristics which are essential for sanding and recoating quickly. According to the commenter, a properly applied primer ensures a long life for a coating system and prevents emissions resulting from excessive repainting. Another commenter (IV-F-2) maintained that their company cannot meet the proposed 350 g/l VOC content limit but offered no basis for this statement.

Response: The EPA has retained the proposed VOC content limit of 350 g/l for primers and undercoaters based on consideration of survey data and State architectural coating regulations. The 1990 VOC Emission Inventory Survey showed that about 82 percent of solventborne and waterborne sales for primers had VOC contents at or below 350 g/l and about 60 percent of solventborne and waterborne undercoaters sales were at or below 350 g/l. All of the State architectural coating rules reviewed, without exception, have a 350 g/l VOC content limit for primers and undercoaters. Therefore, the EPA believes this is convincing evidence that a VOC content limit of 350 g/l is an appropriate level.

Mastic texture coatings.

Comment: One commenter (IV-D-30) indicated that the proposed VOC content limit of 300 g/l for mastic texture coatings effectively eliminates the use of solventborne systems and argued that waterborne systems are considered inferior. The commenter did not elaborate on any specific problems with waterborne coatings.

Response: Based on a review of survey data and State architectural coating rules, the EPA does not agree that the proposed VOC content limit of 300 g/l effectively eliminates the use of solventborne mastic texture coatings and has not made any change in the VOC limit for these coatings. Mastic texture coatings are highly viscous materials that are waterborne or solventborne and are used for interior and exterior masonry by homeowners and contractors. According to the 1990 VOC Emission Inventory Survey, 96 percent of the total sales had VOC contents at or below 300 g/l. In addition, all of the State rules, except

New Jersey and New York, have a VOC content limit of 300 g/l for this category. The State of New Jersey and the New York metropolitan area have a 200 g/l VOC content limit. These limits have been in effect since 1994 or earlier. The EPA believes that the available information demonstrates that the proposed limit is appropriate.

Traffic marking coatings.

Comment: Several commenters (IV-D-03, IV-D-24, IV-D-40, IV-D-41, IV-D-121, IV-D-153/IV-D-207, IV-D-189) stated that the use of latex and other low-VOC traffic marking coatings would be limited by cold temperatures.

Comments received from the Department of Defense (DOD) (DOD Steering Committee representing the Navy, Air Force, and Army as well as several DOD components and agencies) (IV-D-03, IV-D-121) requested an exemption to allow emergency use of solventborne airfield traffic markings when the ambient temperature is below 55 ^{o}F. One of the commenters (IV-D-121) stated that VOC compliant waterborne coatings satisfy the needs of the Air Force in most cases. However, the commenter stated that until low-VOC markings are developed that perform well at low temperatures, solventborne markings must be used when temperatures are below 55°F. The commenter stated that the typical VOC content of these solventborne coatings is 350 g/l to 400 g/l. The commenter argued that when airfield markings become obscured, they no longer provide visual cues for safe operation of aircraft and support vehicles, and therefore, must be re-marked immediately, regardless of temperature. The commenter asserted that in northern climates, operations could be terminated or severely degraded if solventborne markings are not available for use at lower temperatures. The commenter suggested that this exemption could be limited to airfields that experience extended periods of cold weather or rapid deterioration of existing markings during cold weather. Two other commenters (IV-D-03, IV-D-24) also requested reconsideration of the provision to allow the use of higher-VOC traffic markings if seasonal conditions dictate, as allowed by the Federal Highway Administration.

One commenter from a State Department of Transportation (DOT) (IV-D-40) was concerned with pavement marking safety; that is, the inability to use low-VOC coatings during cold weather. This commenter pointed out that the use of latex or other low-VOC coatings could shorten the fall construction season. One commenter (IV-D-41) from another State DOT, who expressed strong opposition to the proposed VOC content limit, explained that the proposed rule would have an adverse effect on their State's pavement marking program because it will be forced to change from solventborne coatings to other lower-VOC coatings. The commenter claimed that the overall performance of waterborne coatings currently in use is not acceptable. The commenter argued that low-VOC coatings would result in an increase in the total cost of the striping and traffic marking program that would adversely affect the safety of State highways. The commenter objected to having the proposed rule apply to pavement marking from a cost perspective. According to the commenter, exclusive use of waterborne coatings decreases the application season dramatically, and the State funds are too low to warrant purchases of additional equipment to address the State's pavement needs in a restricted application season. The commenter suggested that the rule creates an economic obligation that constitutes an unfunded mandate with respect to striping highway pavement.

One commenter (IV-D-189), a national trade association, recommended that the traffic marking category be amended to allow the use of higher (250 g/l) VOC content coatings during the non-ozone season. The commenter explained that the proposed VOC content limit of 150 g/l is technically acceptable to the majority of State DOT agencies under normal application conditions; however, application of traffic marking coatings at this level is limited in cold weather. According to the commenter, a solution to the cold weather application problem is a provision which would allow government agencies to use higher VOC (250 g/l) traffic marking coatings during the non-ozone season in order to ensure highway safety. The commenter stated

that the incorporation of a seasonal exemption for the application of higher-VOC traffic marking coatings would have no negative impact on the environment and would have a positive impact on public safety.

One manufacturer (IV-F-2) asked why the EPA proposed more stringent requirements for the traffic marking coatings category than for the other categories. Another commenter (IV-F-2) stated that the proposed limit for traffic marking coatings is not achievable.

One commenter (IV-D-153/IV-D-207 (same company)) recommended that the traffic marking coatings category with a 150 g/l VOC content limit be defined as coatings used only for marking streets and highways, which is scheduled during the warm months when latex traffic coatings can be used.

One commenter (IV-D-173) supported the use of alkyd-based street marking paints because many customers paint in the fall and winter when waterbased formulations will not work. In these situations, the commenter argued that solventborne coatings that dry quickly are the only option.

One commenter (IV-G-18) manufactures an acetone-based traffic coating but it is not highly recommended due to its high flammability. Also, acetone traffic coatings can cost 50-100 percent more than conventional solventborne coatings.

Two commenters (IV-D-44, IV-D-182) stated that low-VOC content traffic marking coatings will have increased drying time, poor leveling properties and poor durability as a result of reformulation to comply with the proposed rule. Both commenters stated that they did not have documentation that could be made public to support this statement regarding performance of low-VOC content traffic marking coatings.

Alternatively, one commenter (IV-D-191) argued that the proposed VOC content limit of 150 g/l for traffic marking coatings is not stringent enough. The commenter referred to a California-South Coast Air Quality Management District staff report which showed that half of the market already complies with the 150 g/l VOC content limit. The report also noted that there

would be no cost increase necessary to meet this limit. Therefore, the commenter reasoned that the traffic marking coating category VOC content limit in the final rule should be lower than the proposed 150 g/l, and a second phase VOC content limit should be set at 0 g/l for the year 2000.

Response: The EPA has carefully evaluated the comments and has conducted a separate assessment (IV-B-3) of currently available low-VOC technologies for traffic marking coatings and has evaluated costs for new and retrofitted traffic marking application equipment. The assessment results indicate that low-VOC technologies to comply with the 150 g/l VOC content limit for traffic marking coatings are available and include waterborne coatings, thermoplastics, 2-part systems including epoxy and polyesters, tapes and preformed thermoplastics, raised pavement markers, and acetone-based coatings. The assessment results also show the characteristics, advantages, and disadvantages of using these compliant coatings. For example, epoxy and thermoplastics have negligible VOC contents and boast longer durability than either waterborne or solventborne coatings, but equipment changes and application expenses are higher than for solventborne or waterborne coatings. Compliant acetone-based coatings, unlike waterborne coatings, can be applied in temperatures below 50 ^{o}F and are compatible with solventborne application equipment. Therefore, the use of acetone-based coatings is one alternative to waterborne coatings for highway striping in cold weather to ensure highway safety. Exercise of due caution would be necessary during application of acetone-based coatings due to their flammability.

In addition, according to recent information obtained on the performance of low-VOC traffic marking coatings (IV-B-4), acrylic emulsion coatings can be applied under a variety of temperature and humidity conditions with reasonable drying times and little tracking damage. Acrylics can be interchanged with solventborne coatings without adhesion problems, and adhesion of reflective hydrophillic coated beads to acrylic lines is superior to solventborne coatings. The 100 percent acrylic waterborne

coatings can last twice as long as traditional solventborne coatings; they are more durable, safer for workers and the environment, and result in much easier cleanup of equipment. According to two 1997 publications (IV-B-4, Ref. #14 and #15), new technology latex traffic marking coatings dry as quickly, if not more quickly than solventborne coatings, and provide better durability compared to traditional fast-dry coatings. Polyester coatings provide unsurpassed durability, making them the most cost-effective coating for asphalt, when compared on a life-cycle basis with alternative coatings and marking materials.

The EPA contacted commenters (several State DOTs and one county) to obtain additional information (IV-E-1, IV-E-2, IV-E-32, IV-E-29, IV-E-31). Two of these agencies/commenters stated that the extended compliance date of the rule has allowed them time to purchase new equipment; one (IV-E-32) is currently using compliant coatings and the other (IV-E-41) will be by 1999. One State DOT in a northern climate (IV-E-42) uses 98 percent waterborne coatings and 2 percent solventborne coatings. This State DOT concluded that waterborne traffic marking coatings are more durable than solventborne coatings. Another State DOT (IV-E-2) has used 100 percent waterborne coatings for over a year and uses contractors to apply thermoplastics and epoxies. Yet another State DOT (IV-E-29), also in a northern climate, uses contractors that apply 90 percent of their traffic marking coatings, which are waterborne, and the State applies the remaining 10 percent, which are solventborne coatings.

In addition, the EPA contacted a Department of Defense (DoD) representative (IV-E-48) regarding DoD comments on emergency cold weather airfield markings. As discussed in the response to comments on zone marking coatings (see section 2.2.4.2 of this document), the services typically purchase coatings in 5-gallon containers and transfer the coatings to 1-gallon or 1-quart containers. Therefore, these coatings would be subject to the zone marking coating category VOC content limit of 450 g/l because they are sold or distributed in a container with a volume of 5 gallons or less.

According to the EPA's assessment, the total sales of traffic marking coatings have been fairly constant from 1990 to 1995. About 65 percent of coatings used on roadways are purchased by State highway departments, 25 percent are sold to city and county road authorities, and about 10 percent are used in areas such as parking lots and garages. Of the 65 percent of coatings purchased by State agencies, more than 30 State DOTs use waterborne coatings rather than solventborne, and 10 States use a combination of waterborne and solventborne coatings. The use of solventborne coatings for striping declined from 80 percent in 1991 to 55 percent in 1994, whereas the use of waterborne coatings and other striping materials has increased. Based on available information, the assessment concludes that about 58 percent of traffic marking materials used in the United States in 1995 comply with the 150 g/l VOC content limit in the proposed rule (assuming all technologies except solventborne coatings are compliant).

The EPA agrees that the use of waterborne coatings exclusively could shorten the highway striping season somewhat in very cold climates. The EPA notes, however, that neither waterborne nor solventborne coatings work under extreme conditions and that the "seasons" are, therefore, not markedly shorter in many places. In addition, as discussed previously, there are other low-VOC compliant technologies currently in use that could be applied under normal application conditions or in cold weather, including emergency situations, thus ensuring public highway safety. The EPA does not agree with the suggestion that the traffic marking coating VOC content limit should be lower than 150 g/l. All of the information available to the EPA, including information submitted by other commenters, indicates that a VOC content limit of 150 g/l provides formulation flexibility for manufacturers to supply traffic marking coatings for nationwide applications. Therefore, the EPA has concluded that performance requirements can be met with a VOC content limit of 150 g/l for traffic marking coatings, and it has retained this limit in the final rule.

In response to concerns about the cost of equipment potentially necessary to apply non-solventbased coatings, the EPA investigated the relevant equipment. Several companies manufacture and sell traffic striping equipment. The cost of the equipment varies by size and type of equipment. For various types of solventborne and waterborne equipment, the cost ranges from a minimum of $1,000 for a handheld striper to $280,000 for a Tandem Axel Truck (500 to 800 gallon capacity). For thermoplastic marking equipment, the cost ranges from $1,000 to $225,000. The cost of epoxy equipment ranges from $2,000 to $200,000. For tape application equipment, the cost starts at $5,000; some small jobs do not require any special equipment. Estimates of equipment lifetimes were provided by equipment vendors and State agencies (IV-B-3). State DOTs generally estimate 20-year lifetimes for large traffic striping trucks. In comparison, manufacturers estimate a 5- to 10-year shorter lifetime for the average truck. According to equipment vendors (IV-B-3), before 1990, most stripers applied solventborne coatings. From 1988 to 1998, there has been a pronounced shift from solventborne stripers to waterborne stripers and other stripers (i.e., thermoplastics, epoxies, etc.). One equipment vendor's (IV-B-3) domestic sales have been for only waterborne-compatible equipment since 1990, and one vendor (IV-B-3) has exported only solventborne-compatible equipment since 1993 (i.e., has had no domestic sales of this equipment). According to another vendor (IV-B-3), after 1996, it appears that the government sector began to move away from doing its own striping and toward hiring contractors to stripe roads.

Based on available information (IV-B-3), it is estimated that the national population of traffic stripers is comprised of 38 percent solventborne, 42 percent waterborne, 17 percent thermoplastic, and 3 percent epoxy. All equipment sales reported in 1996-1997 are compatible with low-VOC technologies.

In summary, the EPA's assessment shows that the rule may impact the cost incurred by traffic marking coating users, including material costs, equipment costs, and operational costs.

Based on the assessment in the "Control Techniques Guidelines on Traffic Markings," the use of waterborne, polyester, and epoxy traffic marking coatings results in cost savings compared to use of solventborne coatings when accounting for expected lifetimes. The EPA's assessment estimates that waterborne coatings are the least expensive choice because equipment may be retrofitted (at a lower cost compared to purchasing completely new equipment) and the increases in material cost (i.e., cost difference between waterborne and solventborne coatings) is minimal. Durability estimates factor into cost comparisons on an annual basis instead of an initial purchase and application cost. Shifting technologies away from solventborne coatings requires equipment changes in addition to any increase or decrease in coating costs. The EPA has estimated the total annualized national cost of switching from solventborne stripers to waterborne compatible stripers to be $3.7 million. In terms of operational costs, the use of waterborne coatings exclusively could shorten striping seasons in cold climates because of the temperature restriction for curing waterborne coatings. However, as stated previously, other low-VOC technologies are available for use during these periods.

In addition to the reasons stated above for retaining the 150 g/l VOC content limit for traffic marking coatings, the EPA believes that the final rule provides the flexibility needed for coating manufacturers to continue to provide their customers (e.g., State DOTs and military airfields) with higher-VOC content coatings to the extent they are needed. The exceedance fee and VOC tonnage exemption provisions of the rule provide a mechanism for such instances.

Comment: One commenter (IV-D-53) argued that the proposed traffic marking coating VOC content limit would be a tremendous financial burden on its rural county. This commenter has only one striper which would have to be replaced to apply the lower-VOC coating, and there are not sufficient funds available for a new striper.

Another commenter (IV-D-116), a State DOT, argued that the proposed traffic marking coating limit would effectively ban the manufacture of conventional traffic marking coatings currently in use and expressed concern about their ability to continue to provide cost-effective pavement markings, the resultant fiscal impacts of the proposed rule, and the implications to their overall transportation safety program. According to the commenter, implementation of the rule would result in an increased cost of a minimum of $2 million the first year (equipment and coating costs). Each succeeding year would result in a minimum additional $1.5 million cost for low-VOC coatings. The commenter added that no source of additional State funds is presently available, but they will need to provide continued necessary pavement markings. The commenter requested that the EPA consider the fiscal impacts of the rule on State DOTs.

Response: The Agency received a number of comments from State and local governments concerned that EPA had overlooked potential impacts of the proposed rule upon small governments. Specifically, these commenters claimed that the proposed rule imposed a VOC content limit on the traffic marking coatings category that would force coatings manufacturers to cease production of solventborne traffic marking coatings and that State and local governments would therefore be forced to change their current traffic marking equipment. The commenters explained that older traffic marking equipment is not compatible with non-solventborne coatings and that replacement of this equipment to utilize new types of coatings could be a significant cost to all affected entities which include small governments.

The comment letters suggest that the impacts of the proposed rule could trigger the requirements of UMRA section 203. As stated in the preamble to the proposed rule, UMRA section 203 provides that before EPA establishes any regulatory requirements that may significantly or uniquely affect small governments, including tribal governments, the Agency must have developed a small government agency plan. The plan must provide for notifying potentially affected small governments, enabling

officials of affected small governments to have meaningful and timely input in the development of EPA regulatory proposals with significant Federal intergovernmental mandates, and informing, educating, and advising small governments on compliance with the regulatory requirements. See 61 F.R. 32745.

Prior to proposal, a few representatives of State Departments of Transportation raised the issue of the potential need to replace older traffic marking equipment as one possible impact of a rule that restricted the VOC content of traffic marking coatings. The Agency concluded, however, that the proposed rule would only regulate manufacturers and importers of architectural coatings, and as such contained "no Federal mandates (under the regulatory provisions of Title II of UMRA) for State, local, or tribal governments." 61 F.R. 32745.

The commenters on the proposal have reiterated concern about the issue of the potential need to replace traffic marking equipment as a result of the VOC content limit imposed by the rule. In essence, the commenters are concerned that the lower VOC content limit of the rule will require them to replace older existing equipment used for the application of conventional higher VOC solventborne coatings more quickly than they otherwise would have. EPA has considered these comments carefully to reexamine whether the rule will have any significant or unique impacts upon small governments as contemplated by UMRA section 203. At the outset, EPA notes that because the rule only regulates manufacturers and importers of coatings, the impacts noted by the commenters are indirect effects. It is unclear whether the Agency is required to assess such indirect effects in connection with UMRA section 203. Nevertheless, whether or not the Agency should consider indirect impacts for this analysis, the Agency believes that those impacts are neither significant nor unique in this instance.

EPA has investigated to determine the significance of the impacts of the rule upon small governments by, inter alia, following up with the commenters, by making inquiries regarding existing inventory of traffic marking equipment across the

country, by assessing the availability and cost of replacing or retrofitting traffic marking equipment, and by estimating the potential cost to replace traffic marking equipment as a result of changes in the VOC content of traffic marking coatings. EPA conducted the analysis based on data reasonably available to the Agency on the coatings and traffic marking equipment in use in the United States by all applicators. Based upon this analysis, EPA estimates that the total aggregate annual impact of the rule on all governmental entities, including small governmental entities, should be no more than $3.7 million (in 1996 dollars). Small governments would bear some portion of these costs. See Docket Item IV-B-3. EPA believes that this amount of aggregate impact for governments across the Nation is not significant for purposes of UMRA section 203. In addition, the Agency notes that this number may overestimate the total impact based upon the information provided by governments that many of them have already replaced their equipment in recent years and that new equipment is compatible with both waterborne and solventborne coatings.

Similarly, the Agency believes that the architectural coatings rule will not have a "unique" effect upon small governments as contemplated by UMRA section 203. The term "unique" is not defined in the statute, but the Agency believes that by all reasonable applications of this measure, the rule will not have a unique affect upon small governments. The rule applies not to government entities as government entities, but rather to manufacturers and importers of coatings. To the extent that small governments are directly regulated entities as manufacturers or importers of coatings, they are not uniquely affected in the sense that they are not the sole regulated entities. The indirect effects of the rule likewise fall not uniquely upon small governments as users of coatings, but upon all users of coatings and thus small governments are not uniquely affected in the sense that they are not the sole affected users. Within the category of traffic marking coatings alone, the impacts of the rule fall not uniquely upon small governments as

users of the coatings, but upon governments of all sizes that engage in traffic marking activities, including States and other large governmental entities. Thus, the Agency has concluded that the rule will not have a unique effect upon small governments for purposes of UMRA section 203.

Even though the Agency believes that the rule will not have significant and unique impacts upon small governments, EPA is planning to perform outreach to those affected by the rule to insure that they are apprised of the impacts of the rule on traffic marking coatings. Specifically, EPA plans to devote a section of the small business compliance guide to this education and outreach effort. Finally, EPA notes that the rule is unlikely to eliminate the availability of conventional solventborne traffic markings. The Agency anticipates that manufacturers will continue to produce solventborne coatings, either by developing compliant products or by exercising the tonnage exemption or exceedence fee provisions. So long as there is sustained demand for such coatings, the Agency believes that such coatings will continue to be available. This suggests that small governments should generally be able to obtain higher VOC products for a reasonable period of time, albeit at a moderately higher cost, that will allow them to phase out their older equipment and shift to equipment compatible with waterborne coatings.

2.2.4.4 Recycled Coatings

Comment: One commenter (IV-D-120) suggested that credit for recycled coatings should be considered if and as long as the EPA determines that such credit does not significantly reduce the rule's effectiveness. The commenter requested that the EPA consider allowing credit not only for recycled coatings, but also for recycled VOC.

Response: The EPA believes that the recycled coating provision will not reduce the effectiveness of the rule, but instead will encourage recycling by providing incentives to manufacturers who recycle coatings. Recycling these coatings

eliminates the need for disposal of unused coatings and reduces the amount of new coating that must be manufactured.

The EPA has not expanded the recycled coating provision to include recycled VOC. The flexibility in VOC content allowed for recycled coatings is based on comments received by manufacturers. No such flexibility was requested by manufacturers for recycled VOC. Moreover, the additional recordkeeping and reporting that would be required for recycled VOC would probably negate any benefit obtained from such a provision.

Comment: One commenter (IV-D-161) supported the option EPA provided in the proposed rule for calculation of the VOC content for recycled coatings, because it achieves the goal of reducing VOC without providing a disincentive for companies to develop coatings using post-consumer coatings.

Response: The EPA has retained the recycled coating provision in the final rule to encourage recycling by providing flexibility to manufacturers who recycle coatings.

Comment: Two commenters (IV-D-189 and IV-F-2gen) stated that the EPA should clarify that the recycled coating credit does not apply to the reprocessing of coatings sent to distributors or the in-plant reprocessing of coatings.

Response: The EPA did not intend for the recycled coating provision to be extended to the reprocessing of coatings sent to distributors or to the in-house reprocessing of coatings. The EPA has clarified the intent of the recycled coating provision by adding the statement "by a consumer" to the definition of "post-consumer coating." Also, the words "community-based household" have been deleted because post-consumer coatings collected are not limited to these hazardous waste collection programs.

> "Post-consumer coating means an architectural coating that has been previously purchased by a consumer or distributed to a consumer but not applied, and reenters the marketplace to be purchased by or distributed to a consumer. Post-consumer coatings include, but are not limited to, coatings collected during hazardous waste collection programs for repackaging or blending with virgin coating materials."

Comment: One commenter (IV-F-1b) stated that the recordkeeping requirements of the recycled coating provision will inhibit recycling. The commenter requested that the EPA hold recordkeeping and reporting requirements for the manufacture of paint with post-consumer content to gross IRS type reports with records being kept by manufacturers and supplied on request.

Response: The EPA has determined that the recordkeeping and reporting requirements for the recycled coating provision are necessary for enforcement purposes. The information required to be maintained and reported is information that the manufacturer will have already generated to determine the recycled coating credit, and therefore, the EPA contends that the recordkeeping requirements will not inhibit or reduce the amount of recycling.

Comment: One commenter (IV-F-1e) expressed concern regarding disposal of unused coatings because they do not have post-consumer recycling. The commenter manufactures urethane products, which are susceptible to moisture. The commenter cannot take back a product once it is opened. The commenter is concerned about needing a treatment, storage, and disposal (TSD) permit and becoming a hazardous waste storage facility if they accept post-consumer coatings.

Response: The architectural coating rule does not require manufacturers to recycle coatings, it provides incentive for manufacturers to do so. It is expected that some types of coatings may be more conducive to recycling than others.

2.2.5 Compliance Time Requirements

2.2.5.1 General

Comment: In the proposal preamble (61 FR 32732), the EPA requested comment on the adequacy of the compliance lead time for all regulated entities. The proposed compliance date of April 1, 1997, would have allowed manufacturers of architectural coatings approximately 3 months from publication of the final rule to achieve compliance (assuming promulgation occurred on January 1, 1997). Thirty-three commenters (IV-D-02/IV-D-77/IV-F-01(l), IV-D-08, IV-D-21, IV-D-28, IV-D-44, IV-D-73, IV-D-85/IV-F-02c, IV-D-86/IV-F-01e, IV-D-93, IV-D-114,

IV-D-117, IV-D-120, IV-D-129, IV-D-158, IV-D-161/IV-F-01j, IV-D-162, IV-D-163, IV-D-169/IV-F-02n, IV-D-170/IV-F-02p/IV-F-02p, IV-D-171, IV-D-180, IV-D-182, IV-D-184, IV-D-185, IV-D-189/IV-F-01o, IV-F-01b, IV-D-186/IV-F-01e, IV-F-01k, IV-F-01s, IV-F-02gen, IV-F-02e, IV-F-02j, IV-F-02r) commented on the proposed compliance date. Of these 33 commenters, 28 commenters stated that the 3-month compliance period provided inadequate time to achieve compliance and 5 commenters supported a rapid enactment of the rule. Commenters supported compliance periods ranging from 6 months compliance time (IV-D-28) to 5.5 years (IV-D-02/IV-D-77/ IV-F-01(l)).

Unspecified compliance time. Five commenters (IV-D-73, IV-D-180, IV-F-02gen, IV-F-02j, IV-F-02r) supported more time for compliance but did not recommend a specific compliance time. Two commenters (IV-F-02gen and IV-D-02r) stated that the April 1, 1997 date (3 months compliance time) would not allow enough time to develop compliant coatings and one commenter (IV-F-02j) requested more time for product testing. One commenter (IV-D-180) stated that adequate warning of the compliance date is necessary for manufacturers to change labels, products, and containers. Another commenter (IV-D-73) explained that developing quality formulas that will withstand cold and humid weather in areas like New York would demand more time (unspecified compliance time) for reformulation.

One year or less compliance time. Ten commenters requested a year or less compliance time; seven commenters (IV-D-93, IV-D-161/IV-F-01j, IV-D-169/IV-F-02n, IV-D-171, IV-D-185, IV-D-189/IV-F-01o, IV-D-85/IV-F-02c) requested a year, and three commenters (IV-D-21, IV-D-28, IV-D-129) requested less than a year. Two commenters (IV-D-185, IV-D-189/IV-F-01o) stated that industry needed a full year to comply in order to complete laboratory work, adjust production formulations, reprint labels, adjust inventories, budget expenses, and otherwise modify their operations. One commenter (IV-D-185) pointed out that lead time was especially important for small businesses who have limited

resources and believed that a 1 year compliance period would reduce the need for individual variances. One commenter (IV-D-93), who had 91 products to reformulate, asked that the time to comply be extended to January 1998 (1 year compliance time) to allow for reformulation and use of existing label inventories. One commenter (IV-D-171) stated the April 1, 1997 date (3 months compliance time) would preclude adequate time for research and development needed to achieve required VOC reductions and for labeling reformatting. One commenter (IV-D-169/IV-F-02n) requested that the rule be promulgated as soon as possible with implementation 1 year after publication to accommodate orderly transition in the marketplace. According to the commenter, decisions in the retail marketplace are made around September 1, so a commitment to prompt publication of the rule would allow all parties to plan necessary product changes at the retail level. At the public hearing the commenter explained that the decision process regarding products is especially complicated for products with FIFRA requirements. One commenter (IV-D-85) requested a 1 year compliance time at the public hearing but requested a compliance date of September 1999 (33 months compliance time) in their written comment letter to allow time for reformulation, safety and toxicological testing, recoatability and remove ability evaluation, production, and education of the public sector. Another commenter (IV-D-161/IV-F-02n) supported a 1 year compliance period that would apply to all companies and all aspects of the rule including labeling provisions, reporting provisions, and VOC standards. One commenter (IV-D-28) recommended that all manufacturers and importers, including small businesses, be held to a July 1, 1997 (6 month compliance time) compliance date. Two commenters (IV-D-21, IV-D-129) requested 8 months. One of the commenters (IV-D-21) explained that an 8 month compliance time would allow them to avoid excessive administrative, travel, and reprinting expenses.

More than 1 year compliance time. Eleven commenters (IV-D-08, IV-D-44, IV-D-114, IV-D-120, IV-D-158,

IV-D-170/IV-F-02p, IV-D-182, IV-D-186/IV-F-01e, IV-F-01(l), IV-F-01m, IV-F-02e) requested more than 1 year of compliance time: three commenters (IV-D-112, IV-D-114, IV-D-158) requested 1 to 2 years; two commenters (IV-D-44, and IV-D-182) requested 2 to 3 years; four commenters (IV-D-08, IV-D-186/IV-F-01e, IV-F-01m, IV-F-02e) requested 3 to 5 years; one commenter (IV-F-01(l)) requested 1.5 to 5.5 years; and one commenter (IV-D-120) supported a phased compliance approach and extended compliance date. One commenter (IV-D-114) explained that his company required 6 to 12 months to develop a new roof coating and a minimum of 12 additional months for performance testing; therefore, the commenter requested 18 to 24 months compliance time. One commenter (IV-F-02e) recommended 3 to 4 years of voluntary compliance to allow companies to adjust to the requirements of the rule. According to the commenter, 3 to 5 years was the lead time most commonly advocated throughout the August 13, 1996 public meeting.

Three commenters (IV-D-170/IV-F-02p, IV-D-186/IV-F-01e, IV-F-01(l)) implied that 3 months' reformulation time was unreasonable by referencing a presentation made during the July 28-30, 1993 Regulatory Negotiation meeting and discussed in the Economic Impact Analysis and Regulatory Flexibility Analysis of the Proposed Architectural Coating Rule (A-92-18, 11-A-5). The presentation, given by a representative of a large coatings manufacturer, suggested that 2 to 3 scientist years or an elapsed time of 1.5 to 5.5 years was necessary to develop a new product. This included time for formulating a white paint, formulating the colors, formulating the tinting base paint, labeling, developing material safety data sheets, technical data sheets, and color cards, merchandising, scaling up to production volume, introducing the paint to stores and distributing it. Additionally, one of the commenters (IV-D-186/IV-F-01e) recommended that compliance be postponed until an appropriate compliance time can be determined. Two commenters (IV-D-120/IV-D-85), including one commenter (IV-D-85) who specified a 1 year compliance time, pointed out that the proposed

rule allows manufacturers to sell non-compliant products manufactured prior to the effective date after the rule takes effect. Therefore, manufacturers could theoretically stockpile non-compliant products for sale after the rule takes effect. In practice, however, the commenter (IV-D-120) stated that creating an inventory of non-compliant products is a poor option because inventory is expensive, quality deteriorates with age, and demand for products fluctuates. One commenter (IV-D-08) stated that complying with State architectural coating rules has taken it as long as 6 years, however, compliance with such rules typically require a 3 year time frame. The commenter stated that a variance procedure could be used to extend compliance time and would allow manufacturers reasonable flexibility for implementation of the rule.

Two commenters (IV-D-158, IV-F-01m) claimed that at least 3 years would be necessary to reformulate, test, and market new products. Although one commenter (IV-F-158) stated 3 to 5 years would be necessary to reformulate and indicated that a third of their products would need reformulation, they suggested a compliance date of July 1, 1998 (18 months compliance time). The other commenter (IV-F-01m) referenced the Allied Local and Regional Manufacturers (ALARM) proposal in which the initial standards would take effect 3 years from the date of final promulgation of the rule. Another commenter (IV-D-182) recommended a compliance date of April 2000 (39 months compliance time) because more time is needed for testing. The commenter explained that new products must be tested before they are marketed and testing time varies by product line and by specific product. For example, the commenter stated that testing interior products can take months while exterior products can take years to test. Another commenter (IV-D-44) recommended a compliance date of April 2000 (39 months compliance time), or April 1999 (27 months compliance time) at the earliest. The commenter specified that testing exterior products requires 2 to 3 years and stated that the proposed deadline was unrealistic because of reformulating, testing, marketing, and personnel requirements.

Four commenters (IV-D-02, IV-D-08, IV-D-120, and IV-D-189/IV-F-01o), including one (IV-D-189/IV-F-01(o)) who requested 1 year compliance time and one (IV-D-02) who supported a small business compliance extension, implied that it is unreasonable to require industry to begin compliance activities before the rule is promulgated. One commenter (IV-D-120) pointed out that industry will have wasted time and money if they reformulate their products and promulgation does not occur. The commenter continued by explaining that architectural and industrial maintenance coatings are typically formulated for specific application and performance requirements so reformulation is not simple. The commenter explained that research and development takes longer if technological means are unavailable, and contracts and work plans specifying coatings are difficult to modify. Furthermore, the industry potentially faces loss of marketability of some categories and liability costs associated with introducing alternative products. The commenter preferred that the rule specify the time from promulgation (2 years) rather than a date to insure adequate compliance time in case of promulgation delays.

Compliance extension for labeling. Five commenters (IV-D-93, IV-D-171, IV-D-189/IV-F-01o, IV-F-01b, IV-F-01s) requested more time to comply with the proposed labeling guidelines. One commenter (IV-D-93) asked for 1 year to comply with labeling so that existing label inventories could be used. Another commenter (IV-D-189/IV-F-01(o)) asked for at least 1 year to comply with any new labeling requirements. Two commenters (IV-F-01b, IV-F-01s) suggested allowing the use of old labels on compliant products until the existing label inventories are depleted. The commenters stated that it is typical for large quantities of containers and labels to be produced in advance; therefore, such a provision would eliminate the need to destroy large quantities of existing labels. According to one commenter (IV-F-01b), the label inventory is composed of 10 to 20 million existing labels that would have to be destroyed. Plus, the commenter claimed that it takes longer than 1 year to design and

print new labels. The commenter mentioned stickering as another option but warned that the process is costly and ineffective. One commenter (IV-D-171) recommended a January 1, 1998 compliance date (1 year from promulgation) for requirements found at paragraph (a) of §59.402 (VOC standards), paragraphs (a) and (b) of § 59.403 (labeling requirements), paragraph (b) of § 59.406 (initial report), and paragraph (d) of § 59.406 (date code explanation). The commenter spent over $300,000 in 1996 on labels required by amended Department of Transportation regulations and expects labels for the architectural coating rule to be more expensive.

Oppose compliance extension. Five commenters (IV-D-117, IV-D-162, IV-D-163, IV-D-184, IV-F-01k) opposed extending the compliance time beyond the proposed time (3 month compliance time). One commenter (IV-D-117) pointed out that prompt implementation was critical to air quality and that section 183(e) is intended to obtain VOC emission reductions in a timely fashion. One commenter (IV-D-162) stated that any extension was unwarranted because the industry has already proved its ability to produce compliant products, implying that additional time for reformulating and testing product is not necessary given the VOC content limits of the proposed rule. One commenter (IV-D-163) explicitly stated that a compliance extension to January 1998 (1 year) was unnecessary and that any delay in emissions reduction would impact other programs that rely upon national control measures including States with ozone NAAQS nonattainment areas and possibly the Ozone Transport Assessment Group (OTAG). Another commenter (IV-D-184) urged the EPA to promulgate effective rules in a timely manner and explained that the proposed January 1, 1997 date would diminish the effectiveness of the rule by leaving State and local agencies with a greater shortfall in VOC emission reductions to offset. Another commenter (IV-F-01k) believed that the proposed 3 month compliance time was reasonable, assuming no further modifications to the VOC content limits or the category definitions making the rule more stringent than the current draft. The commenter stated

that it was necessary to implement the architectural coating VOC rule with a 3 months compliance time so that States and localities would not need to implement local regulations that would be a burden on industry. The commenter thus alluded to the fact that many States are intending to rely on the architectural coatings rule for VOC emission reductions and that any delay might force them to enact their own differing standards, thereby imposing burdens upon regulated entities.

Response: The proposed architectural coating rule had a compliance date of April 1, 1997. At proposal, the EPA expected to publish the rule on January 1, 1997. This schedule would have allowed regulated entities approximately 3 months to comply with the rule. After fully evaluating the comments received, the EPA has decided to extend the compliance period for the final rule to 12 months.

Of the comments received where a compliance date was specified, about one-third of the commenters supported a compliance period between 3 months and 12 months. These commenters stated that the additional compliance time would be necessary to adjust formulations, reprint labels, adjust inventories, use existing label stock, and conduct research and development. The EPA agrees that this additional time is needed and based on reported experience believes that a 12-month period is adequate to accommodate this need.

Another third of the commenters stated that the compliance period should be greater than 1 year to allow more time for developing, performance testing, and marketing new products. In particular, commenters stated that performance testing of exterior products requires 2 to 3 years. The EPA has addressed these comments in several ways. First, the compliance period in the final rule was extended from 3 months to 12 months. Second, the EPA believes that the primary concerns for many of these commenters have been addressed through the creation of new categories, clarification of definitions, or some other change to the rule. For example, the primary concern of three of the commenters was addressed through the creation of the concrete

curing and sealing category with a VOC limit that will obviate the need for a lengthy reformulation and testing process. Third, the EPA has included a tonnage exemption in the final rule that allows manufacturers to exempt low volumes of coatings from the rule. Finally, the EPA has included the exceedance fee option in the final rule that allows manufacturers who pay the fee to continue to market non-compliant products.

The last third of the commenters stated that a compliance extension was not necessary. The commenters provided the following reasons: it would result in an adverse impact on the environment; it would lead to additional State regulations; and it is unnecessary given the current state of technology. The EPA generally concurs with these sentiments, especially the concern that a lengthy compliance extension could result in unnecessary adverse environmental impacts. For this reason the EPA has concluded that it is inappropriate to extend the compliance period longer than is reasonably necessary based upon the comments. The EPA supports enacting the architectural coating rule as quickly as possible, but the EPA must balance the environmental benefits with the impacts on regulated entities. The EPA has determined that the 12-month compliance period best achieves this balance.

2.2.5.2 Small Business Compliance Time Extension

Comment: The EPA requested comments on an extended compliance date for small businesses and importers in the proposal preamble (61 FR 32732). Thirteen commenters (IV-D-02/IV-D-77/IV-F-01e/IV-D-08/IV-D-28, IV-D-34, IV-D-43, IV-D-120, IV-D-161/IV-F-01j, IV-D-184, IV-D-189/IV-F-01o, IV-D-226, IV-F-01k, IV-F-02gen) commented on the inclusion of a compliance extension for small businesses. Of these thirteen commenters, one-third of the commenters supported such an extension while two-thirds of the commenters opposed an extension.

Four commenters (IV-D-02, IV-D-08, IV-D-120, IV-F-02gen) supported a compliance extension for small business. One commenter (IV-D-08) suggested that the EPA grant a compliance

extension for all small businesses because of the economic hardship that an unreasonable implementation period would impose on small businesses. Another commenter (IV-D-08) explained that the cost to change products may force small companies to implement changes over a longer period of time. One commenter (IV-F-02gen) requested a 1-year phase-in of the rule for small businesses and supported the small business compliance extension from the draft rule. The commenters indicated that the compliance date extension addressed small business hardship simply and more effectively than the variance provision.

Two of these commenters (IV-D-120, IV-F-02gen) implied that large manufacturers have a competitive advantage and that extra compliance time would allow small businesses to come into compliance with the regulation gradually. One of the commenters (IV-D-120) pointed out that several large companies were involved with the negotiations of the proposed rule and, therefore, had a longer time to prepare for compliance than small companies who were unaware of the proposed rule.

One commenter (IV-D-02) stated that it would be impossible for a small business with multiple product lines to reformulate by the proposed date for compliance. The commenter (IV-D-02) referred to the presentation made to the Regulatory Negotiation Committee (also referenced by commenters IV-D-170/IV-F-02p, IV-F-02e, IV-F-01(1)) that suggested that 2 to 3 scientist years or an elapsed time of 1.5 to 5.5 years was necessary to develop a new product. The commenter (IV-D-02) also referenced his Regulatory Negotiation presentation that discussed the reformulation costs to small companies. The commenter (IV-D-02) explained that small businesses produce more niche, high VOC content paints because they cannot compete on water-based formulas with the big companies which have greater purchasing power and larger production capabilities. The commenter (IV-D-02) stated that small businesses face the same reformulation time requirements as large companies but large companies have a competitive advantage because they typically have fewer products to reformulate and more staff. Given the

time and staff limitations, small businesses must choose which products to reformulate and let competitors reformulate remaining products. The commenter concluded that a small company with marginal finances that loses several products might close.

Nine commenters (IV-D-28, IV-D-34, IV-D-43, IV-D-161/IV-F-01j, IV-D-184, IV-D-189/IV-F-01(o), IV-D-226, IV-F-01k, IV-F-02gen) opposed a compliance extension for small businesses. Two of the nine commenters (IV-D-189/IV-F-01o, IV-D-226) explained that a small business extension is unnecessary because of the proposed coating categories, small volume exemption, and the variance provision. The commenter thus suggested that these mechanisms already provided small businesses with ample flexibility that negated any concerns about the compliance period. One commenter (IV-D-189/IV-F-01o) supported the variance provision if small businesses required longer to comply with the VOC content limits for specific categories and stated that the promulgation delay renders the small business compliance extension unnecessary.

Another commenter (IV-D-28), who supported 6 months compliance time for all businesses, explained that granting a compliance extension to small businesses would make compliant products non-competitive, plus the targeted VOC reductions for State Implementation Plans (SIPs) would not be accomplished. The commenter also pointed out that small businesses should already be in the market if the limits represent best available controls products and technologies, thus, the compliance extension is unnecessary. Another commenter (IV-D-161) stated that there was no basis to provide additional time to small businesses and supported the exceedance fee as a mechanism to extend compliance to all businesses. One commenter (IV-D-43) disagreed with a small business exemption because joint ventures, subsidiaries, etc., blur the lines between small and large companies.

One commenter (IV-D-28) contended that the EPA would be contradicting itself to say the rule was based on best available control while extending compliance for one group if the technology is already available. Two commenters (IV-F-02gen,

IV-F-01k) agreed that if the rule contained reasonable requirements there would be no need for special treatment of small businesses. Two commenters (IV-D-28, IV-D-184) stated that the compliance extension would lessen emission reductions. Two commenters (IV-D-34, IV-D-28) contended that a compliance extension for small businesses would give them an unfair competitive advantage. Three commenters (IV-D-161, IV-D-28, IV-D-43) agreed that small companies have had adequate time to reformulate and raw material suppliers often help small businesses reformulate. Two commenters (IV-D-34, IV-D-161) pointed out that many small businesses who requested a compliance extension for small businesses have already complied with State and county regulations that gave less lead time and contained no small business extension or variance provision. Another commenter (IV-F-01j) stated it is more appropriate to have one rule effective date rather than stagger the effective date based on the size of the business.

Response: At proposal the EPA requested comment on whether the final rule should include a small business compliance extension (61 FR 32732). In effect, this extension would have allowed small businesses 12 months to comply. Two-thirds of the commenters providing comments on this provision were against special treatment for small businesses. The primary concerns were that such a provision would result in unnecessary adverse environmental impacts, would potentially hurt sale of compliant products, thereby, discouraging their development, and would provide small businesses with an unfair advantage in the marketplace. The EPA generally agrees with these concerns and therefore believes that it is inappropriate to provide small businesses with a different compliance period, in light of other mechanisms in the rule that assist them in achieving compliance. Nevertheless, the comments have indicated that a longer compliance period is appropriate for all businesses. After careful evaluation of the comments the EPA has decided not to include a compliance extension specific to small businesses, but has instead lengthened the compliance period for all regulated

entities to 12 months. This time period was selected to balance the needs of the regulated entities, both large and small businesses, against the need for rapid implementation of the rule to achieve the required reductions of VOC.

2.2.6 Labeling, Recordkeeping and Reporting

2.2.6.1 Labeling

General.

Comment: Several commenters (IV-D-30, IV-D-43, IV-D-121, IV-D-129, IV-D-153, IV-D-161, IV-D-181, IV-D-189, IV-F-2gen) provided general comments on the labeling requirements in § 59.403 of the proposed rule and on the potential labeling requirements discussed in section II.E. of the proposed preamble. One commenter (IV-D-181) generally supported the proposed labeling requirements. One commenter (IV-D-161) stated that labeling requirements that are well established in State and local regulations should not be difficult for manufacturers to follow. The commenter stated that new labeling requirements would require several years of lead time to implement. Therefore, the commenter requested that the EPA limit labeling requirements to those found in State and local regulations. One commenter (IV-F-2gen) indicated that the labeling requirements would force them to develop new labels, therefore adding expense to their operating costs. Another commenter (IV-D-121) representing the Department of Defense (DoD) argued that if internal DoD repackaging, distribution, and hazardous material exchange centers are not excluded from the definitions of manufacturer and importer (see comment 2.2.1.1), additional unnecessary labeling would result.

Two commenters (IV-D-43, IV-D-153) stated that current labeling requirements already fill the lids of most coatings, and any additional labeling would damage proper labeling and marketing. One commenter (IV-D-129) stated that the rule's on-can labeling requirements are too inflexible, and that manufacturers should have the flexibility to display the information on the can or on an accompanying product use instruction pamphlet. One commenter (IV-D-189) stated that the

labeling requirements of the rule are potentially the most costly and burdensome features of the rule. Specifically, the commenter stated that if consumer education and coverage labeling are required, manufacturers of architectural coatings products will be forced to redesign and reprint labels for the coatings. The commenter stressed that even the requirements in § 59.403(a)(1) to (3) will severely affect those companies that do not have prior experience with regulations. The commenter stated that the longer time the industry is allowed to implement label changes the more cost-effectively the changes can be made. The commenter stated that at a minimum the industry will need 1 year from the promulgation of the rule to convert their labels.

