Attachment 1

UNITED STATES OF AMERICA

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of)
)
Louisiana Energy Services) Docket No. 70-3070
)
(Claiborne Enrichment Center))

AFFIDAVIT OF ARJUN MAKHIJANI

1) My name is Arjun Makhijani. I am President of the Institute for Energy and Environmental Research. I am an expert in the fields of nuclear engineering and atmospheric protection in relation to the stratospheric ozone layer. A statement of my professional qualifications is attached.

2) I am familiar with the proposed design of the Claiborne Enrichment Facility in Homer, Louisiana.

3) I assisted in the preparation of Citizens Against Nuclear Trash's Contention T, "CEC Design Relies on Use of Illegal CFC." The factual statements in that contention and its basis are true and correct to the best of my knowledge. If Contention T is admitted to this proceeding, I intend to testify on CANT's behalf regarding the the illegality of CFC-11 as a referigerant for the centrifuges at the Claiborne Enrichment Center.

4) I also assisted in the preparation of Citizens Against Nuclear Trash's Contention W, "The DEIS Is Inadequate Because It Fails to Address the Impacts, Costs, and Benefits of Ultimate Disposal of DUF6 Tails, or the Cumulative and Generic Impacts of DUF6 Tails Disposal." The factual statements in that contention and its basis are true and correct to the best of my knowledge. If Contention W is admitted to this proceeding, I intend to testify on CANT's behalf regarding the inadequacy of the DEIS' discussion of LES' plans for disposing of DUF6, and the potential adverse environmental impacts of DUF6 conversion to U3O8 and long-term disposal.

A Makhijani
Arjun Makhijani

Subscribed and sworn to before me this 14 day of January, 1994.

Notary Public

Commission Expires January 17, 1995

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ARJUN MAKHIJANI

Education:

Ph.D. (Engineering - dissertation area: controlled nuclear fusion), University of California, Berkeley, 1972.
M.S. (Electrical Engineering - thesis area: ionospheric wave propagation), Washington State University, Pullman, Washington, 1967.
Bachelor of Engineering (Electrical) University of Bombay, Bombay, India, 1965.

Current Positions:

President, Institute for Energy and Environmental Research, Takoma Park, Maryland.
U.S. EPA Science Advisory Board, Radiation Advisory Committee
U.S. EPA National Advisory Council for Environmental Policy and Technology (NACEPT)

Professional Societies:

American Association for the Advancement of Science
Institute of Electrical and Electronics Engineers
American Geophysical Union
American Institute of Physics

Awards:

The John Bartlow Martin Award for Public Interest Magazine Journalism of the Medill School of Journalism, Northwestern University, 1989, with Robert Alvarez.

European office: Wilhelm-Blum-Str. 12-14, 6900 Heidelberg, Germany, Tel (011-49) 6221-47670, Fax (011-49) 6221-476719

Consulting Experience, 1975-Present

Consultant on a wide variety of issues relating to technical and economic analyses of portions of the nuclear fuel cycle; alternative energy sources; electric utility rates and investment planning; energy conservation; analysis of energy use in agriculture; energy policy for the U.S. and for the Third World.

Among the institutions to which I am or have been a consultant (since 1989 through IEER) are:

Congressional Office of Technology Assessment
Native Americans for a Clean Environment
Lawrence Berkeley Laboratory
Tennessee Valley Authority
International Physicians for the Prevention of Nuclear War
Lower Colorado River Authority
Ford Foundation
United Nations University
Federation of Rocky Mountain States
Edison Electric Institute
Food and Agriculture Organization of the United Nations
International Labour Office of the United Nations
United Nations Environment Programme
United Nations Center on Transnational Corporations
Environmental Policy Institute
Economic and Social Commission for Asia and the Pacific
United Nations Development Programme
National Association of Atomic Veterans
The law firm of Waite, Schneider, Bayless and Chesley

Other Employment

1984-88: Associate Professor, Capitol College, Laurel, Maryland.
1983-84: Assistant Professor, Capitol College, Laurel, Maryland.
1977-79: Visiting Professor, National Institute of Bank Management, Bombay, India. Principal responsibility was the evaluation of the Institute's extensive pilot rural development programme.
1972-74: Project Specialist, Ford Foundation Energy Policy Project. Responsibilities included research and writing on the technical and economic aspects of energy conservation and supply in the U.S.; analysis of Third World rural energy problems; preparation of requests for proposals; evaluation of proposals; and the management of grants made by the Project to other institutions.

1969-70: Assistant Electrical Engineer, Kaiser Engineers, Oakland California. Responsibilities included the design and checking of the electrical aspects of mineral industries such as cement plants, and plants for processing mineral ores such as lead and uranium ores. Pioneered the use of the desk top computer at Kaiser Engineers for the use of electrical design calculations.

Professional Reports and Publications

"Further Comparison of Spread-F and Backscatter Sounder Measurements," with G.L. Hower, Journal of Geophysical Research, vol 74, no. 14, July 1, 1969; p. 3723.

"Multiple Mirror Confinement of Plasmas," with B. Grant Logan and others, Physical Review Letters, vol. 28, 1972; p. 144.

An Assessment of Energy and Materials Utilization in the U.S.A., with A.J. Lichtenberg, University of California Electronics Research Laboratory, Berkeley, 1971. Also published as "Energy and Well Being" in Environment, June 1972.

"Plasma Confinement in Multiple Mirror Systems: Theory," with A.J. Lichtenberg and others, Physics of Fluids, vol. 17, 1974; p. 1291.

One of several co-authors of the final report of the Ford Foundation Energy Policy Project, A Time to Choose: America's Energy Future, Ballinger, Cambridge, 1974.

Energy and Agriculture in the Third World, with Alan Poole, Ballinger, Cambridge, 1975.

Investment Planning in the Energy Sector, with Ed Kahn and others, Lawrence Berkeley Laboratory, Berkeley, 1976.

Energy Policy for the Rural Third World, International Institute for Environment and Development, London, 1976.

"Energy Policy for Rural India," Economic and Political Weekly, vol. XII, Special Number, Bombay, 1977.

"Solar Energy for the Rural Third World," Bulletin of the Atomic Scientists, Chicago, May 1977.

Some Questions of Method in the Tennessee Valley Authority Rate Study, report to the Tennessee Valley Authority, Chattanooga, 1978.

The Economics and Sociology of Alternative Energy Sources, Economic and Social Commission for Asia and the Pacific, 1979.

"An Evaluation of the January 1982 TVA Review of Load Growth and Capacity," report submitted to the meeting of the Board of Directors of the Tennessee Valley Authority, Knoxville, February 17, 1982.

Energy Use in the Post-Harvest Component of the Food Systems in Ivory Coast and Nicaragua, Food and Agriculture Organization of the United Nations, Rome, 1982.

Oil Prices and the Crises of Debt and Unemployment: Methodological and Structural Aspects, International Labour Office of the United Nations, Final Draft Report, Geneva, April 1983.

The Irradiation of Personnel at Operation Crossroads, with David Albright, International Radiation Research and Training Institute, Washington, D.C., May 1983.

Heat, High Water, and Rock Instability at Hanford, with Kathleen M. Tucker, and with an Appendix by Donald E. White, Health and Energy Institute, Washington, D.C., February 1985.

Target: Japan - The Decision to Bomb Hiroshima and Nagasaki, with John Kelly, translated into Japanese by Hajimei Seki, and published under the title Why Japan? by Kyoikusha, Tokyo, September 1985.

Experimental Irradiation of Air Force Personnel During Operation Redwing - 1956, Environmental Policy Institute, Washington, D.C., November 1985.

"Restructuring the International Monetary System," with Robert S. Browne, World Policy Journal, New York, Winter, 1985-86.

Deadly Crop in the Tank Farm: An Assessment of the Management of High-Level Radioactive Wastes in the Savannah River Plant Tank Farm Based on Official Documents, with Robert Alvarez and Brent Blackwelder, Environmental Policy Institute, Washington, D.C., July 1986.

"Relative Wages and Productivity in International Competition," 1987 College Industry Conference Proceedings, American Society for Engineering Education, Washington, D.C., February 1987.

An Assessment of the Energy Recovery Aspect of the Proposed Mass Burn Facility at Preston, Connecticut, Institute for Energy and Environmental Research, Takoma Park, Maryland 20912, March 1987.

Evading the Deadly Issues: Corporate Mismanagement of America's Nuclear Weapons Production, with Robert Alvarez and Brent Blackwelder, Environmental Policy Institute, Washington, D.C., September, 1987.

Release Estimates of Radioactive and Non-Radioactive Materials to the Environment by the Feed Materials Production Center, 1951-85, Institute for Energy and Environmental Research, July 1988.

"The Hidden Nuclear Legacy", (with Robert Alvarez) Technology Review, Cambridge, Mass., August/September 1988.

Saving Our Skins: Technical Potential and Policies for the Elimination of Ozone-Depleting Chlorine Compounds, with Annie Makhijani and Amanda Bickel, Environmental Policy Institute and Institute for Energy and Environmental Research, Washington, D.C., September 1988.

Reducing Ozone-Depleting Chlorine and Bromine Accumulations in the Stratosphere: A Critique of the U.S. Environmental Protection Agency's Analysis and Recommendations, with Annie Makhijani and Amanda Bickel, Institute for Energy and Environmental Research and Environmental Policy Institute/Friends of the Earth, Takoma Park, April 1989.

Reducing the Risks: Policies for the Management of Highly Radioactive Nuclear Waste, Institute for Energy and Environmental Research, Takoma Park, May 1989.

Managing Municipal Solid Wastes in Montgomery County, Prepared for the Sugarloaf Citizens Association, May 1990

To Reprocess or Not to Reprocess: The Purex Question - A Preliminary Assessment of Alternatives for the Management of N-Reactor Irradiated Fuel at the U.S. Department of Energy's Hanford Nuclear Weapons Production Facility, (with Scott Saleska) July 1990.