Several commenters (IV-F-2gen) asked how the labeling requirements in the proposed rule would affect their labeling requirements under FIFRA. One commenter (IV-D-28) recommended that label requirements mandate metric (g/l) and non-metric standard (lbs/gal) so that consumers can easily understand the measurements. Another commenter (IV-F-01s) inquired how to label products for a designated use. The commenter specifically asked about labeling products for application to wood furniture instead of application to architectural surfaces.

Response: The EPA acknowledges that the rule may require manufacturers to develop new labels to comply. To minimize this impact, the labeling requirements in the final rule are based on requirements found in existing State and local regulations. The EPA has elected not to require consumer education and coverage information in the final rule. As requested by commenters, the EPA has selected labeling requirements that require limited label space. Labeling information is required on product labels instead of product literature in order to effectively communicate the information with consumers and to provide for effective compliance checks. Manufacturers cannot always ensure that their associated product literature is distributed to consumers. In order to minimize the impact of the labeling requirements, the EPA has not adopted the suggestion that labels present both metric and English units. The manufacturer or importer is only

required to provide the VOC content in metric units. A manufacturer or importer may also provide information on the VOC content in English units if they choose to do so. The EPA has not specified how products should be labeled for a designated use. However, any coating represented by the manufacturer or importer as an architectural coating must comply with the architectural coating rule. Also, architectural coatings that are registered with the EPA under FIFRA must comply with FIFRA. The EPA has provided an 18-month compliance period for regulated entities to accommodate the FIFRA re-registration process. Consumers who repackage coatings by transferring it to another container without altering the coating VOC content (e.g.,DoD in-house repackaging, distribution, and hazardous materials exchange centers) are excluded from the definitions of manufacturer and importer and, thus, are not subject to the labeling requirements of this rule provided they do not sell or distribute the coating to another party.

Date of manufacture or code.

Comment. Six commenters (IV-D-28, IV-D-161, IV-D-171, IV-D-181, IV-D-189, IV-F-02gen) provided comments on the proposed date code labeling requirement. Three commenters (IV-D-28, IV-D-161/IV-F-02j, IV-D-171) requested that the date code in locations on the can other than the lid. One commenter (IV-D-28) proposed that the EPA require manufacturers to provide manufacturing codes on the bottom of coating cans instead of exclusively on lids, because end-users tend to discard the lids, making it difficult to reconstruct a product's history. One commenter (IV-D-161/IV-F-02j) supported allowing the date code on the label, as required in several existing State regulations.

One commenter (IV-D-189) mentioned that the manufacture date is already carried on a majority of architectural coating labels or containers. One commenter (IV-F-2) inquired as to who must understand the code on the product that indicates the date of manufacture. The commenter indicated that they use sequential batch numbers and would have to indicate that batches above "X" are after the compliance date.

Response: In order to provide greater compliance flexibility and reduce labeling compliance costs, the EPA has modified the labeling requirement to allow manufacturers and importers to place the date the coating was manufactured or a code representing the date on the bottom of the can in addition to allowing placement on the label or lid. The rule requires manufacturers and importers to describe the date code in their initial report to the EPA and update the descriptions within 30 days of modification. Thus, manufacturers and importers may continue to use their own chosen method of denoting the date of manufacture, but they must inform the EPA of the method to interpret such information. The date code description will be used by the EPA enforcement personnel to determine the compliance status of coatings.

VOC content limit.

Comment: Fifteen commenters (IV-D-02, IV-D-30, IV-D-28, IV-D-33, IV-D-129, IV-D-134, IV-D-137, IV-D-158, IV-D-161, IV-D-162, IV-D-181, IV-D-183, IV-F-01k, IV-F-01n, IV-F-01i) provided comments on the maximum VOC content labeling requirement in §59.403(a)(3) of the proposed rule. Two of the 14 commenters (IV-D-28, IV-D-33) requested clarification on language and interpretation, two commenters (IV-D-02, IV-D-134) favored requiring the actual VOC content on labels, and two commenters (IV-D-161, IV-D-181) supported labeling the maximum VOC content instead of the actual or measured VOC content. Three commenters (IV-D-137, IV-D-158, IV-D-162) suggested including a general VOC labeling statement and three commenters (IV-D-183, IV-F-01k, IV-F-01n) opposed any VOC labeling requirement. In addition, three commenters (IV-D-28, IV-D-30, IV-F-1i) requested clarification for labeling units with an overpack and multi-component systems.

Two commenters (IV-D-28, IV-D-33) asked the EPA to clarify the meaning of maximum VOC content. One commenter (IV-D-33) explained that the proposed regulatory language for the labeling requirement could be interpreted to refer to either the actual VOC content or the regulatory limit for the coatings.

Two commenters (IV-D-02, IV-D-134) supported an actual VOC content labeling requirement instead of the maximum VOC content labeling required in the proposed rule. One of the commenters (IV-D-134) explained that many stationary source coating users and industrial facilities are required to report emissions for emission inventories. The commenter stated that if labels only provide the maximum VOC content, emissions inventories would be overestimated and result in increased emission fees. The other commenter (IV-D-02) supported an actual VOC content labeling requirement without regard to thinning recommendations. The commenter explained that the maximum VOC content varies with applicators, application method, and seasonality.

Two commenters (IV-D-161, IV-D-181) supported maximum VOC content labeling and opposed actual VOC content labeling. One commenter (IV-D-161) supported the requirement of a maximum VOC content labeling to avoid the cost for new labels. The commenter explained that because VOC measurements would vary by lab, including actual VOC content as measured would increase labeling costs. The other commenter (IV-D-181) stated that it would be impossible to comply with an actual VOC content labeling requirement because labels printed in advance would not account for the variability in production runs. One of the commenters (IV-D-183) explained that this labeling requirement serves little purpose because the general public does not understand the VOC content terminology. Another commenter (IV-F-01k) also questioned the need for VOC labeling because it is expensive and provides little information to consumers. If the provision is included, the commenter requested clarification that maximum VOC content is required rather than actual VOC content. The other commenter (IV-F-01n) claimed that the labeling would be untruthful because Method 24 overestimates the VOC content of waterborne coatings.

Three commenters (IV-D-137, IV-D-158, IV-D-162) suggested that the EPA allow general VOC content labeling statements rather than the specific, maximum VOC content of coatings in the container. One commenter (IV-D-158) suggested that labels read

"contains no more than X g/l VOC" because the requirement for specifying the VOC content of the coating in the container, or the actual VOC content, presents a hardship to manufacturers. The commenter explained that existing State regulations allow this type of generic VOC content labeling. One commenter (IV-D-162) suggested a general statement that the product meets Federal and State regulations. One commenter (IV-D-137) suggested the following statement "this product complies with VOC content limits for the area in which it is sold."

In addition, two commenters (IV-D-28, IV-F-1i) requested clarification for VOC content labeling of multi-component systems. One commenter (IV-F-1i) discussed coatings provided in two separate packages that must be mixed before application. According to the commenter, these coatings commonly have different VOC contents and one coating is compliant and the other one is not. The commenter indicated that these coatings cannot be premixed at the factory and retain their performance characteristics. Another commenter (IV-D-30) asked for clarification of the labeling requirements for multiple small units contained within a larger "overpack" carton.

Response: The EPA has carefully considered these comments and has decided to modify the labeling requirements. To provide flexibility, in § 59.405(a)(3) of the final rule, the EPA allows either of the following to be included on the label of the coating container: (1) the VOC content of the coating in the container; or (2) the VOC content limit in table 1 of the rule with which the coating is required to comply and does comply. Regarding the request for more general VOC labeling statements, the EPA maintains that labels specifying the VOC content or the required VOC content limit with which the coating complies are essential for compliance enforcement. The EPA agrees that compliance with an actual VOC content labeling requirement may be difficult due to variability of VOC contents resulting from production fluctuations. Therefore, § 59.405(a)(3) of the final rule permits manufacturers to comply by labeling the coating with either the VOC content of the coating including thinning

recommendations, except thinning with water, and considering production fluctuations or the applicable VOC content limit for the coating as listed in table 1 of the rule, provided that the VOC content of the coating does not exceed the VOC content limit. Any coating for which the exceedance fee or tonnage exemption provision is being used must be labeled with its actual VOC content rather than the VOC content limit in the rule because it would not be in compliance with the limit. With regard to multi-component products, two or more component systems must be labeled with either the VOC content of the coating as mixed per the manufacturer's instructions or the applicable VOC content limit to comply as directed with mixing instructions. For multiple units packaged together that are not mixed, the smallest unit sold individually must meet labeling requirements.

Coverage.

Comment: In the proposal preamble (61 FR 32733), the EPA requested comment on the feasibility of a coating coverage labeling requirement. Eight commenters (IV-D-43, IV-D-120, IV-D-161, IV-D-162, IV-D-181, IV-D-207, IV-F-1g, IV-F-1k) opposed requiring coverage information on container labels. The commenters stated that there is no standard method for determining coating coverage and that coating coverage is highly variable depending on the following factors:

- Application technique: spray, roller, brush, etc.
- Nature of the substrate: absorbency, color, temperature, fineness of sanding, presence of existing coatings (if any), etc.
- Nature of the coating: hiding power, color, rheology, etc.
- Environmental conditions during application: temperature, humidity, etc.
- Coating requirements: film thickness required (depends on long-term exposure requirements), etc.

One commenter (IV-D-207) stated that coating coverage can vary by a factor of 2 to 3 times depending on these variables. The EPA agrees that coating coverage information may be useful for

consumers, but other commenters have clearly indicated that it is an inappropriate factor for assessment of VOC emissions limits.

In contrast, one commenter (IV-F-1i) stated that its label already includes maximum VOC content, thinning instructions, warnings, coverage information, and a manufacturing date code on its label. Eight commenters (IV-D-28, IV-D-153, IV-D-161, IV-D-162, IV-D-181, IV-D-207, IV-F-1i, IV-F-1k) explained that the coverage rate depends on the substrate and other variable conditions. Commenters mentioned many variables that affect coverage, including application surface, humidity, temperature, and other exposure conditions. Commenters agreed that specifying coverage rates would not be useful because the actual coverage rate varies with application technique and product use.

One commenter (IV-D-207) explained that a coverage statement offers little benefit but could result in considerable cost to industry and the EPA. According to the commenter, testing to generate coverage rates for each product would be costly for small companies. One commenter (IV-D-181) pointed out that consumers would not make purchasing decisions based on coverage rates. Two commenters (IV-D-28, IV-D-153) stated that coverage information would confuse consumers. Three commenters (IV-D-181, IV-F-01, IV-F-01k) stated that coverage information would require too much label space. Another commenter (IV-D-162) suggested that coverage information should not be required for industrial maintenance coatings.

Four commenters (IV-D-43, IV-D-120, IV-D-207, IV-F-01k) pointed out that the regulation must establish how coverage is to be measured to ensure that coverage information is meaningful. Another commenter (IV-D-120) stated that regulating coverage rate without specifying a standard method creates an "uneven playing field" because the test method selected affects results. Specifically, one commenter (IV-F-01k) suggested specifying the opacity level. Another commenter (IV-D-43) stated that specifying a coating thickness would be difficult to understand.

<u>Response</u>: The EPA acknowledges that coverage rates vary according to substrate surface, coating formulation,

environmental conditions and application technique. The EPA also agrees that standardized test methods would be necessary to ensure comparable results. Although coating coverage rates would provide valuable information to consumers, the information is not necessary to determine compliance. Thus, a coating coverage labeling requirement has not been included in the final rule.

Industrial maintenance coatings.

Comment: Thirteen comments were received on the "not intended for residential use" labeling requirement for industrial maintenance coatings in §59.403(b) of the proposed rule. Four commenters (IV-D-158, IV-D-183, IV-F-01k, IV-F-02b) suggested removing the proposed labeling requirement for industrial maintenance coatings from the rule. One commenter (IV-D-01k) contended that the words would confuse consumers. According to one commenter (IV-F-01k), the requirement is of little value because many companies already have similar phrases on labels and the commenter stated that the proposed rule allowed for the availability of quality products for residential use.

Four commenters (IV-D-101, IV-D-161, IV-D-183, IV-D-189/ IV-F-01o) pointed out that there may be instances where an industrial maintenance coating is appropriate in a residential setting rendering the label statement incorrect. One commenter (IV-D-189/IV-F-01o) explained that the "not intended for residential use" labeling requirement would mislead consumers and result in decreased product use in legitimate settings.

Seven commenters (IV-D-21, IV-D-129, IV-D-161, IV-D-162, IV-F-02gen, IV-F-02b, IV-F-02c) requested more flexibility for the language used to meet this labeling requirement. Several commenters (IV-D-129, IV-D-162, IV-F-02gen, IV-F-02c) suggested that the EPA allow alternate language such as "for industrial use only," which is standard industry practice. One commenter (IV-D-129) pointed out that changing the language they already have on their labels would require unnecessary expense. One commenter (IV-F-02b) noted that the requirement is not in the California rule 1113 and suggested that the labeling statement, if required, list performance criteria rather than location of

use. Some commenters (IV-F-02gen) offered the following suggestion: "this product is intended for use under the following conditions (list conditions)" and "for professional use only." One commenter (IV-D-21) also suggested "for professional use only" because industrial products are used in residential homes. One commenter (IV-D-161) who originally opposed the requirement later suggested that manufacturers be allowed to choose between the language in the California regulations and the language required by the proposed rule. The commenter explained that the California Air Resources Board adopted a suggested control measure for architectural coatings that requires labels to include the statements "not for residential use" or "not for residential use in California."

Response: The EPA has retained in the final rule a special proposed labeling requirement for industrial maintenance coatings. The EPA believes that this requirement will reduce the use of higher VOC content coatings in inappropriate circumstances. However, as requested by commenters, the EPA has allowed greater flexibility in the language of the labeling requirement in order to reduce the burden on industry while still accomplishing the goal of discouraging use of coatings in inappropriate locations. The final rule allows any of the following phrases:

1. For industrial use only;

2. For professional use only;

3. Not for residential use;

4. Not intended for residential use; and/or

5. This product is intended for use under the following conditions (list those that are applicable):
   A. Immersion in water, wastewater, or chemical solutions (aqueous and nonaqueous solutions), or chronic exposure of interior surfaces to moisture condensation;

   B. Acute or chronic exposure to corrosive, caustic, or acid agents, or to chemicals, chemical fumes, or chemical mixtures or solutions;

C. Repeated exposure to temperatures above 120°C (250 °F);

D. Repeated (frequent) heavy abrasion, including mechanical wear and repeated (frequent) scrubbing with industrial solvents, cleaners, or scouring agents; or

E. Exterior exposure of metal structures and structural components.

The EPA believes that the conditions under which industrial maintenance coatings are used are found infrequently in residential settings. However, the EPA does not intend to prohibit industrial maintenance coating use in residential settings, as indicated by the wording of the labeling statement described above.

Educational statement.

Comment: In the proposal preamble (61 FR 32733), the EPA requested comment on the use of an educational statement rather than an educational outreach program. Fourteen comments were received in regard to the EPA's request for comments in the proposal preamble (61 FR 32733 1st column) on the potential impact of labels intended to inform consumers about VOC and their emissions from coatings. Eleven (IV-D-28, IV-D-43, IV-D-129, IV-D-151, IV-D-153, IV-D-161, IV-D-162, IV-D-181, IV-D-207, IV-D-213, IV-F-01i) of the 14 comments received opposed an educational statement. Two comment letters (IV-D-33, IV-D-120) supported an educational statement, and two comment letters (IV-D-151, IV-D-189) recommended an educational outreach program.

Of the eleven commenters who opposed the educational labeling statement, two commenters believed an educational statement would influence consumer decisions and four commenters believed the statement would have little effect. Two of the eleven commenters (IV-D-213, IV-F-01f) stated that an educational statement or an outreach effort would encourage the use of coatings based on VOC content instead of product quality.

One commenter (IV-D-213) representing 3,000 painting contractors contended that consumers would select poor quality

coatings and apply them more frequently if low VOC content was their sole purchasing criterion. According to the commenter, this undermines the basic market incentive of making the best product for specific purposes and selling it at a competitive price. The commenter added that an accurate information piece would describe the potential link between VOC emissions and possible ozone formation, and that issues such as temperature, humidity, and reactivity would need to be discussed.

Four commenters (IV-D-28, IV-D-129, IV-D-153, IV-D-207) opposed the EPA's proposal to add an educational statement on the coating's label, because they claimed that it would produce little or no effect upon the end user's actions. One commenter (IV-D-207) explained that professional painting contractors would choose coatings based on the product's performance and its cost-benefit relationship. The commenter believed that do-it-yourself users would either ignore the statement or delay maintenance to avoid feeling guilty for harming the environment.

One commenter (IV-D-181) stated that it would be difficult to find space on the label because the containers have a limited surface area and must contain required safety warnings (flammability, risk to infants), application instructions, and other commercial information. Second, the commenter did not believe the proposed messages should be included because the statute supposedly does not contemplate such labeling and a statement could not convey the complicated nature of ozone formation.

Two other commenters (IV-D-151, IV-F-1i) opposed an educational statement because they believe it would be a fruitless and costly effort. One commenter (IV-D-43) advised against additional labeling aimed at educating the public, because the public either already understands the environmental impacts associated with VOC, or will be safeguarded by upcoming VOC legislation that will control the products available to the consumer. One commenter (IV-D-129) recommended that an alternative to the proposed educational labeling requirement might be to require the following label: "Volatile Organic

Compounds in this product may contribute to ground-level smog. Call 1-800 ___-____ for additional information." The commenter suggested that the EPA could reference a hotline dedicated to clean air education. One commenter (V-D-161) opposed an educational statement regarding VOC impact to the environment because it would be too costly, too large for the container, would not result in a significantly better educated consumer, and could cause the consumer additional confusion. Another commenter (IV-D-162) opposed requiring an educational label because the company already provides information to facility owners, specifiers and applicators, and expects to increase efforts when the rule is finalized and implemented.

Of the two commenters (IV-D-33, IV-D-120) who supported an educational labeling requirement, one commenter (IV-D-33) recommended the following less technical and simplified description: "This coating contains solvents that will be emitted to the air during use, and may contribute to the formation of summertime smog that is harmful to people's lungs." The other commenter (IV-D-120) preferred a succinct labeling statement because an outreach program based exclusively on architectural coatings, as opposed to the entire VOC-emitting and ozone-forming community, would create a bias against the coatings industry, and leave the public misinformed as to the larger picture of other contributing emission sources. In comparison, two commenters (IV-D-151, IV-D-189) supported an outreach program instead of an educational labeling requirement.

Response: After careful consideration of the comments, the EPA has not included an educational labeling requirement in the final rule. The EPA acknowledges that an educational labeling statement would need to be lengthy to address all the relevant information and may not adequately educate consumers on the relationship between VOC and ozone. As discussed in section 2.8, the EPA will instead consider an educational outreach program.

2.2.6.2 Recordkeeping and Reporting

Comment: Nine commenters (IV-D-28, IV-D-33, IV-D-101, IV-D-161, IV-F-01, IV-F-01a, IV-F-01(1), IV-F-01b, IV-F-02)

offered feedback on recordkeeping and reporting requirements in the proposed rule. Three commenters (IV-D-28, IV-D-33, IV-F-01a) suggested expanded reporting requirements and two commenters (IV-F-01b, IV-F-02) requested reduced reporting. Two commenters (IV-D-161, IV-F-01) reminded the EPA to correct dates and one commenter (IV-F-01(1)) stated that it was impossible to list products by category (a proposal requirement for the initial notification report).

Of the three commenters requesting increased reporting requirements, one commenter (IV-D-28) suggested requiring yearly reporting and certification requirements but did not elaborate on the specifics of such reports. The commenter (IV-D-28) also requested that the EPA provide an address to which manufacturers would send descriptions of their manufacturing code. The other two commenters supporting increased reporting (IV-D-33, IV-F-01a) recommended that the EPA revise the reporting requirements so manufacturers would submit VOC content and coating thinning information on their products a one-time initial basis. This would allow the EPA to detect any regulatory misinterpretations by the manufacturer regarding the proper categorization of the coatings, etc.

Two commenters (IV-F-01b, IV-F-02) requested minimal reporting requirements. One (IV-F-01b) of the commenters suggested that recordkeeping and reporting requirements be held to gross IRS type reports, with records being kept by manufacturers and supplied on request. The commenter stated that this is especially appropriate for the exceedance fee option, low-volume exemption, and the recycled coatings provision. The other commenter (IV-F-2) stated that his company does not have the staff or financial resources to do reporting and recordkeeping. The commenter claimed that it would cost his company more to meet the reporting and recordkeeping requirements than it would to reformulate coatings.

Two commenters (IV-D-161, IV-F-01) commented on the required reporting dates. One commenter (IV-D-161) stated that the reporting requirements must reflect the new effective date for

the rule. One commenter (IV-F-01) pointed out that the preamble requires an initial report "by April 1, 1997 or within 180 days after becoming subject to the requirements of the proposed standard, whichever is later." The commenter noted that no one becomes subject to the proposed standard before April 1, 1997 so, in effect, it says 180 days later.

One commenter (IV-F-01(1)) asserted that it is difficult or impossible to report by product category because the actual end use of a coating is not known by the regulated entity. The commenter stated that the same coating may be marketed for several categories, including categories other than architectural coatings. The end-use category is often not known until sold to the end user. Another commenter (IV-F-2) inquired whether manufacturers must notify the EPA if they begin making a coating in a different category after submitting the initial report.

One commenter (IV-D-101) requested that the EPA answer the following questions with regard to reporting:

1. Why are manufacturers being required to report a list of categories that are manufactured?

2. If a new coating in a new category is introduced after adoption of the rule, would a report be due for the product, and if so, what would be the report's content?

3. Does the EPA plan to require annual reporting? If so, discuss the reasons for the requirement.

Response: The EPA understands the concerns of regulated entities regarding the potential burden of extensive recordkeeping, especially for those regulated entities that will act in good faith to comply with the final rule. Nevertheless, the EPA must have mechanisms to allow proper determination of compliance to insure that the final rule achieves the intended VOC reductions. The EPA believes that the final rule requirements for an initial report and container labeling represent the appropriate balance between burden and information needed for enforcement. The EPA did not adopt the suggestion that the EPA require yearly reporting and certification due to

the burden associated with such a requirement, particularly for small businesses. The EPA believes that the recordkeeping and reporting requirements in the final rule are the minimum that can still meet the needs for adequate determination of compliance and, if necessary, enforcement.

Manufacturers and importers are required to submit in their initial notification report a list of the coating categories they produce to provide the EPA with an initial overview of all manufacturers and importers subject to the standards. For this report, manufacturers and importers must associate coatings with the categories and VOC content limits with which they must comply. To determine which category a coating is in, the rule's definition of the category should be compared to the manufacturer's or importer's representation of its intended use. Manufacturers and importers who begin to sell or distribute new coatings after the rule takes effect and who have already submitted an initial notification report do not have any additional notification requirements. However, a manufacturer or importer who begins to sell or distribute a coating subject to the rule and who has not previously submitted an initial notification report must submit one within 180 days after the coating is manufactured or imported or by the compliance date of the rule, whichever is later.

Regarding the commenters' request to clarify the date the initial report must be submitted, manufacturers that currently produce coatings subject to the rule are required to submit the initial report by the compliance date of the final rule. Manufacturers of new coatings must submit the initial report within 180 days after becoming subject to the rule or by the compliance date, whichever is later. Manufacturers that have already submitted an initial report are not required to report new coatings. The final rule has been revised to clarify the appropriate compliance dates and report submittal dates. With regard to the request that the EPA provide an address for submitting information such as the manufacturing code, § 59.409 of the final rule provides addresses of the Regional Offices of

the EPA. Submittals of all reports required by the rule as well as exceedance fee payments should be sent to the EPA Regional Office which serves the State or territory in which the corporate headquarters of the manufacturer or importer resides.

2.2.7 Determination of Volatile Organic Compound Content

Comment: One commenter (IV-D-02) stated that the EPA failed to use a method to relate emissions to area covered such as one that was proposed during the architectural coatings regulatory negotiation.

Response: As discussed in section 2.2.6.1 of this document the EPA agrees with commenters that it is very difficult to relate coating emissions to the area covered due to the great amount of variability associated with the coverage of coatings. An attempt at such an exercise would not be productive for architectural coatings due to the large variety of coatings and conditions under which they are applied.

Comment: Four commenters (IV-D-20, IV-D-73, IV-F-1b, IV-F-2) opposed calculating VOC content levels for waterbased formulations on a "less water" basis. One commenter (IV-F-2) questioned whether using the less water basis had any positive impact because it negates the desirable practice of adding water to the coating. Two commenters (IV-D-20, IV-D-73) noted that using a "less water" basis dramatically increases the gram per liter VOC content. One of these commenters (IV-D-20) explained that many formulations depend on water as part of their formulation (e.g., increased coating transparency with faux finishing and glazing compounds). The commenter expressed concern that deriving VOC calculations that ignore water content would reduce the incentive to use waterbased formulas and thus, increase the incentive to use solventborne formulas. The commenter specifically requested that VOC content for the "faux finishing/glazing" category be assigned on a formula basis including water. Another commenter (IV-F-1b) stated that architectural coating manufacturers were being treated unfairly compared to consumer product manufacturers because architectural

coating manufacturers must subtract water from their formulations before determining VOC content.

Response: The architectural coating rule's requirement to measure VOC on a less water basis is consistent with other EPA rules and guidance documents for determining VOC content of coatings. This approach relates the mass of VOC emitted to the volume of VOC and solids in the coating. The EPA believes that calculating VOC on a less water basis does not make water-based coatings less attractive nor does it promote using solventborne coatings. It does, however, provide a fair means of comparing the VOC content of coatings in relation to their solids content, and thus, their coverage and emissions potential.

Comment: One commenter (IV-F-2) stated that coatings need solvent to float the resins, but solvent is not required for pigments and extenders. The commenter expressed concern that manufacturers may overload coatings with pigments and extenders to meet the VOC content limits.

Response: The EPA does not agree that coating manufacturers will overload coatings with pigments and extenders simply to meet VOC content limits. First, the addition of pigments and extenders to the coating will increase the cost of the coating without adding value and could possibly even degrade the quality of the coating. Second, the addition of pigments and extenders would reduce the coverage of the paint. The EPA believes that manufacturers will not want to risk alienating consumers by offering them inferior products at higher prices. Therefore, the EPA believes it is unlikely that this situation will occur.

Comment: Four commenters (IV-D-28, IV-D-71, IV-D-134, IV-D-189) raised issues with the validity of Method 24 for certain coatings and/or requested that the EPA allow alternatives to the EPA Method 24 to determine compliance with the VOC content limits. Three of the commenters (IV-D-28,IV-D-134, IV-D-189) requested that the EPA allow alternative methods for determination of VOC content of coatings containing acetone or for waterborne coatings. Two of these commenters requested that the EPA allow use of formulation data. The fourth commenter

(IV-D-71), a State regulatory agency, requested approval of two modifications to Method 24 for use with a traffic marking paint.

Requests for alternative to Method 24. Two commenters (IV-D-28, IV-D-189) requested that the EPA add an alternative to Method 24 to test acetone content and that the EPA accept compliance demonstrations based on theoretical formula calculations or formula batch card loading information. One commenter (IV-D-189) was concerned that a product containing acetone could erroneously appear out of compliance because a reliable test method to isolate and subtract acetone as a VOC does not exist. The other commenter (IV-D-28) also requested that the EPA add an alternative to Method 24 to test acid content.

Another commenter (IV-D-134) requested an alternative to Method 24 for determining VOC content of waterborne coatings in the rule, because according to the commenter, it tends to produce unreliable results, leading to erroneous findings of non-compliance in some tests. The commenter cited documentation of erroneous test results in the aerospace industry that have been submitted to the EPA previously.

Request for modification of Method 24 for use on a type of traffic marking coating. One commenter (IV-D-71), a State regulatory agency, received a request from a manufacturer to modify Method 24, as it would be inappropriate for use with methacrylate multicomponent traffic marking coatings. The letter attached to the comment described the traffic marking coating, and then requested permission to vary Method 24 in two ways. First, the commenter claimed that the dispersion solvent required by Method 24 prevents chemical reactions that would normally consume much of the coating's VOC. Therefore, the letter requested that the solvent be replaced with a procedure whereby a paper clip is weighed within a metal dish, the coating is added to the dish, and the paper clip is used to disperse the coating. Second, according to the commenter, testing the coating at the specified 3 millimeter thickness hinders VOC consumption and is uncharacteristic of the coating's actual use. Therefore, the

letter requested that the sample size be increased to 3.0 grams to enable the reaction to take place and reduce the margin for error. The letter included the following revision for testing for the particular product:

> 3.7.2.1 Weigh and record the weight of an aluminum foil weighing dish and a metal spreading device. Using a syringe as specified in ASTM D2369-81, weigh to 1 mg, by difference, a sample of coating into the weighing dish. For [the requester's coating], a suitable size is 3.0 ± 0.1 g. For other coatings believed to have a volatile content less than 40 weight percent, a suitable size is 0.3 ± 0.10 g, but for coatings believed to have a volatile content greater than 40 weight percent, a suitable size is 0.5 ± 0.10 g.
>
> NOTE: If the volatile content determined pursuant to section 5 is not in the range corresponding to the sample size chosen repeat the test with the appropriate sample size. Add the specimen and use the metal spreading device to disperse the specimen over the surface of the weighing dish. If the material forms a lump that cannot be dispersed, discard the specimen and prepare a new one. Similarly, prepare a duplicate. The sample shall stand for a minimum of 1 hour, but no more than 24 hours prior to being oven dried at 110 °C ± 5 °C for 1 hour.

Response: The proposed rule specified that Method 24 would be used to determine compliance with the VOC content limits. In response to these comments, the EPA has revised the rule to consolidate and clarify the calculation procedures and methods for determining VOC content of coatings. Section 59.406 of the final rule specifies that manufacturers or importers may use either Method 24 results, formulation data, or any other reasonable means to determine the VOC content of a coating for their own internal purposes. Section 59.406(b) also clarifies, however, that the EPA may require a manufacturer or importer to conduct a Method 24 analysis and that Method 24 results will take precedence if there are inconsistencies between Method 24 results and any other means of determining VOC content. This change was made to clarify that manufacturers or importers do not have to perform a Method 24 analysis for every coating unless they choose to do so. If they rely on formulation data or other means, however, they do run the risk that the EPA in enforcement actions, who may use Method 24 to confirm the VOC content, will

find a coating to be non-compliant, even though it may appear to be compliant based on formulation data or other means. The EPA believes that regulated entities will have incentive to use reasonable and accurate methods to determine VOC content without having to perform Method 24 tests on each batch of every product.

The EPA has determined that Method 24 should take precedence in enforcement action if Method 24 results are not consistent with other means of determining VOC content. The EPA believes that use of Method 24 provides consistent, reliable results when determining the VOC content of primers, topcoats, varnishes, lacquers, air-dried coatings, air-dried oxidizing coatings, heat-cured baking systems, multi-component paint systems (water-reducible and solvent-based), water-reducible paints (styrene-butadiene, poly(vinylacetate)-acrylic, acrylic), and solvent-based paints. In addition, Method 24 provides a means of ensuring that the reported VOC content based on formulation data or other means of determining VOC content is correct. This approach is consistent with other coating rules established by the EPA in the past.

With regard to the comment that Method 24 is unreliable for determining the VOC content of waterborne coatings, the EPA contends that Method 24 is the best currently available analytical method for determining VOC content in low solvent content (high water content or waterborne) coatings. For waterborne coatings, the VOC content is determined indirectly using methods that determine nonvolatile matter content and water content. The VOC content is assumed to be what is unaccounted for by these two fractions. The EPA acknowledges that the inherent imprecision of indirectly determining the VOC content of such coatings by this method necessitates an adjustment of the analytical results. Such adjustments must be based on confidence limits calculated from the precision statement established for Method 24. The precision adjustment procedure is incorporated in Method 24. Therefore, the final rule specifies that Method 24 is to be used for determining the VOC content of coatings subject to the rule.

The EPA acknowledges that Method 24 does not currently recommend a procedure for measuring the acetone level of a coating. When a method for determining the acetone level of a coating is developed and adopted by ASTM, the EPA will modify Method 24 to incorporate this method for acetone.

In addition, §59.406(c) provides the option for the Administrator to approve, on a case-by-case basis, alternative methods of determining the VOC content of coatings if they are demonstrated to the Administrator's satisfaction to provide results acceptable for determining compliance with the rule. Such alternative methods could include procedures for testing for acetone and acid content, procedures for testing for water content, and procedures for coatings that are chemically-cured.

Regarding the modification to Method 24 requested by the commenter to accommodate the unique chemistry of a traffic marking coating, the final rule includes a provision specifying the use of this modification for traffic marking coatings.

Comment: One commenter (IV-D-120) requested that the EPA follow South Coast Air Quality Management District (SCAQMD) and provide a 10 percent test margin of error to account for errors in the Method 24 calculation. As applied, the commenter noted that a coating with a VOC content of 400 g/l could produce a test result of 430 g/l and still remain compliant.

Response: The EPA has not revised the rule to include consideration of the variation of Method 24 when determining compliance as requested by the commenter. The VOC content limits in table 1 of the rule are established as limits, not approximated limits. Thus, it would not be appropriate to adopt the commenter's suggestion to increase the standard by the variation of the method. Manufacturers and importers should consider the variation of the method when labeling their coatings and assessing compliance with the rule. A study performed by SCAQMD (IV-J-18) shows that manufacturers typically consider the variation in determinations of compliance with a rule. Specifically, the SCAQMD performed a field study where they purchased and analyzed over 30 coating samples consisting of

various coating categories from retail outlets. The SCAQMD found all of the analyzed coatings to be in compliance with the applicable rule limit. Laboratory tests indicated that the reported VOC content on the container was generally 5 to 40 percent higher than the VOC content of the coating as tested. Thus, the EPA believes that the 10 percent allowance requested by the commenter is unnecessary.

Comment: One commenter (IV-D-32) urged the EPA to remove the exemption for VOC in colorants in determining a coating's VOC content, because the exemption eliminates any incentive to reduce VOC emissions from colorants and fails to reward companies that have invested effort in developing low- and zero-VOC colorants. Another commenter (IV-D-34) advised the EPA to consider including colorant in the calculation of VOC content and enforcing the limits on base colors only, which would increase enforceability. The commenter noted that some manufacturers have developed low- and zero-VOC colorant systems, which are currently more expensive. The commenter discussed data that indicate that including colorants in the VOC calculation could result in a 20 to 300 percent increase in calculated VOC content, depending on color coating VOC content, and colorant VOC content.

Response: The EPA would like to clarify that the proposed rule as well as the final rule excludes only the colorants added to tint bases at the paint store or on-site to produce the desired color. The final rule specifies in §59.406(a) that the VOC content of tint bases shall be determined without colorant that is added after the tint base is manufactured or imported. If a colorant is included in the tint base as manufactured, it is not excluded from the calculation of the VOC content. Because the rule only applies to manufacturers and importers, the EPA believes that the rule does what one commenter (IV-D-34) suggested, i.e., include colorants in the calculation of VOC content for base colors. The EPA did not revise the rule to apply the limit to colorants added to tint bases because colorants are typically added by the retailer at the retail outlet. Because these colorants are not within the control of

the manufacturer or importer this change would have no impact on the VOC content of paints supplied by the manufacturer or importer.

2.2.8 Variance Provisions

Comment: Nine commenters (IV-D-28, IV-D-32, IV-D-34, IV-D-58, IV-D-114, IV-D-120, IV-D-185, IV-F-1g, IV-F-1n) supported the proposed variance provisions. Four of these commenters (IV-D-28, IV-D-32, IV-D-185, IV-F-1n) supported variance options for manufacturers to receive the extra compliance time needed based on economic or technological justification. One commenter (IV-D-58) supported the strengthening of the variance for permanent relief in cases of economic or technological hardship. One commenter (V-D-34) recommended that the EPA adopt more restrictive variance findings, and suggested incorporating findings set out in the California Health & Safety Code, Section 42352 (attached to comment). Another commenter (IV-D-114) supported the use of the variance provisions because manufacturers forced to withdraw from a market during the period of product reformulation and testing will face additional costly and uncertain challenges of the market.

On the other hand, 14 commenters (IV-D-16, IV-D-22, IV-D-30, IV-D-33/IV-F-1a, IV-D-96, IV-D-118, IV-D-119, IV-D-120, IV-D-161, IV-D-163, IV-F-1e, IV-F-1i, IV-F-1m, IV-F-2), including some small businesses, did not support the proposed variance provisions. One commenter (IV-D-33/IV-F-1a) based its opposition on the opinion that the rule fails to represent technology-forcing levels of VOC control and supported a limited variance provision for manufacturers to comply with a more stringent second phase. Two commenters (IV-D-118, IV-D-119) stated that granting variances without the appropriate compensation for adverse impacts on the environment would provide no air quality benefit and reduce the effectiveness of an already weak proposed standard. Another commenter (IV-D-96) maintained that variance provisions based on simply economic hardship would reduce the effectiveness of the architectural coating rule.

One commenter (IV-D-16) stated that the variance procedure did not present a reasonable option because it would impose such a heavy administrative burden that business would choose to shut down rather than use the variance. Another commenter (IV-F-2) stated that the variance procedure, and the proposed public hearing process in particular, would be very burdensome for a small business. Another commenter (IV-D-120) stated that the variance requirements as proposed are unduly difficult to achieve. Instead, the commenter asserted that the variance applicant should only need to establish that compliance would result in economic hardship, and that the company will make a good faith effort to come into compliance within a reasonable time period.

One commenter (IV-D-120) stated that the variance provision as written is not effective, in that it requires significant expense with little or no guarantee of approval. The commenter recommended an extended compliance period as a more effective option to alleviate the heavy burden upon small businesses.

One commenter (IV-D-30) opposed using a variance because it would create an uneven playing field based upon the resources of the company seeking the variance, implying that the variance provides no advantage to small businesses. Another commenter (IV-F-1i) stated that applying for a variance would be a very difficult process for most small companies because they do not have a legal staff or a specialist staff for such a process. In addition, according to the commenter, a variance could commit the company to a program to achieve compliance in an area where they do not know how to do it and if they knew how to do it, they would not need a variance. The commenter maintained that small businesses will avoid applying for a variance.

One commenter (IV-F-1m) estimated a total of 4,770 products will need to be reformulated (8.8 products per company multiplied by 411 companies plus the amount estimated for the 1990 Architectural and Industrial Maintenance Coatings survey population). The commenter asserted that a variance would not provide relief because of the large number of products that will

need to be reformulated in a short period of time. The commenter asked how many people the EPA has on staff to handle variance applications and if they will be able to process 2,000 variance applications between now and the compliance date. Two other industry commenters (IV-F-1e, IV-F-2) also expressed concern about how the EPA would handle a large volume of product variances.

One commenter (IV-D-161) opposed the proposed use of a variance in the rule for several reasons: the lack of required progress reports; the lack of provisions requiring compliance with the schedule associated with the variance application; and the lack of any provision to require exceedance fees for excess emissions. The commenter proposed that the exceedance fee concept be used in place of the variance proposal.

One commenter (IV-D-163) supported the use of market-based mechanisms to provide flexibility to manufacturers that are unable to reformulate their coatings before the April 1, 1997 compliance date. The commenter claimed that the use of exceedance fees and purchase of emission reduction credits (ERC) are options that the EPA should include in the rule, rather than a variance.

Several industry representatives (IV-F-2) asked what type of testimony would be required at the compliance variance hearing and how a manufacturer could demonstrate public benefit. One industry representative (IV-F-2) asked whether there would be a fee for the variance, how the location of the hearing would be determined, and whether the variance would be granted on a company basis or on a coating basis. Another commenter (IV-F-2) asked whether both the variance provision and exceedance fee option would be included in the rule and, if so, why.

Response: The EPA has concluded that the proposed variance procedure would be unworkable and ineffective to accomplish the goals intended by the EPA. The proposed variance provision would have allowed manufacturers and importers of architectural coatings to submit a written application to the Administrator requesting a variance if, for reasons beyond their reasonable

control, they could not comply with the requirements of the proposed rule. In particular, the proposed variance provision allowed additional compliance time and was developed especially for small businesses. In the proposal preamble (61 FR 32743), the EPA requested comments from small businesses on their expected use of the proposed variance provision, as well as other proposed provisions.

Based upon the comments received, it is evident that the variance provision may not provide the intended compliance flexibility, especially for small businesses. Even though the proposed variance requirements were intended to be the minimum necessary to approve a coating variance, the EPA recognizes that the requirements may be burdensome, particularly for small businesses with limited or no regulatory compliance staff. The EPA agrees that it is also possible that the variance provision could create an uneven playing field because small businesses would not have the resources needed to pursue this option, thereby putting smaller businesses at a disadvantage compared to larger businesses. Also, as one commenter pointed out, even with the investment of time and money, the EPA cannot guarantee approval of the variance application. In addition, review and approval of several thousand variance applications would place a heavy burden on the EPA's staff and the potential delays in processing variances would be disadvantageous to the regulated entities. Therefore, the EPA has decided not to include the variance provision in the final rule.

Nevertheless, the EPA believes that there is a need for additional compliance flexibility and, therefore, has incorporated other provisions, more suitable for this industry than variances, into the final rule. The EPA has included a tonnage exemption that phases down over time and an exceedance fee option, in part, to help provide the flexibility that the EPA wanted to implement through the proposed variance procedure. The EPA reasons that these provisions provide even greater flexibility for regulated entities than the variance provision but are less burdensome. Both of these compliance options are

automatically available to all regulated entities, and do not involve complex application and approval processes.

The tonnage exemption will allow each regulated entity to exempt from the VOC content limit a certain amount of coatings each year (the actual amount exempted depends on the VOC content of the coating(s)). Therefore, the EPA believes that this exemption is appropriate for low-volume coatings that would be difficult or not cost-effective to reformulate in the near future. The tonnage exemption will thus reduce the need for any sort of variance procedure.

The exceedance fee option is designed, in part, to give manufacturers and importers additional time to develop lower-VOC technologies, while at the same time providing an economic incentive to reduce the VOC content of coatings. This option allows regulated entities to continue to sell coatings that exceed the VOC content limits, provided that they pay an exceedance fee. The amount of the fee is based on the volume of the coating sold, the VOC content of the coating, the VOC content limit applicable to the coating, and the fee rate. The exceedance fee provision will reduce the need for any sort of variance procedure.

In addition to these provisions, the compliance time, which concerned some commenters, has been extended to 12 months and the EPA added several new specialty coatings categories (zone markings, concrete curing and sealing, conversion varnishes, etc.) to the final rule. The EPA believes that the lengthening of the compliance period will reduce the need for regulated entities to have some sort of variance from the rule. Finally, the EPA notes that the elimination of the variance procedure will help to eliminate erosion of the air quality benefits of the rule that might have occurred under the proposal. The tonnage exemption and exceedance fee mechanism are more narrowly targeted to provide flexibility where needed rather than the broader exclusions that might have occurred under the variance process.

The purchase and use of emission reduction credits recommended by one commenter as a compliance option is not

allowed in the final rule. As stated in section 2.2.4.1 of this document, several alternative market-based approaches were considered and rejected as inappropriate for this industry.

Need for Long-term, Universal Variance Procedure.

Comment: Seven commenters (IV-D-28, IV-D-122, IV-D-185, IV-D-189, IV-F-1g, IV-F-1m, IV-Fo, IV-Fp.) suggested an amendment to the variance provision that would provide a procedure for addressing circumstances where new products that do not fit within a specialized category are developed after publication of the rule. According to one commenter (IV-D-28), the changing nature of the industry (e.g., materials, new processing structures) justifies the use of a more permanent modification procedure, whereby a company could petition the EPA, which would, based on the technical merit, provide a public hearing within 60 to 90 days and grant/reject a proposed modification to the rule. In some of these circumstances, according to another commenter (IV-D-122), a compliance date and increments of progress cannot be specified on the basis of legitimate unique technological and economic feasibility considerations. The amendment proposed by the commenter would establish a time not to exceed 5 years after which the EPA would review the variance to ensure that circumstances have not changed to allow for the specification of a compliance date and increments of progress. According to the commenter, this would allow manufacturers to develop and commercialize innovative coating technologies without requiring a complete rule amendment. The industry's major trade association (IV-D-189) also made the same suggestion, primarily to protect manufacturers who operate mainly in unique or niche markets and whose access to newer technology is limited. They suggested that the variance procedure be easy to apply, balanced, and targeted. Another commenter (IV-F-1g) also maintained that there is a need for a variance procedure so that companies can continue to develop and market unique products.

Two commenters (IV-D-185, IV-Fo) stated that it would be inappropriate to assign default VOC content limits to these highly specialized coatings and innovative technologies and that

the indiscriminate application of default limits could stifle such innovation and leave future consumer needs unmet. The commenters also requested that the EPA permit manufacturers of new products to apply for a long-term variance that would allow the new product to be marketed without specifying a compliance date. The commenter suggested that the variance should be available to any manufacturer, regardless of size, and it could be reviewed by the EPA at specified intervals, not to exceed 5 years, in order to determine whether changes in circumstances or technology permit application of a particular VOC content limit and compliance date.

According to another commenter (IV-F-01p), a permanent variance provision would provide the EPA with the flexibility to decide on a case-by-case basis whether a product should be allowed to stay on the market in its current formulation or be brought to the market even if it does not meet the standard.

Response: For the reasons described in the response above, the EPA has determined that variance provisions are inappropriate for the final rule. As discussed above, the EPA has included alternative compliance mechanisms that it believes will better target the necessary flexibility without providing potentially unlimited exemptions from the VOC standards in the rule.

The EPA notes that if a regulated entity in fact develops a truly new type of coating that does not fall within any of the rule categories, the regulated entity may contact the EPA and petition the EPA to revise the rule to include such new category.

Comment: One commenter (IV-D-22) was concerned that the proposed rule included inappropriate loopholes in the form of variances and possible exceedance fees.

Response: The EPA agrees that the variance procedure had the potential to result in abuse and erosion of the VOC reductions from the rule. For this and other reasons, the variance provisions have not been included in the final rule. Contrary to the commenter's statement, the EPA does not consider the exceedance fee to be a loophole, but a rather necessary compliance alternative for some companies. The EPA's rationale

for including these provisions is included in the section on "Exceedance Fee," section 2.4 of this document.

2.2.9 Clarifications

Comment: One commenter (IV-D-162) noted inconsistencies between the VOC content limits for coatings in the architectural coating rule and VOC content limits for the marine coatings in the NESHAP and CTG for shipbuilding and ship repair (surface coating operations). The commenter suggested that the acceptance of the shipbuilding VOC content limits suggests that lower VOC technology to protect structures in severe service environments is available for several categories of architectural coatings. The commenter compared the VOC content limits set out in both proposed regulations for categories in the following table:

Coating category	Architectural Coating levels (g/l)	Shipbuilding levels (g/l)
General use/Industrial Maintenance	450	340
Antifoulant	400	400
High temperature	650	500
Inorganic/organic zinc	500	340/360
Nuclear	420	420
Pretreatment wash primer	780	780
Repair & maintenance thermoplastic	650	550
Weld-through preconstruction primer	500	650

The commenter concluded that other industry segments, such as chemical processing, petroleum refining, bridges and highways, etc., which use architectural and industrial maintenance coatings should also be capable of eventually adopting similar, more advanced materials such as those being utilized by the shipyards.

Response: The VOC content limits established for Shipbuilding and Ship Repair (Surface Coating) Operations were based on the VOC content of coatings used in that industry and

achievable for that source category. Although lower VOC technology may be available for some shipbuilding coatings as the limits in the above table seem to indicate, the architectural coating rule is broader and covers many more manufacturers and types of coatings. In addition, architectural coatings are applied on-site in a field environment under varying conditions, whereas shipbuilding coatings are applied at surface coating operations at shipyards under more controlled conditions. For example, industrial maintenance coatings are used in industrial, commercial or institutional settings that include extreme environmental conditions such as immersion in water, wastewater, or chemical solutions, or chronic exposure of interior surfaces to moisture condensation; acute or chronic exposure to corrosive, caustic, or acidic agents, or to chemicals, chemical fumes, or chemical mixtures or solutions; repeated heavy abrasion, etc. Considering the timing for implementing requirements (i.e., 1 year), the number of manufacturers, and the variety of products nationwide, the EPA set the VOC content limit for industrial maintenance coatings at 450 g/l. Based on comments received, the VOC content limit in the final rule for the antifouling and nuclear categories was raised to 450 g/l, consistent with industrial maintenance coatings. Also, the metallic pigmented coating limit (500 g/l) in the architectural coating rule is not limited to zinc as it is in the shipbuilding and repair rule (under weld-through preconstruction primer). In comparing the categories in the table above, the EPA agrees that lower VOC technology may be available for some coatings under some circumstances. However, the architectural coating VOC content limits are based on VOC content levels designed to be achievable nationwide under widely varying conditions and performance requirements, whereas the shipbuilding coating requirements are limited to a specific type of application and use and, therefore, can be reflective of a more limited set of performance requirements.

Comment: Several manufacturers (IV-F-2) asked about the number of States getting State implementation plan "credit" for the rule and asked for clarification about the meaning of the term "credit." This industry representative (IV-F-2) asked whether States were getting State Implementation Plan credits for the consumer products regulation and whether the States were happy with the level of stringency of those standards. Another industry representative (IV-F-2) asked if a CTG would provide the same credit to the States as would a national rule.

Response: The term "credit" referred to by the commenters is related to State implementation plans (SIPs) for reducing ozone precursor emissions. States may take "credit" in their SIPs for the VOC emission reduction estimated to result from the architectural coating rule in the geographic area. Based upon guidance provided by the EPA, as of July 1998, fourteen State and local air pollution control agencies have taken credit in their SIPs for a 20 percent reduction in VOC emissions from the architectural coating rule. If the rule fails to result in a 20 percent reduction on a timely basis, State and local agencies will need to make up the "shortfall" from other VOC source categories. Therefore, some States have submitted comments requesting that the EPA pursue the full extent of emission reduction benefits achievable from the architectural coating rule. Some States have complained that the VOC content limits in the proposed rule are not as stringent as some State VOC content limits.

The architectural coating rule is only one of several for which States are able to claim emission reduction credits in their SIPs. The consumer products rule is another national rule being issued under section 183(e) of the Act, as is the automobile refinish coating rule. States may claim credits associated with those rules as well. To review comments from States on the stringency of the consumer products rule and documents supporting the final rule, please refer to the consumer products rule docket (A-95-40).

A CTG would also provide VOC emission reductions. However, CTG limits could differ from those of a national rule and the credits available to States would differ accordingly. The EPA notes that the determination whether to do a rule versus a CTG is dependent, in part, upon which method will best obtain reductions and that other factors are thus relevant.

2.3 IMPACTS

2.3.1 Environmental and Energy

2.3.1.1 HAP Implications

Comment: Three commenters (IV-D-02, IV-D-178, IV-F-1k) stated that the EPA should consider the hazardous air pollutant (HAP) implications of this rule. Two commenters (IV-D-178, IV-F-1k) claimed that HAPs are often used when formulating lower VOC coatings because they have greater solvency. One of these commenters (IV-D-178) expressed concern that the increased use of HAPs in coating formulations would result in increased HAP emissions. Three commenters (IV-D-02, IV-F-1k, IV-F-1(l)) expressed concern if companies that reformulate using HAPs. The commenters were concerned that alternative low-VOC formulations encouraged by the EPA that contain HAPs could later become regulated when the NESHAP standards are developed to control HAPs. According to two of these commenters (IV-D-02, IV-F-1(l)) any such HAP regulations could then impose unrecovered reformulation investments and lost sales on industry.

Response: The EPA disagrees with the commenter's assertion that to meet the proposed VOC content limits, manufacturers would necessarily have to use more HAPs in their lower VOC formulations. Data on speciated VOC content from the VOC Emissions Inventory Survey show no pattern of higher HAP concentrations in lower VOC formulations. Also, an article entitled "Clean Air Act Amendments" which appeared in the October 1995 edition of the Painting and Coatings Industry Magazine, indicates that current HAP solvents such as ethylene glycol ethers or ethylene glycol ether acetates will be replaced with non-HAP solvents such as propylene glycol ethers or

propylene glycol ether acetates in response to Clean Air Act requirements. In addition, information obtained from a December 1995 report entitled "Improvement of Speciation Profiles for Architectural and Industrial Coating Operations" prepared by Dr. Albert C. Censullo for the California Air Resources Board (CARB) indicates that a majority of current water-based formulations (flats and nonflats) contain non-HAP solvents. It appears from this information that the use of non-HAP solvents, such as Texanol and propylene glycol in water-based formulations is prevalent today and should continue in the future. The only NESHAP that might impact architectural coatings is the Miscellaneous Organic NESHAP, commonly referred to as the MON. The MON is currently under development and will limit HAP emissions from the paint and coating manufacturing processes. Naturally, the EPA does not condone the expanded use of HAPs in architectural coatings and does not believe that companies would choose to expose the public to additional HAP emissions when there are other available and reasonable reformulation options.

2.3.1.2 Emission Reduction Estimate

Comment: Four commenters (IV-D-118, IV-D-126, IV-D-191, IV-D-22/IV-F-1a) stated that the EPA's emission reduction calculation on a solids basis overestimates the emission reduction actually achieved. One commenter (IV-D-118) stated that the solids approach is inconsistent with calculation methods commonly used by States with similar rules. Another commenter (IV-D-126) complained that the solids approach is inconsistent with the volume approach agreed upon by the regulatory negotiation participants. A third commenter (IV-D-22/IV-F-1a) explained that calculating emission reductions on a solids basis assumes coatings are reformulated by replacing photochemically reactive solvent with coating solids, resulting in a greater coverage per can of coating. According to the commenter, participants in the regulatory negotiations agreed that the calculation of emission reductions should be on a volume basis, which is a more conservative estimate. This commenter also disagreed with the EPA's assumption that traffic coatings

manufactured by State and local governments increase by three-fold the total volume of such coatings to be figured into an emission reduction calculation. For these two reasons, the commenter contended that the EPA's 20 percent emission reduction claim is an inflated estimate of the proposal's effectiveness and calculated the emission reductions attributable to the proposed architectural coating rule to be no more than 12 percent.

Response: The EPA disagrees that its method of calculating the emissions reductions is inaccurate. The amount of coating required for a specific architectural coating job ultimately depends on the solids content of the coating. The constant solids approach for determining VOC emissions is based on accepted methods of calculation and is consistent with past practice and methods used by industry, the California Air Resources Board (CARB), and the South Coast Air Quality Management District (SCAQMD). Thus, the EPA contends that this approach makes the most sense for determining emissions reductions and is the approach used by the EPA for all of its coating rules.

In calculating the emission reductions for traffic coatings, the EPA used a factor of 2.6 at the time of proposal to account for the traffic coatings not included in the industry survey. The non-reported volume included both coatings manufactured by State and local governments and those manufactured by manufacturers that did not respond to the survey. In the EPA's final emission reduction analysis, a factor of 2.5 was used based on information provided by NPCA in June 1997 that indicated that the market for traffic markings has been fairly constant from 1990 to 1995 and that the 1995 sales volume reported for traffic markings in the Bureau of Census report is close to the actual sales (IV-E-11).

Comment: Five commenters on seven occasions (IV-D-177, IV-D-184, IV-D-212/IV-F-1c, IV-D-214b, IV-D-214c, IV-F-1j) asserted that regulating the VOC content of architectural coatings would result in increased VOC emissions rather than the emission reductions claimed by the EPA. Three commenters

(IV-D-177, IV-D-189, IV-D-212) expressed concern that coating reformulation could result in the manufacture of inferior performing products. Another commenter (IV-F-1j) contended that reformulation would cause unspecified problems with the coatings. These commenters contended that with low-VOC coatings consumers would use more undercoats and apply more topcoats (IV-D-214c); repaint more frequently (IV-D-177, IV-D-189, IV-D-212, IV-D-214c); thin illegally (IV-D-189, IV-D-214c, IV-F-1j); be forced to use a stripper and re-do the coating (IV-F-1j); and do more touch-up painting (IV-D-212). The commenters asserted that these activities will result in increased aggregate emissions. One commenter (IV-D-214c) claimed that 19 years of regulating the VOC content of architectural coatings in California has suggested that these counterproductive effects occur. One commenter (IV-D-177)claimed that although the VOC content of paint in California was reduced in the 1980s, costs escalated, VOC output remained nearly constant on a per population basis, raw material consumption increased, and the population dramatically increased causing much more use and more need for VOC reduction.

One commenter on two occasions (IV-D-214b, IV-D-214c) stated that the proposal preamble purported to address the environmental question of the "increase or decrease in air pollution ... that would result from implementing the proposed standards." According to the commenter, small and regional manufacturers have submitted substantial evidence of activities that would increase air pollution. The commenter claimed that possible increases in VOC emissions or the reactivity of emission due to reformulation required by stringent emissions standards were recognized and delineated in Dunn-Edwards Corp. v. Bay Area AQMD, 9 Cal.App.4th 644, 657-058 (1992). The commenter (IV-D-214b, IV-D-214c) referred to the court decision in Portland Cement Assn. v. Ruckelshaus, 486 F.2d at 385, for the proposition that the EPA is required to take into account "counter-productive environmental effects" of the proposed standard. Also, in Corrosion Proof Fittings v. EPA, 947 F.2d 1201, 1221 (5th Cir. 1991), the commenter claimed that the court held that the EPA could not

validly ban certain products "when it refuses to evaluate the harm that will result from the increased use of substitute products."

The commenter (IV-D-214c, IV-D-214b) claimed that the EPA has ignored the fact that the architectural coatings rule might actually increase air pollution by concluding simply that the rule would reduce VOC emissions and assuming that no counter-productive effects would occur.

Response: The EPA disagrees with the conclusions of the commenters on this issue. The commenters are implying that the proposed architectural coating VOC rule will result in higher, not lower, ozone concentrations because more people will use more coating to coat the same amount of surface and more reactive solvents will be used in the compliant products. The commenters evidently believe that no controls on VOC emissions from coatings are a more effective means to reduce VOC emissions.

First, the commenters provided no evidence or documentation to support their claims of increased thinning, more priming, more topcoating, and more frequent painting. The evidence available to the EPA indicates that the commenters' assertions are incorrect. Specifically, the SCAQMD conducted and reported on studies that addressed the issue of thinning paints in the field. Field investigations of actual painting sites in the South Coast District and other areas of California with rules that limit the VOC content of coatings indicate that thinning of specialty coatings exists but rarely beyond the manufacturer's recommended levels (IV-J-18). Where thinning occurred, therefore, paints were rarely thinned to levels exceeding applicable VOC content limits. Thus, widespread thinning does not occur often; when it does occur, it is unlikely to occur at a level that would lead to a substantial emissions increase when compared with emissions from higher VOC content coatings.

The EPA also has no reason to concur with the commenter's contention that lower VOC content coatings will result in the use of more undercoats. The SCAQMD evaluated the assertion that the use of substitutes or water-based topcoats would result in

increased VOC emissions by comparing the VOC content of substitute coating systems to traditional coating systems and determined that the use of substitute coatings will actually result in significantly lower emissions than using traditional coating systems (IV-J-18). Their study concluded that the low VOC substitutes did not require additional undercoats and that the lower VOC contents of substitute coatings result in lower emissions.

The commenter's claim that users would apply more topcoats is based on their assumption that compliant coatings have a higher solids content that is applied in a thicker coat. The commenter thus asserts that compliant coatings cover less area compared to a high VOC content coating. As a result, the commenter believes a higher volume of compliant coating is needed to get the same coverage, negating any VOC emissions reductions. The EPA expects that low VOC content coatings will have the same or better coverage area as high VOC coatings so it is not expected that a larger quantity of coating will be necessary to cover the same area.

In addition, contrary to the commenters' claim, the EPA did assess available information about the possibility that a low-VOC coating system might paradoxically result in greater VOC emissions because the system might require additional coatings. The EPA has evaluated the VOC emissions from four low-VOC industrial maintenance coating systems suitable for coating steel substrates compared to the VOC emissions from a conventional coating system (IV-B-4). All five coating systems were formulated to be used for the same purposes and all of the coating systems meet the VOC content limit for industrial maintenance coatings in the final rule (i.e. 450 g/l). The conventional coating system consisted of a solventborne alkyd primer containing 394 grams per liter VOC and a solventborne alkyd enamel topcoat containing 424 grams per liter VOC. The low-VOC alternate systems were:

- A three-coat system consisting of a solventborne, moisture-cured polyurethane primer (VOC content of

360 grams per liter), a solventborne, zinc-rich, moisture-cured polyurethane middle coat (VOC content of 360 grams per liter), and a solventborne polyurethane topcoat (VOC content of 372 grams per liter);

- A two-coat system consisting of a solventborne alkyd primer (VOC content of 394 grams per liter) and a waterborne acrylic topcoat (VOC content of 190 grams per liter);

- A single coat system consisting of a two-component polysiloxane epoxy topcoat (VOC content of 84 grams per liter); and

- A two-coat system consisting of a water-reducible alkyd primer (VOC content of 237 grams per liter) and a waterborne acrylic topcoat (VOC content of 284 grams per liter).

The comparison of these coatings with varying VOC content indicates that lower VOC content typically results in lower overall VOC emissions. The average VOC emissions of the two-coat and single-coat alternate systems were lower than those of the conventional coating system. In fact, the VOC emissions from the two-component polysiloxane epoxy topcoat system were approximately 25 percent of the emissions from the conventional coating system. However, the three-component, solventborne polyurethane coating system had higher VOC emissions than the conventional coating system. In this case, the information in the study indicates that the number of coatings required and the additional film thickness played a major role in producing such high emissions. Thus, a low VOC content for a coating does not necessarily mean lower emissions for the system as applied if the system requires additional layers. As a result, the study indicates that users would not need to apply more low-VOC topcoats to achieve the same results.

This study also calculated the transfer efficiency for each of the coating systems using the amount of coating used and the total amount of solids deposited on the test surface. The reported transfer efficiency for the conventional coatings was between 30 and 35 percent. The study reported that the transfer

efficiency was best for the three-coat system (greater than 35 percent), comparable for the two-coat solvent borne alkyd primer/waterborne acrylic topcoat system and the conventional system (30 to 35 percent), and poorest for the single coat system (less than 15 percent). Thus, there are low-VOC and higher solids coatings available that are able to be applied with relatively good transfer efficiency.

The commenter also contended that using compliant coatings will require more topcoats because of the purportedly poorer performance of lower VOC coatings. The Ventura County Air Pollution Control District (VCAPCD) conducted performance tests on a range of low-VOC content coatings from 1991 to 1992 (Cowan, 1992, IV-J-4). The VCAPCD tested 49 different coatings representing compliant clear wood finishes, quick-dry enamels, quick-dry primers, and industrial maintenance coatings using both brush and spray applications. The performance test evaluated ease of application, appearance, adhesion, hardness of topcoat, ability to cover extreme surface conditions (rusty metal, charred wood), and appearance after six months. The VCAPCD found that these coatings performed well and that additional topcoats were not required. The EPA notes that the commenter itself produces a full line of products that meet more stringent VOC content limits in California, that the commenter's products were among those tested in the VCAPCD study, and that the commenters' products are reputed to be of high quality and performance.

With regard to more touch-up and repair work, the EPA expects that low VOC coatings will reduce, not increase the amount of touch-up and repair work resulting from surface contamination. By the commenter's own admission (IV-D-212), these coatings dry more rapidly than high VOC content coatings. As a result of their more rapid drying, the opportunity for surface contamination will be decreased.

Although the commenter asserted that lower VOC content coatings are less durable than higher VOC coatings, information available to the EPA indicates that when applied correctly, compliant coatings are as durable, or in some cases, more durable

than traditional coatings. The durability of a coating is dependent on many factors, including: surface preparation, application technique, substrate coated, and exposure conditions. The EPA has reviewed numerous performance studies comparing low-VOC content coatings with conventional coatings (IV-B-4). The results of these studies indicate that although no one low-VOC content coating may outperform or perform equivalently to the conventional coatings on all substrates under all circumstances, at least one or more low-VOC content coatings do outperform or perform equivalently to the conventional coatings on any given substrate under any given circumstance. Thus, for optimum performance when using low-VOC content coatings, the user must properly select the low-VOC content coating based on the substrate, the desired performance requirements, and the expected environmental conditions to which the coating will be exposed.

Second, the commenter's contention that more reactive solvents will be used instead of traditional less reactive solvents in the compliant products is misleading. This is because (1) the rule does not require such major shifts in existing resin and solvent technology and (2) the benefit from the total mass of VOC emissions reduced is expected to outweigh any differences in relative reactivities of different chemicals. While different chemical species may have different relative reactivities, both the amount of VOC emitted and the reactivity of the VOC (which is dependent on ambient conditions that vary at different times and places), affect the amount of ozone formed. Chemical species with lower reactivities than other chemicals can still be significant ozone producers if they occur at high concentrations and under favorable conditions (Docket A-94-65, Item IV-J-11).

Chemicals in solventborne coatings contain VOC which are reactive (i.e., under most conditions, they have higher reactivity than ethane, which is the EPA's yardstick for determining whether a compound should be declared "negligibly reactive" and, thus, not considered a VOC for regulatory

purposes). The most common solvents used in house paints and other "do-it-yourself" paints are petroleum hydrocarbon solvents, such as "mineral spirits" and VM&P naphtha (which contain large amounts of alkanes), hexane, etc. The most common solvents used in coatings typically applied by professional contractors, such as industrial maintenance and traffic marking coatings, are toluene and xylene. Toluene and xylene rank relatively high on a reactivity scale that measures the potential to form ozone during the first solar day after emission under certain conditions (see Carter, 1994; Docket A-94-65 Item IV-J-5)). Thus, it is misleading to represent traditional solventborne coatings as being of low reactivity or as something that can be ignored when considering the need to control VOC to reduce ozone levels.

Furthermore, the EPA believes that the commenter is not considering the uncertainties associated with relative reactivity scales and the ability to use these scales at this time to make or the current state of knowledge about atmospheric chemistry of organic compounds. Dr. William Carter, University of Riverside, Center for Environmental Research and Technology, College of Engineering, who has established several different reactivity scales, cautions the use of these scales due to the uncertainties involved. For example, Dr. Carter stated that:

> Deriving such numbers is not a straightforward matter and there are a number of uncertainties involved. One source of uncertainty in ozone reactivity scales comes from the fact that the ozone impacts of VOC depend on the environment where the VOC is emitted. A second source of uncertainty is variability in the chemical composition of the VOC source being considered. Complex mixtures such as `mineral spirits' may be more difficult to characterize and may vary from manufacturer to manufacturer though in principal the composition of a given lot can be determined and reasonably assumed to be constant regardless of how the product is used. A third source of uncertainty comes from the complexity and uncertainties in the atmospheric processes by which emitted VOC react to form ozone (Carter, 1995) (IV-J-18).

According to Dr. Carter, reliable reactivity numbers do not currently exist from which accurate air quality policy can be derived based on reactivity and not total VOC emissions. Ketones

are the most important class of consumer emissions for which there are no environmental chamber reactivity data suitable for evaluating reactivity predictions. Also, he finds no experimental reactivity data for glycols or alcohols suitable for mechanism evaluation (Carter, 1995) (IV-J-18).

Another factor to be considered is an accurate speciation profile of water-based and solvent-based coatings. Dr. Albert C. Censullo, Professor of Chemistry, California Polytechnic State University, San Luis Obispo, conducted a comprehensive assessment of species profiles for a number of sources within the general categories of industrial and architectural coatings operations (Censullo, 1995) (IV-J-7). As part of the Censullo study, 52 water-based coating samples were analyzed and species profiles were determined by using an average of at least two analyses. The four most common solvents identified in water-based coatings were Texanol (found in 37 out of 52), propylene glycol (found in 31 out of 52), diethylene glycol butyl ether (found in 23 out of 52), and ethylene glycol (found in 14 out of 52), all of which were identified by Dr. Carter as needing further reactivity assessment.

Additionally, from the Censullo study, emission profiles were obtained for 54 solvent-based coating samples. The results were significantly more complex as compared to the species profiles for the water-based samples, primarily due to the various petroleum fractions used in solvent-based coatings. Some of the species profiles resulted in several hundred components from one sample. Dr. Carter has compiled reactivity data on several of the species identified, but has also indicated the need to further assess the reactivity of MEK, isopropyl alcohol, other alcohols, and esters found in solvent-based coatings.

In the absence of actual reactivity numbers for the compounds in "traditional" formulations and compliant, low-VOC content coatings, emissions must be calculated in the standard manner of total VOC per unit of coating applied. Based on the current state of knowledge regarding VOC reactivity, there is nothing to suggest that the architectural coating VOC rule will

result in adverse air quality impacts due to increased reactivity of solvents used to comply with the rule.

Finally, because of the flexibility of tonnage exemptions and exceedance fees, the EPA does not expect the architectural coating rule to result in the substantial banning of any products. The maximum amount of coating estimated to be withdrawn from the market due to the rule is approximately 700,000 liters of architectural coating products, accounting for less than 0.03 percent of industry product volume.

Comment: One commenter (IV-D-214c) claimed that the EPA had not demonstrated that the mineral spirits in solvent-based coatings were sufficiently reactive to contribute to ozone nonattainment or that the glycol compounds in waterborne coatings were sufficiently volatile to contribute to ozone nonattainment.

Response: In the 1977 policy statement "Recommended Policy on Control of Volatile Organic Compounds" (42 FR 35314, July 8, 1977), the EPA recognized a class of organic compounds that has been determined to have negligible photochemical reactivity and is not required to be controlled under SIPs. Ethane was one of the four compounds on the negligibly reactive list in the 1977 policy statement. Over the years, several other compounds have been recognized as being negligibly reactive and have been added to the list. This list of negligibly reactive compounds was incorporated into the EPA's definition of volatile organic compounds that appears in 40 CFR 51.100(s). This VOC definition in part 51 of chapter I of title 40 of the Code of Federal Regulations does not include mineral spirits on the list of compounds considered to be exempt. Therefore, by definition, mineral spirits are considered to be VOCs and to contribute to ozone formation. Periodically, compounds are excluded from the VOC definition after petitioners satisfactorily demonstrate that the compound has less propensity to contribute to ozone formation than ethane. For example, acetone was excluded from the list on June 15, 1995.

Although glycol compounds are relatively nonvolatile and may not be immediately emitted into the air, the EPA has conducted

studies that indicate that glycol will be emitted gradually over time (see Docket A-94-65, Items IV-J-12 and I-J-13).

Finally, because of the flexibility of the tonnage exemption and exceedance fee, the EPA does not expect the architectural coating rule to result in the substantial banning of any products. The maximum amount of coating estimated to be withdrawn from the market due to the rule is approximately 700,000 liters of architectural coating products, accounting for less than 0.03 percent of industry product volume.

Comment: One commenter (IV-D-128) provided a rough-cut analysis of the impact of the rule on his company. The current weighted average (first eight months of 1996) VOC content for products manufactured by the company with a proposed VOC content limit of 3.75 pounds per gallon is 2.118 pounds per gallon. Ignoring the question of product quality and practicality, full compliance with the proposed rule would reduce the average VOC content of the company's products to 2.091 pounds per gallon, a reduction of 1 percent or approximately 3 tons per year. Therefore, the commenter contended that any increase in painting frequency or required film thickness resulting from using the compliant coatings would more than offset the VOC emission reductions from reformulating the non-compliant coatings.

Response: The amount of VOC reduced from any given manufacturer's product line depends on the sales volume and the difference between the VOC content of the products and the VOC content limit applicable to the product. Naturally, 1 gallon of a product that is very close to the VOC content limit will contribute less to overall VOC reduction than one gallon of paint that is far from the VOC content limit. However, even products that are close to the VOC content limit can contribute significantly to the overall emission reduction if they are sold in large quantities.

As stated in a previous response, the EPA contends that compliant coatings will not result in more frequent painting or reduced coverage because of thicker films. The EPA believes that the available evidence suggests that lower VOC products have

acceptable durability and performance characteristics. The EPA believes that VOC content reductions will not cause the alleged need for more frequent repainting, and that to the extent such an effect were to occur it is still preferable to obtain the large amounts of VOC reduction that will result from the rule notwithstanding such effect. The EPA expects that after the rule is promulgated the same amount or less of compliant coating will be used compared to non-compliant coating use before the rule was promulgated. With respect to the commenters statement that it would be unwilling to do the minor reformulation necessary to achieve the modest VOC reductions necessary in its products, the EPA notes that the flexibility of the tonnage exemption and exceedance fee provides manufacturers with alternatives to reformulating essential coatings that are manufactured in low volumes or that are impractical to reformulate by the compliance date.

2.3.1.3 Wastewater/Solid Waste Impacts

Comment: Three commenters (IV-D-189, IV-F-1e, IV-F-1s) questioned the EPA's conclusion that no significant adverse water impacts would result from the rule. For example, the commenters noted that hazardous waste production which is associated with the manufacture of waterborne coatings could increase. One commenter (IV-F-1s) explained that high-performance resin systems used at their plants have been very difficult to remove from clean-up water using what they know about wastewater treatment technology. The commenter estimated that the current cost to treat this water may be two to three times higher than the costs for solvent system cleanups. The commenter's plants use in-plant solvent distillation systems where the solvent is continually recycled with a small amount of sludge going off site for disposal. The commenter reportedly has a plant that has gone 4 years without making any solvent waste because they sequentially batched materials and recycled the solvent. The commenter claimed that internal recycling of water is more difficult because of bacterial contamination and surfactant addition. The commenter explained that the moment air hits the

resin, the resin is on the tub used to mix the product because the resin forms a tough film very quickly. This can result in manufacturers inappropriately trying to use solvents to wash the resin off and creating a solvent and water mixture. The commenter uses surfactants to clean the resin off of the equipment, which prevents them from recycling the water. A second commenter (IV-F-1e) concurred that the amount of waste generated is more difficult to remove from the mixers unless solvents are used. The commenter asserted that this waste is more difficult to treat. The treatment systems are reportedly expensive to purchase. The chemicals used to treat or flocculate the drills are likewise reportedly expensive. Compared to solvent systems that are easy to use, the commenter claimed that waterborne systems can result in a very tedious process. One commenter (IV-F-1s) also pointed out that obtaining a permit to connect an industrial discharge of wastewater to a publicly owned treatment works (POTW) may cost several hundred thousand dollars in some metropolitan areas. Their facilities sealed their floor drains to prevent solvent from going to the POTW and never had an industrial permit to connect to the POTW.

Response: The EPA acknowledges that in cases where manufacturers achieve compliance by converting from solventborne to waterborne coatings, an increase in wastewater discharge may occur if waste from the manufacture of waterborne coatings is discharged by manufacturers to publicly owned treatment works. Discharges from these facilities or from POTWs would be subject to applicable effluent guideline standards. These discharges would receive appropriate treatment before the water is released into the environment. Thus, these discharges would have small environmental impacts. However, the EPA expects that the majority of the VOC content limits in the rule will not force manufacturers to convert to waterborne coatings. For the vast majority of categories, the VOC content limits are high enough to allow manufacturers to continue to offer solventborne coatings. Therefore, the EPA has concluded that the adverse water impacts

would not be significant in comparison to the air emission benefits resulting from the rule.

2.3.1.4 Energy Impacts

Comment: One commenter (IV-F-1j) believes that for production lines, the slower dry times resulting from higher solid formulations or substitution of waterborne products is going to slow the production schedules, which can increase energy costs associated for forced curing, resulting in higher energy usage.

Response: The architectural coatings VOC rule applies only to coatings applied to architectural structures and does not apply to shop-applied coatings or coatings used for original equipment manufacturing. Thus, the commenter's concern regarding production schedules, forced curing, and higher energy use are not applicable to this rulemaking.

2.3.2 Cost/Economic

2.3.2.1 Reformulation Cost Estimate

Comment: Twenty-seven commenters submitted information in response to the EPA's request for information on the cost to reformulate a product to comply with the regulation. Comment letters received and reviewed for this purpose include:

IV-D-02	IV-D-93	IV-D-152	IV-D-192
IV-D-08	IV-D-108	IV-D-157	IV-D-212aa
IV-D-27	IV-D-110	IV-D-159	IV-D-212cc
IV-D-36	IV-D-115	IV-D-167	IV-D-217
IV-D-38	IV-D-128	IV-D-170	IV-D-222
IV-D-39	IV-D-130	IV-D-173	IV-F-1e
IV-D-44	IV-D-146	IV-D-182	

Response: The EPA appreciates the input from the above commenters. Upon review of these comments, 11 of the responses (IV-D-36, 38, 93, 108, 110, 128, 130, 152, 182, 217 [two estimates], and IV-F-1e) appeared to provide comparable information for gauging lump-sum reformulation costs per product. These estimates are summarized in Appendix A of this BID and in Appendix B of the EIA. Other comments presented costs for all of the company's products, but did not provide information on the

number of products to enable computation of the cost per product. Other comments could not be used either because of incompleteness or lack of clarity about the information provided. The EPA combined these estimates with the original estimate used at proposal to derive a revised average cost to reformulate a product. Cost per product estimates from these comments ranged in value from $576 to $272,000, with a mean value of $86,326. This mean value was rounded to $87,000 to provide a "representative product" cost estimate used throughout the cost and economic analysis for the final rule.

Comment: One commenter (IV-D-08) stated that the EPA's annualized reformulation cost estimate of $17,770 per formula is extremely low and unrealistic for two reasons. First, the commenter argued that it is based on averaging only the costs of laboratory personnel. Second, the commenter stated that it is based on an industry survey which excluded over 400 small paint manufacturing companies. Another commenter (IV-F-1m) stated that the true cost of reformulation should include the costs actually expended by small businesses both to reformulate and to make all of the other changes necessary in their products and marketing tools in order to bring a new product to market. One commenter (IV-D-27) estimated a total cost of $400,000 for each product that could not meet the proposed VOC content limit and could be reformulated. The total cost includes estimated expenses for technical training for chemists; one-time expense for prioritizing products for reformulation; examination, selection, and testing of surveyed raw materials; suitable performance packaging (which is required by another Federal regulation); performance tests for each product; and field/market testing of products. Another commenter (IV-D-93) estimated that 91 of their products will have to be reformulated at an estimated cost of $30,000, which includes a part-time formulator for 6 months and the cost of producing one 50-gallon test batch for each of these 91 products. Another commenter (IV-D-108) estimated the cost to reformulate two products would be $50,000. This estimate did not include other related costs such as the cost of revised and

redistributed Material Safety Data Sheets (MSDS) (required by Federal law) at $35,000; cost of replacement product literature at $30,000; and loss on label conversion at $12,000.

Response: The EPA's annualized "reformulation" cost estimate includes not only the costs of laboratory personnel, but also includes costs for technical and market testing. The EPA thus included those costs that the EPA believes accurately reflect the impacts of reformulation. Table 2-1 in the EIA (Docket Item IV-A-1) lists the various uncertainties and potential biases surrounding the reformulation estimate which generally could not be quantified.

The EPA acknowledges that the industry survey on which the reformulation estimates were based did not include a large number (i.e., close to 400) of small paint manufacturing companies. The survey was designed to obtain input from as many manufacturers of architectural coatings as possible. Over 950 survey forms were mailed by industry representatives to companies that were identified as possible manufacturers of architectural coating products. Of the 173 companies that responded to the survey, 114 manufactured architectural coatings which were estimated to represent 76.6 percent of the total gallons of architectural coating products produced in 1990. The EPA extrapolated the survey population of coating products to account for the volume of products not reported by manufacturers. This approach assumes that the feasibility issues facing the small manufacturers that responded to the survey would be similar to those facing the nonrespondents (i.e., if a portion of surveyed small manufacturers are able to formulate a coating at a given VOC content level, a similar portion of small manufacturers who did not respond to the survey would be able to achieve this VOC content level as well).

To supplement the assumptions made about the feasibility of reformulation, the EPA requested detailed information in the preamble to the proposed rule on the following: (1) any specialty niche products which do not comply with Table 1 and that cannot be cost-effectively reformulated; (2) the sales volume and VOC

content of these products; (3) detailed cost estimate for reformulation; and (4) whether a lower VOC coating exists in the market which can adequately substitute for the identified product.

EPA received some additional reformulation cost estimates during the public comment period (these estimates included costs beyond laboratory personnel). As Appendix A of this document indicates, the EPA's cost estimate used at proposal was 3 to 5 times greater than the average given in the public comments. The EPA adjusted the reformulation estimate to reflect these comments and believes $14,573 represents a realistic value.

Comment: One commenter (IV-D-08) emphasized that the rule would not eliminate the problems and costs of multiple product formulation in different states, as many States with more stringent rules would maintain their programs. As such, the commenter expressed concern that manufacturers will experience increased product formulation and maintenance costs.

Response: The EPA believes the national regulation will minimize the problems associated with compliance and multiple regulations at the State level. This is because some States are relying on the EPA's regulation rather than developing their own rules, some States have included "sunset" provisions in their regulations so that once the national rule takes effect their rule will no longer be effective, and other States have statutes that prohibit their own State regulation from being more stringent than Federal standards. However, as the commenter suggests, the national rule will not entirely eliminate the problems and costs associated with multiple State regulations since some States may choose to impose or continue to impose different and more stringent requirements. The EPA notes that section 183(e) of the Act expressly allows for States and localities to have more stringent rules if they so desire. Nevertheless, the EPA has attempted to issue a final rule that will minimize the need for additional State rules by achieving appropriate reductions nationwide.

Comment: One commenter (IV-D-212p6o) stated that the economic impact on the architectural coatings industry of the proposed rule would be substantially in excess of $40 million estimated by the EPA at proposal. The commenter estimated the minimum economic impact of the proposed controls to be $104 million. The commenter assumed an 18 percent reduction (i.e., 94,500 tons) from a baseline of 525,000 tons of VOC per year nationwide at a cost of $1,100 per ton (as estimated by the Office of Technology Assessment (OTA)). The commenter argued that the South Coast Air Quality Management District's (SCAQMD) estimate of $16,400 per ton of VOC reduced is more accurate. Based on the SCAQMD's cost-effectiveness estimate, the commenter stated that an 18 percent reduction would cost the industry $1.6 billion. Another commenter (IV-F-2) also pointed out that the SCAQMD used a value of $16,400 per ton of VOC reduction for their architectural coatings rule.

Response: The EPA disagrees with the conclusions of the commenters, but understands the source of their misunderstanding. Upon re-examination of the cost impacts of the rule, the EPA has determined that the projected costs were estimated correctly. The detailed approach taken at proposal by the EPA to estimate cost-effectiveness was based on VOC content data from the 1990 VOC Inventory Survey conducted by the National Paint and Coatings Association, which represents the most comprehensive VOC content inventory of the industry's products conducted to date. Based on the sales and VOC content data from the survey, the costs were extrapolated to the nation using conservative (upper bound) assumptions of the total number of products requiring reformulation nationally. The EPA's reformulation cost estimates are based on industry input prior to proposal (adjustments to this estimate have been made based on comments received after proposal). The analysis then considered influences in a competitive market on product price and output, along with the consideration of lower-cost compliance options such as the tonnage exemption, exceedance fee provision or product withdrawal. The analysis not only measures the cost to producers

that must comply with the regulation, but also to all consumers impacted by the changes in the market resulting from the regulation.

The commenter cited an OTA estimate of cost-effectiveness of $1,100 per ton and SCAQMD's estimate of cost-effectiveness of $16,400 per ton. These cost-effective estimates are not meaningful for evaluating the accuracy of the EPA's cost-effectiveness estimate since the cost-effectiveness depends on the specific requirements in the regulation. The OTA estimate was not based upon the national rule as promulgated, and hence does not reflect its costs. All else equal, controlling each incremental unit of VOC emissions will be progressively more costly as the stringency of controls increases and the availability of control technology decreases. For example, the SCAQMD is in need of extensive controls for an extreme ozone problem, which results in a relatively high cost-effectiveness measure. The SCAQMD's estimate of $16,400 per ton of VOC reduction represents a 75 percent reduction from 1990 levels which must be achieved by the year 2010. This is not comparable to the national regulation which is expected to achieve a 20 percent VOC reduction from 1990 levels. The EPA believes the detailed approach taken in the Economic Impact Analysis, which for the final rule resulted in a cost-effectiveness calculation of $250 per ton (1991 dollars), is appropriate and more accurately estimates the costs to the nation than either the OTA or the SCAQMD estimate.

Comment: One commenter (IV-D-120) suggested that the EPA's estimate of the costs to manufacturers to reformulate might not be accurate for every coating category, the commenter claims that their company spent between $250,000 to $500,000 trying to reformulate concrete surface retarders. The commenter recounted its 5-year reformulation effort that resulted in a non-user-friendly VOC compliant product. The commenter claims that it lost 85 percent of its previous business in California as a result of not being able to reformulate to meet VOC compliant levels.

Response: The EPA acknowledges that the costs to reformulate particular products may vary from the average projected, i.e., some will be higher and some will be lower. The EPA cannot assess whether the costs cited by the commenter are correct, but believes that they are not typical. As noted above, the information available to the EPA suggests that the costs of reformulation, on average, will be far lower. The EPA has recognized the special issues associated with reformulating concrete surface retarders and has created a category for these products with a VOC limit of 780 g/l. The addition of this category is described in detail in section 2.2.4.2 of this document.

Comment: One commenter (IV-D-214c) contended there will not be enough time or money for most manufacturers to reformulate to meet the proposed limits. Another commenter (IV-F-1[l]) quoted a representative of a major manufacturer who estimated that reformulating approximately one-fourth of the company's product lines would require 100 to 150 man-years and cost from $10 to 15 million, only including the cost of the labor required to reformulate. Another commenter (IV-F-1m) provided a similar example of a company that has 44 products to reformulate. This will cost the company $11 million at a cost of $250,000 per reformulation. In addition, the commenter claimed that it will take 110 scientist years to do the reformulation. The commenter also pointed out that there are not enough formulation chemists available and there is not enough time to hire them and accomplish the reformulations in time to comply with the rule.

Response: Based on these general comments and several other public comments on the time needed to comply, costs of reformulating individual products, and statements of the burdens on small entities, the EPA revised the rule to include a 1-year compliance period combined with a phased tonnage exemption provision and an exceedance fee provision. All of these provisions will provide manufacturers additional time and flexibility to comply with the standard so that it is economically feasible for a predominant number of products

(excluding the less than 1 percent of products that are projected to withdraw from the market).

This can be exemplified by the information provided by commenter IV-F-1m. The estimate of $11 million in regulatory costs represents the worst case of potential costs in that it assumes that every reformulation will cost the full $250,000, and that none of the noncompliant products are similar enough in characteristics to not incur reformulation costs (i.e., the EIA assumes 1/3 of products requiring reformulation are similar enough in characteristics to not incur a cost). This estimate will be reduced substantially if all options of the final rule are considered by the company along with the revised estimate of product reformulation cost ($87,000 per product). For each of the 44 products, the company should consider the least cost strategy to comply with the regulation from a combination of the tonnage exemption, reformulation, the exceedance fee, and product withdrawal. For example, if the annual fee payments on a product would be less than the annualized reformulation cost estimate, the least cost strategy for this product would be the fee provision. The resulting cost across all 44 products must also be annualized over the appropriate period of time (the $11 million is a lump-sum estimate rather than an annualized value) to compare with company revenues and determine impact to the firm.

Comment: One commenter (IV-D-44) stated that reformulation cost estimates can be very difficult to determine and vary on a case-by-case basis. Another commenter (IV-F-1e) has been working to reformulate products for approximately 4 years and still has over 24 products, excluding various colors, that are not in compliance with the proposed regulation. These products represent $7.4 million in sales which is over 9 percent of the commenter's gross sales. The commenter believes the list will be reduced to 15 products not in compliance by April 1, 1997. These products represent $6.7 million in sales.

Response: The EPA recognizes that each regulated entity will have different impacts from the rule, based upon the number

of products they offer, the types of products they offer, and the current VOC content of such products. The EPA has considered this information on the cost of compliance along with other submittals in determining the cost of the final rule. The summary of the EPA's analysis of reformulation cost comments is presented in Appendix A. The EPA notes that the extended compliance time and other mechanisms in the rule will provide compliance flexibility to regulated entities, beyond that discussed in the proposed rule.

Comment: One commenter (IV-F-1m) asserted that costs for minor reformulations are not free and that some costs should be assigned for those minor formulations involving one-third of the products over the standards.

Response: The economic analysis conservatively assumes that all reformulations, regardless of how far the current VOC content is above the limit will necessitate a "major" reformulation. Thus, there are no minor reformulations that are assigned zero costs. The "one-third" adjustment indicated in the analysis reflects the assumption that, for a typical company, approximately one-third of all over-limit products are similar enough in characteristics to other over-limit products, that a separate reformulation effort will not be necessary. So, for example, if a firm has 15 products that are above the VOC limit, it will, on average, have to develop 10 new formulations. These assumptions were derived based on information presented to the EPA by industry during the regulatory negotiation. Because the EPA cannot assess the exact number of reformulations that each regulated entity will need to perform, and regulated entities themselves may not know in advance, the EPA believes that this is a reasonable means to estimate the number of reformulations conservatively.

Comment: One commenter (IV-F-1m) stated that it is misleading for the EPA to use the annualized value of reformulation to represent the cost of reformulation. For example, the commenter compared the EPA's annualized approach to that of a Mercedes Benz dealer taking out ads to sell cars, which

other dealers are selling for $40,000, and claiming that they only cost an annualized amount of $2,800. Instead, the commenter suggested using actual costs expended both to formulate and to make all of the other changes necessary to produce and market a new product.