The Sources of Risk of Explosions in High Level Waste Storage Tanks at U.S. Department of Energy Sites, (with S. Saleska & M. Ospina), Presented to the American Chemical Society, August 1990.

Bhopal Tragedy's Health Effects: A Review of Methyl Isocyanate Toxicity, (with P.S. Mehta, A.S. Mehta, & S.J. Mehta), JAMA, December 1990.

Radioactive Heaven and Earth: The Health and Environmental Effects of Nuclear Weapons Testing In, On, and Above the Earth, (co-author with many others), Apex Press, New York, 1991.

High Level Dollars Low-Level Sense: A Critique of Present Policy for the Management of Long-Lived Radioactive Waste and Discussion of an Alternative Approach (co-author Scott Saleska), Apex Press, New York, 1992.

From Global Capitalism to Economic Justice: An Inquiry into the Elimination of Systemic Poverty, Violence and Environmental Destruction in the World Economy, Apex Press, New York, 1992.

Plutonium: Deadly Gold of the Nuclear Age (with IPPNW) International Physicians Press, Cambridge, 1992.

Mending the Ozone Hole: The Causes and Consequences of Stratospheric Ozone Depletion and Policies for Restoration and Protection of the Ozone Layer (co-author Kevin Gurney) Report, 1992

Languages: English, French, Hindi, Sindhi, and Marathi.

Attachment 2

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 82

[FRL-4810-7]

Protection of Stratospheric Ozone

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of final rulemaking.

SUMMARY: With this action, EPA is amending the schedule for the phaseout of ozone-depleting chemicals that is specified in section 604 of the Clean Air Act, as amended in 1990 (the Act). This action responds to several petitions and comments submitted by environmental organizations and industry groups seeking an accelerated phaseout of ozone-depleting substances, as authorized under section 606 of the Act. Today's action also establishes regulations implementing the amendments, adjustments and decisions adopted by the Parties to the Montreal Protocol on Substances that Deplete the Ozone Layer at their November 1992 meeting. In this action, EPA adds methyl bromide to the list of class I substances, in response to new scientific information, a petition submitted under section 602 of the Act, and the decision of the Protocol Parties to classify methyl bromide as a controlled substance with an ozone-depleting potential (ODP) of 0.7. EPA is also adding hydrobromofluorocarbons (HBFCs) to the list of class I substances. In addition, in accordance with trade provisions in Article 4 of the Montreal Protocol, EPA is banning specified trade between the U.S. and foreign states not party to, nor complying with the Protocol. Finally, this regulation modifies several recordkeeping and reporting requirements to streamline the reporting burden, and facilitate compliance.

EFFECTIVE DATE: The effective date of this rule is January 1, 1994, except that appendix A of subpart A of 40 CFR part 82, sections E. & G. (the addition of Methyl bromide and the HBFCs to the list of class I substances) is effective December 10, 1993 and § 82.4(d) is effective January 10, 1994. See the SUPPLEMENTARY INFORMATION section of this document for reasons why a 30 day notice is neither necessary nor appropriate.

ADDRESSES: Materials relevant to the rulemaking are contained in Air Docket No. A-92-13 at: U.S. Environmental Protection Agency, 401 M Street, SW., Washington, DC 20460. The public docket room is located in room M-1500, Materials may be inspected from 8:30 a.m. until noon and from 1:30 p.m. until 3:30 p.m. Monday through Friday. A reasonable fee may be charged by EPA for copying docket materials. Information on this rulemaking can also be obtained from the Stratospheric Protection Information Hotline at 1-800-296-1996.

FOR FURTHER INFORMATION CONTACT: The Stratospheric Protection Information Hotline at 1-800-296-1996 or Peter Voigt, U.S. EPA, Stratospheric Protection Division, Office of Atmospheric Programs, Office of Air and Radiation, 6205J, 401 M Street, SW., Washington, DC 20460, (202) 233-9185.

SUPPLEMENTARY INFORMATION:

Additional Information on the Effective Date

The effective date of this rule is January 1, 1994. Methyl bromide and the HBFCs are added to the list of class I substances as of the date of publication. Section 602(d) of the Clean Air Act specifies that extension of the phaseout schedule for a newly listed substance may not extend the date for termination of production for any class I substance to a date more than 7 years after January 1 of the year after the year in which the substance is added to the list of class I substances. EPA believes Congress intended the seven years to be tolled from no later than the date of publication of the listing, and that 30 days notice before the listing becomes effective for this purpose is neither necessary nor appropriate.

EPA believes that the time between publication and January 1, 1994 is sufficient for industry to comply with the annual production and consumption limits beginning January 1, 1994. The Agency believes this is a reasonable amount of notice for this kind of regulation. Compliance with the annual production period controls necessitates less advance notice than regulations for which compliance is measured over a shorter period. Also, since title VI controls of production and consumption are implemented on an annual basis, implementation on January 1, 1994 is necessary to avoid delaying the implementation of control until January 1, 1995. EPA believes that the environmental benefits associated with the 1994 controls warrant this action. Moreover, the Agency notes that 1994 restrictions on class I substances (other than methyl bromide) are necessary for compliance with the Montreal Protocol. Other regulatory provisions in this rule are tied to the production and consumption phaseout. (The class II much later). Finally, EPA has taken steps to provide notice of this final action to the regulated industry upon signature of the rule and prior to publication. For these reasons, EPA believes that the amount of time provided before the rule becomes effective is reasonable.

EPA notes that the general requirement under 5 U.S.C. 553(d) (the Administrative Procedure Act), that publication or service of a substantive rule be made not less than 30 days before its effective date does not apply here. Section 307(d)(1) of the Clean Air Act specifically applies to regulations under title V of the Clean Air Act and provides that "[t]he provisions of sections 553 through 557 and section 706 of title VI shall not, except as expressly provided in this subsection, apply to actions to which this subsection applies." Nowhere does subsection 307(d) expressly provide that section 553(d) of title V applies. Even if section 553(d) were to apply, EPA believes that, for the reasons described above, there is good cause under section 553(d)(3) of title V to provide less than 30 days notice following publication.

The contents of today's preamble are listed in the following outline:

I. Background

A broad scientific consensus has the stratospheric ozone layer will lead to increased penetration of harmful UV-B radiation to the earth's surface, resulting in potential damage to human health and the environment. The risks from ozone depletion include increases in skin cancer and cataracts, suppression of the human immune response system, damage to crops and aquatic organisms, increased formation of ground-level smog, and accelerated weathering of outdoor plastics.

Several national and international assessments have been conducted over the past years and provide useful summaries of the information supporting the linkage between emissions of certain chlorine and bromine-containing substances, depletion of the earth's protective ozone layer, and damage to human health and the environment. See for example, "Assessing the Risks of Stratospheric Ozone" EPA (1985); "Scientific Assessment of Ozone Depletion" WMO/UNEP (1989 and 1991); "Health and Environmental Effects of Ozone Depletion" UNEP (1989 and 1991), and "Methyl Bromide: Its Atmospheric Science, Technology, and Economics."

While considerable uncertainties remain in fully understanding the complex reactions that occur in the atmosphere that cause depletion of the ozone layer, scientific research has made remarkable progress since 1974 in understanding the atmospheric processes that lead to depletion of the ozone layer both in the polar regions and globally. In response to the growing body of evidence that links chlorofluorocarbons (CFCs) and other chlorinated and brominated compounds to ozone depletion, the international community reached agreement in 1987 on a landmark treaty.

The Montreal Protocol on Substances that Deplete the Ozone Layer (Montreal Protocol) initially called for a fifty percent reduction in CFC production and consumption by the year 1998 and a freeze in halon production and consumption. When originally negotiated in 1987, it had been signed by 23 nations and the European Community.

In the six years since its initiation, the Protocol has evolved rapidly in response to new scientific and technology developments. As new evidence was developed suggesting that the risk of ozone depletion from CFCs and other compounds was greater than had previously been thought, nations of the world responded by strengthening the Protocol first in 1990 and again in 1992.

As the treaty currently stands, the nations. Instead of a reduction of 50% in CFCs by 1998, the Protocol now calls for a phaseout in 1996 with the possible exception for critical uses. In the case of halons, the Protocol calls for their phaseout by the end of 1993. In addition to the originally controlled compounds, additional compounds were added first in 1990 when methyl chloroform and carbon tetrachloride were added by the Parties and scheduled for phaseout. The phaseout date for both of these compounds is now 1996. In addition, at their meeting in 1992, the Parties adopted an amendment calling for controls and the eventual phaseout of HCFCs and a freeze on production and consumption of methyl bromide (except quarantine and preshipment uses).

The accelerated phaseout and expanded scope of compounds covered by the Montreal Protocol were in response to a series of reports from the scientific community stating that ozone depletion in Antarctica appears to be directly the result of increased concentrations of man-made chlorinated and brominated compounds, that the potential exists for more significant depletion in the Arctic region, and that mid-latitude concentrations of ozone have also been reduced over the past decade or so. A more detailed description of recent scientific evidence is included in EPA's March notice of proposed rulemaking (NPRM) (March 18, 1993, 58 FR 15014).

The most recent scientific reports on ozone depletion were completed after the publication of the March proposal and show that ozone values over mid-latitudes have been substantially lower in the winter of 1992 and spring of 1993 than had been previously recorded for these times of the year. On April 23, 1993, a paper by Gleason et al. was published in Science and included data from the Total Ozone Mapping Spectrometer (TOMS) instrument on-board the Nimbus 7 satellite which showed that global ozone levels were 2–3% lower than any previous year for these months and 4% lower than normal. Ozone levels for the northern mid-latitudes were about 10% lower than historical averages for this time of the year for this region and appear to have continued at these low levels through the early part of the summer. While the precise cause of these low ozone values cannot yet be determined, it may well prove that they are the result of the indirect effects from the eruption of Mt. Pinatubo in June 1991. These effects could result from the injection of aerosol particles into the stratosphere which provide surfaces for accelerated depletion of ozone by chlorine or stratospheric temperatures and, therefore, lead to faster reactions involving chlorinated and brominated species resulting in more depletion. Investigations continue into better defining the exact role of the sulfur particles from the volcano in the recent increase in depletion.