Response: The EPA believes an annualized value for reformulation is appropriate because the costs of reformulation and its VOC reduction benefits occur in different time periods. The reformulation of current noncompliant products is a "one-time event," but the emission reductions of the new formula persist over time. It is a well-established tenet of benefit-cost analysis and cost-effectiveness analysis that benefits and costs need to be placed on a time-consistent basis for direct comparison (see OMB guidance for implementation of Executive Order 12866, part III.A.3). Therefore, the costs of the action must be computed on an annualized basis through discounting to be time consistent with the annual stream of emission reductions achieved.

To use, as the commenter suggests, the entire lump sum reformulation cost estimate as a measure of annual costs of the rule is conceptually incorrect. It would be similar to using the entire purchase price of a home as the cost of housing in the year that a house is purchased.

The commenter takes issue with the annualization formula used in the analysis, which implicitly assumes that the VOC reduction technology has permanent emissions reduction benefits. The commenter likens this to suggesting that the real cost of a $40,000 Mercedes Benz is only $2,800. However, the analogy is inappropriate. A car must be replaced periodically and, therefore, must be amortized over a finite service life. A technology to reduce VOC does not need to be replaced in the future and, thus, does not have a finite service life in the same way that a car or other capital equipment does. In that regard, the annualization method used in the EIA is appropriate for VOC technology, but not for cars.

The EPA recognizes that a case can be made for treating each product formula as having a finite service life, requiring periodic reformulation. Under this alternative assumption, it should be pointed out that the regulation can be viewed as accelerating each product's next round of reformulation, an event that would have occurred anyway. This alternative assumption (i.e., a product formula having a finite life) is addressed in more detail and its effects are quantified in Appendix B to this document.

As Appendix B indicates, the one-time cost estimate of an accelerated reformulation schedule ranges from a small fraction to a large fraction of the total reformulation cost estimate used in the EIA. In this example, the average product's one-time cost equivalent is less than 60 percent of the estimate used in the EIA. Thus, the EPA's estimate of one-time costs of roughly $250,000 for each over-limit product overstates the true costs in all cases and, as demonstrated in the example above, the overstatement of costs can be substantial. Taken together with the fact that the $250,000 lump sum expenditure is likely an overstatement of the costs to reformulate to achieve a lower VOC content, the EPA's methodology for assigning costs appears to greatly overestimate the costs per product, rather than underestimate these costs as the commenter suggests.

Comment: One commenter (IV-D-128) estimated its company's aggregate cost to reformulate the few products affected by the rule to amount to $85,000 over a 2/3 year period, with a potential cost of approximately $9,000 per ton of VOC emissions reduced. The commenter noted that these products represent a shrinking part of their market and that the wasted reformulation costs will impact their ability to develop very low (or zero) VOC coatings.

Response: The commenter appears to have estimated annual costs of approximately $28,000 ($85,000/3) and divided this number by 3 tons per year of VOC reduction to get the $9,000 per ton estimate. However, as indicated in the previous response to comment IV-F-1m, this method for annualizing costs is

conceptually incorrect because the initial lump sum cost of $85,000 should be matched with reductions achieved in all future years, not just the first 3 years when the $85,000 is expended. If the $85,000 cited here were annualized using the method from the EIA, the annualized cost would be approximately $85,000*.07 = $5,950 which divided by 3 tons per year gives an annual cost per ton of emissions reduction of roughly $2,000. Assuming that these numbers provided by the commenter are accurate, the commenter has four basic choices: (1) withdraw the few products that do not meet requirements and represent a shrinking part of the company's market, (2) claim some portion of these products as exempt under the tonnage exemption, (3) reformulate a portion of the products, or (4) pay the exceedance fee. With an exceedance fee of approximately $2,500 per ton, it would seem to be less costly to reformulate than to pay the fee, as long as annual profits exceed the total annual cost of reformulation (the EIA assumes that a product would be withdrawn if profits do not warrant the expenditure for reformulation).

Comment: One commenter (IV-F-1m) disagrees with the EPA's first reformulation cost estimate (i.e., the reformulation cost estimate presented in the June 1996 EIA) because it is calculated on a per-volume basis rather than on a per-product basis. The commenter disagrees with the EPA's second reformulation cost estimate (i.e., the sensitivity analysis of the national reformulation cost estimate presented in Appendix D of the EIA) because it assumes that the average number of products needing reformulation will increase as the company size increases. The commenter states that the number of products needing reformulation will actually increase as the company size decreases. The commenter also did not understand why the average number of reformulations per small business participating in the survey is 7.8 whereas the average number of reformulations per business for the companies not participating in the survey is about 3.

Response: The EPA recognized potential problems with the per-volume approach of determining the number of products that

need reformulation and, therefore, presented it as a lower bound estimate of costs in the sensitivity analysis presented in Appendix D of the June 1996 EIA for the proposed rule. The second approach -- presented in Appendix D - has a per-product basis for determining the number of products requiring reformulation and is presented as an upper bound estimate. The final EIA only uses the per-product approach for the estimation of national costs.

Although the survey data confirm that larger companies have a greater number of products needing reformulation than smaller companies, that is not the basis of the methodology for the per-product basis cost estimate. First, for each product category, the volume of non-surveyed products is computed as the difference between the national sales volume for that category and the corresponding volume of surveyed products. Then, the number of non-surveyed products is estimated by taking the non-surveyed volume and dividing by the average product volume size (total nationwide volume per product category) for surveyed products produced by small companies in that category. The underlying assumption is that the small companies surveyed were more representative of the non-surveyed companies. Then, the EPA estimated the number of over-limit non-surveyed products by taking the proportion of all products in that category that are over the limit and multiplying by the number of non-surveyed products. This number is then subject to the "one-third" adjustment and multiplied by the reformulation cost per product to get the total reformulation cost for the category. Then each product category has a separate reformulation cost estimate for surveyed and non-surveyed products. The national estimate is derived by summing the surveyed and non-surveyed totals across all categories.

Using the methodology just described, the EPA determined that a large portion of the non-surveyed products are in categories that have a low proportion of products that are over the regulatory VOC content limit (e.g., exterior waterbornes and interior waterbornes). This is because these categories

represent a large portion of the total sales volume that was under-reported in the survey. Therefore, the average rate of reformulation for non-surveyed products was calculated to be lower than the average reformulation rate for surveyed small company products.

Comment: One commenter (IV-D-178) stated that a model $10,000,000 per year sales volume company cannot survive the cost of reformulating its product lines. The commenter questioned the EPA's estimated reformulation cost of $17,772/product. The commenter asserted that the primary cost of reformulating is paying a chemist to do the work at $80,000 per year. In addition, the commenter claimed the cost is expressed in 1991 dollars which doesn't apply to real costs today. The commenter also asserted that the cost estimate assumed an interest rate of 7 percent which is not a valid assumption for small businesses and also assumes that a company is in the position to borrow $267,908 for reformulation which may not be true of all companies. According to the commenter, the economic analysis also failed to consider the impact of lost sales on the survival of a business as it approaches its break-even point.

Response: The EPA cost estimate is based on an estimate of one reformulation taking 2.5 years of a chemist's time at $100,000 per chemist year. At proposal, this was then annualized, as described in the text of the EIA and in responses to comments above, to derive the $17,772 estimate. The commenter's assertion that a chemist year costs $80,000 suggests the EPA may have over estimated reformulation costs.

Because the survey of architectural coating producers was conducted in 1992 with information on products through the end of 1991, the EPA has set 1991 as the baseline year for the analysis. All market data are therefore in 1991 dollars, so for the purpose of modeling, the costs are expressed in 1991 dollars. The EPA notes that transforming these costs to 1998 dollars would not appreciably change the impact in real terms.

The Office of Management and Budget (OMB circular A-94) stipulates that the discount rate used for economic analyses of

federal regulations is 7 percent. This is based on an assessment of a wide range of private and public investment returns. OMB's 7 percent is a real discount rate (adjusting out inflation). In contrast, the market interest rates paid by firms are in nominal terms (i.e., they include a component for inflation). If inflation is 3 percent, then a real rate of 7 percent is equivalent to a nominal rate of 10 percent. All dollar values in the economic analysis are expressed in real terms, thus the discount rate used is a real discount rate.

Finally, the EIA does estimate the value of reduced output that results from product withdrawals and price increases. These estimates are the total value for a market category. The EPA does not have sufficient information to determine the break-even point of an individual firm or to estimate a specific firm's loss in sales. The EPA believes, however, that the final rule includes a variety of mechanisms that will provide sufficient flexibility to regulated entities yet at the same time achieve meaningful VOC emission reductions.

Comment: One commenter (IV-D-57) stated that small regional and local companies may not be able to reformulate their products cost-effectively. Another commenter (IV-D-143), a small business manufacturing wood finishes, requested that instead of providing a per-product exemption, the rule simply exempt all very small businesses (under $1 million in annual sales) so that a company could generate enough funds to reformulate its products. Under the commenter's suggestion, once a company reaches the $1 million mark, the company would have to comply before 2 years pass or an additional $500,000 in sales accrue. The commenter asserted that despite the benefit to its company, an exemption of specific products could lead to abuse and rule circumvention by regulated entities.

Response: The EPA shares the concern of the commenters that the final rule should allow companies of all sizes to meet the requirements in a cost-effective manner. Section 3 of the proposal EIA identified, and to the extent possible, quantifies potential impacts on small firms. This analysis has been revised

given changes to the final rule and has been augmented by a final analysis to meet the requirements of the Regulatory Flexibility Act as amended by the Small Business Regulatory Enforcement and Fairness Act. The analysis shows that because reformulation appears to be a fixed amount no matter how much or how little volume is produced, small firms who generally have smaller volume products may experience reformulation costs that are a greater percent of their baseline cost and revenue. Rather than exempting a particular size company entirely from regulation, the EPA has taken several steps to alleviate the burden on industry including:

- the creation of new product categories where warranted,
- an extension of the period of compliance after promulgation to allow for reformulations,
- a scaled tonnage exemption in years 1 and 2, and all future years of compliance, and
- an exceedance fee provision.

All of these provisions were considered to address niche markets and small business burdens, however, the provisions will be available to all producers, regardless of size.

Comment: One commenter (IV-D-147) stated particular cost concerns regarding products requiring both reformulation and color recalibration. The commenter noted that any reformulation of a tint base system requires the recalibration and reformulation of every color in that system as well as the additional custom color standards of customers. Consequently, this has a greater impact on a product line than would individual product reformulation. As a related issue, the commenter requested some exemption from the rule that is commensurate with their production volumes. The commenter favored a small volume exemption for all categories combined since it would lessen the amount of recordkeeping and reporting.

Response: The EPA has included a scaled tonnage exemption in the final rule which will help respond to particular situations where it may not be cost-effective for a manufacturer to reformulate specific product lines -- in this case products requiring color recalibration. In addition, the commenter could consider the cost of reformulation and color recalibration versus the payment of the exceedance fee to help gain additional time to complete reformulation efforts for some products.

2.3.2.2 Annual Cost to Industry

Comment: One commenter (IV-D-190) stated that the EPA failed to consider several important factors in calculating economic impacts of the proposed rule. The commenter claimed that the EPA overestimated the cost of compliance because the EPA has not completed a systematic account of new paint, coating and resin technologies. Also, the commenter asserted that the EPA failed to include in its analysis other economic benefits associated with low-VOC technologies, such as decreases in costs for health insurance cost for workers producing low-VOC technologies, and the fact that since most low-VOC coatings dry more quickly, the amount of time facilities are unavailable for use may be reduced compared to their counterparts painted with high-VOC coatings. The commenter also claimed that the EPA failed to consider that American jobs may be created due to increased coating technology demand in foreign markets as a result of the rule.

Response: In calculating the number of products expected to need reformulation, the EPA relied on data from a survey which was conducted by the National Paint and Coatings Association during the regulatory negotiation to gather 1990 sales and VOC content information on the architectural coating industry. The results from this survey are considered to be the most comprehensive source of information about VOC and sales information collected on this industry to date. Although much progress in lower VOC technology is expected to have occurred since the 1990 survey data were collected, the EPA does not have the resources to continually evaluate and document such progress

and must, therefore, rely on information available through survey efforts, State regulations, and comments submitted during the public comment period. Based on comments submitted at proposal about the cost to reformulate, the EPA has revised (lowered) the cost of reformulation to reflect this new input, but has not accounted for changes in coatings technology since 1990.

The economic impact analysis (EIA) focuses on the size and distribution of costs of the proposed regulatory action. The EIA qualitatively discusses several effects of a product reformulation on product performance such as drying time, and other characteristics, but is unable to quantify such effects on each product's performance attributes. If such quantification were possible, the comment raised here regarding improvements in drying time for low VOC products would be evaluated along with the several public comments regarding adverse effects of reformulation on product performance to determine whether the net performance effects are positive or negative. The EPA is aware of examples of better performing lower VOC content coatings, but because no comprehensive source of data on coating performance exists, the EPA assumed no net benefit or harm from any changes in coating performance as a result of regulation.

Because all producers (foreign and domestic) must comply with the requirements of the rule, it was assumed there would be a minimal impact on foreign trade. Typically, U.S. regulations impose increased costs of production on domestic producers only, which puts them at a disadvantage compared to foreign producers operating in U.S. markets. However, in this case all producers (foreign and domestic) will face the same level of costs for their respective U.S. markets. Thus, only minimal effects will occur as a result of product withdrawals by producers (foreign and domestic) that do not find it efficient to continue to offer a product to the U.S. market - which allows other producers to meet the demand of these product withdrawals.

It is true, as the commenter suggests, that new technology will result from the rule. However, the EPA is not aware of a current demand in foreign markets for this technology. The only

demand that can be assumed is from potential future requirements by other governments to reduce the VOC content of architectural coatings. If an analysis of trade effects were conducted, the EPA would evaluate the impacts of its rule holding the state of the world markets constant (at baseline conditions), so potential future foreign requirements would not be evaluated. Thus, the trade effects that result from this rule are likely to remain minimal as was assumed at proposal.

Comment: One commenter (IV-D-08) questioned the EPA's estimated cost to society of $25 million per year as being extremely low because, among other costs, the estimate supposedly fails to take into consideration reporting and recordkeeping costs and costs to the EPA. The commenter, based in Ohio, claimed that its company experienced costs in excess of $1 million to convert or change over 15 percent of its products for compliance with current State rules, and estimates that costs to the industry have already been in the billions of dollars.

Another commenter (IV-F-1e) also maintained that the EPA's $25 million dollar cost estimate is too low. The commenter alone reportedly has over $7.8 million dollars in fees and costs ($4 million dollars for products already reformulated, $100,000 for discontinued product lines, $800,000 for exceedance fees, and $2.7 million to reformulate additional products).

Response: The commenters appear to be comparing the EPA's annualized cost estimate ($17,772) with their own estimate of the initial, lump sum costs of reformulation. The EPA's conservative one-time cost estimate at proposal was $250,000 per product. Therefore, for firms with four or more products that need reformulation, the lump sum might be $1 million or more as the first commenter suggests. These costs should, however, be considered on an annualized basis. The EPA computed its annualized cost estimate by first assuming that reformulation will initially require an investment of approximately $83,000 per year for three years, for a total of $250,000 over three years. Because reformulation is the development of intellectual property applicable to all future sales, rather than just sales in those

first three years, the initial cost needs to be capitalized over time to appropriately match costs with the resulting *annual* reduction in VOC emissions.

Comment: One commenter (IV-D-26) stated that the high costs associated with having to comply with the proposed rule for the portion of their products that do not meet the proposed standards (100 out of 1400 formulations) would at least initially require the California-based company to pay the exceedance fee surcharge in lieu of reformulation. Given that the company produces high-end niche products, the commenter predicted that the resulting increase in product price would drive customers to purchase less of the company's products in favor of less costly alternatives. In a related statement, the commenter supported a 5,000 gallon per year low volume exclusion to reduce the burden of reformulating low volume products.

Response: As an initial matter, the EPA notes that a California-based company likely has to meet more stringent limits for sales in that State and presumably already has developed the technology to comply with the final rule. The EPA has added a compliance option to the final rule in addition to the exceedance fee provision that the commenter will be able to use. Specifically, the EPA has included a scaled tonnage exemption of 23 megagrams (25 tons) through the end of the year 2000, 18 megagrams (20 tons) in the year 2001, and 9 megagrams (10 tons) in the year 2002 and all future years, which helps respond to particular situations where it may not be cost-effective for a manufacturer to reformulate specific low-volume product lines.

It should also be noted that the market model the EPA developed for the architectural coatings rule shows that on average, prices will not increase by a significant amount (0.01 percent) and consumption will not drop by a significant amount (0.01 percent). Furthermore, given these low percentage changes in price and consumption, the level of substitution is

expected to be low (i.e. there are expected to be few products which lose markets as a result of this rule).

Comment: One commenter (IV-D-214b) stated that the EPA's estimated cost understated or ignored the most significant costs of the proposed rule, which would result in the expenditure by the private sector of more than $100 million in 1 year. The commenter contended that the EPA's estimate of manufacturers' reformulation costs was seriously flawed and contradicted by the EPA's own work. The commenter calculated manufacturer reformulation costs to be $905 million per year based on the EPA's estimated VOC emissions reduction of 182 thousand tons per year at a cost of $5,000 per ton. The commenter stated that this cost estimate was close to the $930 million per year estimate of OTA in 1987 (taken from the EPA's 1981 draft CTG). The commenter continued by calculating a cost estimate based on $20 thousand per reformulation, 500 manufacturers, and 12.6 reformulations per manufacturer.

Another commenter (IV-D-55) stated that the threshold of section 202(a) of the Unfunded Mandates Reform Act (UMRA) was easily met for the architectural coatings rule considering: (1) the government's own estimates of phase one manufacturer reformulation costs; (2) the costs arising from the inability of most manufacturers to reformulate most of their products; (3) the costs manufacturers would bear under any phase two substitution regime; (4) costs borne by retailers; (5) costs borne by contractors; (6) costs borne by workers; and (7) costs borne by consumers. The commenter contended that there was an urgent need for an UMRA cost-benefit assessment, especially with regards to the anti-competitive and the adverse environmental effects associated with the proposed architectural coatings rule.

One commenter in two letters (IV-D-214b, IV-D-214c) took issue with the EPA's statement in the proposal preamble that the proposed rule "does not contain a Federal mandate that may result in expenditures of $100 million or more for ... the private sector in any 1 year." Id. At 32745-46. In the first letter, the commenter (IV-D-214b) pointed out several major adverse economic

effects to the private sector that were not addressed in the revised draft preamble: (1) increased costs to retail businesses (estimated at 40,000 paint retailers each with an annual cost of $2,500); (2) increased costs to painting contractors due to product failures and increased labor; (3) increased costs to consumers (estimated at 1 percent of total architectural coatings sales of $10 billion); and (4) adverse effects on paint industry workers (estimated at 5,000 lost jobs paying $20,000 per year). The commenter concluded that when the two manufacturing effects that the EPA underestimated and the four effects the EPA refused to evaluate are combined, the proposed architectural coatings rule exceeded the $100 million per year threshold of UMRA.

According to the commenter in the second letter (IV-D-214c), the EPA failed to address not one, but 13 key cost factors in determining that there was no possibility that its proposed rule "may" cost the private sector $100 million or more and the commenter discussed those 13 factors. The commenter also referred to several court decisions that involved judicial review of an administrative determination that the threshold for a statutory mandate had not been met. The commenter concluded that if the EPA had counted the following 13 relevant factors that the UMRA surely would have been triggered:

1. The EPA did not count cost data from all manufacturers.

2. The EPA only considered reformulation costs.

3. The EPA's calculations omitted the costs of most reformulations the average manufacturer will have to pay.

4. The EPA's annualized cost estimate of $17,772 per reformulation is too low.

5. The short deadline will make many of the reformulations infeasible.

6. Reformulation may be financially infeasible due to capital constraints for small firms.

7. The commenter suggests that lacking data, the preamble speculates that estimated market effects of the regulation are relatively slight and relatively little

product volume is projected to be withdrawn from the market. The commenter refers to these points as assumptions and also suggests they are affected by definitional manipulation of 50 product categories into 13 markets.

8. The EPA ignored a formulation's "property value."

9. The EPA failed to measure "stigma" changes arising from the threat of imposing more stringent substitution limits.

10. The EPA did not consider the impact on the 42,000 retail outlets referenced in the BID.

11. The EPA did not consider the impact on the 29,900 coating applicator firms referenced in the BID.

12. The EPA did not consider the employment impacts for any group except manufacturers.

13. The EPA ignored the effect of "product bans" on reduced competition, fewer choices, and lower quality.

Response: The EPA disagrees that the UMRA threshold of $100 million is exceeded by the final rule. The EPA estimates the annual impact of the rule is $32 million (in 1996 dollars). The commenter's calculation of a reformulation cost of $950 million is based on a cost of $5,000 per ton of reduction and a reduction of 182,000 tons. The commenter claims these figures are from EPA's own analysis. The EPA's analysis estimates the rule will result in a cost of $250 per ton of reduction and the emission reduction from the final rule is 113,500 tons. Consequently, the EPA is unsure the source of the commenter's figures. The commenter's calculation of reformulation cost using $20,000 per reformulation and 12.6 reformulations per manufacturer is not consistent with information available to the Agency about the number of reformulations and the cost. The EPA's calculation methodology is detailed in the response to items 2, 3, and 4 that follows below. The EPA understands the desire of the commenters to expand the scope of impacts to increase the amount of the impacts, but does not believe that this overestimation is consistent with appropriate evaluation of the impacts of the rule. The EPA used the best available data to determine the cost

of the regulation. Below is a response to each of the 13 cost factors mentioned by the commenter.

1. *The EPA did not count cost data from all manufacturers.*

The EPA disagrees with the commenter. Regulatory costs were estimated based on information from the regulatory negotiation process (July 28, 1993, Docket# II-E-52) and from a survey of manufacturers that represented roughly 75 percent of industry volume. For those manufacturers who did not respond to the survey, the EPA conservatively estimated costs at proposal in two ways. First, the EPA calculated costs for manufacturers not represented in the survey by taking the regulatory costs for manufacturers who provided responses and multiplying these costs by a ratio of total product volume in the industry (respondents and non-respondents) to surveyed product volume. These results were reported in the economic impact analysis and were used as a lower bound for the cost estimate. For the second method used to calculate costs for manufacturers not represented in the survey, the EPA estimated the ratio of total products in the industry to those included in the survey per category to estimate national reformulation costs. The results were reported in Appendix A of the economic impact analysis. Because this second method produced a larger number of products that needed reformulation, the EPA used these costs as an upper bound.

2. *The EPA only considered reformulation costs.*

The cost estimates provided at the regulatory negotiation meeting (presentation by Carl Minchew of Benjamin Moore & Co. on July 28, 1993, Docket# II-E-52) not only included costs for reformulation, but also costs for technical and market testing. Table 2-1 of the EIA lists all potential costs that are not quantified along with bias factors, positive or negative. This comment relates to the potential downward biases in the cost estimate associated with non-R&D cost, but it does not recognize the upward biases to the cost estimate presented by formulations that are less expensive than the assumed dollar amount for a major reformulation, and the potential for technology

advancements that reduce costs in the future. The cost estimate presented at the regulatory negotiation meeting (July 28, 1993, Docket# II-E-52) was based on the assumption that resources would be needed to research and develop entirely new formulations to meet proposed standards (rather than modifying existing formulas). These new formulations were expected to be based on available resin technology that a manufacturer had not yet worked with within their respective company for a particular product line. The costs presented in this presentation were based on potential rule requirements (including up to three phases of control implemented in an 8-year period) that far exceed those ultimately proposed by the EPA or ultimately included within the final rule. Consequently, it is expected that the estimates presented by industry significantly overstate the costs and time frames needed for a reformulation. Based on public comment received upon proposal and the regulatory negotiation information, the EPA revised its cost estimate to reflect the average of all the cost estimates received.

3. *The EPA's calculations omitted the costs of most reformulations the average manufacturer will have to pay.*

Regulatory costs at proposal were estimated based on information from the regulatory negotiation process and from a survey of manufacturers that represent roughly 75 percent of industry sales volume. Costs were then extrapolated to the national level to provide a complete estimate of the surveyed and non-surveyed population.

It is unclear in the comment what is meant by "the costs of most reformulations." If this refers to the approach for estimating minor reformulations as opposed to major reformulations, the EPA believes that all assumptions used in the EIA lead to a conservative estimate of national costs. First, the EPA chose the conservative approach of basing reformulation costs on 1990 coating VOC content data to determine the number of products exceeding the proposed VOC standard which required reformulation in response to the EPA's national rule. The EPA

conservatively assumed that for all products that exceeded the VOC content levels in 1990, 67 percent of the reformulations would be major involving significant investment in research and development over a 3-year period. Thirty-three percent would be able to rely on the significant investment in research and development for the other reformulated products, and consequently would require a relatively minor effort. For purposes of the cost and economic analysis, these "minor reformulations" were assumed to be so similar to other formulations that the manufacturer would not incur any costs for these modifications in coating formulas. In most cases, an estimate based on 1990 data that assumes 67 percent of the coatings that did not meet the standards in 1990 would require a major reformulation expense in 1998 provides a conservatively high estimate of the level of effort necessary for a manufacturer to meet the VOC requirements proposed. This is because lower VOC technology has progressed over the past 8 years from the 1990 survey data base year in response to consumer demand, State regulations, and impending Federal requirements. Second, in many cases, the cost of reformulation is expected to be partially reduced through the assistance of resin manufacturers/suppliers. Upon request, most resin suppliers are willing to share information as well as sample low VOC coating formulations with interested paint manufacturers, both large and small.

Overall, the assumption that the per product reformulation cost is $250,000 and that 67 percent of the products produced that were over the VOC limit based on 1990 inventories will undergo a major reformulation leads to a conservatively high estimate of national cost.

4. *The EPA's annualized cost estimate of $17,772 per reformulation is too low.*

The EPA's calculation of annualized cost uses principles that are defined by OMB Circular A-94 which provides the EPA with guidance on rule development procedures including cost analysis. This guidance requires all costs and benefits to be discounted to

their present values using a period of time that corresponds to the occurrence of benefits. In the EIA, the EPA computed costs by considering that reformulation will initially require an investment of approximately $250,000 total or $83,000 per year over a 3 year period. Because reformulation is the development of intellectual property (i.e., low-VOC technology) that is applicable to all future sales of the product, rather than just the sales in the first 3 years, the EPA amortizes the reformulation cost over the service life of the product, which is infinitely into the future. The EPA recognizes that individual products may be reformulated again in the future, so that the life of an individual formulation is not infinite. However, the VOC reduction technology developed in response to the standards is expected to be applicable (i.e. be a "building block") to all future modifications of the current formula. Therefore, the effective life of this investment can be interpreted as the effective life of the manufacturing firm itself. Since the value of a firm is typically computed as the present value of its perpetual earnings stream, the initial reformulation investment was amortized as if it were an infinite-lived annuity.

The EPA recognizes that a reasonable case can be made that the service life for a reformulation should be shorter than the effective life of the firm. If, for example the typical product reformulation cycle is every 8 years it could be argued that the appropriate time period for annualizing costs and benefits is 8 years (which does not account for the fact that the accrual of knowledge in these formulations is carried to every future formulation). Under this situation, the regulation does not actually force firms to reformulate, rather it causes them to reformulate sooner than they would otherwise. This does impose some costs on the manufacturer, but the incremental costs attributable to the regulation are then *much lower* than the estimate derived using the EPA's methodology at proposal. A demonstration of this point is provided in Appendix B. The example quantifies the difference in costs under an assumption of

an infinite life and one that would assume an 8-year life of a product formula. The example demonstrates that the one-time cost of a product assumed to have an 8-year life is less than 60 percent of the $250,000 estimate used in the EIA. Thus, the EPA's methodology used in the EIA at proposal is likely to overstate the costs by a substantial amount. Taken together with the fact that the $250,000 lump sum expenditure is likely an overstatement of the costs to reformulate most products, the EPA's methodology for assigning costs at proposal appears to greatly overestimate the compliance costs per product.

5. *The short deadline will make many of the reformulations infeasible.*

The regulatory negotiation process indicated that it could take up to 3 years to develop an entirely new product. It is likely that less time is required to modify existing formulas to comply with the standard since the VOC limits are similar to requirements in place in a number of States that hundreds of manufacturers have been meeting for years. The EPA also received many public comments on the compliance date which are summarized and discussed in section 3.2.5. Based on these comments, the final rule allows 1 year to comply with the standard. Companies that need additional time can use the tonnage exemption provision or the exceedance fee option until reformulation can be completed for all products.

6. *Reformulation may be financially infeasible due to capital constraints for small firms.*

The EPA does not have the financial data from individual (privately owned) manufacturers to analyze the issue of the comment quantitatively. In the EIA, the EPA uses several assumptions to evaluate the impact on small manufacturers. Table 3-5 of the EIA at proposal illustrates that the estimated compliance cost for the average small business represents 3 percent of the sales for the manufacturer. Because this burden could be limiting to some small firms, the EPA consulted with the Small Business Administration (SBA), which suggested two

significant changes to the EPA's proposal. First, the SBA asked that the EPA establish its proposed exceedance fee at $2,500 per ton. Second, the SBA requested that the EPA include a small volume "exemption" for product lines below a certain size. As a result of these suggestions from the SBA, the EPA has incorporated several elements into the final rule to alleviate the burden on small entities. First, as discussed previously, the final rule includes a tonnage exemption that allows manufacturers and importers to sell or distribute limited quantities of coatings that do not comply with the VOC content limits. This exemption is described in detail in section 2.2.1.2. The final rule also has a provision for an exceedance fee payment for manufacturers and importers. This is an economic incentive approach that allows compliance by paying a fee in lieu of meeting the applicable VOC content limits. The fee payment is $2,500 per ton of excess emissions above the limit. The details of this provision are described in section 2.4. Both of these provisions essentially allow manufacturers to gain additional time to reformulate products (i.e., claiming the exemption or paying the fee until the reformulation occurs). The EIA indicates that several of the manufacturers with low product volumes would take advantage of the fee, and reduce the compliance costs by a substantial amount. In general, smaller manufacturers tend to have smaller sales volumes per product line and, therefore, would be more likely to take advantage of the exceedance fee payment provision. In addition, the VOC limits in the final rule are similar to those in place in New York, New Jersey, Massachusetts, and Oregon. Over 100 manufacturers, both large and small, compete in those markets.

7. *The commenter suggests that lacking data, the preamble speculates that estimated market effects of the regulation are relatively slight and relatively little product volume is projected to be withdrawn from the market. The commenter refers to these points as assumptions and also suggests that they are*

affected by definitional manipulation of 50 product categories into 13 markets.

The EPA's small market quantity and withdrawal quantity estimates are not assumptions, rather they are projected outcomes, based on policy simulations run through the architectural coatings market model described in the EIA. Withdrawals occur when product-level profits are insufficient to cover reformulation costs. Using this methodology, approximately 1.4 percent of all products are projected to withdraw when the exceedance fee is included as a compliance option. The volume associated with these withdrawals is estimated to be less than one-tenth of 1 percent of total market volume (p. 2-37 of the proposal EIA). Furthermore, withdrawn product volumes may be partially offset by increased production of *similar* non-withdrawn products.

The EPA divided categories into 13 market segments to mirror the market segments used by the U.S. Census of manufacturers SIC product codes. This enabled the EPA to obtain quantity and price data at the national level. Because the Census product codes did not match exactly with the product groupings from the VOC emissions inventory survey, a cross-referencing method was devised for linking Census categories to survey categories. This cross-reference method is defined in appendix A of the proposal EIA. Often the Census categories were defined heavily upon the coatings use (e.g., SIC 2851163: Interior flat solvent wall paints and tinting bases), while the survey categories were defined primarily on technology (e.g., Flat, interior - solvent borne). Thus, multiple Census codes typically had to be aggregated to correspond with an aggregation of survey product codes before a meaningful correspondence could be established (e.g., interior solvent borne). The EPA's objective was to specify as many market categories as the data would allow. Using this method, the largest possible number of meaningful market categories was 13. As a result, the aggregation process may make it difficult to detect relatively large impacts within one

subgroup of a market category, if these impacts are offset by relatively small impacts in other subgroups. In other words, a product may be more likely to be withdrawn from the market than is indicated in the 13 market segments of the analysis since multiple product niches would be lumped within the same market segment. On the other hand, this aggregation may increase the estimated effect on manufacturers by over-stating the degree to which products within the market segment can substitute for products affected by the regulation. Notwithstanding these limitations, the aggregation process presents an appropriate way to analyze the cost and economic impacts and does not in any way diminish the estimates of the absolute impact of the regulation.

8. *The EPA ignored a formulation's "property value."*

At any one time, an asset's (property's) net present value is based on the flow of net profits generated by that property over time. Since the EPA's analysis estimates the effect of the regulation on annual profits per product, the analysis directly estimates the formula's property value. The comment seems to suggest that the EPA should also estimate annualized changes in asset value for the product formula, which is a subset of the measure of profits. Because this would create a double-counting of effects -- profits and asset value -- the EPA only measures changes in profits.

9. *The EPA failed to measure "stigma" changes arising from the threat of imposing more stringent substitution limits.*

The EPA interprets this comment to relate to the potential future phase of regulation discussed in the June 25, 1996 preamble [A61 FR 32729]. The EPA is not aware of "stigma" damages that will result from a discussion of potential future regulation of the architectural coating industry. The commenter has not provided enough detail to allow the EPA to consider the issue further.

10-12. *The EPA did not consider impact on the 42,000 retail outlets referenced in the BID. The EPA did not consider impact*

on the 29,900 coating applicator firms referenced in the BID. The EPA did not consider employment impacts for any group except manufacturers.

While the EPA did not directly measure impacts on the retailing sector and other consumers, the indirect impacts to these entities and other users of coatings products are captured in the market analysis by the estimated change in "consumer" surplus, along with all other downstream effects beyond the manufacturer. Consumer surplus is the measure of utility (or benefits) consumers (retailers, contractors, home-owners, or any other architectural coating user) receive for the supply of a product at a certain price and quantity. When prices increase and output falls as a result of a regulation, this measure is reduced to a certain extent. The estimated change in consumer surplus is estimated in the EIA to be a reduction of $3 million under the proposed limits and a reduction of $6 million if the rule includes the exceedance fee provision. Since the impact on consumers is less than one-third of the manufacturers' burden, and contractors and retailers are a small subset of this effect, the EPA saw no indication of a need for a special analysis of secondary impacts.

It should be recognized that retail outlets have the ability to substitute between compliant and noncompliant coatings offered for sale. While the EPA projects the number of withdrawn products to be small, if a manufacturer does choose to discontinue a product, retailers will presumably replace this product with other compliant products in that category. Thus, although foregone profits are "lost" for the manufacturer withdrawing a product, the retailer offsets any lost profits from selling the withdrawn product with profits obtained by selling substitutes within that category. As indicated above, the number and volume of product withdrawals is projected to be quite small, thus suggesting retailing effects, if they exist at all, are also likely to be quite small.

The job loss and other substantial economic impacts that are referred to by the commenter are the result of assuming that every reformulation required by the standards is not feasible, thus the products would be taken from the market causing manufacturers, contractors, retailers and other consumers to be economically impacted. According to the EIA, there are a very limited number of products that are expected to be withdrawn from the market. Most products will be reformulated or produced with current compliant formulations (with some manufacturers using the tonnage exemption provision or paying the exceedance fee for emissions in excess of the standards).

13. *The EPA ignored the effect of "product bans" on reduced competition, fewer choices, and lower quality.*

The proposed regulatory action is not a product ban because it is technically feasible to reformulate all product categories to meet the standards. The EIA indicates that only 1 percent of the products will be removed from the market because the cost to reformulate would exceed the profits obtained from the product. This level of withdrawal is the aggregate of numerous varieties of products across 13 different market segments, so it is unlikely to eliminate (or ban) an entire product category. At proposal, the EPA specifically sought public comment on niche products needing any special attention. The EPA considered comments received and as a result added seven categories to the final rule. The rule contains limits for 61 categories of products, many of which were created, in part, to preserve specialty, niche market sectors within the industry; most of the new categories added since proposal are low-volume. Also, no product is "banned" since the tonnage exemption and exceedance fee provisions in the rule are expected to provide further compliance flexibility which will allow manufacturers to maintain product lines with VOC contents that exceed the VOC content levels of the final rule. Consequently, the resulting effect on industry competition is also likely to be very small. Compared to other industries, the coatings industry is highly competitive

due to the numerous manufacturers in the industry[2]. Therefore, a relatively small product withdrawal effect on a very competitive industry suggest that significant degradation of market competition is unlikely.

As discussed in section 2.2.4.1 of this BID, high performing products are available in a wide range of VOC content levels in many product categories.

Comment: One commenter (IV-F-1b) believed that the EPA's cost estimates for compliant product development is too low, especially for industrial maintenance coatings and other specialty areas where liability and product functionality/acceptability is more precise and requires more detailed, time-consuming, and costly testing. The commenter also pointed out that there is the cost of foregone new product development when expending scarce technical effort to reformulate existing products.

Response: The EPA's cost estimate is assumed to be an average and, therefore, may underestimate costs in some cases and overestimate costs in other cases. Public comments have provided numerous estimates suggesting that average (one-time) reformulation costs per product are well below $250,000 (see Appendix A), and the EPA has adjusted its analysis to reflect all of the information received during the public comment period.

For industrial maintenance coatings, the EPA's VOC limit is consistent with existing limits in many State regulations and is not as stringent as limits in some California districts. In New

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[2] One method to evaluate industry competitiveness is by examining the concentration of firms in the industry. An industry consisting of very few firms would have a high concentration measure, while a competitive industry would have several firms and a low concentration. The Herfindahl-Hirschman Index (HHI) provides a scaling of concentration from zero (perfect competition) to one (pure monopoly). The HHI for the Paints and Allied products SIC code is 0.0305, which indicates an industry structure close to perfect competition. (Source: 1992 Census of Manufacturers; report M92-S-2, "Concentration Ratios in Manufacturing)

York and New Jersey manufacturers have been meeting a similar VOC limit for almost 10 years.

The cost of foregone new product development is an aspect of opportunity cost that is implicitly included in the EPA's estimate of economic impacts. The amortized cost of reformulation reflects both the payment of principal and the cost of capital. The cost of capital directly reflects the value of opportunities foregone by investing funds in a particular activity, in this case, reformulation. Thus, if investing in reformulation diverts funds from investing in other product enhancements, the foregone value of those investments is captured in the discount rate used in the analysis. Per guidance from the Office of Management and Budget (57 Fed. Reg. 35613 [1992], proposed August 10, 1992), a real discount rate of 7 percent is used to capture the opportunity cost of capital invested in environmental compliance.

Comment: One commenter (IV-D-128) asserted that as a result of the rule, the company would have to divert formulation resources, which include those for high-solids or zero VOC products, to reformulating products in a shrinking part of the company's market. The rule reportedly will strain the company and may result in higher VOC emissions because of lost opportunity to develop lower-VOC products. The commenter believes that lack of regulation would have actually resulted in less VOC emissions.

Response: The economic impact estimate does include the opportunity costs of funds spent on reformulation, however, there are no specific assumptions about what those opportunities might be. A firm in this situation will have many alternatives available to them. Instead of reformulating the products in the shrinking market, the firm could utilize the exemption or fee options to keep the products on the market at existing levels, or the company could discontinue production of these products earlier than they would otherwise.

2.3.2.3 Costs not Considered

Comment: One commenter (IV-D-16) expressed concern that the EPA focused on reformulation costs, but appeared to ignore costs associated with reporting, recordkeeping, labeling, and manufacturer education. Another commenter (IV-D-115) asserted that costs such as research and development, product impact and exposure studies, labeling, and recordkeeping cannot accurately and fully be anticipated and budgeted.

Response: The EPA did include appropriate costs in the total impacts of the rule. Research and development are included as part of the cost of reformulation. Reporting and recordkeeping costs are estimated separately and added to social costs from the EIA to generate an estimate of total national costs of the regulation.

The reformulation cost included in the EIA at proposal did not include labeling and manufacturers' education program costs. However, the average of the cost estimates submitted in the public comments, which did include labeling and education costs, was substantially less than the reformulation costs used by the EPA in the analysis at proposal (see Appendix A). Therefore, the EPA believes that omission of these cost components in the proposal analysis did not cause an understatement of national costs. In any case, the analysis for the final rule has been refined to reflect public comments which included labeling and education costs (costs for retraining sales professionals on the use and application of reformulated products and for holding seminars and meetings for customers to ensure that they understand the contents and applications of the reformulated products).

Comment: One commenter (IV-F-1e) asked if the EPA included litigation costs due to increased safety hazards from using acetone formulations into the determination of the financial impact.

Response: The EPA did not consider case-by-case examples of how material substitution would alter product attributes, safety, or liability. There are substitution possibilities other than

acetone, so if safety factors in the case of this commenter outweigh the benefits of acetone, other raw materials should be considered in the formulations.

Comment: One commenter (IV-F-1[l]) mentioned the added costs of facility modification, obsolete label inventories, lost business resulting from a poor performing product and not being able to produce a compliant product.

Response: The EPA has considered all comments on the cost of complying with the regulation in its final report titled, "Economic Impact and Regulatory Flexibility Analyses of the Final Architectural Coatings VOC Rule." The commenter does not provide any description of the costs of facility modifications that would result from the rule, and no other commenter has reported any such costs. Thus, the EPA is unable to verify that this would be a cost associated with the rule and cannot include an estimate in its analysis. The EPA believes that due to the year lead-time a vast majority of existing label inventories will be utilized prior to the effective date of the rule. Finally, the EPA is unable to quantify any potential changes in performance due to lack of data, but describes these effects qualitatively in the EIA recognizing that the impacts can be positive (i.e., better performance) or negative depending on the specific product and the specific manufacturer. The EPA does, however, take into account the impact of product withdrawals on the industry and finds the impact to be relatively slight (i.e., less than 1 percent are withdrawn nationally).

Comment: One commenter (IV-F-1m) maintained that the EPA should consider the costs for preparing product literature, including material safety data sheets, sales aids, color brochures, and technical data bulletins. Another commenter (IV-F-2) stated that the EPA's cost estimates should include the costs associated with warranty claims and complaints about poor performance of lower VOC coatings. Based on the experience of one of the commenters (IV-F-1m) in California, newly formulated products brought to the market with less than 3 to 5 years of field testing suffer from higher than normal rates of product

failure. The commenter stated that policy adjustments and product liability settlements are often many times the cost of reformulation. The commenter also noted that the consumer would be paying higher costs per gallon and higher cost per unit of area coated. The commenter pointed out that the cost per unit of time in the service life of coatings may be higher. Higher application costs may result from impacts on both labor and equipment. Special training in the use of new materials is often required along with more surface preparation, more priming, more finish coating, more touch-up and repair work, and more frequent recoating overall. New materials may require the replacement of existing application equipment with more specialized equipment.

Response: Product literature costs are included in the estimates provided in the public comments, as is discussed in Appendix A.

The comment implies that the new products would be systematically inferior to existing products and, therefore, would subject manufacturers to increased liability. The EPA is not aware of any widespread evidence that low VOC products systematically incur greater product liability costs than products above the VOC limit.

The economic analysis does project that prices will increase to a small extent as a result of the regulation.

It is not clear that application costs will rise, on average. The EPA was unable to measure quantitatively differences in qualities of compliant versus noncompliant products. Table 2-1 of the EIA qualitatively shows the possible cost biases of the potential differences. The commenter qualitatively suggested what he believes would cause increases in costs, but did not supply supporting data. Nevertheless, table 2-1 shows that the change to compliant products could have either an upward or downward cost bias. An example of a downward bias is possible lower application and drying time with waterborne coatings than with solventborne coatings.

Comment: One commenter (IV-F-1e) stated that alternate solvents for low VOC coatings cost $2-4 per pound versus 10 to 20

cents a pound for traditional solvents. The commenter stated that industry is not going to absorb all the cost for this regulation and asked who is going to pay for this increase in product cost.

Response: At the outset of the analysis, the EPA was unable to obtain verifiable information on material cost effects of reformulation. Anecdotally, it was suggested that solventborne material costs might rise in some situations (e.g., those described in the comment), but might fall in others (e.g., substitution of water carriers for solvent). The net effect across all products is unknown. Without sufficient data on the size or direction of material cost effects, the EPA recognized that the effect can go in both directions, but assumed no net material cost effects in the quantitative analysis.

2.3.2.4 Cost-effectiveness

Comment: One commenter (IV-D-96) stated that it is important to characterize cost-effectiveness in a consistent manner so that various alternative control strategies can be compared on equal footing. The commenter asserted that calculating cost-effectiveness based solely on nonattainment areas unfairly biases the calculation by ignoring the benefit of reducing the transport of ozone and its precursors. The commenter supported calculating the cost-effectiveness on a national basis, which would amount to $237 per ton, which is low compared to VOC RACT costs which can exceed $5,000 per ton. Another commenter (IV-D-33) advised the EPA to maintain the traditional measure of offering a $/ton comparison, since it is commonly used and will continue to provide meaningful comparisons. The commenter opposed more narrow measures of cost-effectiveness, such as exclusively measuring the effect on ozone concentrations, or the reductions in ozone nonattainment areas. Another commenter (IV-D-162) considered cost-effectiveness based on VOC content reductions solely in ozone nonattainment areas to be impractical, because the manufacturer has little control over where the coatings will be used. It would thus require

additional recordkeeping to track intended and actual locations of use.

Response: In the preamble to the proposed rule (61 FR 32735, June 25, 1996), the EPA solicited comments on alternative approaches to the cost-effectiveness calculation for the proposed rule.

Cost-effectiveness, i.e., the cost per ton of emissions reduced, is a measure used to compare the cost efficiency of alternative strategies for reducing pollutant emissions, or to provide a comparison of a new strategy with historical strategies. The EPA's established method of calculating the cost-effectiveness of a rule with nationwide applicability is to divide the total cost of the rule by total emission reductions. At proposal, the EPA requested comment on two alternative ways of calculating cost-effectiveness for the architectural coatings rule: (1) cost-effectiveness considering total emission reductions in ozone nonattainment areas only, and (2) cost-effectiveness considering emission reductions in ozone nonattainment areas during the ozone season only.

After considering the comments summarized above, the EPA does not plan to adopt these alternative approaches to calculating cost-effectiveness for rules with nationwide control requirements, for reasons that are presented below.

One issue raised by the comments is whether the EPA's traditional measure creates a bias against strategies that apply in a limited geographic area (e.g., in nonattainment areas) relative to nationwide strategies, or against seasonal strategies relative to year-round strategies. This issue would arise if the EPA used cost-effectiveness figures to compare the desirability of these dissimilar types of strategies. In fact, the EPA did not use cost-effectiveness estimates in this way in developing the architectural coatings rule and does not plan to do so for other rules or guidance being developed under section 183(e). In the case of the architectural coatings rule, the EPA considered applying restrictions to architectural coatings only in nonattainment areas (either by rule or through a CTG). The EPA

determined that such geographically targeted restrictions for these nationally distributed architectural coatings would pose substantial implementation difficulties for government, would impose substantial compliance burdens on a large number of regulated entities, and would be less effective at reducing emissions than a national rule. Given that a strategy applicable only to nonattainment areas is not practical or desirable for architectural coatings, the EPA did not see a need to invest resources to pursue that strategy and calculate its cost-effectiveness.

The EPA considered whether use of one of the alternative cost-effectiveness methodologies would enable the EPA to make valid cost-effectiveness comparisons between nationwide and targeted geographic strategies, or year-round and seasonal strategies, for reducing ozone pollution. The EPA has the following concerns about the two alternative approaches: First, VOC emission reductions have benefits other than reducing ozone levels in nonattainment areas. As a result, the EPA believes the cost-effectiveness calculation for a nationwide, year-round rule should not exclude VOC emission reductions in attainment areas or outside the ozone season. The EPA recognizes that a primary objective of section 183(e) of the Act is to reduce VOC emissions in ozone nonattainment areas. However, as previously explained, in the development of the architectural coatings rule, the EPA found that the best policy alternative is to implement a nationwide rule. Therefore, emission reductions from this rule will not only be realized in ozone nonattainment areas, but also in all other parts of the country in which architectural coatings are distributed and consumed.

In general, the benefits of VOC reductions in ozone attainment areas include reductions in emissions of VOC air toxics, reductions in the contribution from VOC emissions to the formation of fine particulate matter, and reductions in damage to agricultural crops, forests, and ecosystems from ozone exposure. Emission reductions in attainment areas help to maintain clean air as the economy grows and new pollution sources come into

existence. Also, ozone health benefits can result from reductions in attainment areas. The closure letter from the Clean Air Science Advisory Committee (CASAC) for the recent review of the ozone NAAQS states that there is no apparent threshold for responses to ozone exposure [See U.S. EPA; Review of NAAQS for Ozone, Assessment of Scientific and Technical Information, Office of Air Quality Planning and Standards Staff Paper; document number: EPA-452\R-96-007]. In other words, reactions to ozone have been found at concentrations below the current standard (0.12, 1 hour), and the revised standard (0.08, 8 hour).

Second, under either alternative approach, emission reductions in ozone attainment areas would not be included in the calculation of a rule's cost-effectiveness. The implicit assumption is that emissions reductions in attainment areas do not contribute to cleaner air in nonattainment areas. In fact, NO_X emitted long distances away can affect ozone levels in nonattainment areas. In some circumstances, VOC sources outside nonattainment area boundaries contribute to ozone levels in nonattainment areas. As a result, a cost-effectiveness comparison based on the alternative approaches sometimes could create a bias against a nationwide rule relative to a strategy that applies in nonattainment areas only.

In light of the transport issue, it has been suggested that the EPA apply a weighting factor to account for differences in the extent to which emissions inside and outside nonattainment areas contribute to ozone formation in nonattainment areas. The EPA is concerned that in order to calculate cost-effectiveness using this concept, the EPA would have to conduct extensive and costly air quality modeling to estimate ozone reductions resulting from each candidate control strategy and that this would require extensive data on the location of emissions. Such detailed analysis is appropriate for some policy decisions, but not for all. As a result, the EPA is skeptical that this weighting approach would represent a generally useful analytical tool for decision making.

The EPA, of course, agrees that differences in the location and timing of emission reductions are a significant consideration in choosing among alternative strategies. The extent of ozone reductions and other benefits resulting from VOC emission reductions varies, partly based on location and season. In considering nationwide vs. geographically targeted controls, and year-round vs. seasonal controls, the EPA considers available information on the effectiveness of those strategies in reducing ozone--as well as other health and environmental considerations, economic considerations, and other relevant factors--in making a holistic assessment of which strategy is most desirable from an overall public policy standpoint.

There are instances where the EPA does provide an estimate of cost-effectiveness of a control strategy during the ozone season, i.e., generally, when a control strategy is feasible to apply on a seasonal basis, or when limits are set on a seasonal basis. Although these figures are useful for comparing different seasonal strategies, the EPA does not plan to use cost-effectiveness figures to compare seasonal and year-round strategies for the 183(e) program for the reasons presented above. In regard to the architectural coatings rule, the EPA notes that the nature of architectural coatings emissions does not allow for control strategies that reduce emissions only during the ozone season to be an objective for consideration. One reason is that the shelf life and consumption rate of architectural coatings varies greatly and one cannot predict that a certain percentage of a product made with a specified formulation will be consumed and, thus, result in VOC emitted during the ozone season. Due to the fact that reductions only during the ozone season is not a viable control strategy for architectural coatings, the EPA cannot endorse a seasonal approach to measuring cost-effectiveness for the architectural coatings rule.

Comment: One commenter (IV-D-16) expressed concern that the EPA supports the regulation of products when there is little, if any, cost-effectiveness to doing so.

Response: The EPA believes that the commenter's concerns are misplaced. The EPA favors controls that are cost-effective, when it is possible to do so from a policy and legal perspective. The EPA often compares the relative cost of different measures for controlling a pollutant by calculating the "cost-effectiveness" of the measures. Using the EPA's traditional calculation methodology, the cost-effectiveness of a regulation that applies nationwide is based on a comparison of national costs and nationwide emission reductions. This comparison is expressed as the cost per Mg (or ton) of emissions reduced. The EPA has assessed the cost-effectiveness of the architectural coatings rule. Using the estimated cost of $28 million (in 1991 dollars) and emission reductions of 103,000 Mg (113,500 tons), the nationwide cost-effectiveness of the architectural coatings regulation is $270 per Mg ($250 per ton). This compares favorably with emission reductions from other 183(e) rules, including consumer products at $256/Mg ($233/ton) in 1991 dollars and automobile refinish coatings at $140/Mg ($130/ton). The cost per ton of reductions from each of these rules is far more cost-effective than other sources of VOC reductions that can range up to thousands of dollars per ton. The EPA notes that Congress recognized consumer products (including paints and solvents) as a source for cost-effective reductions of VOC emissions when in enacted section 183(e) of the Act.

2.3.2.5 Disproportionate Impacts on Small Businesses

Comment: Using the State of California as an example, one commenter (IV-D-02/IV-F-11) claimed that the architectural coatings regulation would impose a devastating impact on small businesses. According to the commenter, since the California rules have been in effect, more than half the paint manufacturers in Northern California have closed. The commenter proposed that the EPA revisit a document that was presented during the Reg-Neg process entitled "ICF Study Summary, Small Business Economic Impact Study" final report, released in June 1988. This study examined the impact of a number of SCAQMD's rules, including its

architectural rule, on small businesses. Another commenter (IV-D-115) remarked that the shutdown of hundreds of paint manufacturers is at least in part due to the costs or physical constraints associated with increased environmental regulations.

One trade association (IV-F-2) representing 30 manufacturers, of which 20 are small businesses, conducted a poll of their members and gathered the following data on the impacts of regulation: (1) 10 to 50 percent of product lines were discontinued or replaced by new formulations as a direct result of the California regulations; (2) 64 percent of the companies lost market share, which resulted in a loss of revenue of $250,000 per year; (3) 27 percent of the companies lost market share, which resulted in a loss of revenue of greater than $1 million; and (4) 80 percent of the companies said that their product complaints had increased since the regulations took effect, resulting in costs of $250,000 per year per company.

The commenter also cited the results of the 1988 ICF study of SCAQMD, which the commenter claimed established that: (1) National coating companies specialize in water-based products; (2) smaller coating companies specialize in higher performance solvent-based products; and (3) smaller companies produce the coatings that are regulated and, therefore, bear the bulk of the cost of the regulation. In addition, the commenter stated that even though it may appear that only a small percentage of products require reformulation under the proposed rule, these products may be key for a small business to maintain viability.

The commenter (IV-D-214b) stated that product removal or withdrawal costs were more substantial than the EPA estimated, especially for those costs that would be incurred under a second phase of regulation. The commenter asserted that the discussion of removal costs in the draft architectural coatings preamble was devoid of merit. First, the commenter stated that the EPA treated the impacts of product removal as if they did not exist by aggregating multiple categories in a few meaningless segments. The commenter asserted that proposed limits of 250 or even

350 grams per liter would effectively remove traditional glossy alkyd enamels from the market. The commenter cited examples of paint companies being sold at a loss because of California rules banning traditional glossy alkyd enamels. The commenter stated that as a result of California's VOC limits for traditional glossy alkyd enamels for general purpose use, his family's company lost sales, was forced to discharge a large percentage of their work force, had difficulty raising debt and equity capital, and lost fair-market value. The commenter continued that the EPA's projection that less than 0.1 percent of product volume would be withdrawn from the market as a result of the proposed rules was too low. The commenter cited the 1988 ICF SCAQMD commissioned study which, according to the commenter, demonstrated that only a few regional and local manufacturers were expected to survive regulation of architectural coatings by SCAQMD Rule 1113. The commenter estimated that there were 500 small or regional paint manufacturers with aggregate sales of about $2.5 billion a year. The commenter asserted that the adoption of the proposed architectural coatings rule would reduce the estimated aggregate profits and company value by hundreds of millions of dollars, largely as a result of lost sales and profits from product removals.

Three commenters (IV-D-44, IV-D-110, IV-D-147) predicted large undue burdens for many small manufacturing companies due to reformulation, especially those with a small chemist staff. One commenter (IV-F-1[1]) stated that small businesses that only manufacture and sell in attainment areas do not contribute to ozone non-attainment and should not have to bear the cost of reformulating their products if the real intent of the rule is to reduce the potential of paint emissions to contribute to ozone levels that violate the NAAQS.

Another commenter (IV-D-02) stated that the proposed regulation has the effect of discouraging niche market formations which are a mainstay for small businesses. The commenter also stated that the regulation places undue resource burdens on the

small business, and it appears that because of this the regulation's effects favored large paint manufacturers.

One commenter (IV-D-175) stated that the rule will discriminate against the small business because large companies have greater resources and chemist staffs. The commenter claimed that the proposed rule threatened to put small businesses out of business.

Two commenters (IV-D-115, IV-D-147) predicted that manufacturers of products will not be able to compete with national manufacturers with larger resources and experience in VOC-compliant manufacturing.

One commenter (IV-D-130) requested that the EPA consider the significant financial impact of the rule on their small family-owned business and other small businesses. This small business reportedly manufactures and sells one waterborne and six solvent borne formulations of form release compounds in both attainment and non-attainment areas. The commenter indicated that two of its solvent-borne compound formulations would not meet the proposed VOC standards. According to the commenter, at least one of these products cannot be reformulated and will have to be discontinued. The commenter stated that his small business will lose $600,000 in gross sales over the next 3 years if one product cannot be reformulated; $1.5 million in gross sales if both products have to be discontinued. The commenter also estimated that the additional costs of testing, reformulation, technical help, labeling, liability, etc., would total $38,800. The commenter added that many of these items are one-time costs, but for a small company they are significant.

One commenter (IV-D-178) stated that many small businesses will be eliminated by the VOC limits in the proposed rule. The commenter was concerned that a number of its products could not comply with the proposed limits. The commenter estimated that it will require a minimum of 10 man-years to reformulate all of these products. Because the commenter only has two chemists working full time and cannot afford to hire an additional

chemist, the commenter considered the January 1, 1997 compliance date is unrealistic.

One commenter (IV-F-11) stated that small companies typically have limited funds, less than $100 million in sales, and less than 500 employees. The commenter noted that small companies tend toward specialties and niches, that uniformity eliminates specialties and niches, and that large companies desire uniformity. The commenter noted that small companies have limited staffing for research and development and for administrative requirements, have limited data processing abilities, and are often family-owned and operated. The commenter believed that regulation would eliminate niche markets, increase administrative requirements such as record keeping and labeling requirements, and consume research and development time to formulate complying products to replace products in order to stay in business, therefore eliminating R&D time for formulating new products for growth. The commenter also asserted that regulation consumes sales time educating customers of the rule requirements and methods to apply compliant coatings and increases the rate of product failures and rejects, therefore increasing waste and inventory obsolescence. The commenter claimed the following effects of California's rules: death of several paint industry executives due to heart failure, stroke, and suicide; daily violations of rules by many businesses; scores of businesses driven from the State and country; and negative impacts on air quality.

Another commenter (IV-F-1h) stated that the architectural coatings rule will cost small business a lot of money so the rule should be based on sound science, facts, and risk-cost benefit analysis.

One commenter (IV-D-55) stated that the publication of the proposed architectural coating rule would adversely affect many small businesses by making the industry aware that certain products may no longer be produced in the near future. The commenter stated that this would affect specifiers because they would be uncertain about the availability and performance

qualities of certain specialty and high-performance coatings. The commenter stated the proposed architectural coating rule would create hardship on companies because they would need to consider changing raw materials, manufacturing processes, etc. The commenter stated that the potential for additional study and amending of the proposed rule created uncertainty which might cause small companies to conclude that their only recourse was to seek out a merger or consolidation.

Another commenter (IV-F-2) likewise expressed concern about the ability of small businesses to comply with the rule. This manufacturer reportedly has about $6 million in annual sales, less than half of which is architectural coatings. The company sells coatings in all 50 States, but 80 to 85 percent of these sales are in California. The company specifically targets its sales in the unregulated areas in California. The commenter indicated that all of the company's products are relatively low volume. This small coatings manufacturer produces coatings in 29 different coating categories. Within the 29 categories, 30 to 40 products would have to be reformulated to meet the proposed standards. The commenter operates close to the break even point and has gone from one chemist to five chemists.

Response: The EPA understands the concerns of small businesses regarding compliance with the rule and has made adjustments in the final rule to address their concerns. The EPA notes, however, that comparisons to the effect of California regulations, even if they were correct, are not appropriate given the different VOC content limits of the final rule and existing regulations in California. The existing rules in California generally require lower VOC contents than the limits in this rule. Because the national regulation is generally not as stringent as existing California district regulations, there should be no incremental impact on small producers selling in California markets. These producers may experience impacts from the national rule if they sell in non-California markets and have not found a way to produce lower VOC coatings since the California limits were put in place. Notwithstanding the

concerns expressed by the commenters, the existing rules in California do not appear to have eliminated the paint industry in that State. Based on a 1990 survey of the manufacturers that sell architectural coatings in the California market, there were 149 small businesses with total company sales less than $50,000,000 that participated in that market compared to 25 large manufacturers with total company sales greater than $50,000,000.

Several statutes provide guidance for the EPA to consider the impacts of its regulations on small firms. The EIA report for proposal identified and, to the extent possible, quantified the impacts of a national rule on small producers in accordance with the Regulatory Flexibility Act. This analysis has been revised given changes to the final rule and has been augmented by an analysis to meet the amendments to the Regulatory Flexibility Act by the Small Business Regulatory Enforcement and Fairness Act. Similar to the finding of the ICF report, the EPA's analysis confirms that because compliance costs are fixed for all levels of production (i.e., it is not reduced if the volume produced is low), these costs comprise a greater share of baseline costs and revenues for small producers. The EPA analysis also confirms that small producers are more heavily represented in the higher VOC categories. The EPA has considered these factors and the comments received on the proposal in developing the final rule and has included several provisions to address such concerns, including:

- the creation of new product categories where warranted;
- an extended period for compliance after promulgation to allow for reformulations;
- a VOC tonnage exemption; and
- an exceedance fee provision.

All of these provisions were considered, in part, to mitigate unnecessary adverse impacts of the rule upon small businesses. The EPA notes that section 183(e) of the Act

instructs the EPA to obtain appropriate VOC emission reductions from consumer and commercial products. In seeking to achieve these reductions from the architectural coatings rule, the EPA has adjusted the final rule in ways that it deems reasonable to help to limit the impacts on small businesses. The analysis of the final rule conducted by the EPA confirms that these mechanisms will provide the intended compliance flexibility, while still allowing the final rule to achieve necessary levels of VOC reductions from this product category.

The EPA's rationale for controlling attainment areas is provided in section 2.1.2 of this BID.

Comment: Two commenters (IV-D-212, IV-D-212p6k, IV-F-11) pointed out that smaller companies have a higher percentage of coatings that may require reformulation because they tend to produce niche market coatings that have higher solvent contents. One commenter (IV-F-11) explained that smaller companies find it difficult to compete with the large companies on the more common water-based paints because of their large batch sizes, better purchasing power and other economies of scale, including significantly increased sales dollars relative to R&D expenses. The commenter stated that a small company cannot pay $10 to $15 million and spend 100- to 150-person years to reformulate their coatings when there are only six person years available. According to the commenter, a small company can only look at a few product lines and reformulate them and let the rest go to the competition. The commenter predicted that half of the 400 to 500 companies with sales less than $10 million will be gone by the year 2000 if the proposed rule were adopted.

The other commenter (IV-D-212, IV-D-212p6k) explained that the large national and multinational paint manufacturers devoted a high percentage of their product mix to waterborne paint products and seldom attempted to meet the needs of local and regional conditions. The commenter (IV-D-212p6k) stated that for small regional companies, a higher percentage of special products were made which the local market requested and required for their particular needs. The commenter (IV-D-212) stated that the cost

of reformulation to these manufacturers would be substantial and would force some companies out of business.

Four commenters (IV-D-16, IV-D-26, IV-D-73, IV-D-110) asserted that the rule would destroy solventborne niche markets generally maintained by smaller producers, and would help foster an anti-competitive and oligarchical setting in the architectural coating industry.

Response: The EPA agrees that small companies do produce many high-VOC products. The Regulatory Flexibility Analysis (RFA) chapter of the proposal EIA report confirms that small firms tend to produce niche products with higher VOC content. The report indicates that products from the small company segment of the survey population are more heavily represented in high VOC categories (specialization effect) and more heavily represented in the high VOC products within categories (technology effect).

The EIA assumes that if the cost of reformulation exceeds the profits of a product, then a firm will choose the least-cost option and will withdraw the product from the market. The report found that given the fixed costs of reformulation (i.e., cost does not vary with volume level) many of the smaller volume products (that may or may not be produced by small firms) would be predicted to exit the market. The EPA has included this in its consideration to revise the rule to include the tonnage exemption and the fee provisions, which will reduce the burden on all firms.

The EPA estimates that just over 1 percent of the baseline products will be removed from the market, so the potential effect on industry competition appears to be very small. Compared to other industries, the coatings industry is relatively unconcentrated[3], which implies that it is highly competitive.

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[3]Relative industry concentration is typically measured using a Herfindahl-Hirschman Index (HHI). HHI is represented on a scale of zero (perfect competition) to one (pure monopoly). The most recent HHI value for SIC 2851: Paints and Allied Products is .0305, which indicates and industry structure close to perfect competition (Source: 1992 Census of Manufactures report MC92-S-2 "Concentration Ratios in Manufacturing").

Therefore, a relatively small product withdrawal effect on a relatively unconcentrated industry suggests that significant degradation of market competition is unlikely. Thus, although the EPA agrees with the commenters that many small companies make higher VOC products, the EPA disagrees with the conclusion of the commenters regarding the actual impacts of the architectural coatings rule. The EPA's analysis suggests that the alternative compliance mechanisms in the final rule will mitigate the impacts of concern to the commenters.

Comment: The commenter (IV-D-212) stated that in the Regulatory Flexibility Analysis (RFA) for the architectural coatings rule, the EPA attempted to justify cost data and its effect on small business by analyzing only a small representative pool of businesses (36 paint manufacturers). The commenter asserted that the EPA made no attempt to supplement this information so that the economic analysis would be based on a more complete set of data which was available at that time.

Response: The EPA's analysis of small entity impacts utilized data provided by the industry survey. The survey includes detailed information on nearly 5,000 architectural coatings produced by 116 manufacturers, 36 of which claim to be small businesses. To preserve confidentiality, however, the data were provided to the EPA at an aggregated level for the small business sector. The small business component of the survey provided the total number of products produced by these firms, the VOC content of the products, and total sales volume (in units, not dollars), but did not link any of this information to specific firms.

With the survey information, the EPA was able to develop impact estimates for a model small company. The model company parameters were assigned by taking per company averages for the 36 surveyed small companies in the following categories:

- number of architectural products sold (27.5)
- number of non-compliant products (7.8)
- volume per product (66,400 liters)

And taken together with an average sale price of $2.52 per liter,

- coating revenue ($4.6 million).

This information was used to evaluate the impact of the regulation on a model small entity. Impacts were initially estimated by computing the ratio of the cost of reformulating all non-compliant products to total revenue. The resulting cost/revenue ration is 2.5 percent. This gives an upper-bound estimate of average impacts, because it does not consider compliance strategies that are less expensive than reformulation (i.e., exceedance fee or product withdrawal). When those strategies are factored in, the ratio drops to 2 percent. Moreover, this estimate is still biased upward in the sense that it implicitly assumes that the firm is unable to increase prices for the product to recover some of the additional cost.

The EPA also obtained a list of other small businesses in the industry and obtained total revenues for these firms. However, without specific information on the number of products produced and their VOC content, there is no method to determine the number of products that would incur reformulation costs. Unfortunately, assigning the model firm's costs (based on 7.8 non-compliant products) does not produce a meaningful evaluation of the distribution of small firms' impacts. This occurs because the calculation of cost/revenue ratios for these firms varies the denominator (firm revenues) by firm, but the numerator (compliance costs) remain fixed as those represented by the model firm. Using this method, the estimated impacts would, by definition, be relatively larger for firms with small revenues. However, it does not necessarily follow that a firm with low revenues would have the same level of reformulation costs as a firm with larger revenues and such an analysis would, therefore, overstate impacts on the smallest firms. Therefore, for the final rule, the EPA used the data from the 36 firms in the survey to provide a representative look at model company small business impacts, as described above.

Comment: One commenter (IV-F-1c) asserted that the proposed rule was anti-small business. The commenter stated that the EPA

had not taken into account the impact of the rule on small paint retailers. The commenter claimed that the effect of the proposed rule on small business was not adequately addressed in the EPA's analysis. The commenter asserted that the EPA decided not to have the rule subjected to the new Reg Flex amendments which were so important to the small businesses. The commenter also stated that for small businesses the products affected represented a higher percentage of: products, sales, profits, and cost of reformulation.

Response: Section 3 of the proposal EIA identifies, and to the extent possible, quantified potential impacts on small firms. The EPA's analysis has been revised and improved given changes in the final rule and has been augmented to meet the requirements of the Small Business Regulatory Enforcement and Fairness Act. This analysis suggests that because reformulation appears to be a fixed amount no matter how much or how little is produced, small firms who generally have smaller volume products may experience reformulation costs that are a greater percent of their baseline cost and revenues. The EPA has taken several steps to alleviate this burden, including:

- the creation of new product categories where warranted,
- an extended period of compliance after promulgation to allow for reformulations,
- a VOC tonnage exemption, and
- the exceedance fee provision.

All of these provisions were considered, in part, to address niche markets and small business burdens.

While the EPA did not directly measure the impacts of the rule on the retailing sector, which would include small dealers in small towns as well as all other dealers, the indirect impacts on these sources of price increases and lower product output is properly reflected in the market analysis of the EIA by the estimated change in "consumer surplus." In general, consumer

surplus is the measure of utility (or benefits) consumers (i.e., retailers, contractors, home-owners, and other AIM coating users) receive for the supply of a product to the market. When prices increase and output falls for products in a market as the result of a regulation, this measure is reduced to a certain extent. The EPA estimated that consumer surplus at proposal would potentially be reduced by approximately $3 million if reformulation was also the only compliance option, and by $6 million if the fee provision is considered. Since the impact on consumers is less than one-third of the burden on manufacturers, and small dealers are a small subset of this effect, it is likely the impact on small dealers will be minimal. Another indicator of a minimal impact on small dealers is the fact that the analysis predicts that less than 1 percent of all products will be withdrawn from the affected markets. Although some producers may decide to discontinue certain products, these products will be produced by another manufacturer if demands warrants it. Thus, retailers may see a change in the manufacturer, but will still be able to sell such products.

Comment: One commenter (IV-D-52) stated that the EPA's proposed VOC content limits would require virtually all small paint manufacturers (except those who have long been regulated) to cease making many of the products they desire to make.

Response: The EPA disagrees that the rule will have the severe impact feared by the commenter. The EPA's analysis suggests that the impacts will be limited. The EIA assumes that a manufacturer will reformulate a product if it is economically feasible, that is, if the profits of the product exceed the costs of complying with the regulation. Using this criterion, the EIA suggests that the vast majority of reformulations are economically feasible, which is evident by the finding that only 1 percent of the products will be removed from the market because the cost to reformulate would exceed the profits obtained from the product. This level of withdrawal is the aggregate of numerous varieties of products across 13 different market segments, so it is unlikely to eliminate an entire product

category. In addition, the final rule contains 61 categories of products, many of which will preserve specialty, niche market sectors within the industry. Also, the tonnage exemption and exceedance fee provisions in the rule are expected to provide further compliance flexibility which will allow manufacturers to maintain product lines with VOC contents that exceed the VOC content levels of the standard.

Comment: One commenter (IV-F-1e) estimated that reformulation will take 1 to 2 years and cost at least $150,000 per product line. The commenter stated that it will need a minimum of $450,000 to reformulate. If the commenter does not reformulate, it estimated that its exceedance fee will exceed $4.4 million, a cost that it will pass on to its customers.

One commenter (IV-D-189) emphasized the very diverse nature of the architectural coatings industry, and the disproportionate cost impacts the national rule will have on manufacturers. For many companies, the commenter asserted that compliance with the national rule will impose tremendous economic burdens. The commenter noted that timing plays a key function regarding determining cost of the rule's implementation; that is, the more time provided for manufacturers to comply, the lower the cost for most companies to implement the rule. The commenter recommended that the EPA give more weight to the impact the national rule will have, not only on unregulated areas, but currently regulated areas as well. A currently regulated area with similar VOC limits such as those in the national rule will benefit because any end-use of out-of-State non-compliant products within the currently regulated area would decrease.

Response: Based on this and other comments requesting adequate lead time for compliance, the EPA is allowing a year for compliance after promulgation. In addition, the final rule allows a 23 megagrams (25 ton) of VOC exemption per manufacturer in the time period from the compliance date through the year 2000, 18 megagrams (20 tons) in the year 2001, and 9 megagrams (10 tons) each year for the year 2002 and all future years. If additional flexibility is required beyond these provisions,

producers can pay an exceedance fee on any remaining products that exceed the limitations. All of these measures are expected to reduce the burden and cost to producers. In addition, the EPA has also modified its reformulation cost estimate, taking into consideration the costs provided by commenters (see section 2.3.2.1 of this document).

2.3.2.6 Effect of Rule on Competition

Comment: Two commenters (IV-D-165, IV-D-166) stated that the proposed rule would make their company's products economically anti-competitive. Another commenter submitted four letters (IV-D-212, IV-212p6, IV-D-212p6k, IV-D-212jj) claiming that a national rule provides a competitive advantage for large national and international companies over small regional and local companies. The commenter stated that the larger companies market throughout the nation so a uniform national rule simplifies marketing, production, and compliance activities. Also, the commenter claimed that the larger companies predominantly produce waterborne coatings which already meet the proposed limits so that these larger companies will not be subjected to the costs of product reformulation and product withdrawal. In contrast, the commenter claimed that most smaller companies market in local regions that are in attainment with the ozone standard and are not subject to VOC content limits. Thus, in the absence of a national architectural coatings rule, these companies would be unaffected by the problem of ozone nonattainment. The commenter (IV-D-212p6k, IV-D-212jj) stated that the larger companies have access to technology that provide them with a competitive advantage in reformulating products.

The commenter (IV-D-212p6k, IV-D-212jj) contended that the National Paint and Coatings Association advanced a policy for a national rule because it is composed primarily of large manufacturers, and large manufacturers promote a national architectural coatings rule because a national rule will provide their companies with competitive advantages. The commenter (IV-D-212, IV-D-212p6k, IV-D-212jj) implied that the EPA was biased in favor of larger manufacturers and against the smaller

manufacturers. The commenter (IV-D-212p6k) cited "Catching Our Breath, Next Steps for Reducing Urban Ozone" prepared by the Office of Technology Assessment as an example of bias for the larger manufacturers. The commenter noted that "Catching Our Breath" recommended the regulation of architectural coating products on a national basis and the only apparent representative of the paint industry on the advisory panel was a representative from one particular large company. The commenter asserted that the imposition of regulations would have a very strong competitive benefit on behalf of the large national companies while having a severe economic impact on the many hundreds of small paint manufacturers across the country. The commenter (IV-D-212, IV-D-212jj) concluded that although the Act did not contain provisions conferring a competitive advantage to one segment of the industry over another, the effect of the proposed architectural coatings rule would extend a decided competitive advantage to the large and international companies, which was contrary to the express intent of Congress and the President of the United States. Another commenter (IV-D-26) suggested that the EPA has not worked closely enough with small paint manufacturing companies, but instead worked closely with the National Paint and Coatings Association.

One commenter (IV-D-212) noted that mergers in the paint industry were being partly driven by increased regulatory activity and threatened regulatory activity.

One commenter (IV-D-212jj) stated that a national trade association observed during the Reg-Neg process that a substitution of products would place its members at a competitive disadvantage and drive many of them out of business. The commenter also stated that the small business would be most adversely affected if prohibition-type regulations were imposed (most of the large national manufacturers focus almost exclusively on water-based products). The commenter questioned whether most large national and international companies favored a Federal national rule for purposes of cleaning up the air or for marketing and competitive purposes.

The commenter (IV-D-212p6k, IV-D-212jj) also claimed that major national companies openly acknowledged that certain individual companies may have favored such a policy for competitive reasons. The commenter cited one large firm as an example and stated that this company had access to technology which would give it a competitive edge if it had a national standard to which it could formulate.

One commenter (IV-D-212p2) claimed that a substantial number of companies in California were opposed to the proposed regulations. According to the commenter, these regulations were being used primarily for the purpose of achieving market uniformity on behalf of large national and international companies while causing a severe disadvantage to many local and regional companies, which could have anti-trust implications. The commenter (IV-D-214c) claimed the main effect of the proposed rule would be severely anti-competitive, that the industry would be controlled by "federal bureaucrats" and a few corporations.

One commenter (IV-D-212) asserted that the proposed architectural coatings rule was anti-competitive in nature, pitting the small, local and regional manufacturer against the national and international manufacturer. The commenter explained that companies in attainment areas, who have heretofore been unregulated, would be required to reformulate with new products and would find it difficult to compete against most of the other companies who would not be compelled to reformulate.

Response: The EPA disagrees with these comments which suggest that the EPA intends the rule to favor large companies over small companies, national companies over regional companies, or any permutation thereof. The EPA intends the rule to achieve necessary VOC emission reductions consistent with the provisions of section 183(e). The EPA's rationale for a national regulation compared to a CTG is provided in section 2.1.2 of this BID, and is based on the effectiveness in achieving reductions, not on economic efficiency.

As the EIA indicated at proposal, estimated market effects from the architectural coatings rule are relatively slight for

all regulated entities under the rule. Approximately 1 million liters of architectural coating products, accounting for less than one-tenth of 1 percent of industry product volume, are projected to withdraw from the market during the first year that the architectural coatings rule goes into effect. Price effects in each market are expected to range from no effect to an increase of less than two cents per liter, which is still less than a 1 percent increase of the baseline price. Average price and quantity effects across all market segments were each less than one-tenth of 1 percent of baseline values. Given the small impacts of the rule on the industry as a whole, the EPA does not believe that the rule will result in a significant competitive advantage to any segment of the industry.

The level of product withdrawal discussed above is the aggregate of numerous varieties of products across 13 different market segments, so it is unlikely to eliminate an entire product category. In addition, the rule contains 61 categories of products, 7 of which were added into the final rule based on public comment and many of which will preserve specialty, niche market sectors within the industry. Also, the tonnage exemption and the exceedance fee provisions in the rule are expected to provide further compliance flexibility which will allow manufacturers to maintain product lines with VOC contents that exceed the VOC limits set by the standard. The rule also exempts products sold in containers of 1 liter or less. Consequently, the resulting effect on industry competition is also likely to be minimized. Compared to other industries, the coatings industry is highly competitive due to the numerous manufacturers in the industry. Therefore, a relatively small product withdrawal effect on a very competitive industry suggests that significant degradation of market competition is unlikely. Given the low percentage change in price and consumption, the level of substitution to other manufacturers products is expected to be low.

Finally, the EPA notes that the effect of the final rule is not anticompetitive merely because those companies with low-VOC

products will have more limited costs of compliance. Those companies have already expended resources to develop lower VOC products and the rule is intended to encourage the development of such products in the future.

Comment: Two commenters in three letters (IV-D-55, IV-D-214b, IV-D-214c) stated that the EPA was required but failed to assess the impact of the proposed rule on painting contractors and independent retail dealers. One commenter (IV-D-214c) claimed that the impact of the rule would have a profound ripple effect in various related sectors. For example, instead of choosing from many low-priced high-quality products supplied by many manufacturers, a dealer might be forced to choose from a few dominant manufacturers. According to the commenter, about 29,900 painting contractors would be adversely impacted; most of the 26,100 workers in the paint manufacturing industry were employed by those manufacturers adversely impacted by the proposed rule; and consumers would face restricted choices, lower quality, higher product costs, and higher labor costs as a result of the rule.

Response: The EPA disagrees with the conclusions drawn by the commenters. The impacts on painting contractors and their employees and the restricted choices to consumers that are referred to by the commenter are the result of the commenter's assumption that every reformulation required by the VOC standards is economically infeasible, thus the products would be taken from the market causing manufacturers, contractors, retailers and consumers to be substantially impacted. The analysis in the EIA assumes that reformulation is economically feasible if the profits of the product exceed the costs of reformulation. Given this assumption, the EIA analysis suggests that only 1 percent of the products will be removed from the market (prior to consideration of the tonnage exemption and exceedance fee provisions). This level of withdrawal is the aggregate of numerous varieties of products across 13 different market segments, so it is unlikely to eliminate an entire product category and thereby limiting product choice. In addition, the

rule contains 61 categories of products, many of which were created, in part, to preserve specialty, niche market sectors within the industry. Thus, the EPA contends that the rule simply will not have the effects feared by the commenters. The EPA's analysis indicates that the VOC content limits imposed by the rule are reasonable and that the adverse impacts of the rule will be limited.

While the EPA did not directly measure impacts on contractors and other consumers, the indirect impacts to these users of coatings products are captured in the market analysis by the estimated change in "consumer" surplus, along with all other downstream effects beyond the manufacturer. In general, consumer surplus is the measure of utility (or benefits) consumers (i.e., retailers, contractors, home-owners, and other paint users) receive for the supply of a product to the market. When prices increase and output falls for products in a market as the result of a regulation, this measure is reduced to a certain extent. The change in consumer surplus is estimated in the EIA at proposal to be $3 million under the proposed standard and $6 million if a fee option is considered. Since the impact on consumers is less than one-third of the manufacturers' burden (producer surplus), and contractors and retailers are a small subset of this effect, the EPA saw no indication of a need for a special analysis of such indirect impacts. Again, the EPA's analysis indicates that the overall adverse impact of the rule will be limited.

Comment: One commenter (IV-D-177) expressed concern that the proposed architectural coatings rule would have a negative impact on the nation's paint industry and on the nation's ability to compete in the global market place.

Response: Because all producers (foreign and domestic) must comply with the requirements of the rule for paint sold in the United States, it was assumed there would be a minimal impact on foreign trade. Regulations which impose increased costs of production on domestic producers only may put them at a disadvantage compared to foreign producers operating in U.S.

markets. However, in this case all producers (foreign and domestic) will face the same level of costs for their respective U.S. markets. Thus, only minimal effects will occur as a result of product withdrawals by producers (foreign and domestic) that do not find it efficient to continue to offer a product to the U.S. market.

The demand U.S. manufacturers face for products abroad should remain constant with or without the regulation on U.S. products. Manufacturers who already sell their products in foreign markets will not have to adjust formulations because of the VOC content limits of the architectural coatings rule, because exported coatings are not subject to the rule.

2.3.2.7 Economic Hardship

Comment: One commenter (IV-F-1e) is a nationwide company that supplies a number of products and is known as a one-stop supplier. The commenter noted that in California, when product quality decreased on one product, sales declined on other products. Also, the commenter stated that his company might lose over $3 million in compliant top coat and base coat sales because the primer could not comply with the limit set in the proposed rule. Another commenter (IV-F-1h) believed the proposed architectural coatings rule would force it to sell a lower-quality, higher-priced product and quality is very important to it as a small company.

Response: The commenters did not provide sufficient detail for the EPA to address the commenters' points specifically. As noted earlier in this document, the EPA has no evidence that products of acceptable quality cannot be manufactured at the VOC content limits specified in the regulation. Furthermore, there are multiple options under the final rule for the commenters, including the option of reformulating, using the tonnage exemption, or paying the exceedance fee.

Comment: One commenter (IV-D-182) estimated that the architectural coatings rule will cost it a total of $2,605,000 which would be a tremendous economic hardship. The commenter explained that reformulation costs are difficult to estimate and

there are many "other" costs that they have no idea about how to estimate. Their cost estimate includes: (1) reformulating costs, (2) costs incurred due to lost business and lost new product research, (3) costs for material storage tanks or space for any special raw materials needed, (4) costs for collecting and replacing labels, MSDS sheets, and product information sheets, and (5) costs for training store employees and dealers. The commenter believes considerable additional cost that they have no way of measuring at this time could arise due to poor quality performance or premature product failure and complaint adjustments to customers. According to the commenter, implementation of the architectural coatings rule will shift its company's major focus from producing, marketing, and selling quality paint to meeting the architectural coating regulations.

The commenter provided the following basis for its cost estimate. First, it will have to reformulate 98 different products within 18 different lines of paint. The products which will need reformulating fall into ten categories: (1) fog coatings, (2) nonflat coatings (exterior), (3) nonflat coatings (interior), (4) primers and undercoaters, (5) quick dry enamels, (6) quick dry primers, (7) rust preventative coatings, (8) stains (clear and enamels), (9) traffic marking coatings, and (10) waterproofing sealers and treatments (clear). Based on past experience, they estimate it would take at least six months to reformulate properly and thoroughly and test a product for interior application only, and it would take longer for exterior applications. Based on the compensation and related benefits for the technical director and lab technicians, the average cost comes to $85,000 per product line for a total reformulation cost of $1,530,000. Because some lines have tint bases that will take longer than 6 months, the actual cost will be even higher, increasing the estimate to approximately $2,000,000.

Second, the commenter estimates $285,000 of business would be lost due to banned products and lost customers. The commenter lacks sufficient personnel to reformulate everything that needs reformulating by April 1997 so they would be forced not to sell

certain products. Because they are in a market where their customers expect one company to supply them with every product they need, the inability to supply some products could cause some customers to be lost.

Third, the commenter estimates $365,000 would be lost in economic opportunities for product improvement and new product development. Fourth, the commenter estimates $225,000 in costs for storage space for new materials that may be required in new formulations and for extra storage space for slow moving raw material inventories that may need to be maintained. Finally, the commenter estimates $200,000 in costs for collecting, reproducing and redistributing new product labels and associated paperwork.

Response: The average of the cost estimates submitted in the public comments (including the commenter's costs), which include most of the "other" costs referenced in the comment, was substantially less than the EPA's original estimate of one-time costs used in the proposal analysis (see Appendix A). Although many of these "other" costs are now included in the final analysis based on the public comments received, omission of these cost components at proposal did not cause an understatement of national costs. The EPA used an estimate of $250,000 for reformulation, thereby overestimating costs for this producer ($85,000).

While the EPA maintains that its methodology for estimating the number of products nationwide needing reformulation is appropriate, it is not possible to verify that the 18 product lines referenced in the comment were either directly (through the survey) or indirectly (through the methodology for estimating non-surveyed product costs) included in the national number.

The final rule is not expected to "ban" any products because reformulation is anticipated to be technically feasible without significant product quality changes. The financial losses are quantified in the EIA as producer impact based on reductions in profits (rather than lost sales). Using the average profit margin presented by NPCA in the regulatory negotiation of

18.3 percent, the estimated losses based on the information in this comment from product withdrawals would be approximately $52,000 per year if the firm only considered product withdrawal as an alternative to reformulation and did not utilize the exemption provision, or fee option.

The EPA cannot validate the estimate that $365,000 would be lost in economic opportunities for product improvement without more information. However, the EIA analysis estimates the costs of funds invested in reformulation, which directly reflects the opportunity cost of capital, i.e., the economic value of foregone opportunities.

In regard to the $225,000 estimate for storage space for new materials, it is not clear from the comment why storage of materials used in new formulations would exceed storage needs for materials in old formulations. Storage is needed for the new materials, but presumably, storage will no longer be needed for the materials that are being replaced.

Divided by 18 product lines, the $200,000 cost for collecting, reproducing, and redistributing new product labels and paperwork would come out to approximately $11,000 per product. These being one-time costs, they need to be viewed in the context of the $250,000 one-time costs that the EPA assumed for reformulation at proposal. The commenter has indicated that the one-time per product reformulation cost estimate for this company is $85,000. Therefore, even if the $11,000 is added to the $85,000, the total cost is well below the $250,000 per products assumed in the EIA at proposal. Moreover, paperwork costs are estimated separate from the EIA and are added to the social cost estimate from the EIA to get the national cost estimate. Therefore, paperwork costs are not excluded from the national estimate.

Comment: One commenter (IV-D-180) maintained that only 58 percent of its 20.5 million dollar 1995 coating sales was for products that complied with the proposed rule, which is too low a percentage to sustain their coating business.

Response: As the rule was structured at proposal, manufacturers only had the options of reformulating products to comply with the limits, or withdrawing a product from the market. Under this situation, the commenter may have determined that it would cost the company less to lose the profits ($20.5 MM x profit margin of 38 percent) from these products than to incur the costs of reformulation. The final rule, however, provides two additional options for this company: a tonnage exemption and payment of an exceedance fee. This commenter suggested that a 450 gram per liter limit for floor coatings would enable the company to remain competitive in the market. Given that the company's products are relatively close to the limit (i.e., within 50 grams per liter), the exceedance fee approach would likely be an attractive, viable option for this manufacturer once the company has taken advantage of exempting some of the noncompliant flooring product sales under the tonnage exemption.

Comment: One commenter (IV-D-152) noted that the annual sales of its products affected by the proposed rule is under $10 million but represents 20 percent of its total revenue base. Product line includes concrete curing and sealing compounds, form releases, penetrating sealers and coatings. The commenter points out that even with the adoption of its recommended 700 g/l limit for concrete curing and sealing compounds, as discussed in section 2.2.4.2, the company expects a significant shrinkage of architectural coating sales due to the rule. The commenter noted that a total elimination of solvent-based concrete curing and sealing compounds would hurt its business growth because the loss of the financial resources being generated from the sales of those products.

The commenter presented a breakdown of the impact of the proposed rule on its financial resources as follows:

Reformulation of 12 products @ $72,000/product:	$864,000
Literature development/alterations:	$60,000

Label changes:	$10,000
Training of sales force/distributors	$85,000
	$1,019,000
Manufacturing/Capital Equipment	$450,000
Total Costs	$1,469,000

The commenter emphasized that the above direct cost estimates do not include opportunity loss. All of the costs assume a fully implemented new architectural coating product line on the date the regulation takes effect. In practice, according to the commenter, this could not happen and the timeframe between the effective date of regulations and introduction of new compliant products represents potential lost revenue and profits. This loss is potentially the largest of all costs according to the commenter. Further, the above costs do not address the issue of having the funds available for such a project or the uncertainties of holding a market share in a rapidly changing market. Based on these costs, the commenter estimated the selling prices of materials would be expected to rise 15 to 18 percent to cover costs and the resulting higher incidence of claims due to product failure.