II. Accelerated Phaseout of Class I Controlled Substances

A. Summary of Proposal

EPA considered several schedules in the March 18 proposal to accelerate the phaseout of class I controlled substances. The Agency had received prior to the proposal two petitions to accelerate the phaseout, as well as several industry comments on those petitions, submitted under section 606 of the Clean Air Act Amendments. These two petitions laid out recommended schedules to complete the phaseout sooner than the year 2000, the date required under section 604 of the Clean Air Act. The Alliance for a Responsible CFC Policy (the Alliance) petitioned the Agency to complete the phaseout by 1996, allowing for a limited volume of CFC production until 2000 to service existing refrigerator and air-conditioning systems. The Alliance suggested a cut of 50 percent of 1986 production levels for 1993, with subsequent cuts to 40 percent and 25 percent in 1994 and 1995, respectively. The Natural Resources Defense Council, the Friends of the Earth, and the Environmental Defense Fund (NRDC/FOE/EDF) requested more drastic reductions in 1992, 1993 and 1994 of 40 percent, 25 percent and 15 percent, respectively, with a complete phaseout by the end of 1994 for CFCs. The environmental groups also requested that the production of halons and carbon tetrachloride stop as of 1992, with a 50 percent of baseline cut for methyl chloroform in 1992, and its complete phaseout by 1993.

In November of 1992, the Parties to the Montreal Protocol met and agreed to a set of "adjustments", or changes to the phaseout schedules for the existing controlled substances. The Parties agreed to phase out all CFCs by 1996, allowing for production and consumption of 25 percent of baseline level in 1994 and 1995. The Parties also agreed to cut carbon tetrachloride to 15 percent of baseline levels in 1995, and to complete its phaseout by 1996. Methyl chloroform was to be eliminated by 1996 also, with a cut to 50 percent of baseline in 1994 and 1995. The Parties agreed to phase out the production of halons by the end of 1993. In order to facilitate these expedited reduction schedules, the Parties also established criteria for exempting essential uses from the production phaseout.

In response to the two petitions and the agreement reached by the Parties in Copenhagen, the Agency proposed in the March 18 NPRM to cut CFC production and consumption to 25 percent of baseline in 1994, with a subsequent cut to 15 percent by 1995. The Agency proposed to phase out CFCs by 1996, with no production extending beyond that date to service existing equipment, as had been requested by the Alliance, but discussed criteria established under the Montreal Protocol for granting essential use exemptions. Since the publication of the March 18 NPRM, the Agency came to believe that the 15 percent level it had proposed for 1995 would be too stringent for the sectors that rely on CFCs. Although CFC use has dropped significantly over the last few years, a reduction to 15 percent of baseline levels for CFCs in 1995 could hurt certain sectors, where alternatives are not yet feasible (e.g. metered dose inhalers, possibly household refrigerators), or where CFCs are required for servicing equipment with long useful lifetimes such as the automobile air conditioner and comfort cooling sectors. Since retrofits for existing equipment are still being evaluated and tested for several large use sectors, the Agency believed that the proposed level of 15 percent in 1995 could deleteriously affect consumers and these user groups. EPA asked for comments at the public hearing on changing the 1995 limit to 25 percent and published a separate notice requesting comment on this issue (58 FR 25793, April 28, 1993).

After its proposed regulation was initially signed by the EPA Administrator, DuPont announced its intent to phase out its production of CFCs by the end of 1994. Since DuPont has historically been allocated about half of all allowances (based on the 1986 base year), its decision to stop production a year ahead of the schedule proposed by EPA has potentially significant consequences. EPA also requested comments at the public hearing on the possible implications of DuPont's action on sectors requiring CFCs.

With respect to class I substances other than CFCs, the Agency proposed to phase out production of carbon tetrachloride and methyl chloroform by January 1, 1996 also, with interim reductions of 50 percent and 15 percent of baseline for carbon tetrachloride in 1994 and 1995, and 50 percent and 30 percent of baseline cuts for methyl chloroform for those years.

B. Comments on Proposal

EPA received eight comments supporting the proposed accelerated schedule with the modified 1995 limit of 25% baseline production and consumption. These commenters, primarily CFC and methyl chloroform users, believed the proposed schedule feasible, and that many were on the way to completing the phaseout. However, several of these companies warned that any further acceleration would jeopardize phaseout plans and would possibly force the use of unsafe substitutes. Many agreed that the United States must adhere to the international phaseout dates set in the Montreal Protocol, but that it should not unilaterally expedite the phaseout.

Two environmental groups objected to the proposed scheduling, both arguing that a faster accelerated schedule was possible and that CFC production should cease as of January 1, 1995. One commenter cited DuPont's and the European Community's announcements to stop production as of that date as proof that such a phaseout is possible. Both commenters believe that methyl chloroform could be phased out in 1995, and that carbon tetrachloride could be phased out by January 1, 1994.

In addition, EPA received several comments on the issue of Dupont's decision not to produce CFCs in 1995. Several major industry groups stated that full production of the 25 percent allowance is critical to the smooth transition out of CFCs and that without this quantity available in 1995 severe shortages are likely to exist and significant economic hardship to consumers and equipment owners is likely to result. One commenter opposed any Agency action on this issue, suggesting that DuPont's decision is better for the environment. DuPont in its comments reiterated that it believes that demand will drop off to such a degree in 1995 that its allocation will not be necessary, but that if the Agency believes that production of the full 25 percent of baseline levels for 1995 is necessary it would not object if the Agency were to take action to facilitate this production.

Based on its current view of the marketplace, EPA expects that almost all major uses of CFCs in new equipment will have shifted by January 1, 1995, with the possible exception of metered dose inhalers and some lines of home refrigerators. Thus, the major source of demand for CFCs in 1995 will be to service existing refrigeration and air-conditioning equipment.

To reduce future demand by those sectors, EPA has initiated a number of activities to implement its mandatory recycling and recovery and disposal rules, to minimize leaks from equipment, and to encourage retrofits and replacements of existing air-conditioning and refrigeration systems. However, in the absence of a drop-in refrigerant to service existing CFC–12 vehicles, the Agency has determined that the Protocol allowable production and consumption of 25% in 1995 is necessary to minimize economic disruption and to facilitate a smoother transition out of CFCs on the accelerated schedule adopted today. Furthermore, as explained below in the section on essential uses, EPA denied several such applications related to servicing air conditioning and refrigeration equipment on the assumption that steps will be taken to ensure that full production of CFCs is permitted in 1994 and 1995 to provide additional supplies beyond 1995 in order to minimize the costs of the phaseout to vehicle and equipment owners. As a result, the rulemaking contains the legally permissible 25 percent allowable production level in 1995 and the Agency intends to follow-up on the issue to ensure that this level of production is made available.

C. Final Schedule

In today's rule, the Agency has finalized the following schedule for the accelerated phaseout of the class I, groups I through V controlled substances. This is the schedule originally proposed in the March 18 notice, with the exception of the 25 percent level for CFCs in 1995, which is the level on which the Agency requested comment in its April 28, 1993, Federal Register Notice.

FINAL SCHEDULE FOR CLASS I CONTROLLED SUBSTANCES, GROUPS I, II, III, IV AND V

[Percent Allowable of Baseline Production and Consumption]

Year (beginning Jan. 1)	CFCs (Group I and III)	Halons (Group II)	Carbon tetrachloride (Group IV)	Methyl chloroform (Group V)
1994	25	0	50	50
1995	25	0	15	30
1996	0	0	0	0

The Agency has decided on this accelerated schedule for several reasons. First, with one exception discussed below, this is the schedule that the Parties agreed to in Copenhagen in November of 1992. The United States agreed to this schedule at that time, and believe that the schedule appropriately reflects the fastest technological and economically feasible reduction schedule. The United States, as well as the majority of the Parties, believes that a 1996 phaseout is possible, but that an earlier phaseout would exceed technological capabilities and result in excessive economic costs. Without international commitment to a phaseout date, this unilateral action by the United States to phase out earlier would pose significant costs, but would yield few benefits. It is true that despite the agreed-to 1996 phaseout, the European Community and several other countries party to the Protocol have decided to phase out of the class I chemicals one year earlier (i.e., January 1, 1995). However, EPA understands that the European Community and other countries pursuing an earlier phaseout are not as dependent on CFCs for refrigeration and air-conditioning as the United States. Consequently, the financial cost of such a phaseout by the European Community is not nearly as great as it would be for the United States (see cost implications below). EPA believes that the schedule set in Copenhagen is sufficient to allow an orderly transition out of class I chemicals without significantly further degrading the ozone layer. However, EPA believes that a faster schedule for the reduction in 1995 of methyl chloroform in the United States is both technically and economically feasible and environmentally desirable. As a result, EPA proposed and is today finalizing the proposed reduction to 30 percent of baseline levels for this compound compared to the 50 percent reduction required by the Montreal Protocol for 1995.

Recent analysis indicates that substantial costs to U.S. industry and consumers would occur if the U.S. were to accelerate further the phaseout for CFCs to 1995, rather than 1996. Much of this cost would fall on consumers and equipment owners in the refrigeration and air-conditioning sector. Unlike other sectors, such as solvents and foam blowing, the switch to alternatives has been complicated by the search for refrigerants that could be used to service existing equipment and would not diminish the efficiency and capacity of existing equipment, and by the search for refrigerant-compatible lubricating oils. Although alternatives have been developed for new equipment, the issue of servicing existing equipment with useful lifetimes well exceeding the 1995 phaseout is substantially more complicated. In many cases, owners of existing equipment must make modifications to accommodate possible alternatives. This problem is complicated by the large amount of air-conditioning and refrigeration equipment in existence. EPA and industry estimates that over 100 million mobile air-conditioners currently require CFC–12 as a refrigerant. Some percentage of these will need to be retrofitted if CFC–12 is not available past the phaseout. Although refrigerant recycling and recovery at disposal sites will supply this sector some CFC–12 past 1995, the required volume of refrigerant will exceed the supply of recycled CFC–12, even with 1995 production at 25% of baseline. (EPA could not allow production at greater than 25% level, however, because the Protocol establishes the level of 25% for 1995.)

For stationary refrigeration sectors, EPA estimates that more than 67,000 CFC chillers, as well as 7,000 industrial process chillers are currently operating in the United States. This equipment has a useful life of 30 years or longer. Although owners are beginning to retrofit and replace these chillers, the pace of these activities has been slow, and it is not clear that there will be sufficient recycled refrigerant past 1995. Retrofits are available, but costs vary significantly by sector and even within sectors by type of equipment.

The Agency had proposed in its March 18 NPRM to limit production and consumption to only 15 percent of baseline in 1995. However, EPA requested comment on whether the less stringent reduction to 25 percent baseline would be more appropriate (58 FR 25793). In today's final action, EPA is allowing the 25 percent baseline production to be consistent with the provisions of the Copenhagen agreement by the Parties, and because consumers and equipment owners would face significant retrofit costs if production levels were further reduced in 1995. The need for full allowable production under the Montreal Protocol in 1995 is even more critical given the limited essential uses likely to be granted under the Montreal Protocol for production after that date.

EPA is limiting carbon tetrachloride to 50 percent of baseline in 1994, with a subsequent cut to 15 percent of baseline in 1995, and no production in 1996, consistent with the Protocol. Environmentalists, in their comments on the proposal, requested a carbon tetrachloride phaseout date of January 1, 1994. In response, the Agency believes that significant steps have been taken to eliminate the use of this chemical for both health and environmental reasons. However, the remaining uses are often unique applications for which the industry continues to search for substitutes. EPA believes that this remaining 15 percent of production and consumption for carbon tetrachloride is necessary to assist the industry in the transition to a complete phaseout.

EPA intends to limit methyl chloroform to 50 percent of baseline allowances in 1994, and to further reduce consumption and production of this chemical to 30 percent of baseline in 1995, with a complete phaseout in 1996 also. Environmentalists commented that EPA should phase out this chemical in 1995. In response, EPA believes that the 1996 phaseout is more appropriate. This user sector has been subjected to more immediate and drastic reductions than the other major controlled substances over the last three years, and to phase out one year earlier than required under the Montreal Protocol would place an undue burden on a sector that involves many small users and has faced continually changing reduction schedules. Despite this, EPA is only allowing production and consumption equal to 30 percent of baseline, due to the advancements made by the user sector rather than the 50 percent allowed under the Protocol. EPA believes that this level is a feasible one.

EPA performed a comprehensive review of all costs and benefits of the phaseout of class I chemicals associated with the various proposed schedules. However, the quantification of benefits is difficult. In the past, scientists have generally underpredicted the extent of ozone depletion caused by these chemicals. For this reason, scientists and policymakers have relied more on chlorine loading calculations as a surrogate for risk of ozone depletion than predictions of ozone depletion. Policymakers have set a target concentration of 2 parts per billion (ppb) of chlorine as the level that existed prior to the Antarctic ozone hole. All policies are directed toward reducing the peak chlorine levels and minimizing the length of time that concentrations exceed 2 ppb.

EPA examined the impact on chlorine levels under the schedules proposed by the environmental groups and by industry as well as their suggested schedules submitted in their comments on the proposal. According to this analysis, all three schedules would return chlorine concentrations to below 2 ppb at the same time over the next 100 years. As for "peak" concentrations, the environmental groups' schedule limited peak concentrations to little over 4.0 ppb by the turn of the century, with the concentrations under the schedules announced here also peaking at this time, but at approximately 4.1 ppb. The chlorine loadings for the industry schedule rose to about 4.2 ppb, but peaked at a later date than either the final rule schedule or the environmentalists' schedule. Under all schedules, chlorine concentrations would decrease from the peak level several years after the [illegible]5 phaseout and again following the HCFC ban. Although chlorine concentrations under the environmentalists' schedules do peak at the lowest level of the chlorine concentrations of the three schedules, EPA believes that the total volume of additional chlorine loading from the final rule schedule over the earlier phaseout of environmentalists' schedule is not significant, especially when considered over the next century.

EPA calculated the benefits for the various accelerated schedules and compared those benefits with their corresponding costs through a more traditional cost-benefit analysis. In past analysis of the benefits of reducing production and consumption of ozone-depleting chemicals, the Agency has monetized many of the health and environmental benefits (skin cancer and cataract cases avoided, crop loss, materials damage, etc.) due to the protection of the ozone layer. Social costs reflect the expenses incurred from the transition to alternatives.

The table below presents the costs and benefits for the phaseout schedules analyzed for the rulemaking.

Incremental Costs and Benefits of the Accelerated Class I Phaseouts Over the 2000 Phaseout (Methyl Bromide Not Included; Costs and Benefits Discounted at a 2% Discount Rate)

[In Billions of Dollars—Cumulative Costs: 1989–2075 in 1985 Dollars]

Scenario	Benefits	Costs	Net benefits
Final rule	48–189	7	41–182
NRDC	56–221	29	27–192
Alliance [1]	39–152	1	38–151

[1] The "Alliance" is the Alliance for a Responsible CFC Policy, an industry lobby group representing producers and users of these chemicals.

The table does not reflect the large number of uncertainties associated with such an analysis. The numerical value of benefits varies depending on the assumed value of life, while costs reflect social costs and not necessarily the actual costs faced by companies. However, despite these uncertainties, the analysis does provide a range of net benefits for the phaseout of class I chemicals, and indicates that these net incremental benefits range from approximately $37 to $192 billion. The NRDC phaseout achieves the highest net benefit under one set of benefit assumptions, but the lower end of its net benefit range is below the range for both the Alliance and the final rule schedule. This is because of the relatively high cost of the NRDC phaseout. (The Agency analyzed the reduction schedule suggested in NRDC's response to the proposed rule. EPA's analysis indicates that, although costs are lowered, the net incremental benefits are approximately the same as those of the schedule proposed in their petition.) Both the final rule schedule and the Alliance schedule have similar net benefits, but the upper range of the benefits of the final rule schedule exceeds the benefits range for the Alliance schedule. For these reasons, the Agency believes it appropriate to set the reduction schedules as specified in this final rule.

In performing this analysis, the Agency examined the necessary reductions to meet the production and consumption targets of this rule. For CFCs, the final rule schedule requires a 75% reduction in the 1986 baseline in both 1994 and 1995. For the air-conditioning and refrigeration sectors, EPA assumes that there is full implementation of recovery of refrigerant at servicing and disposal. Also, the Agency assumes that all new equipment in these sectors contain such alternatives as HFC–134a, HCFC–123, ternary blends and ammonia, and that high-efficiency purges have been installed on half of the existing chillers by the end of 1995.

For the foam sector in 1994 and 1995, the Agency estimates that more than 23% of the rigid polyurethane boardstock market will have shifted to product substitutes, and that the remaining share of that sector will shift to HCFC substitutes. One commenter did note that the appliance manufacturers would not completely shift to HCFC replacements by the end of 1993, as had been noted in the proposal. All other foams have shifted to water blown foams or product substitutes. With the exception of appliance foam, EPA expects all uses of CFCs in this sector will have been eliminated by the end of 1993.

EPA expects that both the solvent and sterilant sectors will continue to use engineering and housekeeping controls to limit use of CFCs and shift to alternatives or process changes. Aqueous, semi-aqueous cleaning, and "no clean" technologies continue to penetrate the new equipment market, while existing equipment adopts drop-in replacements. Many of the aerosol products have already moved to alternative propellants and delivery systems. EPA expects that all uses of CFCs in these sectors will be eliminated by the end of 1995.

By the beginning of 1996 all CFC use sectors, except for certain essential uses, will have made the transition to alternative chemicals and products. However, as noted earlier, existing air-conditioning and refrigeration equipment will require utilizing some combination of existing CFC inventories, maximum recycling and recovery at disposal, retrofits, actions to minimize leaks, and replacement of older, less energy efficient equipment.

The final rule schedule calls for a 50% reduction in 1989 baseline use of methyl chloroform in 1994, with an additional 20 percent reduction in 1995. The Agency believes that this sector may accomplish these reductions in 1994 through implementation of engineering and housekeeping controls in all solvent equipment, and by industry beginning to use aqueous cleaning in cold cleaning and conveyorized vapor degreasers. The adhesives sector will continue implementation of water-based adhesives, and begin to use hot melts and other solvent based adhesives, while the coatings and inks sector will continue to use powder coatings, and expand use of water based coatings.

The 1995 target of 30% of baseline may be achieved by implementation of additional alternative solvents in new and existing cold cleaning, conveyorized and open-top equipment. In addition, methyl chloroform aerosol producers and users will begin to adopt petroleum distillates and water based applications. The industry will completely phase out of methyl chloroform by the full penetration of these technologies by 1996 except possibly for limited essential uses.

The schedule in today's final rule requires the complete phaseout of halons by January 1, 1994. Indeed the Agency understands that all manufacturers in the United States will soon have stopped production of these compounds. The fire prevention community has successfully completed the transition by adopting alternatives as well as minimizing the emission of halons during training, and increased recycling through the recent establishment of halon banks. EPA commends the halon user sector for their efforts in the elimination of their use of new, virgin halon. Efforts to establish halon banks are now underway and should provide adequate supplies of recycled halons for all critical uses well into the future. The cooperation of this industry and its resolve to minimize emissions represents a model for the remaining sectors to achieve the same results.

In the March proposal, EPA also discussed in detail the essential use provision provided for in a decision taken by the Parties to the Montreal Protocol at their 1992 meeting in Copenhagen. The proposal discussed the criteria established by the Parties for granting essential uses, noted that any uses granted under domestic rules must be consistent with actions taken by the Parties, and stated that EPA would be requesting essential use nominations through separate **Federal Register** announcements.