Response: Using the commenter's cost estimate of $1,019,000, the average one-time cost per product is approximately $85,000 per product, which is substantially below the $250,000 cost estimate used in the EIA at proposal. It should be noted that, in part, in response to this commenter's request, a category of "concrete curing and sealing" compounds with a VOC content limit of 700 g/l was added to the final rule, as discussed in section 2.2.4.2 of this document, and would be expected to significantly reduce the cost for compliance for this company. The EPA has also considered this compliance cost information in the adjustment of one-time costs used in the final analysis (see Appendix A for a description of the review of compliance costs).

It is not clear what the manufacturing/capital equipment costs of $450,000 refer to. If new machinery must be purchased to reformulate (and do nothing else), information on the service life of that machinery is necessary to place it on a comparable annual basis with all other costs.

With regard to the statement about foregone profits for products being the largest cost, these losses should be mitigated by the availability of the 1-year compliance period, the tonnage exemption, and the exceedance fee option of the final rule for an interim period until the products can be developed.

2.3.2.8 Small Business Administration

Comment: One commenter (IV-D-16) expressed concern that the Small Business Administration (SBA) appears to support the exceedance fee, low volume exemption and the variance provision, despite the commenter's belief that the recordkeeping and reporting burden of these options is too high for small businesses to take advantage of them. One commenter, the Small Business Administration (SBA)(IV-D-57/IV-D-75), acknowledged that the EPA consulted with SBA during the development of the proposed rule, and the EPA incorporated several of SBA's suggestions in the proposal and supporting regulatory analysis. The commenter also noted that SBA has been working with the trade associations and some individual paint manufacturers on the rule.

Response: The SBA was involved in the regulatory development process to provide suggestions on alternatives to minimize the impacts of the rule on small businesses. Based on input from the Office of Management and Budget and the SBA prior to proposal, the EPA requested comment on inclusion of an exceedance fee provision and took comment on the need for additional provisions to further accommodate specialized, niche products. After consideration of the many comments on these provisions, the EPA has included an exceedance fee provision and a tonnage exemption in the final rule. As discussed in section 2.4.1 of this BID, the exceedance fee provides long-term flexibility, and a less costly compliance option, for both small and large manufacturers selling very low-volume specialty

coatings where the cost of reformulation may be prohibitive compared to the potential profit. The estimated cost for reporting and recordkeeping of the fee provision at a company with an average of eight reformulations is approximately 0.1 percent of sales revenue for a company with $5 million of sales revenue. Therefore, the EPA believes that the recordkeeping associated with this compliance option does not present a significant burden, even for small businesses. The final rule also includes a tonnage exemption that can be used in combination with the exceedance fee. The final rule does not include the proposed variance option.

2.3.2.9 Definition of "Small Business"

Comment: One commenter (IV-F-1m) suggested that a better definition to use in examining the economic impacts on small businesses is companies with less than $50 million in annual sales and fewer than 500 employees. Another commenter (IV-D-44) advised the EPA to raise its unrealistically low categorization of small business manufacturers to about $20-30 million dollars in annual sales. Another commenter (IV-D-120) requested that the EPA change its definition of a small business as having less than $10 million in annual architectural coating sales and less than $50 million in total annual sales of all products, to those businesses with fewer than 500 employees or less than $10 million in architectural coatings sales.

Another commenter (IV-D-180) requested that the EPA carefully consider the definition of a small business. The commenter stated that its complete company would not meet the SBA definition of a small business, but its floor coatings division would. The commenter stated that larger companies are impacted less by the proposed architectural coatings rule because they have both research resources and a broad product offering that includes many coating areas where lower performance can be satisfied with existing low VOC technology. Another commenter (IV-D-102) also expressed concern and stated than generally small companies have less than $100 million in sales on an annual basis and have less than 500 employees.

One commenter (IV-D-171) agreed with the use of this alternative definition to identify small entities under the Regulatory Flexibility Act.

Response: The EPA believes that the definition of small business, developed in conjunction with the SBA, for the proposed rule is the most appropriate definition. Because the coating manufacturing industry is not labor-intensive, a revenue value cut-off rather than a number of employees cut-off is a better measure to reflect the ability of a manufacturer to devote time and research and development resources to meet regulatory requirements. Based on input during the regulatory negotiation process (II-E-62), the EPA has defined a small business as one having less than $10 million in annual architectural coating sales and less than $50 million in total annual sales from all products. Using this definition, between 70 and 85 percent of the architectural coating industry would be classified as small. This definition does not change the requirements of the RFA; it is used for analysis purposes only. If the definition were changed to include more firms at sales levels greater than 10 million, the EPA is concerned that the impacts on this sector of the industry may appear lower on average because the impacts on a company with sales around $30 million may offset impacts on a $5 million company. In such a case, it may have been less appropriate to consider provisions such as the exceedance fee or tonnage exemption designed to minimize the impacts on small businesses. The EPA believes that the definition of small business adopted for this rule allows it to estimate more accurately the impacts of the rule.

2.3.2.10 Cost-Benefit Perspective

Comment: One commenter (IV-D-10) expressed concern that the EPA is proceeding with this rulemaking at a pace too fast to consider cost-benefit issues. Another commenter (IV-D-115) stated that the benefit of a federal rule to set VOC limits on all architectural coatings does not remotely outweigh the cost. One commenter (IV-D-212) asserted that the EPA had not established technological and economic feasibility for the

proposed table of standards for architectural coatings. Another commenter (IV-D-108) requested that the EPA share its documentation that shows the benefits that will be gained from this rule.

Response: Concerning the allegations that the EPA is proceeding with this rulemaking too quickly to consider cost-benefit issues properly and that the costs of the rule outweigh the benefits, the EPA notes that development of the rule has taken place over 8 years and involved numerous stakeholders, including small and large manufacturers, suppliers, States, and environmentalists. Based on guidance set forth by the Office of Management and Budget for meeting the requirements of E.O. 12866 and the Unfunded Mandates Reform Act, a quantitative assessment of benefits is not necessary for this rule. The EPA did prepare an economic impact analysis of the proposed and final rule requirements. Potential cost, price, and output effects of the rule were examined for the proposed requirements for VOC content limits as well as the requirements in the final rule. The economic analysis also evaluated the effect of the exceedance fee and the tonnage exemption on the costs, price, and output effects. Although the EPA did not quantify all the benefits of the architectural coatings rule, the reduction in emissions of VOC is estimated to be 103,000 Mg (113,500 tons) per year. When compared to the estimated cost of the rule, $28 million (1991 dollars), the resulting cost-effectiveness value ($270/Mg or $250/ton) is considerably lower than for typical VOC regulations for other types of sources. Thus, even without a quantitative benefit analysis, it appears that the cost-benefit ratio for this rule would be as good as or better than that for other Federal rules already established.

As discussed in detail throughout section 2.2 of this BID, the VOC content limits of the rule are based on performance of existing technology and there are coatings in the market that meet these limits. In fact, 64 percent of the products included in the 1990 industry survey meet the VOC content limits in this rule. Furthermore, some States have VOC content limits for

architectural coatings that are more stringent than this rule. Therefore, as noted earlier in this document, the data and information available to the EPA indicate that the VOC content limits in conjunction with the exceedance fee provision and tonnage exemption, in the final rule reflect BAC for the architectural coatings category.

2.3.2.11 Executive Order 12866, Small Business Regulatory Enforcement Fairness Act, Unfunded Mandates Reform Act

Comment: One commenter (IV-F-1m) maintained that a better economic analysis and a full cost-benefit analysis is required under Unfunded Mandates Reform Act (UMRA) and a much greater degree of scrutiny under the Regulatory Flexibility Act as amended by SBREFA (RFA) is required before this rule becomes final. Another commenter (IV-D-214c) claimed that the EPA unlawfully withheld a cost-benefit statement required under UMRA for rules imposing significant mandates on the private sector.

Response: The EPA has complied with the requirements of UMRA. Implementation of this regulation is estimated to result in national annualized costs of approximately $28 million (1991 dollars). This value is equivalent to approximately $32 million (1996 dollars.) This is before the $100 million threshold under UMRA and E.O. 12866. Thus, based on guidance from the Office of Management and Budget on meeting the requirements of E.O. 12866, and UMRA, a quantitative analysis of benefits and a benefit-cost comparison is not required for this regulation. In addition, the EPA did conduct an evaluation of small business impacts of the proposal in accordance with the Regulatory Flexibility Act and requested comment at proposal on several provisions that would alleviate some burden on small entities. For the final regulation, the EPA has met the requirements of the RFA.

Comment: One commenter (IV-F-1i) maintained that the small container exemption, the compliance variance, the exceedance fee option, and the low volume exemption which were included in the proposed rule primarily to reduce small business impacts will not primarily benefit small business. The commenter (IV-F-1i) believed that the cost to reformulate products to meet these

regulations is not the real danger to small business. The commenter believes that small business is doomed by the existence of the regulatory environment which requires very specialized and expensive staff. The commenter stated that when society decided to regulate in the business area, they signaled the end of small architectural coating business and also essentially eliminated start-up operations.

Response: The EPA has made every effort to consider specific small business concerns identified during the public comment period. As a result of this consideration the compliance period was extended, seven new coating categories have been added to the final rule, a tonnage exemption was included, and the exceedance fee option was included. The EPA has discussed the impact of the rule on small businesses in section 2.3.2.5 of this BID and how the national rule compares to State rules in section 2.2.4.

2.3.2.12 Adverse Socioeconomic and Related Impacts.

Comment: One commenter (IV-D-212 and IV-D-177) stated that the EPA failed to examine the effect of the architectural coatings rule on low income and minority workers. The commenter (IV-D-212, IV-D-212p4) asserted that the architectural coatings rule would adversely affect the sociological/psychological health of individuals because jobs and human utility are directly tied to self-worth. The commenter (IV-D-212, IV-D-212p4) claimed that the proposed architectural coatings rule would result in the loss of jobs which would adversely affect sociological and psychological health.

One commenter (IV-D-212p) requested that the EPA, pursuant to section 309 of the Act and E.O. 12898, analyze the environmental effects of the rule on minority and low-income communities, including human health, social, and economic effects. According to the commenter, any additional regulations affecting the coatings industry would have a substantial negative effect on residents and businesses located within the State of California. The commenter also contended that the rule, if promulgated, would exacerbate the economic problems of other

similar urban areas. The commenter referred to a letter from the EPA to Senator Kit Bond dated on or about June 15, 1995, which acknowledged that the proposed regulation could result in an adverse economic effect on small businesses. The commenter also referred to several documents which it believed supported its request for analysis of the environmental effects on minority and low-income communities.

The commenter also stated that the rule failed to address the concerns of the small business manufacturers, who were often located in metropolitan areas and who would suffer the economic effects. The commenter contended that the implementation of the rule would result in the loss of jobs, particularly in medium-sized, regional, and local small businesses. The commenter claimed that the manufacture and sales of paint products was concentrated in approximately 11 major metropolitan areas in the United States and contended that the harshest effects of the rule would occur in these metropolitan areas.

Another commenter (IV-D-49) stated that making the poor poorer was harmful to the environment and our democracy. The commenter claimed that there is a substantial link between the hopelessness of today's youth and the nation's 30-year history with VOC regulations, downsized jobs, and the loss of American manufacturing.

Response: The EPA believes that a national architectural coatings rule promulgated under section 183(e) of the Act will not have the significant negative economic impacts claimed by the commenter. The EPA's position is further explained in section 2.3.4 of the 183-BID. Many of the economic concerns raised by the commenter are not direct effects of the regulations. Because the EPA's economic impact analysis for the architectural coatings rule indicates that the direct economic effects of a national architectural coatings rule will be small, the EPA believes that indirect economic effects from this rule will also be insignificant. The EPA notes that the economic impact of the rule is limited, in part, because the rule provides compliance mechanisms other than reformulation of products and

because the VOC content limits were established considering the proper VOC content limit for specialty niche products. In other words, the EPA designed the rule to limit the impacts on small businesses, to the extent feasible and appropriate, consistent with the goal of achieving VOC emission reductions.

The EPA also notes that the VOC content limits in the architectural coatings rule are less stringent than the limits in California state rules and are equivalent to or less stringent than limits in rules established by other States. Thus, the EPA notes that even if the commenters' characterization of the impacts of the California rule were accurate, they are not relevant to this rule. The EPA has concluded that it is extremely unlikely that the Federal rule would have the severe consequences suggested by the commenters.

Finally, the EPA believes that the particular analyses requested by the commenters are not required by section 309 of the Act or E.O. 12898. The reasoning is explained below for each of these authorities.

Section 309. Section 309 of the Act requires the Administrator to review and comment in writing on the environmental impact of certain legislation and actions of other Federal agencies. When activities are found to be unsatisfactory from the point of view of public health or welfare, the EPA is required to refer its finding to the Council on Environmental Quality. The policy review provisions of section 309 do not apply to regulations that are promulgated by the EPA. Thus, section 309 does not require the EPA to perform any additional economic or impact assessments or judgments that are not already required to promulgate a rule under section 183(e).

Executive Order 12898. Executive Order 12898 established the Administration's policy for identifying and addressing disproportionately high and adverse human health or environmental effects of federal agency programs, policies, and activities on minority populations and low-income populations. While the Executive Order was intended for internal management of the executive branch and does not create legal rights or provide for

judicial review, federal agencies are to implement its provisions "consistent with, and to the extent permitted by, existing law." 59 F.R. at 7632-33. As noted in the Presidential memorandum that accompanied the Executive Order, it is designed to focus the attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities to realize the goal of achieving environmental justice.

The commenters suggested that their decision to eliminate jobs of minority and low-income workers in response to regulation creates an environmental justice concern that would necessarily preclude the Agency from issuing the architectural coatings rule. EPA disagrees with that view. The Agency interprets section 183(e) of the Clean Air Act to be a mandate to obtain VOC emission reductions to achieve ozone reductions to protect the health of all persons. Section 183(e) does require the Agency to take into consideration the economic feasibility of the regulations as part of the determination of what constitutes "best available controls" for each category. Assuming, without deciding the issue, that section 183(e) thus provides the Agency with a mechanism to evaluate the possible economic impacts of the rule upon low income and minority communities as one factor in the determination, such impacts would be but one factor in the analysis and must be viewed in the context of a statutory provision designed to reduce exposure to ozone pollution for all citizens.

Using this assumption, EPA has considered the potential impacts of this action on the human health and environmental conditions in minority communities and low-income communities. The Agency believes that the architectural coatings rule will provide public health and environmental protection to all communities, regardless of their socioeconomic condition and demographic makeup. Contrary to the assertions of the commenters, the Agency believes that the architectural coatings rule will not have the significant economic impacts claimed by the commenters. For example, the Agency's Economic Impact

Analysis for the final rule estimates that out of a total employment of 51,000 in the architectural coatings manufacturing industry, there may be a loss of ten jobs. See EIA at 3-10, 11. It is not possible for the Agency to determine whether these jobs will be held by members of low income or minority communities, or whether those individuals will obtain new employment elsewhere. Nevertheless, EPA does not believe that these speculative limited impacts will have a disproportionately high and adverse impact on minority or low income communities and do not outweigh the pollution reduction benefits of the rule as a whole. In fact, reduction of VOC emissions from consumer and commercial products such as those regulated by this rule should reduce public exposure to ozone pollution widely, and especially in urban core areas where there are concentrations of minority or low-income populations. EPA has thus concluded that the rule will help to achieve the goals of environmental justice and will not have the disproportionately high and adverse human health or environmental effects addressed by the Executive Order.

2.4 EXCEEDANCE FEE

2.4.1 Exceedance Fee Concept

Comment: Eleven commenters (IV-D-60, IV-D-114, IV-D-120, IV-D-161, IV-D-169, IV-D-181, IV-D-189, IV-D-190, IV-D-206, IV-F-1b, IV-F-1j), including two national coating manufacturers trade associations, supported the exceedance fee approach for the following reasons. One commenter (IV-D-190) maintained that the exceedance fee and compliance variance in the proposed rule are adequate protection for small domestic paint manufacturers that cannot invent or license new environmental technologies. One commenter (IV-D-181) supported the exceedance fee because it provides manufacturers flexibility for some products that might be difficult to reformulate. One commenter (IV-D-189) supported the exceedance fee under the conditions that it would not be excessive, it would not serve as a Federal tax on coatings, and it would not dissuade consumers from purchasing architectural coatings subject to the fee. The commenter concluded that the

optional nature and the amount of the proposed fees would be consistent with these principles.

Another commenter (IV-D-60) believed that an exceedance fee provides added flexibility, allows for the continued sale of high-price, high-performance coatings that are kinder to the environment due to their longer durability, and offers market-based incentives consistent with other EPA-regulated industries. The commenter maintained that an exceedance fee would be far more equitable than a low-volume exemption, especially for smaller companies.

One commenter (IV-D-120) stated that the exceedance fee would provide flexibility to both small and large businesses to sell specialty coatings if reformulation is not technologically or economically feasible. One commenter (IV-D-114) from a large company indicated that the company supports exceedance fee provisions in situations where a variance is not available. Three commenters (IV-D-161, IV-F-1b, IV-F-1j) strongly recommended an exceedance fee as a voluntary alternative to compliance. For example, one commenter (IV-F-1j) discussed a scenario where the cost of formulating one color in a line with 20 colors when all 20 colors are needed to sell the line would be enormous compared to the return. One commenter (IV-D-161) discussed a scenario where the cost of reformulating a particular technology may be prohibitive compared to the potential profit and cited the example of small volume specialty coatings. Also, the commenter added that the exceedance fee would allow companies to introduce new technologies that may need additional development efforts to reduce the VOC content to the proposed level. The commenter also emphasized the importance of providing a flexible and cost-effective regulation while still achieving the air quality goals. The commenter pointed out that the industry cannot determine if the compliance costs are excessive compared to other industries. According to the commenter, if the cost of compliant coatings is more than the cost of non-compliant coatings after payment of the fee, then compliance with the limits becomes an excessive economic burden to that industry for

that product. This commenter supported the proposed variance and the exceedance fee provisions to provide compliance relief for all manufacturers rather than a small business compliance extension. The commenter stated that small businesses had ample time to prepare and pointed out that many States had already adopted similar limits without special provisions for small businesses or a variance provision.

One commenter (IV-D-169) advocated the exceedance fee as an excellent way to offer flexibility when current technology does not offer acceptable performance.

A national trade association (IV-D-206) maintained that the EPA should allow products with higher VOC content to be sold if manufacturers pay exceedance fees. They maintained that it may be necessary for a few products that exceed the proposed VOC content limits to remain on the market. They also asserted that the higher costs resulting from the exceedance fees will motivate manufacturers to develop high performance products with low VOC content and users to select complying products whenever possible.

Two commenters made specific recommendations:

(1) One commenter (IV-D-161) recommended replacing the variance option and low-volume exemption with the exceedance fee to provide long-term control of reformulation activities to the manufacturer. Additionally, the commenter stated that an exceedance fee would reduce the growing number of categories and exceptions to those categories without placing a burden on the industry or the environment.

(2) Another commenter (IV-D-209) requested that the EPA combine a 5,000 gallon exemption with a reasonable exceedance fee option (without excessive recordkeeping and reporting requirements) to provide some relief for small and large manufacturers who sell niche products that cannot be economically or are not technologically feasible to reformulate. These options may allow some manufacturers to stay in business.

The EPA also received comments critical of the exceedance fee concept. Sixteen commenters (IV-D-02, IV-D-12, IV-D-22, IV-D-32, IV-D-43, IV-D-126, IV-D-129, IV-D-148, IV-D-191, IV-D-213, IV-F-1a, IV-F-1f, IV-F-1i, , IV-F-1k, IV-F-1l, IV-F-1m) opposed the exceedance fee. One commenter (IV-F-1i) asserted

that if the public health is in danger, then no one should be endangering public health for a fee. The commenter believe that if the public health is not in danger, then the entire regulation is unnecessary or the limits are more stringent than necessary.

Another commenter (IV-F-1k) urged the EPA to drop the exceedance fee provision from the rule. The commenter asserted that if the VOC content limits are not reasonable, then the EPA should raise the limits. The commenter maintained that a fee would disrupt the marketplace, shifting business from company to company depending on their willingness to pay the fee.

One commenter (IV-D-43) believed any exceedance fee would be complicated and confusing. Two commenters (IV-D-12/IV-F-1l, IV-F-1m) stated that an exceedance fee should not be an alternative to compliance. One of the commenters (IV-F-1m) maintained that standards can only be made less stringent by demonstrating technical and economic infeasibility and not by paying a fee. One commenter (IV-D-02) stated that an economic incentive in the form of fees would be a market disincentive and that administration and compliance would be especially difficult for small businesses. Two commenters (IV-D-32, IV-D-126) regarded the exceedance fees as unnecessary. One commenter (IV-D-32) reported that Oregon's regulation, for example, was successfully implemented without such provisions. The commenter asserted that exceedance fees would diminish overall emission reductions and would not protect from an uneven geographic effect. According to the commenter, the exceedance fees are appropriate if more stringent levels are adopted in the future. If the provision is included, the commenter suggested that the EPA require those manufacturers to show that their increased emissions will not adversely affect attainment of the National Ambient Air Quality Standards for Ozone in nonattainment or maintenance areas. The other commenter (IV-D-126) suggested that the fee was unnecessary because the EPA's VOC content limits are not technologically difficult to achieve.

One commenter (IV-D-129) calculated that the cost of reformulated products would double or triple while exceedance

fees would add only 20 to 25 percent to the cost of the product. The commenter pointed out that this would force businesses to pay the exceedance fee for non-compliant materials in order to stay in business. The commenter also expressed concern that an exceedance fee was difficult to police and would cause an unfair business climate. The commenter mentioned that California's architectural coating rules were difficult to enforce and alleged that some businesses intentionally do not comply. This commenter and another (IV-F-1f) questioned how the EPA would enforce this provision on a national level. One commenter (IV-D-129) considered the 8 years of negotiations plenty of time for manufacturers to prepare for the final architectural coating rule. The commenter maintained that the exceedance fee was a disincentive for the companies that have used the last 8 years to formulate compliant low VOC products. In short, the commenter indicated that the exceedance fee approach is fundamentally flawed and defeats the purpose of the Clean Air Act and that his small company does not support an exceedance fee option under any circumstances. The commenter (IV-F-1a) only supported a limited exceedance fee if there is a second phase of VOC content limits.

Two commenters (IV-D-213, IV-F-1f), one (IV-D-213) representing 3,000 paint contractors, were opposed to an exceedance fee mechanism because they believe it would drive the market towards lower-cost and possibly less-dependable products merely because of the price sensitivity of the market. According to the commenter the largest amount of sales occur in the do-it-yourself segment of the market, and the commenter (IV-D-213) believed that these consumers will make purchases largely on the basis of price considerations. The commenter asserted that there is no substitute for VOC content limits that reflect performance criteria and do not disturb currently used products.

One commenter (IV-D-226) maintained that the proposed approach would be ineffective for providing an incentive to develop low VOC content products where the products are

inherently high in unit cost and low in volume compared to other coating categories.

Two commenters (IV-D-129, IV-D-191) stated that the fee is unacceptable because the fees are too low to motivate any manufacturer to reduce VOC emissions. Instead, the commenter expressed concern that the exceedance fee provision will encourage industry to pay rather than reformulate.

Response: After careful evaluation of all of the comments and discussions with the Small Business Administration (IV-H-2), the EPA has decided to include the exceedance fee in the final rule. Under this approach, manufacturers and importers have the option of paying a fee, based on the extent to which VOC content limits are exceeded, instead of achieving the VOC content limits in the rule. The fee is calculated at a rate of $0.0028 per gram ($2,500 per ton, 1996 dollars) of VOC in excess of the applicable VOC content limit, multiplied by the volume of coating produced. The EPA is including this option in the rule for several reasons. The exceedance fee option will provide transition time for those manufacturers that need additional time to obtain lower VOC technologies. The exceedance fee provides long-term flexibility, and a less costly compliance option, for both small and large manufacturers selling very low-volume specialty coatings where the cost of reformulation may be prohibitive compared to the potential profit. These important specialty products will continue to be available to consumers. The exceedance fee option is significantly less burdensome for manufacturers than the proposed compliance variance provision, which has not been retained in the final rule (see discussion in section 2.2.8 of this document). Contrary to some comments received, the EPA contends that the costs resulting from the exceedance fees will generally motivate manufacturers to develop innovative technology, such as high performance products with lower VOC content.

The EPA does not agree with some commenters that the exceedance fee will disrupt the marketplace. The EPA expects that the regulated entities will use the fee primarily for the

manufacture of low-volume specialty coatings, which are driven by demand from consumers. It is not likely that the demand from these markets would be significant enough to provide any incentive for manufacturers to shift to these products. The impacts to the market are lower with the fee than they would be if reformulation was the only option available for producers, because the fee reduces the number of potential product withdrawals and reduces the net social cost. Raising the VOC content limits in lieu of offering the fee could significantly undermine the emissions reduction objectives of the proposed rule. The fee provides some flexibility to producers of low volume products, or products that are only slightly above the VOC content limit of the standard who may find it prohibitive to incur the largely fixed cost of reformulation. Because products for which the fee is likely to be chosen would tend to represent a small portion of the national VOC emissions from architectural coatings, the EPA anticipates that the fee option itself would not significantly undermine emission reduction objectives. However, raising the VOC content limits in the rule would negate reductions from all products that would no longer be subject to the standards. The fee also provides continued incentive for producers to reduce VOC content until they approach the VOC content limits in table 1 of the rule.

Also, the EPA does not agree with the comment that the inclusion of the exceedance fee will increase VOC emissions, thereby endangering public health. The EPA believes that the fee will be used primarily by those regulated entities manufacturing low volume specialty coatings. Therefore, the EPA does not expect that the continued use of these low volume coatings will result in significant emission increases. In addition, the EPA expects emissions to decline over time because new low-VOC products will be developed to avoid the fee. The EIA for the final rule evaluated the magnitude of lost emission reductions in considering the fee provision and found that the fee would result in a relatively minor adjustment in emission reductions, while providing considerable flexibility in the marketplace, thus

reducing the number of products that withdraw from the market. The emission reductions that are not achieved as a result of the fee are spread across 13 market segments throughout the country. Therefore, it is highly unlikely that the fee will result in the concentration of additional VOC emissions in a small geographic area that could harm the public health.

With regard to concerns about enforcement of the exceedance fee, the recordkeeping and reporting requirements are designed to ensure compliance with this option. Any violations of the recordkeeping and reporting or any other requirements could result in enforcement actions and the possibility of additional penalties.

Assuming $5 million of sales revenue as a midpoint estimate for small companies in the $0-10 million range, fee recordkeeping costs would be approximately 0.1 percent of sales revenue, which is not a significant burden.

As indicated in the economic analysis, the EPA was unable to obtain data on the effects of reformulation on product costs. Anecdotal evidence revealed some cases where costs would presumably rise (e.g., higher solids content) and some cases where costs would presumably fall (e.g., higher water content). As a result, it is not possible for the EPA to verify or refute the commenter's claim that product costs would double or triple for reformulated products, or, if it is true in the experience of the commenter, whether that experience is representative of the majority of other products. The EPA agrees, however, that the costs of the exceedance fee may be less for source products and, therefore, that some manufacturers will wish to utilize the exceedance fee where the costs of reformulation may be less economically attractive.

The EPA acknowledges that price increases on fee-paying products may cause some substitution to non-fee-paying (lower VOC) products. For some products, it may not be profitable to reformulate or pay the fee, so firms may consider withdrawing the product from the market. These phenomena are explicitly modeled in the economic analysis. However, the premise of the fee is

that it internalizes the (public) environmental cost of VOC emissions into the private cost of the good. Therefore, if some consumers substitute away from the now higher priced fee-paying product, it reflects the fact that they are not willing to pay the "full" cost of consuming the higher VOC products. This is the fundamental purpose of market-based incentives for environmental protection. The EPA notes that section 183(e) explicitly authorizes the EPA to utilize "economic incentives" as part of the regulatory approach to obtaining VOC emission reductions from consumer and commercial products.

As discussed in section 2.2.4 of this BID, the VOC content limits in the rule are based on the EPA's determination of best available controls. As discussed in section 2.2.8 of this BID, the EPA decided not to include the variance provision in the final rule because the EPA determined that the variance provision may not provide additional compliance flexibility, especially for small businesses, as intended.

2.4.2 Exceedance Fee Levels

Comment: Several commenters (IV-F-2) asked how the fee level was developed. One commenter (IV-D-189) voiced concern that the fee level was chosen as an initial rate and opposed any unspecified increases in the future. Also, the commenter expressed concern that States might develop a fee system that would piggyback on the Federal system thereby increasing the fees on manufacturers. In the opinion of the commenter, any such State effort would have to be reviewed and approved by the EPA Administrator.

One commenter (IV-D-120) indicated that the current exceedance fee was too high, but did not suggest an alternative fee rate. Another commenter (IV-F-1b) requested that the fee be set lower (possibly at $1,000 per ton) to offset the excess recordkeeping requirements for these products. Other commenters (IV-D-22, IV-D-79, IV-D-33, IV-D-34) also expressed the opinion that the proposed level of the fee was too low.

Three commenters (IV-D-22, IV-D-79, IV-F-1a) thought that the primary path to reduce VOC emissions from architectural

coatings is through reformulation, but paying the exceedance fee is less expensive than reformulating. They also stated that a limited exceedance fee could play a role only if set at a level that is high enough to ensure that economics would drive development of compliant coatings. Two commenters (IV-D-34, IV-D-96) agreed that the fees were too low and that manufacturers would not reformulate as a result of the availability of the exceedance fee.

Two commenters (IV-D-33, IV-F-1a) recommended an exceedance fee that adds 10 to 20 percent to the retail cost of the non-compliant coating to encourage manufacturers to reformulate. The commenter explained that the proposed incentive fee, a 60 cent per gallon cost increase, would easily be absorbed into the price of home paints, which cost $10.00 to $20.00 per gallon. In short, the commenter (IV-D-33) supported an exceedance fee that is high enough to encourage development of compliant coatings.

One commenter (IV-D-93) stated that an exceedance fee was an excellent alternative for products with high consumer acceptance that cannot be reformulated immediately. The commenter suggested a $.50 per gallon fee for products that are less than 100 g/l in excess of the VOC content limit prescribed by the rule and a $1.00 per gallon fee for the higher-polluting products. The commenter supported a phase-out of the availability of the exceedance fee mechanism as technology progresses.

One commenter (IV-D-181) believed the EPA should reevaluate the exceedance fee structure. Rather than basing the exceedance fee on the volume of VOC in the product, the commenter recommended that the exceedance fee be based on some other parameter, such as the retail price of the product. The commenter requested this reevaluation because the $0.0028 per gram (per liter) approach has a larger impact on lower cost products, such as bituminous coatings and mastics compared to higher cost products. For example, the exceedance fee for a product with an exceedance of 50 g/l would be $0.53 per gallon, which results in only a 3 percent cost increase for a $15 per

gallon product, but a greater than 25 percent increase for a $2 per gallon product. Another commenter (IV-D-226) also suggested that the fee be based on a percentage of the price, especially for high cost, low volume categories.

One manufacturer (IV-F-2) stated that the exceedance fee does not take into account the competitiveness in the marketplace. A $1.00 per gallon fee is a significant price to pay for coatings that only cost a few dollars. One industry representative (IV-F-2) believed that the exceedance fees would level the playing field between small and large companies. One small business (IV-F-2) stated it will cost $2.50 more per can for a compliant coating if exceedance fees are paid. Another small business (IV-F-2) stated that the exceedance fee was too high relative to the price of his products.

One manufacturer (IV-F-2) suggested that the exceedance fee be phased in gradually (i.e., increase over time) and be available only for a limited time.

Another commenter (IV-D-169) suggested a phased-in fee of $500 per ton the first year that escalates $500 per ton for each year up to $2500 per ton in the fifth year. The commenter also suggested that excess VOC be calculated on an actual VOC basis. If the "less water" method is used for waterborne coatings, the excess VOC would often be 2-3 times larger than on a per gallon of coating basis. Also, the commenter stated that the exceedance fee is more appropriate than the small volume exemption.

Response: The EPA considered several factors in choosing the exceedance fee level, including the benefit per ton value historically used in analyses under the Clean Air Act, the historical range of acceptable cost-effectiveness values for VOC, the magnitude of the loss in emission reductions, and the effect on the market model (price and output adjustments, changes in consumer and producer surplus, and changes in net social cost).

More specifically, the value chosen for analysis at proposal is slightly higher than the benefit transfer value (i.e., the benefit value per ton of VOC reduced) historically used in the EPA analyses, and is also slightly higher than historical

cost-effectiveness values for VOC. This was done to provide incentive for manufacturers to continue to strive to find low cost methods of reducing the VOC in their products. Therefore, manufacturers that find the fee the lowest cost option of compliance with the regulation (in comparison to reformulation or losing profits from product withdrawal) would pay the fee, but be encouraged to find an even lower cost solution to reduce total production costs in the long run.

Another consideration by the EPA was the amount of emission reductions lost at the selected fee level. This level also proved to provide only minor adjustments in market price and quantity in comparison to reformulation by itself, while providing substantial flexibility to manufacturers of small volume products or products that exceed the standards by a small amount. The EPA also evaluated a higher fee rate prior to proposal and found that net social cost increased with a relatively small change in lost emission reductions (as compared to the lower fee rate). The EPA concluded that because the fee was set high enough to make reformulation attractive for the majority of producers, but low enough to allow a small sector of products to remain on the market in lieu of withdrawal, and because the lost emission reductions were minimal and the impact on the markets was minor, the chosen level of $2500 per ton was deemed acceptable.

Based on the EPA's economic analysis, the fee does not appear to be set too low. The economic model compares the cost of paying the fee to the cost of reformulation for surveyed products. While the analysis suggests that many regulated entities will opt for the fee for certain products, these products are uniformly small in volume; thus, their contribution to total market output (and emissions reduction) is relatively small. The EPA's analysis suggests that it will rarely be advantageous for manufacturers of large volume products, which generate a disproportionately large share of emissions, to opt for the fee over reformulation. Furthermore, the existence of the exceedance fee provides continued incentive for fee-paying

firms to reduce VOC contents on the margin, as this will reduce the amount of fee they must pay.

Some commenters suggested that the exceedance fee should be based on product price, rather than the quantity of VOC emitted by the product. The premise of the commenters is that only a large proportional price effect will induce large changes in behavior. The objective of a pollution fee, however, is to "charge" for the pollution generated. The only consistent way to accomplish this is to have the fee payment depend on the amount of pollution generated. It is not clear how a price-based fee would be tied to the amount of VOC emitted. For instance, a low-priced high VOC product could have a fee per unit that is much lower than a high-priced lower VOC product. In this case, the fee mechanism is not working to ensure enough incentive for the higher VOC product to reduce VOC content. In other words, a ton of extra emissions from one product is being charged less than a ton of extra emissions from the other. Alternatively, having one ton of exceeded emissions face the same fee, regardless of source is more efficient, and seemingly more fair.

The phasing of the tonnage exemption (see section 2.2.1.2 of this document) in combination with the exceedance fee provision is essentially doing what the commenters suggest for the industry. In the time period from the compliance deadline through the year 2000, manufacturers may exempt from regulation 23 megagrams (25 tons) of VOC, so total fee payments would be lower than in the second year. The following year, 2001, has a lower exemption level of 18 megagrams (20 tons) of VOC, so fee payments would be slightly greater. In the next year and any subsequent year of compliance, the fee rate would become level because the exemption level remains the same at 9 megagrams (10 tons) per year. The fee payments would also provide incentive for manufacturers to find lower cost VOC technology to meet the standard and eliminate or reduce their fee payments.

In the future, the Agency may consider revising the rule to adjust the fee rate. Considerations in deciding to make an

adjustment may include, but are not limited to, inflation rates, usage of the fee, and related emission impacts.

2.4.3 Use of Collected Exceedance Fees

Comment: One commenter (IV-F-2) asked where the money collected from the exceedance fees would be deposited. One commenter (IV-D-189) concurred that any decisions relating to spending the exceedance fees must be made through the annual appropriations by Congress and that the EPA should consult with industry when developing a recommendation. The commenter disagreed with the EPA's suggestion to award grants to private firms and other entities to promote the development of lower VOC coatings because the industry already supports substantial research efforts. Alternatively, the commenter recommended awarding grants to universities to help in the education of paint chemists.

One commenter (IV-D-162) recommended that revenues from exceedance fees be used to study the performance capabilities of advanced technology coating material. Another commenter (IV-D-206) strongly recommended that the funds be used for study or other research to evaluate the availability and performance of products with reduced VOC content in order to evaluate the effectiveness of the regulation in reducing ozone levels. However, the commenter recommended that exceedance fee funds not be used for administration and enforcement purposes.

One commenter (IV-D-151) supported the allocation of a portion of the fees for public outreach programs.

One commenter (IV-D-120) stated that the EPA should split exceedance fee revenues, using half to cover enforcement and administration and reserve the other half to conduct a future study to assure that the reductions are achieved in a reasonable timeframe and in a cost-effective manner and without disastrous economic effects to the industry.

Response: As discussed in the preamble to the proposed rule, section 183(e) specifies that fees "... shall be deposited in a special fund in the United States Treasury for licensing and other services, which thereafter shall be available until

expended, subject to annual appropriation Acts, solely to carry out the activities of the Administrator for which such fees, charges or collections are established and made." Through the annual appropriations process, Congress will determine whether and how to spend any fee revenues collected. The EPA will take into consideration the commenter's recommendations when communicating with Congress regarding how the fees would be used.

2.4.4 Exceedance Fee Recordkeeping and Reporting

Comment: One commenter (IV-F-11) noted that small businesses commonly sell the same product for use as architectural coatings, miscellaneous metal parts coatings, or wood products coatings, and so on. Because the difference in use generally occurs after the point of sale, the commenter asked how a manufacturer would predict which containers would be subject to an exceedance fee.

One commenter (IV-F-2) agreed that the suggested reporting schedule for fee payments was reasonable. However, another commenter (IV-D-169) requested that the reporting schedule be cut to once or twice a year. One commenter (IV-D-120) stated that the recordkeeping and reporting were too intensive, but did not offer any alternatives.

Response: The decision of which containers of architectural coatings would be subject to an exceedance fee is not made at the point of sale. If the coating is intended for architectural use, even if it is suitable for other uses as well, then it is subject to the rule, and the manufacturer or importer is required to meet the applicable VOC content limit or use alternative compliance provisions, such as the exceedance fee option. Except for specific exemptions listed in the rule, the most restrictive VOC content limit applies for coatings that meet the definition of more than one of the coating categories listed in table 1. Thus, the manufacturer would pay the appropriate exceedance fee on all containers of a coating product that is in a given category with a limit the coating does not meet, even if some of the containers may eventually be sold for another purpose for which the product meets the applicable limit in the rule or for which the rule is

not even applicable. Manufacturers and importers are required to keep records and submit reports detailing the following information for all architectural coatings for which fees are paid: VOC content, excess VOC content above the limit, volume of coating manufactured or imported, annual fee for each coating, and the total annual fee for all coatings. The EPA considered the comments on frequency of reporting and determined that annual reporting and fee payment is an appropriate interval for compliance assurance and enforcement purposes. Therefore, the rule requires that the exceedance fee be paid annually to the Administrator and is due no later than March 1 each year for the previous year in which the coating is manufactured or imported.

2.5 REGULATORY NEGOTIATION

2.5.1 Section 183(e) Requirements and the Architectural Coatings Regulatory Negotiations

Comment: Two commenters (IV-D-212; IV-D-214d) stated that the EPA did not have the statutory authority to establish the architectural coatings regulatory negotiations (hereafter called "the reg-neg") prior to the completion of the consumer and commercial products study and report to Congress that was mandated by Section 183(e) of the Act. One of the commenters (IV-D-214d) cited an August 14, 1992 letter from EL RAP that stated, "Section 183 expressly provides that the required Consumer and Commercial Products Study must precede any regulation."

Two commenters (IV-D-212; IV-D-214d) stated that, by proceeding with reg-neg prior to the completion of the study, EPA assumed that paint products would be subject to regulation and that they would be regulated in the first group. According to the commenters, EPA made the determination that architectural coatings were subject to regulation before an objective study had been commenced or completed. The commenters stated that factors key to this determination, such as reactivity, cost/benefit, and uses and benefits of paint products, were unknown at the time the reg-neg proceedings were commenced in early 1992. Furthermore, one commenter (IV-D-212) expressed concern that the fact that EPA began the reg-neg activities biased the eventual ranking of architectural coatings in the first group.

One commenter (IV-D-212) stated that the reg-neg process was contrary to the requirements of section 183(e) of the Act and the intent of Congress. The following examples were provided:

1. The proposals were based on percent reduction targets assigned by the EPA, rather than a determination of BAC.
2. The proposals contained tables of standards that would take effect in the future.
3. The proposals were national rules that included ozone attainment areas.

4. VOC calculations were based on mass tonnage, rather than on a reactivity adjusted basis.
5. Performance was not properly addressed.
6. The five factors listed in the Act were not followed.

One commenter (IV-D-214d) cited a July 15, 1994 Petition For Redress Of Grievances made by Smiland Paint Company and Dunn-Edwards Corporation that stated that during the reg-neg process EPA openly focused on percentage of VOC reduction targets, which are neither mandated nor authorized by Section 183(e). The commenter stated that the VOC reduction targets were a result-oriented approach with no factual basis.

Response: The EPA disagrees with the commenter's views (1) that EPA did not have the statutory authority to establish the architectural coatings regulatory negotiation and (2) that the timing of this regulatory negotiation biased the study and Report to Congress toward regulation of paints. The EPA also disagrees with the commenters' opinions that the regulatory negotiation was contrary to the requirements of section 183(e) of the Act and the intent of Congress.

At the outset, the EPA notes that section 183(e) does not address the issue of whether or when the EPA may initiate a regulatory negotiation for an anticipated rule. Section 183(e) directs the EPA to conduct the study, to develop criteria, to submit the report to Congress, and to list products for regulation. The provision does not limit the EPA's ability to begin a regulatory negotiation process. The EPA's use of the regulatory negotiation process is permitted in accordance with the provisions of the Negotiated Rulemaking Act, 5 U.S.C. §§581 et seq., which likewise did not preclude the EPA from initiating a regulatory negotiation in this instance.

The EPA initiated the regulatory negotiation for architectural coatings prior to completion of the section 183(e) study and Report to Congress because it was widely recognized that architectural coatings are a major source of VOC emissions and it was highly likely that architectural coatings would be

among the products listed for regulation under section 183(e). It was known that architectural coatings were one of the largest identifiable unregulated sources of VOC in many states' emissions inventories, and one of the largest sources of VOC emissions among categories of consumer and commercial products. Because of information such as this, Congress explicitly identified paints, coatings, and solvents, as products for EPA to regulate as consumer and commercial products under section 183(e) of the Act. Contrary to the assertions of the commenters, preliminary information was available for architectural coatings on the factors to be considered in the section 183(e) study. Past EPA studies of paints and other coatings for CTGs and from State regulatory efforts provided information on the availability of alternatives, estimates of VOC emissions from the category, general information on formulation of paints, and uses and benefits of the products. At the time the regulatory negotiation was initiated, EPA estimated that architectural and industrial maintenance coatings represented 20 percent of the VOC emissions from consumer and commercial products (57 FR 31473). Based on this estimated contribution and other preliminary information, EPA initiated regulatory development concurrently with information gathering for the section 183(e) study and report to Congress.

The EPA does not believe that concurrent development of the regulation and section 183(e) study biased the eventual ranking of architectural coatings in the first group. The information developed in the regulatory negotiation and other information available on architectural coatings was considered in the same manner as information on other categories of consumer and commercial products. See the section 183(e) BID, section 2.1.1.6 for a description of the ranking process and the consideration of statutory criteria; and section 2.1.1.7 concerning the ranking and consideration of criteria for architectural coatings. As explained in those sections of the section 183(e) BID, architectural coatings were judged using the same ranking criteria and procedures as the other product

categories. If during the regulatory negotiation, it had been determined that emission estimates were inaccurate, or that cost-effective controls were not available, or if any other new information was received which affected the ranking, EPA would have altered the priority given to the product category. Had the study and Report to Congress indicated that architectural coatings should not be regulated under section 183(e), the EPA would not have proceeded to regulate them and the result of the regulatory negotiation, if any, would have been moot. However, to date, EPA has had no basis for making such a finding for architectural coatings products. On the contrary, the regulatory analysis for architectural coatings has confirmed that architectural coatings are an emission source that warrants regulation under section 183(e) of the Act.

The EPA believes that concurrent development of the architectural coatings rule and the study and Report to Congress represented prudent planning and management of resources. This approach is reasonable considering (1) the 3 to 4 years typically required to study an industry and develop a proposed rule and (2) the requirement in section 183(e) to issue the first group of rules within 2 years of completion of the study and the Report to Congress. Because EPA estimated that architectural and industrial maintenance coatings were a major contributor to emissions from consumer and commercial products, it was considered highly likely that they would be regulated in the first group of products to be regulated under section 183(e).