EPA has published two such announcements in the past six months. The initial announcements dealt with essential use nominations for halons for 1994 (58 FR 6788). Following that, EPA issued a second announcement (58 FR 29410) covering CFCs, carbon tetrachloride, methyl chloroform, and HBFCs for production in 1996.

In the case of halons, EPA received a number of applications for essential uses, but was able to cooperate with each of the applicants to address their short-term needs, and therefore the United States did not nominate any essential uses for halons for 1994. Nominations were, however, submitted by about a dozen other nations. As a first step in the review process, these nominations were examined by the halon committee of the Technology and Economic Assessment Panel under the Montreal Protocol. This panel concluded that either adequate substitutes existed for each of these applications or adequate supplies existed in the halon bank, and therefore recommended against any additional production in 1994 for halon essential uses. This recommendation was unanimously supported at the Open-Ended Working Group which met in August 1993 in Geneva. The final decision will be taken this year by the Parties at their meeting in Thailand.

In the case of the other compounds, EPA received approximately twenty. In evaluating whether additional production would be needed in 1996, one important consideration is whether adequate supplies will exist, either from recycled or recovered sources or from production allowed in 1995 or before, that might be available for use in 1996 and beyond. To the extent that supplies are available from any of these sources, then the criteria of "no available supply" necessary for granting an essential use would not be satisfied.

The United States Government reviewed these applications and forwarded to the Protocol's Secretariat nominations for production after 1995 for use in: Metered dose inhalers and other specified medical applications; a bonding agent for the Space Shuttle; aerosol wasp killers; a limited use in a specified bonding application and specified polymer application; and a general nomination for laboratory uses under specified limitations. The United States did not forward applications submitted in the area of servicing automobile air conditioners and building chillers. These were rejected because the government believed that by taking all economically feasible steps including shifting to alternatives, initiating retrofits, reducing emissions and utilizing 1994 and 1995 productions of CFCs, adequate supplies would exist for servicing for 1996 and for the same period beyond. However, in putting forward its nominations, the United States discussed its continued concern about the potential costs if a significant number of expensive retrofits are required. It reserved the right in future years to submit nomination in areas other than those submitted for 1996. The decision by the Parties on essential uses for CFCs, MCF, carbon tetrachloride and HBFCs for 1996 will be taken at the 1994 Meeting of the Parties. EPA will periodically inform the public through **Federal Register** notices of the schedule for future essential use nominations and the outcome and decisions by the Parties of past nominations.

D. Legal Authority

Section 606 of the Act provides the Administrator with authority to accelerate the phaseout of ozone-depleting substances. That section authorizes the Administrator to promulgate regulations that "establish a schedule for phasing out the production and consumption of class I and class II substances (or use of class II substances) that is more stringent than set forth in section 604 or 605, or both, if:

(1) Based on an assessment of credible current scientific information (including any assessment under the Montreal Protocol) regarding harmful effects on the stratospheric ozone layer associated with a class I or class II substance, the Administrator determines that more

stringent schedule may be necessary to protect human health and the environment against such effects,

(2) Based on the availability of substitutes for listed substances, the Administrator determines that such a more stringent schedule is practicable, taking into account technological achievable, safety, and other relevant factors, or

(3) The Montreal Protocol is modified to include a schedule to control or reduce production, consumption, or use of any substance more rapidly than the applicable schedule under this title. In making any determination under paragraphs (1) and (2), the Administrator shall consider the status of the period remaining under the applicable schedule under this title."

As explained above, section 606(a) of the Act sets forth the criteria on which EPA is to base a decision to accelerate the phaseout schedule for ozone-depleting substances. The accelerated schedules established today are justified under both sections 606(a)(1) (necessary to protect human and the environment) and 606(a)(2) (technologically feasible).

Recent scientific evidence, including the latest of the Montreal Protocol assessments, provide ample "credible" evidence of the need for further reductions. As discussed above, the latest scientific evidence provided by NASA, NOAA, and the UNEP assessment demonstrates that ozone depletion is occurring at a far more rapid rate than was thought to be the case at the time of the enactment of the 1990 Clean Air Act Amendments. This evidence clearly warrants an acceleration of the phaseout schedule. With respect to section 606(a)(2), the substantial reductions in production of class I substances highlight the progress being made in shifting to alternatives. Furthermore, the latest UNEP Technology Assessment provides adequate documentation of the technological availability of accelerating the phaseout of these chemicals.

Section 606(a)(3) also provides authority for implementing the adjustments to the Protocol agreed to at the Fourth Meeting of the Parties, i.e., the acceleration of the phaseouts of CFCs, halons, carbon tetrachloride, and methyl chloroform. Unlike amendments, adjustments do not need to be ratified by a specified number of Parties before they enter into force. The adjustments entered into force on September 22, 1993, prior to the promulgation of this phaseout rule. Thus, EPA believes that section 606(a)(3) provides additional authority for accelerating the phaseout of class I substances at this time.

With respect to amendments approved by the Parties to the Protocol that accelerate the phaseout of substances listed under the CAA, such as HCFCs, section 606(a)(3) provides additional authority for the acceleration of their phaseout schedules once the amendments have been ratified by the necessary 20 Parties; all that remains is the passage of time before the amendments enter into force.

EPA also notes that section 614(b) of the CAA provides that in the case of a conflict between title VI of the CAA and the Protocol, the more stringent provision shall govern. Thus, the Act requires the Agency to establish phaseout schedules at least as stringent as the accelerated ones agreed to by the Parties. The phaseout schedules that the Agency is establishing today are at least as stringent as those required by the adjustments to the Protocol. The final phaseout dates that are required for all Class I substances are the same as those in the new adjustments. The interim reductions required for CFCs in 1994 and 1995, for methyl chloroform in 1994, and for carbon tetrachloride in 1995 are also identical to those contained in the adjustments. The other required interim reductions are more stringent than those contained in the adjustments. These are being established under the authority granted in section 606(a) (1) and (2), as explained in the NPRM (58 FR 15021–22).

EPA believes that an acceleration of the phaseout can be justified under either paragraph (1) or paragraph (2) of section 606(a), but that even if EPA determines that an accelerated schedule is warranted based solely on an assessment of credible scientific information under paragraph (1), it can take into account the availability of substitutes in determining the specific accelerated schedule that it promulgates.

EPA believes that this view is reasonable and supported by both the language and the legislative history of the 1990 Clean Air Act Amendments. The last sentence of section 606(a) provides that in making any determination under paragraphs (1) and (2), the Administrator shall consider the status of the period remaining under the applicable schedule under this title. Implicit in the sentence is the notion that EPA will consider both environmental need and technological achievability in making "any" determination to accelerate the phaseout schedule. On its face, the sentence provides that even when making a decision regarding acceleration pursuant to paragraph (1), EPA is to "consider the status of the period remaining under the applicable schedule." This connotes that EPA is to consider the practicality of an accelerated schedule, including the availability of substitutes.

Even apart from the language at the end of section 606(a), which was added during the House-Senate Conference on the 1990 Clean Air Act Amendments, EPA believes it has the authority to take into account the technological achievability of a specific schedule in accelerating a phaseout schedule on the basis of scientific findings. Congress itself recognized the linkage between the need to phase out the production and consumption of ozone-depleting chemicals to protect the environment and human health and the availability of substitutes for those chemicals. Even though Congress understood that any delay in phasing out ozone-depleting substances would delay a return to normal ozone levels, Congress did not require an immediate phaseout. Instead, Congress established a schedule phasing out the chemicals over a period of several years to allow time for substitutes to be developed and for affected industries to adjust.

The Senate Environment and Public Works Committee noted that the "importance of accelerating the phaseout schedule is reflected in the estimate, presented by expert witnesses, that a three to five year delay in the phaseout deadline translates into an additional 20 to 30 years of elevated chlorine levels in the atmosphere. An additional 20 years of elevated chlorine levels presents an unacceptable risk that must be avoided if it is at all possible to do so." (S. Comm. Rep. No. 101–228 at 394). Furthermore, with respect to a provision concerning the phaseout of HCFCs, the Committee Report stated that it must be recognized "that the goal of eliminating the potent, long-lived CFCs as rapidly as possible is, to some extent, dependent on the near-term availability of HCFCs as intermediate substitutes * * *." (Id. at 395) Thus, the Senate clearly recognized that the availability of substitutes had to be taken into account in determining how quickly CFCs could be phased out, notwithstanding the environmental benefits that would result from an even more rapid phaseout.

Moreover, in explaining the provision of the Senate Committee Report concerning the acceleration of the phaseout schedule, which provided for EPA to accelerate the schedule if any of three criteria substantially identical to those in the Amendments were met, the Committee stated that "[i]n keeping with the national policy of the production before the year 2000, to the maximum extent practicable, the Administrator is directed to determine no less often than every 18 months whether any of three conditions requiring acceleration of the schedule has been satisfied." (S. Comm. Rep. No. 101–228, Dec. 20, 1989, at 393., emphasis added). The Committee's use of the terms, "as rapidly as possible" and "to the maximum extent practicable," demonstrates its recognition of the role of considerations other than strictly scientific ones in the application of section 606(a).

In taking the availability of substitutes into account, the Administrator may consider the future potential for substitutes, as well as the cost of the substitutes, and adopt a phaseout schedule that will be technology-forcing by inducing the development of substitutes on a more accelerated pace than would otherwise have been the case. This is confirmed by the same Senate Committee Report that indicated a role for technological factors in the establishment of a phaseout schedule. The report notes that a unilateral acceleration of the phaseout schedule by the Administrator may be necessary "to accelerate technological developments." (*Id.* at 393).

EPA believes that the accelerated phaseout schedules for class I substances are fully justified and within its authority.

III. Accelerated Phaseout of Class II Controlled Substances

In today's final rule, EPA accelerates the phaseout of production and consumption of HCFC–22, HCFC–141b and HCFC–142b, three relatively high ODP-weighted HCFCs. The Agency believes that this approach will meet the requirements of the Copenhagen Amendments, as well as comply with the requirements of the Clean Air Act. Specifically, the Agency will ban the production and consumption of HCFC–141b as of January 1, 2003. The production and consumption of HCFC–142b and HCFC–22 will be frozen at baseline levels in 2010, with a complete phaseout of these chemicals by January 1, 2020. Production and consumption of these chemicals between 2010 and 2020 can only be for the purpose of servicing equipment manufactured prior to January 1, 2010. Production and consumption of the remaining HCFCs will be frozen at baseline levels beginning January 1, 2015, with all uses of virgin production of these meterials banned except for use as a feedstock or as a refrigerant in appliances. The final category of HCFCs would be phased out by January 1, 2030.

The Agency has not established a baseline year or corresponding levels for these HCFCs at this time. EPA will continue to monitor the production and consumption of these chemicals to determine the appropriate baseline to ensure that the requirements of the Copenhagen Amendments and the Clean Air Act are met. Although a baseline level may be required in order to establish the appropriate freeze levels in 2010 and 2015 as required under section 605(d) of the Clean Air Act, the Agency believes that action so far in advance of these dates is neither necessary nor desirable.

A. Statutory Authority

Today's final rule accelerates the phaseout of production and consumption of specified HCFCs. The revised schedule for phasing out these compounds modifies the schedule contained in section 605 of the CAA, which states: "(a) That effective January 1, 2015, it shall be unlawful for any person to introduce into interstate commerce or use any class II substance unless such substance—(1) has been used, recovered, or recycled; (2) is used and entirely consumed (except for trace quantities) in the production of other chemicals; or (3) is used as a refrigerant in appliances prior to January 1, 2020, and (b) that effective January 1, 2015, it shall be unlawful for any person to produce any class II substance in an annual quantity greater than the quantity of such substance produced by such person during the baseline year. Effective January 1, 2030, it shall be unlawful for any person to produce any class II substance."

The authority to accelerate the phaseout of HCFCs is contained in section 606 of the CAA, which has been discussed above in the context of the accelerated phaseout of class I substances. As part of the petitions submitted to the Agency under section 606 of the CAA, both NRDC/FOE/EDF and the CFC Alliance proposed modified dates for the phaseout of certain HCFCs. In addition, the Agency received a third petition dealing with class II substances submitted by the Institute for Energy and Environmental Research (IEER). The Agency responded to the first two sections in the March 18 proposal while the Agency's response to the IEER petition is discussed in detail below.

B. Copenhagen Amendments to the Montreal Protocol

At the Fourth Meeting of Montreal 1992, the Parties agreed to amend the Protocol to include a control regime restricting the consumption of HCFCs. The measures adopted by the Parties place an overall cap on consumption of these compounds based on their ozone-depleted weights, and gradually reduce the permissible amount allowed under this cap. The regime also calls for a phaseout of consumption in 2030. The consumption cap for each of the developed countries is equal to the sum of 3.1 percent of the country's 1989 ODP-weighted consumption of CFCs in Group 1 of Annex A and the ODP-weighted level of HCFCs also consumed in that year. The HCFC restrictions are to begin in 1996, assuming that the Copenhagen Amendments have entered into force by that date. The amendments further call for a 35% reduction under the cap in 2004, followed by a 65% reduction in 2010, a 90% reduction in 2015, a 99.5% reduction in 2020, and a total phaseout in 2030.

Under a separate **Federal Register** notice (58 FR 40048), EPA has requested the 1989 HCFC and CFC data it needs to establish the exact level of the cap that would be applicable to the United States under the Protocol amendments. Once EPA has calculated the United States' baseline, the Agency shall publish in the **Federal Register** the consumption baseline for the purposes of the Montreal Protocol.

C. CAA Petitions

1. NRDC/FOE/EDF

The NRDC/FOE/EDF petition requested, among other things, that the Agency accelerate the phaseout of certain HCFCs, with the earliest phaseout dates proposed for those compounds with the highest ODP. Specifically, the petitioners requested that the production and consumption of HCFC–22, HCFC–141b, and HCFC–142b be prohibited from use in new equipment by January 1, 2000. The environmentalist would allow these compounds to be available for an additional 5 years, until January 1, 2005, to service existing equipment.

2. CFC Alliance Petition

The CFC Alliance Petition proposed an acceleration of the same compounds identified in the NRDC/FOE/EDF petition, but requested different phaseout dates. It suggested a January 1, 2010 ban on the production and use of HCFC–22, HCFC–141b, and HCFC–142b in new equipment, with a total phaseout of these compounds in 2020. The petition submitted by the CFC Alliance was generally supported in comments

Appliance Manufacturers and the Air Conditioning and Refrigeration Institute.

3. IEER Petition

IEER also submitted a petition dated April 23, 1992 that relates to the issue of controls on class II substances. IEER requested that EPA: (1) Reclassify HCFC–22, HCFC–141b, HCFC–142b as class I substances; (2) recalculate the ozone depletion potential of any partially halogenated substance with an atmospheric lifetime of six months or more based on its peak contribution to atmospheric chlorine relative to CFC–11 following an instantaneous release of each; and (3) survey all chlorine-containing substances with an atmospheric lifetime greater than one month and list as a class II substance any such compound that contributes greater than three parts per trillion to atmospheric chlorine.

The IEER petition argues that the use of "steady state" ODPs are an inappropriate basis for dealing with the risks associated with various compounds. The calculation of an ODP is based on its contribution to ozone depletion compared to that of CFC–11 over a period of roughly 200 years, which is based on the length of time that CFC–11 would contribute to ozone depletion. This is referred to as the "steady state" ODP. Since the HCFCs have a considerably shorter atmospheric lifetime, their contribution to the risks of ozone depletion occurs over a period of a few years to several decades, a period far shorter than that of CFC–11. The IEER petition argues that using the "steady state" period of roughly 200 years for analyzing the impact of the HCFCs is inappropriate and masks their near-term impact. IEER contends that, most importantly, since the risks of ozone depletion are greatest over the next decade or so when atmospheric chlorine and bromine levels are likely to peak and then begin to decline, EPA should alter its method of calculating ODPs to that proposed by the petitioner and list compounds as class I or II substances based on this modified approach.

4. EPA's Proposed Action

In its proposal, EPA addressed both the Copenhagen Amendments and the issues raised in the NRDC/FOE/EDF and CFC Alliance petitions. The proposal incorporated several key concepts contained in these petitions, including distinguishing among HCFCs based on their ODP and phasing out use in new equipment prior to use for servicing existing equipment. The proposal did not explicitly follow the cap approach adopted internationally under the Copenhagen Amendments, but instead contained specific timetables for the phaseouts of each compound that EPA expects will result in full compliance with the phased reductions called for by the Protocol Amendment.

The proposal set forth the following schedule for HCFC reductions: by January 1, 2003, all production and consumption of HCFC–141b would be eliminated; by January 1, 2010, production and consumption of HCFC–22 and HCFC–142b would be frozen at baseline levels and virgin material could only be used only as a feedstock or as a refrigerant in appliances manufactured prior to January 1, 2010; by January 1, 2015, baseline production and consumption of all other HCFCs would be frozen and all uses of virgin production of these materials would be banned except for use as a feedstock or as a refrigerant in appliances manufactured prior to January 1, 2020; by January 1, 2020, production and consumption of HCFC–22 and HCFC–142b would be prohibited; and by January 1, 2030, production and consumption of all other HCFC substances would be banned.

In this proposal, the Agency discussed at length the basis for accelerating the phaseout of HCFCs to respond to increased risks of ozone depletion. It also described its rationale for rejecting the earlier phaseout dates requested in the NRDC/FOE/EDF petition. EPA's rationale focused primarily on the fact that alternatives to many of the HCFCs have not yet been developed to the point that the Agency could determine that commercialization would be feasible on a faster timetable. The Agency views HCFCs as important interim substitutes that will allow for the earliest possible phaseout of CFCs and other Class I substances. However, the Agency believes that the use of HCFCs should be limited to only those applications where other environmentally acceptable alternatives do not exist. EPA has proposed limitations under its section 612 rulemaking (Significant New Alternatives Policy Program) to implement this approach. 58 FR 28094 (May 12, 1993).

By distinguishing between HCFCs based on their relative contributions to ozone depletion, the Agency has also sought to minimize risks associated with the use of HCFCs. In particular, the early phaseout date for HCFC–141b was proposed because its ODP is substantially greater than any other of the HCFCs. Similarly, in allowing until 2030 for the phaseout of HCFC–123 and other HCFCs with very low ODPs, the Agency's proposed action reflected the fact that these compounds will contribute substantially less to the risks of ozone depletion.

The Agency's proposal also explained in detail the rationale behind implementing a regulatory scheme that differed in approach from that adopted by the Protocol. The Agency explained that the cap approach adopted in the Protocol could create unworkable administrative problems in allocating allowances and that its proposed regime built on activities (e.g., HCFC production and use plans) already well underway and would be less disruptive and provide greater certainty for industries moving aggressively out of class I substances.

Most importantly, the proposal explained the basis for the Agency's belief that its regulatory scheme would ensure compliance with the United States' obligations under the Montreal Protocol. The Agency presented detailed, sector-by-sector, analysis of likely uses of HCFCs and determined that based on conservative assumptions, total use within the United States under its proposal would not exceed the limits established in the Protocol.

5. Response to IEER Petition

While EPA's March 18, 1993 proposal on class II substances addresses many of the issues raised in the IEER petition, the Agency did not explicitly respond to the petition in the context of that proposal. In doing so here, the Agency believes it is important to address directly the issues raised by IEER concerning the listing of several HCFCs as class I substances and the method of calculating ODPs.

As discussed above, the IEER petition requested that the Agency shift its methodology in calculating ODPs from the "steady state" calculations that have traditionally been used by EPA under the Clean Air Act and under the Montreal Protocol to a calculation based on the ODP at the time of a compound's peak contribution to atmospheric chlorine or bromine. The rationale behind this proposal is that an ODP calculated in this manner better represents the risks of ozone depletion associated with compounds that have relatively short atmospheric lifetimes and that this approach is particularly appropriate given that atmospheric chlorine levels, and therefore health and environmental risks, are likely to peak around the turn of the century. The table below contains ODP calculations for different periods of time that have recently been published in the scientific literature. It demonstrates the general point made in the IEER petition that substantially higher over the short- than over the longterm.