The EPA believes that the commenters' allegations that the regulatory negotiation was contrary to the requirements of section 183(e), that there was no factual basis for the VOC reduction target, and that there was no focus on determining BAC are unfounded and irrelevant to the final rule. The proposed rule and the final rule are based on EPA's evaluation of the degree of emission reduction that is achievable for architectural coatings. The EPA used information developed in the regulatory negotiation (e.g., types of coatings, definitions of common terms used in the industry) along with other information developed by

EPA in the determination of BAC for different categories of architectural coatings. It is important to note, however, that the reg neg committee did not reach consensus and thus did not produce a proposal that the EPA used as the basis for the proposed rule. Thus, even, if there had been any error in beginning the reg neg prior to completion of the study, that error was moot with respect to the final architectural coatings rule.

The specific points raised by commenter IV-D-212 are addressed in section 2.2.4, section 2.6, section 2.1.2, and section 2.1.1 of this BID and section 2.1.1 of the section 183(e) BID.

2.5.2 Regulatory Negotiations Committee Was Not Properly Constituted

Comment: Two commenters (AIM-IV-D-212, AIM-IV-D-214d, AIM-IV-D-212jj) claimed that the reg-neg committee did not adequately represent all of the interested and affected parties.

Both commenters (AIM-IV-D-212, AIM-IV-D-212jj, AIM-IV-D-214d) asserted in three letters that the Reg-neg Committee was dominated by representatives of large business, by governmental officials, and by representatives of environmental organizations. One commenter (AIM-IV-D-212, AIM-IV-D-212jj) claimed that large national and international companies had a far superior representation on the committee even though small manufacturers, compose 90 percent of the paint industry. The commenter asserted that the constitution of the reg-neg committee was such that a high percentage of reg-neg members (including the industry caucus) strongly favored a national rule over other alternatives.

One commenter (AIM-IV-D-214d) stated that the reg-neg committee was dominated by members who supported substitution regulations and therefore was unbalanced on the basis of viewpoint. The commenter cited a December 6, 1991 letter from Smiland Paint Company that stated that one-half of the committee members should have been persons who, through past words and deeds, showed not only a mastery of the subject matter but also a conviction that the rules at issue were both economically and

environmentally counterproductive and that the products in question should be preserved.

The commenter (AIM-IV-D-214d) claimed that EPA either ignored requests to add or delete committee members in an effort to obtain balance or acted in a way that insured that imbalance was maintained.

One commenter (AIM-IV-D-212jj) implied that the EPA intentionally skewed the membership of the reg-neg committee to be unrepresentative of the industry. The commenter asserted that EPA, in addition to its official Federal Register notice, informed selected parties (implying those that EPA wanted on the committee) in time for them to seek participation.

One commenter (AIM-IV-D-214d) stated that because it was unbalanced, the reg-neg Committee had acted outside the bounds of FACA. The commenter cited cases ostensibly supporting its contentions that the committee was unbalanced and thus in violation of FACA.

Response: On February 4, March 20, and April 15-16, 1992 the Agency held three public meetings to explore the feasibility of conducting a regulatory negotiation for the development of a national architectural coatings rule (57 FR 1443, 57 FR 8286). A primary goal of the meetings was to identify the interests that would be significantly affected by the rule and to identify individuals who might represent those interests on an advisory committee, if a regulatory negotiation approach was chosen by the Agency.

On July 16, 1992 (57 FR 31474), the EPA published notice of its intent to form an advisory committee to negotiate a proposed regulation for architectural coatings under the Federal Advisory Committee Act (FACA) and the Negotiated Rulemaking Act of 1990 (NRA). In this notice, the Agency published a proposed list of advisory committee members that was generated using the information from the three public meetings, Agency expertise, and information obtained by the Agency's conveners. The proposed list of advisory committee members represented all of the identified interests that would be significantly affected by the

rule. The list included seventeen industry representatives, one consumer organization, five representatives of federal agencies, five State and local representatives of air pollution control agencies, three representatives of environmental groups, and one labor organization. In the notice, the Agency requested comments on whether the persons proposed for the advisory committee would adequately represent all the interests that would be significantly affected by an architectural coatings rule. The notice also explained that

> any person who may be significantly affected by the proposed rule discussed in this notice, and who believes that their interests will not be adequately represented by the persons or entities listed in Section III of this notice, may apply for membership on the advisory committee. Or as an alternative, such person may nominate another person for membership on the advisory committee.

The publication of the notice marked the beginning of a 30-day comment period during which the public could submit comments and applications for membership on the advisory committee.

A final scoping meeting was held on July 28 and 29, 1992 to discuss further the feasibility of conducting a regulatory negotiation for the architectural coatings rule and the make-up of the advisory committee. Based on the interest of the potentially affected parties and other considerations, the EPA decided to proceed with the regulatory negotiation process for the development of the AIM coatings rule. Therefore, on October 2, 1992, the Agency published its decision to establish a negotiated rulemaking advisory committee for the architectural coatings rule (57 FR 45597).

Based on the information provided at the final scoping meeting, the comments and applications received on the proposed advisory committee membership list, agency expertise, and information obtained by the Agency's convener, two more industry representatives were added to the regulatory negotiation committee, bringing the total to 34 committee members.

The regulatory negotiation procedures allowed the addition of new committee members during the regulatory negotiations provided there was committee consensus. This provision was exercised to add new committee members as was deemed necessary by the committee. The EPA did not ignore requests to change the committee composition (add members) to obtain or maintain balance. The EPA initiated the appropriate procedures for consideration of new members. The Agency believes that the process above resulted in a balanced committee that adequately represented all of the significantly affected interests.

With respect to the cases cited by the commenters in support of claims that the reg-neg committee violated the provisions of FACA, the EPA notes that the cases are clearly distinguishable on their facts. Even without these distinctions, however, EPA believes that the commenters cannot demonstrate a violation of FACA regarding the "fair balance" of the committee. See Fertilizer Institute v. EPA, 938 F.Supp. 52 (D.D.C. 1996) (composition of committee is not justiciable and plaintiffs could not establish standing). The EPA notes that the reg neg committee did not reach consensus and thus that it did not produce a proposal to form the basis for the EPA's proposed rule. Thus, even if there had been any unbalance on the committee, it did not affect the commenters.

2.5.3 Regulatory Negotiations Procedure

Comment: One commenter (AIM-IV-D-214b/CP-IV-D-07b) stated that the early convening, the lack of balance in the committee membership, and the procedural improprieties were deliberately designed by the EPA to support a predetermined outcome. According to this commenter, the predetermined outcome was early promulgation of a VOC content-limiting regulation similar to but with lower limits than existing rules in California. Another commenter (AIM-IV-D-212j) also alleged that the outcome of the reg-neg was predetermined by the EPA.

Concerning the allegation of a predetermined outcome, one commenter (AIM-IV-D-214d) stated that EPA appeared to have unilaterally abandoned its obligation to "negotiate" to reach a

"unanimous" agreement on a rule. The commenter cited an August 10, 1993 letter from the facilitator to committee members that stated that there may have been "enough" support for a framework for use "as the basis for EPA's draft rule language" and for forwarding to EPA for its "use in developing a draft proposed rule." The commenter expressed confusion regarding whether EPA was still one among equals attempting to negotiate a rule to which all committee members would unanimously agree or had unilaterally scuttled reg-neg and started its own notice and comment rulemaking.

One commenter (AIM-IV-D-212jj) alleged that there were contacts between NPCA and EPA during the assessment of whether to establish the reg-neg. The commenter (AIM-IV-D-212jj) speculated that these contacts appeared to extend beyond what was appropriate. The commenter (AIM-IV-D-212jj) implied that EPA colluded with NPCA to heavily weight the Reg Neg committee with members who favored a national rule. This commenter (AIM-IV-D-212jj) alleged that the range of acceptable emission limitations and corresponding categories were among the issues that were taken up, and agreed to by EPA, before negotiations began.

A commenter (AIM-IV-D-214d) contended the EPA facilitator acted in ways that were not impartial. According to the commenter:

1. In the Spring of 1993 the facilitator asked three caucuses, excluding the ALARM caucus, to designate representatives to several important new workgroups and denied workgroup membership to one ALARM member who requested it. The commenter admitted that on May 12, 1993 EPA reversed its decision and allowed ALARM Caucus members to participate in workgroups.

2. The facilitator elected not to hear the ALARM proposal during the reg-neg session held at the end of July, 1993, even though the commenter believed it was the most carefully prepared and defended of all the proposals.

3. On July 29, 1993, promptly after circulation of the ALARM proposal, the facilitator caused to be

circulated, discussed, and partially supported at a meeting of selected persons from three of the four caucuses a competing conceptual framework for a rule based on substitution.

4. The facilitator failed to honor the ALARM Caucus members' request not to present the competing conceptual framework until after the ALARM Caucus proposal had been given full and fair consideration.

5. In an August 11, 1993, letter, the facilitator questioned whether the ALARM Caucus' participation in the regulatory negotiation continued to be in good faith.

The commenter (AIM-IV-214d) stated that the requirement of openness was violated in at least four main respects:

1. On April 27, 1993, the facilitator ruled that the new workgroups it had created would meet in private. The commenter admitted that on May 11, 1993, EPA and Keystone reversed the decision for secrecy.

2. After May 1993, open plenary sessions of all committee members and observers became the exception rather than the rule and substantive discussions were conducted on a caucus-to-caucus basis.

3. On July 29, 1993, EPA and the facilitator, without notice to the public or to the ALARM Caucus, held a secret meeting late into the night miles away from the site of the reg-neg session with selected representatives of three of the four caucuses.

4. On March 2, 1994, members of the same small group which had met privately in Washington in July 1993 again met in Washington and again no member of the ALARM caucus was invited to attend or was represented at the meeting.

Response: Prior to the establishment of the regulatory negotiation to negotiate a rule for architectural coatings, the EPA convened a series of open workshops to discuss the scope of a possible negotiation, review existing and planned data collecting efforts, and determine the additional information that would be required to support a rule. These meetings were a necessary part of the EPA's assessment of whether a regulatory negotiation or other consensus building approach would be appropriate for this

rule. Contrary to the allegations by the commenters, the EPA did not have a predetermined outcome for the negotiation or a pre-established position. This fact is demonstrated by the numerous alternative proposals that were discussed in the committee meetings. Specifically, during the negotiations, most of the caucuses submitted proposed architectural coatings regulations for review and discussion by the rest of the committee. In addition, several regulatory frameworks, based on elements from the individual caucus proposals and discussions, were prepared by the EPA and the facilitator. The EPA also believes that the VOC limits, as well as other aspects, of the final rule demonstrates that the EPA did not have a predetermined position on the rule at the time of the regulatory negotiation.

The regulatory negotiation for the architectural coatings rule was conducted according to EPA's procedures for advisory committees and EPA disagrees with the commenters allegations that the meetings were conducted improperly. The EPA's advisory committees operate under the Federal Advisory Committee Act (FACA), as amended, (5 U.S.C. App. 2); the Negotiated Rulemaking Act of 1990 (NRA), (5 U.S.C. Sec. 581 et seq.); the General Services Administration Rule on Federal Advisory Committee Management (GSA Rule), as amended, (41 C.F.R. Part 101-6) and Executive Order 123838 "Termination and Limitation of Federal Advisory Committees." The EPA's policies, procedures, and responsibilities relating to the establishment, renewal, termination, operation, management, and public accessibility of EPA's Federal advisory committees are contained in EPA's Committee Management Manual. The Architectural and Industrial Maintenance Coatings Negotiated Rulemaking Advisory Committee, was established and operated in full accordance with all of the above provisions.

As required by FACA, all of the architectural coatings reg-neg meetings were open meetings that were announced in the Federal Register and all interested persons had an opportunity to file comments before or after meetings, or to make statements to the extent that time permitted.

As allowed by the NRA, the architectural coating advisory committee developed an organizational protocol that outlined the procedures and guidelines that were followed in the negotiations (Docket Number A-92-18, Docket Item II-E-34). Among other things, the organization protocol clearly outlined:

- the committee members responsibilities regarding representation and attendance;
- the process for adding new committee members;
- the decision making process that was followed, including, a definition of consensus and guidelines for the formation of workgroups;
- the definition and terms of agreement on the product of negotiations;
- the role of the facilitator;
- the process for conducting, announcing, and summarizing meetings;
- the process for forming caucuses;
- the committee member's legal rights; and
- the schedule.

The procedures and guidelines in the organizational protocol were followed throughout the regulatory negotiations by both the committee and the facilitator. As outlined in the protocol, all decisions or agreements made during the course of the negotiations required unanimous consensus of all the committee members.

The protocol allowed for the formation of caucus meetings, which were defined as "meeting breaks usually called for specific parties to confer." During the negotiation process it became evident to the committee that certain groups of committee members shared similar views and interests. Because these groups frequently held caucus meetings during the negotiations, they were called "caucuses." The following caucuses were formed: Users Caucus, State/Environmental Caucus, ALARM Caucus, and Industry Caucus. During the negotiations, most of the caucuses submitted proposed architectural coatings regulations for review by the rest of the committee. In addition, several regulatory

frameworks, based on elements from the individual caucus proposals and discussions, were prepared by the EPA and the facilitator. Despite these efforts, the committee could not reach consensus on an architectural coatings regulatory framework. Therefore, on September 23, 1994, EPA announced the conclusion of the architectural coatings regulatory negotiations without consensus.

Given that the reg neg committee was unable to reach a consensus, the EPA contends that even if there had been any error in the procedures, such an error has no bearing on this final rule. Because the reg neg committee reached no consensus, it produced no proposal for consideration by the EPA in developing the proposed rule.

The commenter's points concerning the representation on the regulatory negotiation committee are addressed in section 2.5.2 of this BID.

2.5.4 Miscellaneous

Comment: One commenter (IV-D-212) implied that EPA went forward with the Architectural Coatings rule because of the momentum created by the reg-neg and to justify the time and money spent on it. The commenter estimated that EPA spent between $500 to $900 thousand dollars on the reg-neg.

Response: The EPA proceeded with development of a rule for architectural coatings because the category of architectural coatings is one of the largest sources of VOC emissions among the categories of consumer and commercial products and it was expected that significant emission reductions could be achieved at much lower cost than from reductions of other stationary sources of VOC emissions. Emissions of VOC from architectural coatings in 1990 were approximately 560,000 tons per year. The final rule is expected to reduce these emissions by approximately 113,500 tons per year, a 20 percent reduction. The estimated total annualized cost of the rule is approximately $28 million (1991 dollars). The average cost per ton of VOC emissions reduced is $250 per ton for architectural coatings compared to over $2,000 per ton for recent emission controls on new cars and

$2,000 to $10,000 per ton for controls on other industrial sources.

Comment: One commenter (IV-D-214d) stated that EPA and its facilitator declined a request to establish a workgroup on environmental and economic impacts. The commenter stated that the adverse environmental and economic impacts of substitution was not taken into consideration during the negotiations.

Response: In development of the rule for architectural coatings, EPA took into consideration potential adverse environmental and economic impacts from the rule. See section 2.3 of this BID for responses to comments on this topic. Since the regulatory negotiation closed without consensus on a draft rule, the commenter's specific concerns with procedures are not relevant to the final rule.

Comment: One commenter (CP-IV-D-07a) stated that consensus was not reached because several of the caucuses were willing or eager to ban glossy enamels.

Response: The EPA believe that there were many factors that caused the reg neg committee to fail to reach consensus. With respect to the particular concern of the commenter, the EPA does not believe that the architectural coatings rule will result in a ban of any category of paints given the VOC content limits set in the standard as well as the alternative compliance options of the exceedance fee and tonnage exemption. Based on the 1990 survey data, which contained information on over 40 million gallons of exterior "nonflats" (includes oil-based exterior house paints), the VOC content limit in the final rule is at a level that would allow over 80 percent of these exterior nonflat products to continue to be marketed. The rule establishes VOC content limits at levels that would still allow glossy enamels to be produced. The EPA also notes that the positions of caucuses in the regulatory negotiation are not relevant to the BAC determinations in the architectural coatings rule since the rule is not based on the regulatory negotiation.

Comment: After conclusion of the regulatory negotiations without reaching consensus, one commenter (IV-D-212jj) presented

a series of arguments against EPA proceeding with development of a national rule for architectural coatings. In these arguments, the commenter (IV-D-212jj) stated that there was not a broad base of support for a federal rule within the architectural and industrial maintenance coatings industry. As part of the statement of this position, the commenter (IV-D-212jj) claimed that the industry caucus group from the regulatory negotiation was dominated by large national and international manufacturers. The commenter (AIM-IV-D-212jj) continued that the ALARM caucus did not support the rule and that a straw-poll of small and regional architectural coating manufacturers were unfavorable to the EPA proposal. The commenter concluded that support for the EPA proposal came mainly from the large national and international manufacturers and that the proposal generally did not have strong support among regional and local manufacturers.

Response: The EPA notes that the commenter's concern was with the draft regulation that was developed in the regulatory negotiation and that the positions of various caucuses on that rule are not relevant to the proposed or final architectural coating rule. Based on information available to EPA, many members of the affected industry do strongly support the architectural coating regulation. The EPA has worked closely over many years with members of the industry (including small manufacturers) in order to develop a regulation that is effective yet not overly burdensome to manufacturers. In addition, the EPA has worked closely with small manufacturers and with the Small Business Administration to ensure that the rule does not impose unnecessary impacts upon small businesses. The main trade association for the architectural coating industry, the National Paint and Coatings Association, supports our efforts to issue a rule limiting VOC emissions from architectural coatings.

2.6 FUTURE STUDY

The EPA maintains that further reductions in VOC content limits beyond those in table 1 of the architectural coating rule may be technologically and economically feasible. However, much controversy surrounds the proposal of more stringent VOC content

limits in a future phase of regulation. To address the controversy, the EPA announced in the preamble of the proposed rule (61 FR 32743) that it would (1) investigate the cost and performance characteristics of coatings with VOC contents lower than the promulgated limits and assess the environmental and economic impacts of requiring lower VOC contents; and (2) continue to meet with other stakeholders regarding the potential for a future phase of regulations for the architectural coating rule.

At proposal, the EPA requested comment regarding a future joint EPA and industry study particularly with respect to any performance, cost, or reactivity considerations that should be included in the study. The EPA also requested information on coating categories where recent progress in low-VOC resin systems has resulted in new low-VOC coatings being introduced into the market since 1990. In addition, the EPA requested cost information and comments on the ability of coatings with VOC content levels lower than the proposed limits to meet the performance needs within the various coating categories. The EPA reiterates, that this second study would address whether more stringent VOC content limits might be appropriate in the future. The study and Report to Congress performed by the EPA pursuant to section 183(e) already demonstrated that consumer and commercial products have the potential to contribute to ozone nonattainment and that architectural coatings should be regulated and should be regulated in the first group of product categories for regulation.

Comment: A total of 29 commenters in 23 letters and 6 presentations (IV-D-28, IV-D-32, IV-D-33, IV-D-34, IV-D-82, IV-D-96, IV-D-117, IV-D-118, IV-D-120, IV-D-126, IV-D-148, IV-D-158, IV-D-162, IV-D-180, IV-D-181, IV-D-185, IV-D-188, IV-D-189, IV-D-206, IV-D-211, IV-D-213/IV-F-1f, IV-D-214c, IV-D-215, IV-D-217, IV-D-22/IV-F-1a, IV-F-1b, IV-F-1i, IV-F-1m, IV-F-2) responded to the EPA's request for comments on a study and future phase of VOC content limits. One commenter (IV-D-206) supported a study and expressed interest in participating in it.

Four commenters (IV-D-126, IV-D-158, IV-F-1b, IV-F-1f) opposed a study. Five commenters (IV-D-162, IV-D-185, IV-D-189, IV-D-211, IV-D-213) neither supported nor opposed the study and future phase of regulations but expressed an interest in being involved in the study if the EPA decides to pursue it. Two commenters, one supporting (IV-D-32) and one opposing (IV-D-189), discussed the concept of continuous ongoing review and revision of section 183(e) rules as best available control evolves. Two commenters (IV-D-181, IV-F-1i) encouraged the EPA to set future limits that were feasible and practical. One commenter (IV-D-120) recommended that any future EPA/industry study include all groups affected, both large and small businesses.

Five commenters (IV-D-158, IV-D-181, IV-D-206, IV-F-1b, IV-F-1f) supported the EPA's decision to include only a single table of standards for the proposed standards, while one commenter (IV-D-180) recommended that the EPA promulgate at least two tables of VOC emission standards phased in on two separate dates. Eleven additional commenters (IV-D-33, IV-D-34, IV-D-96, IV-D-117, IV-D-118, IV-D-126, IV-D-148, IV-D-188, IV-D-191, IV-D-215, IV-D-22/IV-F-1a) supported a future phase with more stringent VOC emission reductions. Eight of these commenters (IV-D-33, IV-D-34, IV-D-96, IV-D-117, IV-D-118, IV-D-126, IV-D-215, IV-D-22/IV-F-1a) supported the future phase table of VOC content limits recommended by STAPPA/ALAPCO that would achieve a 40 percent emission reduction by 2002. The commenter (IV-D-22/IV-F-1a) maintained that States would welcome a second phase of standards even if the rule is delayed, provided that State Implementation Plan (SIP) credits were able to carry over. Two commenters (IV-D-148, IV-D-22/IV-F-1a) suggested the phased reduction should be set to achieve a 45 percent reduction in overall VOC emissions within the industry as was agreed on during the regulatory negotiation. One commenter (IV-D-188) requested that the EPA work closely with California to help develop a second phase to the proposed rule such that it will address areas with the State's unique air quality challenges.

According to some commenters, there are advantages to having a second table of emission standards or a future phase with more stringent VOC emission reductions:

- Providing greater certainty to industry by not submitting them to unknown future VOC content limits imposed by States and providing them with adequate warning about when the new emission standards will be effective (IV-D-126, IV-D-180, IV-F-1a);

- Requiring that emission standards reflect BAC (IV-D-96, IV-D-126, IV-F-1a);

- Obtaining additional emission reductions (IV-D-34); and

- Allowing additional time for the industry to develop coatings that are significantly less polluting and that maintain the qualities demanded by customers (IV-D-96, IV-D-126, IV-D-148, IV-D-180, IV-F-1a).

One commenter (IV-D-148) asserted that a phased reduction could be accomplished in a relatively cost-effective manner compared to VOC reductions in other areas. Another commenter (IV-D-126) warned that the failure of the EPA to implement future reductions in its rule effectively forces States to develop subsequent coating regulations independently, increasing the hardship on manufacturers. This commenter also asserted that a future phase reduction that lowered VOC contents in 12 major coating categories would give States additional reductions while also addressing reformulation concerns of low-volume specialty coating manufacturers.

Eight commenters (IV-D-28, IV-D-158, IV-D-214c, IV-D-217, IV-F-1b, IV-F-1f, IV-F-1m, IV-F-2) opposed a future phase of regulations. Two commenters (IV-D-158, IV-D-214c) stated that section 183(e) of the Act does not authorize the EPA to impose future VOC content limits on the architectural coating industry. One commenter (IV-D-214c) expressed concern that neither the preamble nor the proposed rule says anything substantive about the possibility of the EPA imposing more stringent substitution limits in a second round of regulation. Two commenters (IV-D-158, IV-F-1b) asserted that any future phase reductions would be technologically infeasible.

One commenter (IV-F-1f) asserted that further reductions would force products to market that would not be appropriately tested and could result in contractors and customers spending large sums for coatings that do not perform. Thus, according to the commenter, any environmental benefits that might be achieved through accelerating reduction of VOC at the risk of performance would be hollow gains and would ultimately result in more emissions from coatings having to be reapplied. One commenter (IV-F-1m) expressed concern that a future standard in as little as 4 or 5 years will effectively negate the value of the earlier reformulation and more than double the burden on businesses that must reformulate to meet the first standard. One commenter (IV-F-2) claimed that regulation will lead to accelerated consolidation in the industry that will increase competitive pressures on the remaining manufacturers. Therefore, the commenter asserted that the contemplated second phase would be the last straw for many companies.

One commenter (IV-D-217) addressed the financial and technical burdens upon his company that would result from the "year 2000" potential regulation of VOC emissions from architectural coatings, using suggested values as published in current trade journals. The commenter also presented the assumptions made for analyzing the effects of the "year 2000" potential VOC regulations. (The commenter is apparently referring to VOC content limits that were discussed in the regulatory negotiation as potential requirements for a second phase that would have been effective in the year 2000.) For the year 2000, his company will manufacture and offer for sale 255 individual formulas, both solventborne and waterborne. Of the 255 formulas, 52 of these formulas will not meet the potential VOC content limits for the year 2000. Of the 52 affected formulas, 35 of these formulas cannot be reformulated to meet the VOC content limits and will have to be discontinued. The remaining 17 affected formulas probably can be reformulated to meet potential VOC content limits for the year 2000, but at great cost to the company. At this time, the company cannot predict

which of the 17 formulas will not be successfully reformulated. The commenter estimated a total cost of 6.4 million (rounded) dollars to comply for the year 2000. The commenter requested that the EPA consider the financial damage that will result from potential future VOC regulations for small, regional paint manufacturers such as the commenter's company.

One commenter (IV-D-32) encouraged the EPA to conduct future review and revision of the proposed rules as new best available controls emerge. According to the commenter, such a review and revision will serve to reduce demand for future local rules to control VOC emissions. The commenter noted that section 183(e) of the Act requires the EPA to use best available control to limit consumer and commercial product VOC emissions. The commenter asserted that a standard based on best available control must inevitably evolve with the development of new technologies or the introduction of newly exempted VOC.

In contrast, another commenter (IV-D-189) contended that because of the vast array of coating systems and the diverse and distinct demands for various coatings, attempting continuously to capture technological advances in regulatory mandates for this complicated, diverse industry would be costly for the industry as a whole, as well as being potentially anti-competitive and difficult for the EPA to administer. The commenter noted that Congress never stated any clear intention in section 183(e) of the Act that the EPA is required or authorized to act to capture or prod technology changes on a continuing basis. The commenter noted that the EPA is explicitly required or authorized under other provisions of the Act to revise guidance and other national regulations and standards, e.g., automotive emission standards, but claimed that there is no such explicit requirement or authorization under section 183(e) of the Act.

One commenter (IV-D-181) supported the EPA's decision to make future rules contingent on a study of the feasibility and practicability of such changes. Another commenter (IV-F-1i) urged the EPA to avoid setting extremely stringent VOC content limits requirements at some future date and then raising the

levels to what most products achieve. The commenter noted that when leading edge products are designed to meet a regulation, cost and performance may be compromised. When less stringent regulations are set, the market for those products disappears and the manufacturers lose money.

One commenter (IV-D-206) supported the concept of a joint future study to determine whether additional reductions in VOC content levels are feasible. The commenter stated that a joint study is a rational way of proceeding with consideration of more stringent levels. Another commenter (IV-D-211), a principal supplier of coatings to the installers and refinishers of sports floors, agreed with the EPA that further VOC reductions "may be technologically and economically feasible" in the sports floor category.

According to one commenter (IV-D-28), the EPA and industry lack the budgets to make the contemplated cost sharing study of such a magnitude that it will be total, definitive, and/or complete to justify additional regulation. The commenter suggested that the EPA point out these limitations so as not to raise expectations of the various stakeholders and requested that all parties agree to a protocol with a tolerable cost level that also ensures the likelihood of some reactivity results that will have utility for the regulator and the regulated community. Another commenter (IV-F-1f) stated that feasibility must include evaluation of a coating's ability to perform and urged the EPA to consider performance issues as paramount in any future study.

Four commenters (IV-D-126, IV-D-158, IV-F-1b, IV-F-1f) opposed a future study. Two commenters (IV-D-158, IV-D-189) asserted that section 183(e) of the Act may not authorize the EPA to conduct a future study to determine the technological feasibility to impose additional controls in the future. One commenter (IV-D-126) stated that the focus of a national regulation is to achieve actual VOC reductions that are known to be technologically feasible. Based on the lower VOC content limits currently established by many states that are being met by manufacturers, the commenter believed that lower limits are

clearly viable and should be pursued in a regulatory format rather than after a future study. Therefore, the commenter asserted that it is unreasonable to waste precious resources conducting further analyses with no promise of further reductions. Another commenter (IV-F-1b) contended that a future study would be time consuming, costly and unlikely to find clear, unambiguous evidence of appropriate VOC levels relative to quality paint products. The commenter asserted that the EPA presented the study in a particularly one-sided way, giving little chance of favorable industry hearing on the subject. Another commenter (IV-F-1f) contended a study would be done unfairly as an attempt to rationalize further reductions.

Seven commenters (IV-D-82, IV-D-162, IV-D-185, IV-D-189, IV-D-206, IV-D-211, IV-D-213) expressed interest in participating in any future study conducted to determine whether it is technologically and economically feasible for the architectural coating industry to develop products that are lower in VOC content than the limits promulgated in the national rule. One commenter (IV-D-189) will participate to ensure that the EPA has sound information and that any decisions concerning technological and economic feasibility of reformulating architectural coatings are made at the national and not the State and local levels. Another commenter (IV-D-162) expressed interest in providing evidence of coating performance, and will furnish studies of low VOC industrial maintenance coatings as they become available. One commenter (IV-D-82) requested that the Solvents Council of the Chemical Manufacturers Association be included along with other stakeholders during the early stages of future rulemakings for consumer and commercial products.

One commenter (IV-F-2) requested that the EPA clarify the process for the future phase study, and another commenter (IV-D-189) requested that the EPA clarify the technological and economic considerations that will determine its potential conclusions in the study. Three commenters (IV-D-185, IV-D-189, IV-D-213) provided input on how the EPA should conduct the study. Two of these commenters (IV-D-189, IV-D-213) stated that for any

such study to have credibility and integrity, it must be conducted under the proper conditions. The other commenter (IV-D-213) stated that any future EPA study with members of the industry to determine whether further reductions are technologically and economically feasible must incorporate the impact on contractors as well as manufacturers. The commenter stated that if the EPA pursues further reductions, it must focus on the impact of such reductions on the performance of the products affected. The commenter agreed that the study should examine cost and economic impact of lower VOC as well as performance issues. The commenter also approved of looking at reactivity considerations because reactivity factors could yield a more sensitive and narrowly tailored regulation if the EPA can find a way to work reactivity into a regulatory structure. Two commenters (IV-D-185, IV-D-189) urged the EPA to approach the subject of future regulation without preconceptions. They stated that the study should not guarantee further regulation (i.e., the possibility of no further regulation should be one possible outcome). One commenter (IV-D-185) stated that such a study should consider all significant business and scientific factors including product performance, compliance costs, and the incremental environmental benefit of further VOC restrictions. The commenter stated that the study should be fair and not unfairly burden the paint and coating industry compared to other regulated industries.

Response: The final architectural coating rule contains only one phase of VOC content requirements. The EPA has determined that the rule's requirements, considering the compliance lead time and alternative compliance options (exceedance fee and tonnage exemption), represent BAC for these products at this time. For a more detailed discussion of BAC determination, see section 2.2.4 of this document.

In addition, the EPA has concluded that additional study of this category may be warranted to determine the feasibility of additional reductions in VOC content in the future. However, contrary to some commenters' assertions, the EPA would not

necessarily impose additional VOC reduction requirements as a result of any study. The future study could indicate that further regulation of architectural coatings is unwarranted. The EPA notes that contrary to the assertions of some commenters, the EPA's initial study and Report to Congress provided ample support for the conclusion that consumer and commercial products have the potential to contribute to ozone nonattainment and that architectural coatings should be regulated. The purpose of the contemplated second study would be to determine if additional VOC reductions might be appropriate given recent technological advances.

The EPA appreciates the willingness of manufacturers and trade associations to participate in a joint study of future reductions from architectural coatings. The effectiveness of any such study is highly dependent on a spirit of openness and cooperation between all affected parties. In order to determine the potential for useful results from this second study, the EPA will solicit input from industry representatives and other interested parties on the timing, scope, and content of the study. Decisions concerning the second study will be made on the basis of this input.

Some commenters questioned the EPA's authority to engage in any future regulatory initiatives involving architectural coatings. These commenters did not identify any statutory language in section 183(e) of the Act that supports this position. Moreover, there is nothing in the statutory language that prohibits the EPA from amending or revising the rule, should that be appropriate in the future. The EPA believes that section 183(e) explicitly authorizes the EPA to use "any system or systems of regulation" appropriate to achieve the goals of the statute, and the EPA's explicit directive is to require BAC. The EPA has striven to promulgate appropriate regulations given the current state of technology. Nevertheless, the EPA acknowledges that in the future there may be advances that would justify the EPA's reexamination of the question of BAC and what level of VOC content would be appropriate. As pointed out by some commenters,

as technology evolves, it may be appropriate for the EPA to reexamine whether the rule should be revised.

2.7 LEGAL ISSUES

2.7.1 Publication requirements of the Clean Air Act and the Administrative Procedure Act

Comment: Two commenters (IV-D-212, IV-D-214c pp. 22-25) expressed concern because the EPA published the architectural coating preamble on June 25, 1996 (61 FR 32729) and the proposed rule on September 3, 1996 (61 FR 46410). The commenters claimed that because the EPA published the architectural coatings rule preamble without the proposed rule text, the EPA failed to comply with the law. One commenter (IV-D-214c) specifically stated that the EPA failed to meet the publication requirements of Act section 307(d)(3) and Administrative Procedure Act (APA) section 553(b)(3). The commenter claimed that because the preamble did not include the definition of each of the categories of architectural coatings, a manufacturer could not know to what limit a product would be subject. Therefore, the commenter claimed that the EPA had not issued the proposed rule in accordance with either Act section 307(d)(3) or APA section 553(b)(3).

Two commenters (IV-D-04, IV-D-11) also took exception to the use of electronic bulletin boards as the method of providing complete "regulatory text" to the public, as it tends to favor larger business with an understanding of the electronic format over smaller businesses. The commenters expressed concern that use of the electronic format would result in fewer comments from small businesses.

Response: Contrary to the commenters' claim, the EPA did comply with the rulemaking requirements of both the Act section 307(d)(3) and APA section 553(b)(3) when it published the architectural coating rule's preamble in the Federal Register on June 25, 1996 (61 FR 32729) and the text of the proposed rule on September 3, 1996 (61 FR 46410). Section 307(d)(3) of the Act requires that:

> In the case of any rule to which this subsection applies, notice of proposed rulemaking shall be published in the Federal Register, as provided under section 553(b) of Title 5, shall be accompanied by a statement of its basis and purpose and shall specify the period available for public comment (hereinafter referred to as the "comment period"). The notice of proposed rulemaking shall also state the docket number, the location or locations of the docket, and the times it will be open to public inspection. The statement of basis and purpose shall include a summary of--
>
> (A) the factual data on which the proposed rule is based;
>
> (B) the methodology used in obtaining the data and in analyzing the data; and
>
> (C) the major legal interpretations and policy considerations underlying the proposed rule. ...

Section 553(b) of the Administrative Procedure Act requires that:

> (b) General notice of proposed rulemaking shall be published in the Federal Register, unless persons subject thereto are named and either personally served or otherwise have actual notice thereof in accordance with law. The notice shall include--
>
> (1) a statement of the time, place, and nature of public rulemaking proceedings;
>
> (2) reference to the legal authority under which the rule is proposed;
>
> (3) either the terms or substance of the proposed rule or a description of the subjects and issues involved. ...

Thus, as provided above, the EPA is under no obligation to publish the text of a proposed rule in the Federal Register. The EPA frequently does publish proposed regulatory text, however, as a means of eliciting more specific comments from commenters. In this instance, the EPA believes that most parties, including the commenters, had participated in the regulatory negotiation process and, accordingly, had sufficient notice of the coating categories under consideration for regulation. In addition, the proposed regulatory text for the architectural coatings rule was available on the EPA's electronic bulletin board, and was available from the docket for the rulemaking, which was open to the general public on the date that the proposed rulemaking was published in the Federal Register. In a special effort to reach small coating manufacturers in particular, the EPA also mailed

the text of the proposed rule to over 600 small and medium-sized businesses, announced the public hearing and small business meeting, and requested comment on specific areas of the proposed rule. Moreover, when the EPA received a request to publish the proposed regulatory text, it did so on September 3, 1996 and extended the comment period to insure that all interested parties had time to review and comment upon the proposed regulatory text. Thus, the EPA believes that it has complied with the requirements of section 307(d) of the Act and the APA, and that there was no prejudice to the commenters.

With regard to the use of electronic bulletin boards, this is only one method of providing the complete regulatory text to the public. The regulatory text for a rulemaking can be obtained from the particular rulemaking docket when the proposed (or final) rule is published in the Federal Register. The EPA is cognizant of the need to make materials available to interested parties by different methods to insure that lack of access by one method does not preclude access to information.

For these reasons, the EPA maintains that it is in compliance with the procedural and publication requirements of the Act section 307(d)(3) and Administrative Procedure Act section 553(b)(3).

2.7.2 Compliance With the Regulatory Flexibility Act (RFA) and the Small Business Regulatory Enforcement Fairness Act (SBREFA)

Comment: Two commenters (IV-D-62, IV-D-214c) maintained that the EPA failed to prepare an initial regulatory flexibility analysis or publish a "summary" as required under §603(a) of the Regulatory Flexibility Act (RFA) for the AIM rule. One commenter (IV-D-214c) stated that the Economic Impact Analysis (EIA) found in the EPA's docket included the EPA's initial regulatory flexibility analysis, but in at least the following areas it failed to meet the mandates of §603: (1) there was no consideration of 13 types of economic costs by small businesses [603(a), 603(c)]; (2) the EPA failed to discuss any "differing compliance ... timetables" for phase one; instead a prohibitively short deadline is discussed [603(c)]; (3) omission of various

other "alternatives" to "minimize" the impact of those limits; (4) no statement of the "legal basis" of imposing limits to apply to attainment areas, as required by §603(b)(2); (5) the failure to state the "legal basis" for any potential second phase of limits, as mandated by §603(b)(2); and (6) failure to include a description of the "reasons why" imposing such limits is being considered by the EPA, or the "objectives" thereof as required in §603(b)(1) and (2). The commenter stated that instead of completing the required summary, the proposal preamble contained only four brief paragraphs, which discuss an incomplete set of certain points. The commenter stated that in a two-page summary of the EIA in the docket, the EPA conceded that "products made by small producers, on average, have higher VOC content than the industry average." The commenter concluded that this suggests that small businesses receive disproportionate impacts.

Response: The EPA prepared an initial regulatory flexibility analysis for the proposed rule and summarized that analysis in the notice of the proposed rule in accordance with the RFA [5 U.S.C. 609(b)]. The EPA published the summary of the initial regulatory flexibility analysis in the notice of the proposed rule on June 25, 1996 (61 FR 32745). The initial regulatory flexibility analysis addressed all the requirements of the RFA. The analysis is contained in the draft EIA and describes affected entities, analyzes market presence, discusses the potential for disproportionate impacts based on the product specialization of small businesses, estimates the costs associated with regulatory compliance, and assesses regulatory impacts, such as the cost to sales ratio for small businesses and the estimated change in small business producer surplus. The EIA was summarized in the proposal preamble, and was available for review in the public docket.

Comment: Four commenters (IV-D-214b/CP-IV-D-07b; CP-IV-D-07a; IV-D-212; IV-D-214c) stated that the EPA looked only at impacts on manufacturers with less than $10 million of annual revenue from the sale of AIM coatings, whereas Small Business Administration (SBA) rules regard a small paint manufacturer as

one with 500 or fewer employees. As a result, the commenters stated that the EPA erroneously excluded from its analysis many small companies. One commenter (IV-D-212) stated that the EPA allowed the NPCA to redefine small business as one with sales of $10 million per year. The commenter stated that there was no authority for any such redefinition of what constitutes as small business and that the EPA performed this redefinition in order to alter the analysis in the RFA. The commenter cited a letter it wrote to Mr. Lader, SBA administrator, which referenced the Rauch Guide and reiterated its contentions that the EPA marginalized small business. The commenter contended that the EPA showed a strong and continuing bias against small business which was contrary to the express intent of Congress as well as the President of the United States.

Response: The EPA did not include manufacturers having annual sales above $10 million but fewer than 500 employees in the initial regulatory flexibility analysis. The EPA established an alternative definition of small businesses for the architectural coating industry based on input from stakeholders during the regulatory negotiation process. Since the architectural coating industry is not labor-intensive, the EPA determined that a dollar value cut-off rather than an employee number cut-off would be a better measure to reflect the ability of a given manufacturer to devote time as well as research and development resources to meet regulation requirements. Using this alternative definition (less than $10 million in annual sales of architectural coatings and less than $50 million in total annual sales), the EPA determined that between 70 and 85 percent of the industry should be classified as small. The EPA believes that this definition of small companies is more appropriate for the impact analysis under the RFA. If the definition were changed to include more firms with sales greater than $10 million but fewer employees, the impacts on this sector of the industry would likely appear lower on average because the impacts on a company with sales around $30 million may offset

impacts on a $5 million company. Using such a definition, there may have been less justification to consider special provisions such as the exceedance fee or tonnage exemption to assist small businesses.

The RFA allows agencies the flexibility to define small entities using the criteria prescribed in the RFA or some other criteria defined by the EPA. The SBA's general size standard definitions for Standard Industrial Classification (SIC) codes is one way to define small business. The EPA can, however, modify the definition where appropriate with the cooperation of the SBA, the EPA did follow the proper procedures to choose the appropriate definition of small business in this regulation. As explained above, the EPA believes that the definition of small business used in the RFA is more appropriate and puts greater emphasis on potential impacts on small businesses than would the SIC code definition alternative.

Comment: Four commenters (IV-D-05, IV-D-52, IV-D-55, IV-D-62, IV-D-67, IV-D-70, IV-D-212, IV-D-214c, IV-F-1c) expressed concern regarding the EPA's conclusion that the proposed rule was not subject to SBREFA requirements because the rule was published before SBREFA regulations became effective. Two commenters (IV-D-212, IV-D-52) stated that the fact that the EPA published the rule 3 days before the effective date of SBREFA showed that the EPA rushed publication to beat the deadline. One commenter (IV-F-1c) stated that the fact that the EPA only published the preamble in the June 26, 1996 notice, was further evidence that the EPA rushed publication of the rule. The other commenter (IV-D-55) contended that despite the period between the proposal of the AIM rule and the effective date of SBREFA, the AIM rule ought to be subject to the SBREFA requirements. The same commenter (IV-D-214c) asserted that as a matter of law, the EPA's contention that it was not obligated to comply with §609(b) because it published the preamble 3 days before §609(b) became "effective," was erroneous.

Response: The EPA disagrees with the assertions of the commenters that the AIM rule was rushed to avoid the statutory

requirements of SBREFA. The EPA published the summary of the initial regulatory flexibility analysis in the notice of the proposed rule on June 25, 1996 (61 FR 32745), while RFA §609(b) took effect on June 28, 1996. However, the architectural coating regulation was under development for many years prior to publication. The proposed rule was the culmination of rulemaking efforts that began in 1990. More than 2 years of formal regulatory negotiation, involving representatives of both large and small businesses, ended without consensus in September 1994. Stakeholders expected proposal of a national rule in early 1995. However, the schedule was delayed as the EPA responded to concerns raised by both large and small businesses over VOC requirements. The EPA dramatically changed the rule in response to these concerns. The proposal included VOC limits that are very similar to VOC content levels petitioned for by both large and small businesses during 1995, and a second, more stringent phase of VOC limits was removed from the proposal. The EPA completed work on the proposed rule and submitted it for OMB review on March 1, 1996. SBREFA was not enacted until March 29, 1996. The proposed rule package underwent the maximum 90-day OMB review allowed by the Executive Order, and then was signed by the Administrator on June 18, 1996. Thus, the close proximity in time between the issuance of the proposal and the effective date of SBREFA is not significant. The significant fact is that the EPA developed the proposal over several years preceding the existence of the statute.

The EPA specifically disagrees with the commenters' assertions that there was inadequate consultation with small businesses prior to the proposal. The EPA has coordinated extensively with small business representatives during rule development. Small businesses were represented in the 2-year regulatory negotiation process. During that process, two meetings were held specifically to solicit additional small business input. The EPA worked with the SBA, the trade association representing many small businesses, and individual

small businesses to insure that the EPA adequately took small business concerns into account.

Following proposal, the SBA (IV-D-65) concluded that the new SBREFA requirements did not apply to the proposed architectural coatings rulemaking, because the rule was issued before SBREFA became effective, and that in any case, the final rule and final regulatory flexibility analysis would be subject to SBREFA and judicial review. The SBA expressed satisfaction with the changes the EPA made to the rule and the related regulatory analyses prior to proposal IV-D-65.

After proposal, the EPA undertook an extensive effort to solicit comment and information from small businesses in the architectural coatings. As discussed in section 2.8 of this BID, the EPA held a public hearing and two meetings with industry to provided additional opportunity for discussion of concerns. The EPA also mailed over 600 letters to small and medium-sized businesses announcing the publication of the rule, announcing the public hearing and small business meeting, and requesting comment on specific aspects of the rule. The EPA notes that the final rule is subject to the RFA as amended by SBREFA and, accordingly, the EPA has complied with the statutory requirements for the final rule.