SEMI-EMPIRICAL POLAR OZONE DEPLETION POTENTIALS

	Time horizon (yrs.)			
	10	20	100	500
HCFC–22	0.17	0.14	0.07	0.05
HCFC–141b	0.45	0.33	0.13	0.11
HCFC–123	0.19	0.08	0.03	0.02
HCFC–142b	0.16	0.14	0.08	0.07

Source: Solomon and Albritton (1992).

The Agency believes that the need to consider the short-term impacts of HCFCs on ozone depletion is important in its decisions to set various control measures for controlled substances required for phaseout. The decision to accelerate the phaseout of Class II substances and to require a faster phaseout of those HCFCs with a higher ODP reflects the Agency's response to this concern. Indeed, EPA's modeling analysis accounts for short term effects. Thus, this consideration supports the Agency's decision to phase out HCFC–141b before any other HCFC.

While recognizing the importance of short-term impacts on ozone depletion in its regulatory decisions, the Agency has decided not to modify the manner in which it calculates ODPs for the purposes of regulating compounds under the CAA. The Agency believes it has adequate authority to consider a compound's short-term impact in shaping its regulatory policy without such a change. For example, in calculating the risks associated with different phaseout schedules and interim reduction targets, the Agency's analytical tools (e.g., modeling of chlorine and ozone depletion) take into consideration both the near-term and longer-term impacts associated with each compound. Indeed publication of an atmospheric lifetime and halogen loading potential reveals these impacts, when considered together with the steady state ODP. The Agency has authority under section 602 to add substances to the class I and II lists based on their overall harm to the ozone layer and under section 606 to accelerate the phaseout of class II substances in the light of these impacts.

The Agency believes that changing the calculation methodology for ODPs as IEER suggests would conflict with the Agency's goals in protecting against ozone depletion which reach beyond simply reducing the near-term risks. The Agency and the Montreal Protocol also have as an important goal restoring onset of the Antarctic ozone hole. To achieve this goal, it is necessary to also reduce the use of the compounds with longer atmospheric lifetimes and very high ODPs, including the CFCs and carbon tetrachloride. To the extent that the availability of HCFCs allows for the accelerated phaseout of CFCs, their use contributes to this important objective. (For several important uses of CFCs, HCFCs are currently the only available alternatives.) Changing the method for calculating ODPs could limit the Agency's flexibility to allow continued use of certain HCFCs as transitional substitutes for the CFCs.

Furthermore, the Agency has decided not to modify its method for calculating ODPs because of two potentially important inconsistencies that such a change would create. First, the 0.2 threshold in section 602 for listing a class I substance was specified by Congress on the basis of a steady state ODP. Since this level is fixed in the CAA, shifting to short-term ODPs for determining whether a compound should be listed would produce unintended results. While the Agency always has the flexibility to add substances to the class I list based on significant contribution to ozone depletion, considering all relevant information, the Agency believes the 0.2 mandatory listing threshold was established with a steady-state ODP concept in mind. Congress itself assigned steady state ODPs in section 602, Table 1. While the Agency is authorized to adjust the Table 1 ODPs, The numbers Congress assigned indicates that the 0.2 threshold was intended to represent a steady state ODP. Furthermore, Congress explicitly called on the Agency to use steady state ODPs as the basis for evaluating impacts instead of using chlorine loading potentials, even though the concept of chlorine loading was recognized at the time the legislation was adopted and EPA is required to publish a compound's chlorine loading potential under section 602(e).

Congress' understanding that ODPs are calculated as a "steady state" is clearly reflected in the legislative history, as is Congress's intent that chlorine and bromine loading potentials be published to allow analysis of "future peaks and rates of increase or decline." See Senate Committee Report, Report No. 101–228, 101st Cong., 1st Sess., at 389 (December 20, 1989) (hereinafter "Senate Report") ("ODPs * * * reflect the relative chronic ozone destruction * * * of a substance after nearly constant emissions for a century.

contribution of different halocarbons to the amount of chlorine in the atmosphere over the next decade and beyond.").

The second reason the Agency has elected not to modify the way it calculates ODPs is that section 602(e) of the CAA requires that the ODPs used by the Agency be consistent with the Montreal Protocol. The Agency, therefore, believes the steady state approach must be used to assign ODPs under the CAA in order to be consistent with the steady state approach used under the Montreal Protocol's Copenhagen Amendments, at least when those Amendments to the Protocol enter into force (likely sometime in 1994). Even before the Amendments enter into force, the Agency believes it would be inappropriate for EPA to adopt one set of values now only to have to change them within the next several months when the Copenhagen Amendments entered into force for the United States.

Short-term ODPs were discussed as part of the Scientific Assessment report to the Montreal Protocol Parties and therefore were before the Parties as an option to be adopted. However, neither the Scientific Assessment Panel nor the Parties themselves recommended or even considered any proposal to shift the calculation of ODPs from a steady-state to a short-term basis. Despite being explicitly included in the Scientific Assessment report the Parties rejected a shift to short-term ODPs primarily because they view as the objective of the Protocol both the near-term reduction of risks and the longer-term return of the atmosphere to pre-Antarctic ozone hole conditions. A shift to short-term ODPs might compromise the longer-term objective.

EPA believes, for the reasons discussed above, that to adopt an approach to ODPs that the Scientific Assessment Panel and the Parties rejected would be "inconsistent" with the Montreal Protocol and therefore in these circumstances in conflict with section 602(e).

While EPA has rejected IEER's request for modifying the way it defines and calculates ODPs for assignment under the CAA, the Agency notes that if it had done so, very little would change in its regulatory program. Of the three compounds that IEER requested be shifted to class I status (HCFC–22, –141b, –142b), only HCFC–141b would appear to exceed 0.2 based on the 10–20 year lifetimes calculated in the scientific literature and based on the calculations made by IEER using its "peak" approach. Thus, if the Agency

HCFC–141b and allowed the full seven years extension time permitted under section 602(d) based on what is attainable, it would require a phaseout in 2002, only one year earlier than today's final action provides. The other compounds (HCFC–22 and –142b) have short-term ODPs below 0.2 based on the calculation contained in the scientific literature and therefore would not have to be added to the class I list based on the assigned ODP alone.

EPA also does not believe that the addition of these HCFCs to the class I list can be justified independently on the basis that they "contribute significantly" to ozone depletion. EPA believes that the use of these HCFC compounds will allow for the accelerated phaseout of CFCs in several important sectors and therefore facilitates rather than increases reduction in both short-term and to a greater extent long-term risks of depletion.

The final request in the IEER petition involves a review of other partially halogenated substances to determine if they contribute to ozone depletion and if they should be listed as class II substances. While EPA has not conducted an exhaustive review of all other halogenated compounds, it believes that the limited data available for such high-volume chlorinated compounds as perchloroethylene and methylene chloride support the view that these compounds have very short atmospheric lifetimes (e.g., much shorter lifetime than any of the HCFCs) and therefore do not contribute in any significant way to ozone depletion.

6. Today's Final Action

HCFC restrictions and the approach included in today's final rule have not changed from those proposed by the Agency in March. EPA received comments from several groups on different aspects of its proposal. In general, these comments supported the general approach taken by the Agency in implementing the Montreal Protocol's restrictions on HCFCs. These comments supported the Agency's proposal to phase out compounds based on their relative ODPs with the compounds with higher ODPs phased out earlier than those with lower ODPs. Comments also generally supported the decision to phase out consumption in new equipment prior to that for servicing existing equipment. Comments strongly opposed using an allowance allocation or auction to more directly implement the cap approach adopted in the Protocol.

Several commenters, however, argued for earlier phaseout dates for several of the HCFCs. These commenters argued that EPA's proposal would allow too long a period for the use of HCFCs. For example, these comments suggested that HCFC–141b could be phased out earlier in foam and HCFC–22 could be eliminated at an earlier date in refrigeration applications. Other commenters argued that while alternatives might be feasible by the proposed dates, it was still too early to tell if they would be and that the Agency should build in additional flexibility to allow use to continue for a longer period of time in the event alternatives do not become available. While EPA intends to monitor closely the development of alternatives, it has decided against either requiring an earlier phaseout date for these HCFCs or allowing greater flexibility by extending the dates. The Agency believes that critical research into alternatives, particularly for HCFC–141b in foam and in limited solvent applications and HCFC–22 in refrigeration and airconditioning is currently on-going and should result in the availability of substitutes by the dates contained in the HCFC phaseout schedule. While promising alternatives for these compounds are currently in early stages of evaluation, considerably more product testing and energy efficiency evaluations are required. Any conclusions concerning earlier availability or commercialization of those alternatives would currently be premature.

Issues related to HCFCs are also undergoing further review by the Parties to the Protocol. A new scientific and technical assessment of relevant issues should be available in late 1994 and will be used by the Parties in reviewing its current HCFC limitations in 1995. EPA believes that any further actions regarding HCFCs should await the outcome of that process.

Finally, in the proposed regulation, EPA restricted both the production and consumption of the specific HCFC compounds at specified dates. The Agency received comments stating that the Montreal Protocol provision on HCFCs restricted only consumption of HCFCs, defined in the Protocol as the amount produced plus the amount imported minus the amount exported and that EPA should similarly restrict only consumption.

Section 602(c) of the Clean Air Act requires that EPA restrict production and consumption of class II substances on the same schedule. Furthermore, EPA believes that, even if authorized by the Act, it could not adopt final rules restricting only consumption without requesting public comment on the approach since it would represent a significant departure from the proposal, which dealt with both production and consumption.

Moreover, EPA notes that, notwithstanding the production phaseout, section 605(d)(2) of the CAA allows for continued export of HCFCs to developing countries that are Party to the Protocol for their basic domestic needs through 2040. While the section provides a cap on the amount beyond the baseline permitted for such experts, as noted earlier, EPA is deferring for now the establishment of any specific baseline levels for HCFCs.