Comment: Two commenters (IV-D-55, IV-D-70, IV-D-214c) claimed that the EPA did not take actions mandated by § 609(b) of the RFA as amended by SBREFA for the proposed rule. Such actions included: notifying the SBA and providing information on the potential impacts of the proposed rule on small businesses; convening a review panel for such rule consisting of employees of the EPA, SBA, and Office of Management and Budget; and reporting on the representatives' findings. Three commenters (IV-D-52, IV-D-62, IV-D-214c) alleged that the EPA was required to designate a small business advocacy chairperson to be responsible for implementing new § 609(b). One commenter (IV-D-52) asked whether the EPA complied with this mandate and requested the chairperson's name, address, telephone number, and activities with regard to implementing § 609(b). One commenter (IV-D-214c)

specifically claimed that the EPA did not designate the small business advocacy chairperson until June 11, 1996, which was after the April 28, 1996, date mentioned in SBREFA. Also, the commenter contended the chairperson failed to perform his statutory responsibility to implement the review process mandated by § 609(b) of the RFA for the proposed rule.

One commenter (IV-D-70) supported an in-depth review of the rule by a panel of knowledgeable small business operators to identify the extent of the economic impact on the small business community of the architectural coatings industry.

Response: The EPA disagrees with the comments because they presume that the proposed rule was subject to the RFA as amended by SBREFA. As discussed above, the proposed architectural coatings rule predated the effective date of SBREFA. Since the initial regulatory flexibility analysis for the proposed rule was completed and published in summary form prior to the effective date of § 609(b) of the RFA, it cannot be subject to the requirements of that section, which directs the EPA to convene a panel for rules "prior to publication of an initial regulatory flexibility analysis." Although a delay did occur in the appointment of the EPA's small business advocacy chairperson, it did not adversely affect the EPA's consideration of small businesses concerns or the EPA's coordination with small business representatives. The RFA, as amended by SBREFA, does not require a review panel for rules published prior to June 28, 1996. Given that the architectural coating proposal was not expected to go through the panel review process, the EPA's small business advocacy chairperson would have had no duties with respect to the proposal prior to his appointment on June 11, 1996. Additionally, even though the architectural coatings regulation was not subject to SBREFA's small-entity provision, extensive coordination with small businesses and their representatives occurred throughout the rule development process. There is a strong record of coordination with small business representatives beginning in 1992 during the regulatory negotiation. Although

consensus was not reached, the negotiation sessions/public meetings provided a forum for small businesses to make their concerns known. Based on small business concerns, the EPA has included a 1-year compliance period in the final rule. In addition, the EPA has increased the compliance flexibility of the rule through the addition of the tonnage exemption and the exceedance fee option.

2.7.3 Unfunded Mandate Reform Act (UMRA)

Comment: One commenter (IV-D-214b/CP-IV-D-07b - page 12) stated that the EPA failed to perform mandatory duties under UMRA. The commenter claimed that the EPA failed to comply with the following sections of UMRA:

- Section 201 - which provides that each agency shall assess the effects of Federal regulatory actions on the private sector.

- Section 205(a)(2) - which provides that the EPA shall identify and consider a reasonable number of regulatory alternatives and, from those alternatives, select the least costly, most cost-effective, or least burdensome alternative that achieves the objectives of the rule for the private sector.

- Section 202(a) - which provides that the EPA must prepare a budgetary impact statement to accompany any proposed or final rule that includes a Federal mandate that may result in estimated costs to State, local, or tribal governments in the aggregate, or to the private sector, of $100 million or more in any one year.

A second commenter (IV-D-52) likewise expressed concern that the EPA had not complied with the cost-benefit assessment provisions of section 202(a) of the UMRA of 1995.

One commenter (IV-D-214b/CP-IV-D-07b) also stated that the EPA incorrectly concluded in the preamble to the proposed rule that the architectural coatings rule contained no Federal mandates and was not, therefore, subject to the requirements of section 202 and 205 of the UMRA. The commenter stated that § 59.402(a) of the proposed rule mandated that manufacturers shall limit the VOC content of each coating manufactured to

certain VOC levels, which was a Federal mandate for the private sector.

The commenter (IV-D-214b/CP-IV-D-07b, CP-IV-D-07a) asserted that conducting an UMRA analysis would force the EPA to consider more adequately the economic and environmental impacts of the rule. The commenter (IV-D-214b/CP-IV-D-07b, CP-IV-D-07a) stated that the written statement required by section 202(a) of UMRA should include an assessment of the effect of the proposed rule on the natural environment. The commenter claimed that the EPA has totally ignored the possibility that the architectural coatings rule may actually increase air pollution rather than reduce it.

Response: The EPA believes that the commenters base their comments regarding the EPA's compliance with UMRA upon mistaken premises. As noted by the commenters, UMRA section 202 generally instructs the EPA to prepare a cost benefit analysis for proposed or final actions that will impose a Federal mandate upon State, local, or tribal governments, or upon the private sector, in excess of $100 million in any one year. As explained in section 2.3.2 of this document, the EPA has performed appropriate analyses which indicate that the economic impact of this rule will be approximately $28 million per year. This level is obviously far below that which would necessitate the specific type of analysis required under UMRA section 202. The EPA recognizes that the commenters dispute the amount of the total impacts of the rule, and would expand those impacts to assure that they exceeded $100 million per year. As discussed in section 2.3 of this document, the EPA believes that it has conducted the proper analysis and has included the appropriate impacts in calculating the total impacts of the rule.

Given the foregoing analysis, it is also apparent that UMRA section 205 does not apply to the architectural coatings rule. As the commenters noted, UMRA section 205 generally requires the EPA to identify and consider regulatory alternatives and to adopt the least costly, most cost-effective or least burdensome alternative that achieves the objectives of the rule, with

certain exceptions. The specific analysis of UMRA section 205 is not required unless the economic impacts of the rule exceed the $100 million threshold. A criterion that the architectural coatings rule does not meet. However, the architectural coatings rule was developed in the spirit of UMRA, being proposed after years of development during which many regulatory alternatives were considered. Some of these were explored during the failed regulatory negotiation, and others closer to the proposal date. Even though this rule does not meet the section 205 criterion the EPA developed the rule by evaluating many alternatives and choosing cost-effectiveness alternatives that minimize economic impacts on regulated entities.

In short, the EPA disagrees with the commenters' claim that the EPA has ignored the requirements of UMRA. To the contrary, the EPA has assessed the potential impacts of the rule and has concluded that the rule will not impose a Federal mandate with impacts in excess of $100 million in any one year. As such, the EPA did not prepare the specific types of analyses demanded by the commenters. The EPA notes, however, that it has nevertheless attempted to promulgate a final rule that minimizes the potential impacts upon the private sector as explained throughout this document.

2.7.4 Environmental Justice

Comment: One commenter (IV-D-177) expressed concern that the EPA has not complied with E.O. 12898 in connection with the architectural coatings rule. The commenter implied that the rule would force manufacturers to terminate the employment of employees who are members of low income or minority communities, thereby contravening the principles of environmental justice.

Response: Executive Order 12898 established the Administration's policy for identifying and addressing disproportionately high and adverse human health or environmental effects of federal agency programs, policies, and activities on minority populations and low-income populations. While the Executive Order was intended for internal management of the executive branch and does not create legal rights or provide for

judicial review, federal agencies are to implement its provisions "consistent with, and to the extent permitted by, existing law." 59 F.R. at 7632-33. As noted in the Presidential memorandum that accompanied the Executive Order, it is designed to focus the attention of federal agencies on the human health and environmental conditions in minority communities and low-income communities to realize the goal of achieving environmental justice.

The commenters suggested that their decision to eliminate jobs of minority and low-income workers in response to regulation creates an environmental justice concern that would necessarily preclude the Agency from issuing the architectural coatings rule. EPA disagrees with that view. The Agency interprets section 183(e) of the Clean Air Act to be a mandate to obtain VOC emission reductions to achieve ozone reductions to protect the health of all persons. Section 183(e) does require the Agency to take into consideration the economic feasibility of the regulations as part of the determination of what constitutes "best available controls" for each category. Assuming, without deciding the issue, that section 183(e) thus provides the Agency with a mechanism to evaluate the possible economic impacts of the rule upon low income and minority communities as one factor in the determination, such impacts would be but one factor in the analysis and must be viewed in the context of a statutory provision designed to reduce exposure to ozone pollution for all citizens.

Using this assumption, EPA has considered the potential impacts of this action on the human health and environmental conditions in minority communities and low-income communities. The Agency believes that the architectural coatings rule will provide public health and environmental protection to all communities, regardless of their socioeconomic condition and demographic makeup. Contrary to the assertions of the commenters, the Agency believes that the architectural coatings rule will not have the significant economic impacts claimed by the commenters. For example, the Agency's Economic Impact

Analysis for the final rule estimates that out of a total employment of 51,000 in the architectural coatings manufacturing industry, there may be a loss of ten jobs. See EIA at 3-10, 11. It is not possible for the Agency to determine whether these jobs will be held by members of low income or minority communities, or whether those individuals will obtain new employment elsewhere. Nevertheless, EPA does not believe that these speculative limited impacts will have a disproportionately high and adverse impact on minority or low income communities and do not outweigh the pollution reduction benefits of the rule as a whole. In fact, reduction of VOC emissions from consumer and commercial products such as those regulated by this rule should reduce public exposure to ozone pollution widely, and especially in urban core areas where there are concentrations of minority or low-income populations. EPA has thus concluded that the rule will help to achieve the goals of environmental justice and will not have the disproportionately high and adverse human health or environmental effects addressed by the Executive Order.

2.7.5 Executive Order 12866

Comment: Two commenters (IV-D-55, IV-D-214b) argued that the EPA did not properly apply E. O. 12866 to the proposed architectural coatings rule. According to the commenters, the EPA failed to provide the required economic analysis to OMB. One of the commenters (IV-D-214b) argued that the EPA had ignored the fact that the rule would constitute a significant regulatory action under section 3(f)(1) of the Order (i.e., a rule with impacts over $100 million per year) which necessitates preparation of additional analyses under section 6(a)(3)(C) of the Order. The other commenter (IV-D-55) also stated that a full cost-benefit assessment of each alternative method of regulation (exemption, reformulation, or substitution) was required under the Executive Order [section 6(a)(3)(C)] for each of the 50 categories of coatings in the proposed rule.

Response: The EPA does not agree with the commenters that this rule is a significant regulatory action under section 3(f)(1) of the Order. At the time of proposal, the EPA

performed an economic impact analysis of the proposed rule and placed this analysis in the docket (II-E-5). This analysis indicated that the impacts of the rule were approximately $25 million, with an upper bound estimate of $40 million per year, and that the impacts would probably be less than either figure. This amount is far below the $100 million per year level of impacts that triggers the obligation to do further analysis under the Order. The EPA did not ignore the requirements of E.O. 12866.

Although the impacts of the rule fell far beneath the $100 million threshold explicitly noted in section 3(f)(1) of the Order, the EPA did submit the rule to OMB for consideration because the rule potentially posed "novel legal or policy issues arising out of legal mandates." The EPA determined that this rule is a "significant regulatory action" based on the novel use of economic incentives (exceedance fee provisions)(61 FR 32744). The proposed rule was submitted to OMB for review. Contrary to the commenters' assertions, submission of the rule to OMB on the basis of novel legal or policy issues does not trigger the obligation under section 6 of the Order to conduct additional economic analysis. Such additional analysis is only necessary when and if a regulation has impacts in excess of $100 million per year and meets the other requirements of section 3(f)(1). The Guidance from OMB regarding implementation of Executive Order 12866 indicates that such additional economic analysis is only applicable in the event a rule is economically significant (i.e., has impacts of $100 million or more per year). The EPA nonetheless provided additional analysis in both the preamble and the BID for the proposed rule that addressed the benefits and impacts of the rule in qualitative terms.

One commenter (IV-D-214b) implied that the EPA did not take into account all of the costs of the rule in calculating the aggregated economic impact for the purposes of the Order. The EPA notes that it conducted the economic analysis appropriately, taking into account all relevant factors and issues. The EPA considered net social cost, distribution of costs to consumers

and producers, employment impacts, and small entity effects. (See Economic Impact Analysis). The EPA believes that this analysis reflects an accurate and appropriate assessment of the impacts of the rule. Furthermore, the EPA has concluded that to expand the analysis in the fashion suggested by the commenter would misrepresent the true impacts of the rule rather than insuring the accuracy of the analysis.

Finally, the EPA notes that the Economic Impact Analysis for the final rule indicates that the impacts of the final rule will be approximately the same as the impacts for the proposed rule (IV-A-1). The estimated cost for the final rule reflects several adjustments to the cost estimates used at proposal. These adjustments include a decrease in the reformulation cost based on information submitted in public comments and decreases in compliance costs due to the EPA's decision to provide compliance alternatives in the form of exceedance fees and the tonnage exemption. These compliance alternatives provide long-term flexibility and less costly compliance options for low volume specialty coatings where the cost of reformulation may be prohibitive compared to potential profits. Because of these adjustments to the rule to further mitigate potential impacts, the EPA has confirmed that the rule will not have impacts of over $100 million per year and therefore that the types of analyses requested by the commenters are neither required nor necessary.

2.7.6 The U.S. Constitution

2.7.6.1 Interstate Commerce Clause

Comment: One commenter (AIM-IV-D-214c) asserted that the EPA's regulation of architectural coatings under section 183(e) of the Act violates the Commerce Clause of the U.S. Constitution. The commenter stated that the regulation of products by the EPA is impermissible based upon U.S. v. Lopez, 115 S. Ct. 1624 (1995) (Congress lacked power under the Commerce Clause to criminalize possession of a firearm within 1000 feet of a school).

Response: The EPA disagrees with these comments. The Constitution gives Congress the power "[t]o regulate commerce ...

among the several States." U.S. Const., Art. I, section 8, cl.3. Under the Commerce Clause, Congress may "regulate those activities having a substantial relationship to interstate commerce, i.e., those activities that substantially affect interstate commerce." Lopez, 115 S. Ct. at 1629-30 (citations omitted). The courts have consistently held that Congress acted within its powers under the Commerce Clause when it enacts statutes to control pollution such as the Clean Air Act. See, e.g., Hodel v. Virginia Surface Mining & Reclamation Ass'n., 452 U.S. 264, 289 (1981). Regulation of air pollution and of emission sources that contribute to air pollution is a legitimate exercise of the EPA's authority under the Act and is thus within the scope of Congress' power under the Commerce Clause.

The Supreme Court's opinion in Lopez confirms this analysis. The Court noted that "[t]he possession of a gun in a local school zone is in no sense an economic activity that might, through repetition elsewhere, substantially affect any sort of interstate commerce." Lopez, 115 S. Ct. at 1634; see also, Id. at 1640 (Kennedy, J., concurring)("here neither the purposes nor the design of the statute have an evident commercial nexus"). The Lopez decision thus indicates that one test of the validity of a statute under the Commerce Clause is whether the statute does govern economic activity which through many repetitions can have a cumulative effect upon interstate commerce.

Unlike the statute at issue in Lopez, section 183(e) of the Act and the architectural coatings rule affect conduct and products that are unquestionably commercial. The limitation of VOC content and related requirements directly affect entities (manufacturers and importers), conduct (marketing and selling), and a subject matter (products for sale both locally and nationwide) that are involved in interstate commerce. The Supreme Court has consistently held that Congress may regulate products or services that substantially affect interstate commerce. See Hodel v. Virginia Surface Mining & Reclamation Assn., Inc., 452 U.S. 264, 276-80 (1981)(interstate coal mining); Perez v. U.S., 402 U.S. 146, 155-56 (1971)(intrastate

extortionate credit practices); Katzenbach v. McClung, 379 U.S. 294, 299-301 (1964)(restaurants utilizing substantial interstate supplies); Heart of Atlanta Motel, Inc. v. U.S., 379 U.S. 241, 252-53 (1964)(hotels catering to interstate guests); Wickard v. Filburn, 317 U.S. 111 (1942)(intrastate production and consumption of homegrown wheat). In particular, the Supreme Court has recognized that Congress has authority under the Commerce Clause to regulate those intrastate activities "that arise out of or are connected with a commercial transaction, which viewed in the aggregate, substantially affects interstate commerce." Lopez, 115 S. Ct. at 1631.

The products covered by the architectural coatings rule substantially affect interstate commerce. Data from 1990 indicate that architectural, industrial maintenance, and traffic marking coatings constituted 52 percent of the volume and 46 percent of the value of all paint and related products shipped in the United States in that year (III-B-1 pg. 3-8). These percentages translated into 1,219 million gallons of product with a value of approximately $12.4 billion (III-B-1 pg. 3-9). The industry includes hundreds of companies, each manufacturing in excess of $100,000 worth of product per year (III-B-1 pg. 3-9 and 3-11). Regulated entities actually sell and ship a significant portion of this product on an interstate basis. The trade association representing the paint industry estimated that only between 5 and 7 percent of the architectural coating manufacturers limit the marketing of their architectural coatings to an intrastate (single State) area (IV-J-19). With regard to architectural coatings alone, the NPCA estimates that there are approximately 42,000 retail outlets for the product throughout the United States. It should also be noted that the products covered by the architectural coatings rule are comprised of numerous components such as resins, pigments, solvents, and other additives that are themselves significant items in interstate commerce (III-B-1 pg. 3-2). In 1991, manufacturers used a total of approximately 4,396 million pounds of resins, pigments,

solvents, and additives as raw materials in their products (III-B-1 pg. 3-2).

The EPA believes that the data regarding the size and composition of the industry affected by the architectural coatings rule demonstrates that Congress and the EPA are seeking to regulate products that, in the aggregate, have a substantial impact on interstate commerce. The EPA, thus, concludes that the regulation of architectural coatings is within Congress' power under the Commerce Clause, in accordance with the Supreme Court's recent opinion in Lopez. For this reason, the EPA believes that the other judicial opinions cited by the commenter are not controlling and should not alter the EPA's analysis.

2.7.6.2 Coating Manufacturers' First Amendment Rights (Freedom of Speech, Association)

Comment: Two commenters (AIM-IV-D-55, AIM-IV-D-214c) have alleged that the EPA's promulgation of a rule regulating the VOC content of architectural coatings is the result of retaliatory action against the commenter in violation of its rights under the First Amendment to the U.S. Constitution. The commenters alleged that certain public statements by an EPA official made in the course of his duties in connection with the regulatory negotiation process evidenced an animosity toward the commenter and other members of the regulated community. The commenters implied that this animosity prompted the EPA to regulate architectural coatings in such a way as to retaliate against the commenter for having engaged in constitutionally protected speech, with the intent to chill such expression in the future.

Response: The EPA disagrees that the determination to regulate architectural coatings, or any aspect of the regulations, constitutes retaliation against any person for any reason. The EPA has determined to regulate architectural coatings in accordance with the mandate from Congress in Act section 183(e) which explicitly directs the EPA to regulate consumer and commercial products that emit VOCs, and explicitly refers to paints and coatings in section 183(e)(1)(B). As discussed elsewhere in this BID, the decision to regulate

architectural coatings and to place the product in the first group of regulated products was the direct result of the EPA's analysis of VOC emissions in the Report to Congress.

Far from retaliating against the commenter, or the architectural coatings industry in general, the EPA has striven to address concerns of the commenter and the industry and to accommodate their reasonable concerns. In addition to solicitation of written comments, the EPA invited participation by the commenter in other forums, including the regulatory negotiation process, public hearings, and direct meetings with representatives of the EPA. As detailed in an August 9, 1996, letter from the Assistant Administrator for Air and Radiation to the commenter placed in the docket for this final rule, the EPA, in fact, considered and made many changes in its regulatory approach that were responsive to the commenter and the industry in general, when such changes were appropriate and consistent with the EPA's statutory mandate. Specifically, the EPA has established VOC content limits that are generally similar to the limits petitioned for by many large and small businesses during development of the rule. In addition, the EPA has provided compliance flexibility through a tonnage exemption and an exceedance fee compliance provision. Furthermore, throughout the development of this rule, the EPA made numerous changes to the approach and requirements based on small business and other stakeholder involvement. To suggest that the architectural coating regulations reflect any retaliation against the commenter or the industry is misguided. The EPA believes that to suggest further that the EPA designed these regulations to chill future expression by anyone strains credulity.

The precedents concerning retaliatory governmental action cited by the commenter further demonstrate the error of the commenter's allegations. For example, the EPA believes that U.S. v Steele, 461 F.2d 1148 (9th Cir. 1972), is simply inapposite. That case pertained to criminal prosecution for failure to complete census forms and the government's actions to prosecute

certain individuals who were vocal opponents of the census. The Steele defendant argued that the government had chosen him for prosecution because of his vocal opposition to the census simply because the government had failed to show that its selection for prosecution either rested upon a valid ground or was merely random. Id. At 1152. The EPA's promulgation of regulations to regulate the architectural coatings industry, or even segments of that industry, do not constitute singling out of individuals for selective prosecution. Any differentiation made between the VOC content of particular types of products does not demonstrate the equivalent of "discriminatory prosecution." The determination to regulate the products and the VOC content limits set in the regulations reflect the results of an extensive, open, and inclusive regulatory process amply demonstrated by the items in the docket. Thus, any supposed improper differentiation or selection in fact has a valid and permissible ground of the type discussed by the Steele court.

The EPA also believes that the commenter mistakenly cited cases with allegations of particularly egregious alleged behavior by governmental officials, above and beyond anything that the commenter alleged in connection with the architectural coatings rulemaking. For example, in Gibson v. U.S., 781 F. 2d 1334 (9th Cir. 1986), the plaintiffs fired a battery of allegations against various law enforcement officials to support claims under 42 U.S.C. §§1983 and 1985, the Federal Tort Claims Act, and the judicial rule under Bivens v Six Unknown Agents, 403 U.S. 388 (1971). Solely in the context of determining whether the trial court properly dismissed the plaintiff's action for failure to state a claim, the Gibson court enumerated a litany of allegations that included, inter alia: frequent low level helicopter flights over the plaintiff's house, transmission of defamatory information to the plaintiff's employer, illegal wiretaps of the plaintiff's home for 9 years, and a "campaign of intimidation, burglary, and petty arson." Id. at 1342. Without assessing the truth of any of these allegations, the Gibson court

merely determined that summary judgment against the plaintiff had been improper. Id. at 1345.

In contrast, the commenter here merely alleged that a representative of the EPA made statements in public during the regulatory negotiation process that the commenter characterized as "arrogant" and "threatening." Examination of the summaries of the meetings in the docket dispels the shadow of bias that the commenter sought to create. The statements in question do not establish bias; they merely constituted a common sense observation that it was in the best interest of the industry to participate in the regulatory negotiation process to develop a satisfactory approach that the EPA could use as a basis for the proposed rule in accordance with the Negotiated Rulemaking Act. The commenter evidently mistakenly believes that a representative of the EPA is not permitted to advocate the position of the EPA in the regulatory negotiation process, or indeed, to advocate any position.

The EPA believes that the controlling case law supports the EPA's position that such vague and unsubstantiated allegations are insufficient to establish the existence of a supposed bias. Courts apply a presumption that policy makers with decision making power exercise their authority with honesty and integrity. See Schweiker v. McClure, 456 U.S. 188, 195 (1982). To overcome the presumption, a party must make a strong showing of bad faith or bias. Citizens to Preserve Overton Park, Inc. v. Volpe, 401 U.S. 402, 420 (1971). A mere unsupported allegation is insufficient to show bias. Louisiana Ass'n of Indep. Producers v. FERC, 958 F.2d 1101, 1119 (D.C. Cir. 1992). Further, it is well established that in a rulemaking context (as opposed to an adjudicatory process), EPA officials are not to be disqualified for bias or prejudgment of an issue merely because of statements made in the rulemaking process. See Ass'n. of Nat'l Advertisers v. FTC, Inc., 627 F.2d 1151, 1168-70 (D.C. Cir. 1979), cert. denied, 447 U.S. 921 (1980)("[i]f an agency official is to be effective, he must engage in debate and discussion about the policy matters before him").

The commenter relied most heavily upon Soranno's Gasco, Inc. v. Morgan, 874 F.2d 1310 (9th Cir. 1989), which the commenter identified as the leading case concerning improper governmental action in retaliation for exercise of First Amendment rights. That case addressed a dispute between a seller/distributor of petroleum products and a California Air Pollution Control District (APCD). The APCD temporarily suspended the plaintiff's license to sell gasoline for failure to supply legally required information and the plaintiff alleged that the suspension was actually in retaliation for its public opposition to, and pending litigation against, regulations developed by the APCD.

The EPA believes that the Soranno case confirms that the EPA's regulations cannot constitute governmental retaliation. First, following Mt. Healthy City School Dist. Bd. of Educ. v. Doyle, 429 U.S. 274, 287 (1977), the Sorrano court noted that a plaintiff alleging "retaliation for the exercise of constitutionally protected rights must initially show that the protected conduct was a 'substantial' or 'motivating' factor in the defendant's decision." Sorrano, 874 F.2d at 1314. Assuming that a plaintiff can make that showing, the Sorrano decision indicates that the defendant then has a burden of proof to show not that it could have taken the action in question regardless of the plaintiff's constitutionally protected conduct, but that it would have. Id. In accordance with the latter point, the mere fact that a governmental entity has the legal authority to take an action against the plaintiff under certain circumstances is not, in itself, dispositive of whether it would have taken that action absent the plaintiff's exercise of protected rights. Id. At 1315.

The EPA believes that the commenter cannot even make the initial showing under the Sorrano decision that any alleged retaliation was a "substantial" or "motivating" factor in the EPA's issuance of regulations, because it was not a factor at all. The EPA's promulgation of regulations was the result of an express statutory mandate from Congress in Act section 183(e). The particulars of the regulations are the result of an

extensive, open, and inclusive regulatory process in which the commenter and many others participated. In accordance with the second prong of the analysis in Sorrano, the EPA believes that the extensive and comprehensive docket supporting the architectural coating regulations demonstrates that the EPA "would" have issued such regulations, and "would" have issued them in the same form, regardless of the commenter's exercise of its rights under the First Amendment. Moreover, the docket further illustrates that the EPA in fact made numerous accommodations for the commenter, within the constraints of the requirements of the statute and when otherwise appropriate. The EPA welcomes, encourages, and appreciates the exercise of First Amendment rights by all persons, but does not concur that this includes the right to dictate to the EPA exactly when and how to regulate. Finally, the EPA believes that the commenter is not entitled to "chill" the legitimate exercise of First Amendment rights by representatives of the EPA via unfounded and unsubstantiated allegations of bias or retaliatory motivation.

2.7.6.3 Taking Under the Fifth Amendment

Comment: Two commenters (AIM-IV-F-1c; AIM-IV-D-214c) argued that the regulation of the VOC content of architectural coatings will effect a taking compensable under the Taking Clause of the Fifth Amendment to the U.S. Constitution which provides that "private property [shall not] be taken for public use, without just compensation." U.S. Const., Amdt. 5. The commenters stated that the regulations would impair or destroy the value of its formulas, good will, and other unspecified "intangible property rights" in connection with its production and sale of architectural coatings.

Response: The EPA disagrees that these regulations effect a taking in violation of the Taking Clause. The EPA's conclusion is based on the following standard taking analysis.

The Taking Analysis. The determination of when a compensable taking occurs is "a problem of considerable difficulty" for which the Supreme Court has not developed any "set formula." Penn Central Transp. Co. V. City of New York, 438

U.S. 104, 123-24 (1978). Contrary to the assertion of the commenter, mere diminution in value of the property, without more, does not establish a taking. Id. at 131. The Supreme Court has developed three factors for courts to weigh in assessing whether a regulation effects a compensable taking: (1) the character of the governmental action; (2) the economic impact of the action; and (3) the action's interference with reasonable investment-backed expectations. Ruckleshaus v. Monsanto Co. , 467 U.S. 986, 1005 (1984). Any one of these factors may be decisive if it is "so overwhelming ... that it disposes of the taking question." Id. The EPA believes that analysis of the architectural coatings rule in accordance with these three factors establishes that there is no compensable taking under the Taking Clause.

The character of the government action. Under the first factor, courts are more likely to find a taking when the interference with property may be characterized as a physical invasion by the government or as a commandeering of property for the government's own use, than when the interference is merely the result of a regulatory program that "adjust[s] the benefits and burdens of economic life to promote the common good." Penn Central, 438 U.S. at 124. Courts accord particular deference to governmental actions designed to protect public health, safety, and welfare. See, e.g., Keystone Bituminous Coal Ass'n v. DeBenedictis, 480 U.S. 470, 488 (1987); Penn Central, 438 U.S. at 125-26.

First, the regulations do not cause any physical invasion of the property of the regulated community. In addition, the effect of the regulations may be to limit the utility of certain types of property to the regulated community, but the regulations do not constitute a taking of that formula for use by the government itself. The government, thus, "has taken nothing for its own use." Connolly v. Pension Benefit Guar. Corp., 475 U.S. 211, 224 (1986).

Second, with the enactment of section 183(e) of the Act by Congress and the promulgation of these regulations by the EPA at

Congress' behest, the government is seeking to protect public health, safety, and welfare. Congress determined that the prevalence of groundlevel ozone pollution poses a serious threat to the populace of the nation and explicitly instructed the EPA to develop regulations that would reduce the emission of VOC ozone precursors from consumer and commercial products in order to lessen this threat (See 42 U.S.C. § 7511b). Congress expressly included "paints, coatings, and solvents" in the definition of consumer products. 42 U.S.C. § 7511b (e)(3)(A). By setting appropriate VOC limits for architectural coatings, the EPA has formulated regulations that substantially advance, and are rationally related to, the EPA's legitimate interest in protecting public health, safety, and welfare. By effecting a partial reduction of VOC emissions from architectural coatings as instructed by Congress, the regulations will help alleviate tropospheric ozone pollution in conjunction with other reductions from other products and other sources. See Keystone, 480 U.S. at 485. Indeed, the government's regulation of VOC emissions arguably constitutes action to address a condition that does, or could, constitute a common law nuisance, and it is axiomatic that no compensation is required for governmental actions to address such a condition. Lucas v. Carolina Coastal Council, 505 U.S. 1003, 1029-30 (1992).

For the foregoing reasons, the EPA believes that this factor of the taking analysis demonstrates that there is no compensable taking as a result of the architectural coating regulations.

The economic impact of the government action. The second factor in the taking analysis is the economic impact of the regulation. Courts have indicated that there is "no fixed formula to determine how much diminution in value is allowable without the fifth amendment coming into play." Florida Rock Indus., Inc. v. U.S., 791 F.2d 893, 901 (Fed. Cir. 1986), cert. denied, 479 U.S. 1053 (1987). Nevertheless, past decisions clearly hold that mere diminution in value, without more, is not enough to establish a taking, and that a regulation may have significant economic impact without constituting a taking. See,

e.g., Concrete Pipe and Products of California, Inc. v. Construction Laborers Pension Trust for Southern California, 508 U.S. 602 (1993)(citing cases finding no taking despite diminution of up to 92.5 percent). Mere denial of the most profitable or beneficial use of property does not require a finding that a taking has occurred. Andrus v. Allard, 444 U.S. 51, 66 (1979).

In light of this backdrop, the EPA believes that the architectural coatings rule will not constitute a compensable taking. First, the regulations will not operate as a total taking of any property of the regulated entities. With respect to paint formulas, nothing in the regulations will prevent the use of a particular formula completely. The architectural coatings rule provides a "tonnage exemption" which will allow manufacturers and importers to sell or distribute limited quantities of architectural coatings that do not comply with the VOC content limits and for which no exceedance fee is paid[4]. [See Final Rule, section 40 CFR 59.408]. This approach continues to accommodate small businesses, niche markets, and specialty products and the EPA has provided this exemption as one means of allowing manufacturers and importers to continue to market reasonable amounts of products that could not comply by reformulation, while limiting the VOC emissions that would result from the exemption. Second, the regulations provide an exceedance fee mechanism which will allow manufacturers or importers to continue to market noncomplying products in amounts above the limits of the tonnage exemption if they pay an exceedance fee. [See Final Rule section 40 CFR 59.403]. The EPA believes that the exceedance fee will cause regulated entities and consumers to internalize some of the costs of the pollution caused by the excess VOC content of the products and

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[4]Under the tonnage exemption provisions, each manufacturer can exempt a quantity of coatings that contains no more than 23 megagrams (25 tons) of VOC during the first 15 months, 18 megagrams (20 tons) of VOC in the year 2001, and 9 megagrams (10 tons) of VOC per year in the year 2002 and each year thereafter.

simultaneously will encourage manufacturers and importers to develop and market complying products. The EPA recognizes that the process of reformulation and testing of new products will require time and investment by the regulated entities and anticipates that the exceedance fee mechanism will allow regulated entities flexibility to develop complying products. In addition, paint manufacturers will still have the ability to manufacture paint without modification of their formulas for the foreign market. [See Final Rule section 40 CFR 59.400]. The EPA thus believes that the architectural coating rule will not constitute a complete taking of any property of the regulated entities in the form of formulas.

Although compliance with the architectural coatings regulations will require expenditures and may mean that regulated entities have to make changes in their products, the regulated entities will not be denied the economic value of their property. The VOC content limits may require some regulated entities to reformulate or modify some of their products that will not otherwise meet the limits or fall into regulatory exemptions. Information obtained during the regulatory process from other sources and commenters establishes that reformulation is feasible and, in fact, has already occurred with success in States that currently have regulations governing the VOC emissions from this type of product III-B-1 pg. 2-9). Reformulation may be costly, as argued by the commenter, but the imposition of regulations that cause a regulated entity to expend money to comply is not the type of economic impact that results in a compensable taking. See Concrete Pipe, 508 U.S. at 644-45 (claimant's property cannot be divided into what was taken and what was left in order to show that the taking of the former is complete); Atlas Corp. v. U.S., 895 F.2d 745, 756 (Fed. Cir. 1990) (regulatory requirement that mining corporations expend money to reclaim mill tailings and decommission contaminated mills does not constitute a taking).

Examination of the economic impact factor of the taking analysis indicates that the regulations will not constitute a taking of the property of the regulated entities.

Interference with reasonable investment-backed expectations. The final factor of the taking analysis is whether a regulated entity has a reasonable investment-backed expectation in continuing to use the property at issue, whether it be formulas, goodwill, or other forms of property, exactly as it has used the property in the past. To be reasonable, expectations must take into account the power of the Government to regulate in the public interest. Pace Resources v. Shrewsbury Township, 808 F.2d 1023, 1033 (3rd Cir. 1987). Reasonable expectations must also take into account the regulatory environment, including the foreseeability of changes in the regulatory scheme. Concrete Pipe, 508 U.S. at 645 (those who do business in the regulated field cannot object if the legislative scheme is buttressed by subsequent amendments to achieve the legislative end); California Hous. Sec., Inc. v. U.S., 959 F. 2d 955, 959 (Fed. Cir.), cert. denied, 506 U.S. 916 (1992)(members of a regulated community are "on notice that [they] might be subjected to different regulatory burdens over time") .

Some state and local governments have regulated architectural coatings as sources of VOC for years (III-B-1 pg. 2-9). For example, the California Air Resources Board (CARB) established a model rule for use by that state's air pollution control and air quality management districts in 1977. Of the 34 California local air districts, 16 have already adopted architectural coating rules. The CARB model rule includes VOC content limits for numerous categories of architectural coatings also covered by the EPA's architectural coatings rule. In some instances, the CARB rule standards are in fact more stringent than those in the EPA's final architectural coatings rule. [Compare, e.g., Final Rule section 59.402 with South Coast Air Quality Management District Rule 1113].

The EPA believes that the manufacturers and importers in general, and the commenter in particular, are on notice that their products are potentially subject to governmental regulation and have had reasonable notice that the regulatory scheme to limit the VOC content of their products might change. See

Dunn-Edwards Corp. v. South Coast Air Quality Management District, 19 Cal. App. 4th 519 (1993)(rejecting claims by regulated entities that SCAQMD failed to respond to certain industry concerns prior to amending state VOC content regulations). The EPA, likewise, believes that regulated entities are on notice that they must comply with regulations governing the VOC content of their products. See U.S. v. Vista Paint Corp., 976 F.2d 139 (9th Cir. 1992), cert. denied, 510 U.S. 826 (1993). A number of manufacturers and importers have already modified their products to comply with existing State regulations and have begun to market lower VOC content products throughout the nation. [See, e.g., items IV-D-26, IV-D-114, IV-D-161, IV-G-04 in the Docket.]

Finally, the EPA notes that the Supreme Court has stated that investment-backed expectations in personal property, are by their nature, limited:

> [I]n the case of personal property, by reason of the State's traditionally high degree of control over commercial dealings, [the property owner] ought to be aware of the possibility that new regulation might even render his property economically worthless (at least if the property's only economically productive use is sale or manufacture for sale).

Lucas, 505 U.S. at 1027-1028. Since the property noted by the commenter (formulas, goodwill and unspecified intangible property) is personal property, there can be no reasonable investment-backed expectation of absolute protection from regulation that renders them economically less valuable or even economically worthless.

Application of this final factor confirms that the architectural coatings rule will effect no taking of the regulated entities' property as contemplated by the Fifth Amendment.

2.7.6.4 The Tenth Amendment (Delegation Powers)

Comment: One commenter (AIM-IV-D-214c) suggested that the architectural coatings rule is suspect under the Tenth Amendment to the U.S. Constitution. The commenter argued that Congress

improperly enacted Act sections 110, 172, and 182, because they purportedly allow the EPA to force states to regulate in compliance with the standards of the Act. The commenter cited the Supreme Court decision in New York v. U.S., 505 U.S. 144 (1992), in support of the proposition that Congress cannot usurp powers not expressly delegated to it under the Constitution and cannot "conscript" state and local governments to enforce Federal laws. Because these provisions of the Act are allegedly unconstitutional, the commenter also questioned the EPA's reasoning that a national architectural coatings rule would provide an attractive alternative to numerous State regulations with potentially inconsistent standards. Apparently, the commenter argues that if the Act is unconstitutional, States will not feel compelled to regulate architectural coatings in any fashion.

Response: The EPA disagrees with these comments. The EPA believes that the provisions of the Act, and hence the architectural coatings rule, do not violate the Tenth Amendment. The Tenth Amendment provides that "[t]he powers not delegated to the United States by the Constitution, nor prohibited by it to the States, are reserved to the States respectively, or to the people." It follows that "[i]f a power is delegated to Congress in the Constitution, the Tenth Amendment expressly disclaims any reservation of that power to the States." New York v. U.S., 505 U.S. at 156. Because the EPA is acting in accordance with the Act, which Congress enacted under its Commerce Clause authority, the architectural coatings rule does not violate the Tenth Amendment.

The EPA further disagrees that the cases cited by the commenter render the enumerated provisions of the Act suspect as improper impositions of Federal authority upon States. The Act encompasses, inter alia, the concept of "cooperative federalism" in the form of national emission standards which States may meet through State regulation and State implementation plans. If a State chooses not to regulate, the Federal Government will do so through the mechanism of a Federal implementation plan. If a

State chooses to regulate in lieu of the Federal Government, it must meet Federal requirements set forth in the Act and related regulations. The Supreme Court has held that Congress may offer States the choice of regulating an activity according to Federal standards or having State law preempted by Federal regulation. New York v. U.S., 505 U.S. at 167; accord, Hodel v. Virginia Surface Mining & Reclamation Assn., 452 U.S. 264, 290 (1981); FERC v. Mississippi, 456 U.S. 742, 746 (1982). Where States have a choice of implementing Federal standards through State law, or having the Federal Government implement Federal law, there is no unconstitutional imposition upon State sovereignty.

The commenter specifically criticized the sanctions provisions of the Act as violative of the Tenth Amendment. The EPA notes that the U.S. Court of Appeals for the Fourth Circuit has explicitly upheld the constitutionality of the sanctions provisions of the Act against a direct Tenth Amendment challenge by a State. See Virginia v. Browner, 80 F.3d 869 (4th Cir. 1996), cert. denied, 117 S.Ct. 764 (1997) (sanctions constitutional because they "amount to inducement rather than 'outright coercion'") (citing New York v. U.S., 505 U.S. at 165-67). Congress is permitted to induce States to adopt Federal standards.

Finally, the EPA believes that the commenter misconstrues the nature of the architectural coatings rule as a usurpation of State authority. First, the rule does not require State or local governments to implement or enforce the regulations. Thus, the architectural coatings rule does not constitute a "conscription" of State or local governments to enforce Federal law. Second, the final rule merely sets a Federal "floor" for VOC content regulations, i.e., the minimum level of regulation of the products in all States, whether implemented by the States or the Federal Government. Nothing in the architectural coatings rule prevents a State, as a separate sovereign, from implementing different VOC emission control limits within its borders. Unlike other provisions of the Act, section 183(e) does not contain an express preemption of State and local regulations. Thus, the

Federal rule applies whether or not there are applicable State rules. The EPA continues to believe that a uniform national rule with consistent VOC emission limits for architectural coatings for all States is preferable, but the EPA will not prevent States from regulating if they so elect.

2.8 OUTREACH

Comment: Two commenters (IV-D-117, IV-D-148) recommended an outreach program to better educate consumers about coating selection choices, the importance of scheduling coating projects when the environmental impact is minimized (i.e., not on summer days when the ozone standard is expected to be exceeded), and a better understanding of available options to complete a coatings project. Both commenters encouraged the use of private-public outreach to maximize the benefits of the architectural coating rule. One commenter (IV-D-148) suggested an outreach program be developed through a partnership with the coating manufacturers and National Paint and Coatings Association (NPCA) and implemented through the States.

Another commenter (IV-D-120) stated that an outreach program based exclusively on architectural coating, as opposed to the entire VOC-emitting and ozone-forming community, would create a bias against the coatings industry, and leave the public misinformed as to the larger picture of other contributing emission sources.

Response: Outreach is targeted for the regulated community and others affected by a rule. Outreach opportunities include using literature to disseminate information about an industry; participation in training courses, trade shows, or meetings; and coordinating with the Small Business Assistance Program. Literature may include fact sheets the EPA prepared during rule development or pamphlets produced by the EPA Regional Office or a State or local entity to address specific needs of a geographic area. The EPA also considers preparing plain-English guides (or other languages) for the regulations, especially those affecting small businesses. Education efforts such as training courses often provide outreach opportunities. At times, the EPA provides

technical assistance to these seminars through expert speakers and literation. Other training opportunities include satellite downlink courses. These courses are usually presented by the EPA through a university grant and often have trade associations as joint sponsors. These courses involve the EPA, State, and industry representatives, and the resulting videotapes can be distributed to an even wider audience.

The EPA will consider which outreach tools will be most appropriate for the architectural coating rule. The Agency will consider the input of coating manufacturers, distributors, and retailers in developing and implementing the program in order to maximize its effectiveness.

Comment: One commenter (IV-D-10), who believed the EPA rushed publication of the proposed rule, requested that the EPA cancel the public hearing and enter into meaningful discussions with industry. One commenter (IV-D-11, IV-F-1c) expressed concern that the short comment period provided insufficient notice for the large body of industry and other interested parties to comment on the proposal. The same commenter (IV-D-16) expressed concern in another letter that the EPA Headquarters finds it difficult to communicate with the industry when it is so easy for the commenter to communicate with the EPA regional staff. Another commenter (IV-D-30) stated that their company shared other companies' concerns that the EPA appeared to display a genuine lack of effort in communicating the rule and notice to companies outside the NPCA. Another commenter (IV-F-2f) maintained that all of the affected manufacturers are not finding out about the proposed rule and suggested that the EPA and the Small Business Association evaluate their method of communication. This small business ($8 to $9 million per year) of concrete curing compound materials stated that curing compounds are a major part of the industry, and their company only recently became aware of the proposed regulation.

Response: The proposed rule for architectural coatings was published in the Federal Register on June 25, 1996. The public comment period was initially 60 days, but was later extended and

reopened to provide a 120-day comment period. After proposal of the rule, a public bearing and a public meeting were held by the EPA on July 30, 1996 and August 13, 1996 for the specific purpose of giving small businesses added opportunity to discuss their concerns with the EPA. Small businesses attended these meetings and presented comments on various issues related to the proposed rule; responses to those comments are included in this document.

The EPA met with concrete curing compound manufacturers in September 1996 and has addressed their concerns in section 2.2.4.3 of this document. On July 18, 1996 the EPA mailed over 600 letters to small and medium-size coating manufacturers announcing publication of the rule; requesting comments on specific aspects of the proposed rule; and announcing the public hearing, comment period, and small business meeting. The July 18, 1996 mail-out included a Fact Sheet and a copy of the proposed rule.

After the final rule is published in the Federal Register, the EPA plans to take the following steps: (1) notify the industry, including trade associations and other groups, of publication of the final rule and send copies of the final rule; and (2) prepare and distribute materials and, if resources are available, hold workshops to aid manufacturers in complying with the rule. The EPA will discuss implementation plans with the SBA, the EPA Regional Offices, and State and local agencies in an effort to reach all coating manufacturers affected by the rule.

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(Please read Instructions on reverse before completing)

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16. ABSTRACT

A final rule for the regulation of volatile organic compounds (VOC) from architectural coatings is being promulgated under the authority of Section 183(e) of the Clean Air Act. This document contains comments received from the public, and the EPA's responses to these comments.

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Air Pollution Volatile Organic Compounds Consumer Products Consumer and Commercial Products		

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