EPA proposed quarterly reporting of all HCFC production and use in order to monitor compliance with the Montreal Protocol. Several commenters objected to quarterly reporting, stating that such reporting was burdensome. However, EPA continues to believe that quarterly reporting is necessary. EPA has developed an approach to limit HCFCs by targeting for phaseout the high ODP-weighted HCFCs. By accelerating the phaseout of HCFC–141B, HCFC–142B and HCFC–22, EPA believes it will meet its obligations to the Montreal Protocol. However, the Agency must receive HCFC production and consumption data (i.e., imports and exports) quarterly to ensure U.S. compliance. If it should appear that the United States is to exceed its limits, EPA may act to ensure that compliance is maintained. Although there may be several approaches that EPA may use to control production and consumption under these circumstances, it is likely that EPA would resort to rulemaking during this period, including the use, if necessary, of a direct or interim final rule. For this reason, EPA will require quarterly reporting of production imports and exports of HCFCs. With this data EPA can monitor national consumption of these data. (EPA does note that to date companies have always significantly underproduced their allowable level).

Although the March 18 Notice stated that EPA proposed to require use data, the Agency will not require information on use from the user sectors. EPA believes that only data on production imports and exports are required at this time.

IV. Addition of Methyl Bromide to List of Class I Substances and Phaseout Schedule

A. Summary

Based on recent scientific assessments and the most recent actions by the Parties to the Montreal Protocol, EPA methyl bromide as a class I substance under section 602(c)(3) of the Clean Air Act; and to phase out production and consumption of this substance by the year 2000. This was in response to a petition filed on December 3, 1991 by Natural Resources Defense Council, Friends of the Earth, and the Environmental Defense Fund (hereafter referred to as NRDC/FOE/EDF petition).

As part of that proposal, EPA rejected the more stringent phaseout schedule proposed by the petitioners, based on the lack of available substitutes in the near-term. Instead, EPA proposed a freeze in production and consumption of methyl bromide beginning on January 1, 1994 at 1991 levels, no interim reductions, and a phaseout by the year 2000. In addition, the Agency proposed that ozone depletion warning labels required under section 611 of the Clean Air Act for products "manufactured with" ozone-depleting substances does not apply to agricultural products, such as fruits and vegetables. See, Response to Comments on section 611 labeling rulemaking.

EPA received 560 comments on the methyl bromide aspects of its March 18th proposal. The large majority of comments were from members of the agricultural community and generally raised scientific issues regarding the ozone depletion potential (ODP) of methyl bromide, the lack of alternatives, and the economic impact of phasing out the production of this compound.

Today's final action examines in detail the issues raised by these comments, and adopts an approach that, consistent with the ozone layer protection requirements of the Clean Air Act, responds to the current state of scientific understanding concerning this compound. The regulatory schedule (freeze without interim reductions followed by the required phaseout of the compound), fully utilizes the limited flexibility permitted by the statute.

Specifically, today's final action lists methyl bromide as a class I substance with an ODP of 0.7 as specified in the latest Montreal Protocol international scientific assessment and as agreed to by the Parties to the Protocol at their meeting in Copenhagen in November 1992. The final rule does not require any interim reductions and provides the longest possible period (7 years or until January 1, 2001) allowed under section 602 for the phaseout. Finally, for the reasons explained in the proposal, EPA is interpreting "manufactured with" in section 611 to mean "the mechanical or chemical transformation of materials into new products or to assemble component products" and to exclude products for which methyl bromide is used thus need not be labeled under section 611.

B. Legal Authority

1. CAA Legal Authority

Under section 602(a), EPA is to add to the list of class I substances any substance that the Administrator finds causes or contributes significantly to harmful effects on the stratospheric ozone layer, including all substances that the Administrator determines have an ozone depletion potential of 0.2 or greater.

Under section 602(e), simultaneously with any addition to the class I list, the Administrator shall assign to each listed substance a numerical value representing the substance's ozone depletion potential. In addition, the Administrator shall publish the chlorine and bromine loading potential and the atmospheric lifetime of each listed substance. Section 601(10) of the Act defines ODP as "a factor established by the Administrator to reflect the ozone depletion potential of a substance on a mass per kilogram basis, as compared to chlorofluorocarbon-11 (CFC–11)," and goes on to state that "such factor shall be based upon the substance's atmospheric lifetime, the molecular weight of bromine and chlorine, and the substance's ability to be photolytically disassociated, and upon other factors determined to be an accurate measure of relative ozone depletion potential."

Section 602(e) also states that "[w]here the ozone depletion potential of a substance is specified in the Montreal Protocol, the ozone depletion potential specified for that substance under the subsection shall be consistent with the Montreal Protocol." When the Copenhagen amendments to the Montreal Protocol, which include the ODP for methyl bromide as 0.7, enter into force for the United States, this statutory provision will apply for methyl bromide.

Under section 602(c)(3), any person may petition the Administrator to add a substance to the list of class I substances. Such a petition is to include a showing by the petitioner that there are data on the substance adequate to support the petition.

Also, section 604 authorizes EPA to promulgate regulations phasing out the production of class I substances from baseline levels, in accordance with the schedule specified in that section. The "baseline year" is defined in section 601(2)(C) to mean a representative calendar year selected by the Administrator in the case of substances authorizes EPA to promulgate regulations providing for production and consumption allowances of class I substances.

Under section 602(d), for a newly listed class I substance (such as methyl bromide), the Administrator may extend any schedule or compliance deadline contained in section 604 if that schedule is unattainable considering when it is added to the list. But the provision specifies that no extension under that subsection may extend the phaseout to a date more than 7 years after January 1 of the year after the year in which the substance is added to the class I list. As EPA is adding methyl bromide to the class I list in 1993, the phaseout date may not be extended beyond January 1, 2001.

2. Public Comments on Legal Issues

While many commenters argued that EPA should delay action until scientific uncertainties are resolved, the Agency received few comments specifically questioning its legal authority to act under title VI of the CAA.

The Methyl Bromide Working Group (MBWG) provided the only extensive comments questioning the Agency's legal authority to list methyl bromide. Its comments stated that EPA's only nondiscretionary action was to respond to the petition by NRDC/EDF/FOE and that a more appropriate response would be to deny the petition on the basis of scientific uncertainty and instead to issue a "tentative, non-binding ODP range for methyl bromide—without listing it as a class I substance".

In making this argument, the MBWG argued that the ODP listed in the report issued by the Montreal Protocol assessment panel (Methyl Bromide: Its Atmospheric Science, Technology and Economics, Montreal Protocol Assessment Update, June 1992; hereafter referred to as Assessment Update) should not be the basis for U.S. domestic regulatory action and that EPA is required to undertake its own evaluation of this compound's ODP.

EPA has thoroughly reviewed the issue of whether a range of values for the ODP would be more appropriate than the 0.7 value contained in its proposal. As explained in detail below, in the context of this review the Agency has considered the statutory language and treatment of ODPs, the actions taken by the Parties to the Montreal Protocol, the Scientific Assessment Update, and other relevant scientific information. Based on this review, the Agency has determined that a listing of methyl bromide with an ODP of 0.7 is

Section 602(e) of the Clean Air Act addresses the impact of the Protocol's ODP on EPA's regulatory obligations. When the Protocol enters into force, EPA must assign an ODP "consistent with the Montreal Protocol." The commenter argued that a range of values including the one adopted by the Protocol would be legally valid. The Agency notes, however, that the Parties to the Montreal Protocol expressly considered adopting a range of values for the ODP of methyl bromide and rejected this approach. EPA believes that adoption of such a range would, under these circumstances, be inconsistent with their action.

The Protocol's Scientific Assessment Update on methyl bromide also considered a range of values (from .25 to 1.11) for the ODP but offered in their report a single value for the ozone depleting potential for methyl bromide. While both the experts involved in the assessment panel and the Parties to the Protocol recognize that the calculation of ODPs for all controlled substances involves some degree of uncertainty, the Parties have nonetheless always adopted a single value for each specific compound. This approach has historically been used because of the need to use the "calculated level" of production and consumption for a group of compounds, but has also been adopted in the case of methyl chloroform and carbon tetrachloride, which are single compounds in distinct groups similar to methyl bromide.

Section 602(e) of the CAA also provides single values for the ODP of each listed substance in Table 1 and states that the Agency shall assign "a numerical value representing the substance's ozone depletion potential." (Emphasis added) Scientific uncertainty is inherent in assigning any ODP, and EPA has concluded that scientific uncertainty in the case of methyl bromide does not warrant a different approach to assigning ODP.

The Parties to the Protocol will reconsider the ODP of methyl bromide at their 1995 meeting based on an update by the scientific assessment panel and could at that time recommend modification. Should such a change occur, EPA would also reconsider the ODP assigned to methyl bromide under the Clean Air Act.

EPA's legal obligation under section 602(e) to assign an ODP to methyl bromide consistent with that specified in the Montreal Protocol technically will not arise until the Copenhagen Amendments to the Montreal Protocol enter into force. Those amendments are to enter into force on January 1, 1994, provided that twenty Parties have ratified the amendments by that time. Otherwise, the amendments will enter into force 90 days after the twentieth instrument of ratification is deposited by a Party. As of September 1993, seven Parties have deposited their instruments of ratification.

EPA also believes that the best scientific evidence currently available supports assigning methyl bromide an ODP of 0.7. This evidence is addressed in the Scientific Assessment Panel's updated assessment report on methyl bromide. The world's leading experts on this issue prepared and peer reviewed this report, and it represents the best available scientific analysis for EPA evaluation and a sound basis for EPA action. A detailed discussion of the scientific issues surrounding methyl bromide's ODP is presented below.

Finally, EPA has also examined closely the scientific issues raised by the MBWG and others in the comments and addresses these concerns in detail below. Based on this review and for the reasons stated above, EPA has rejected the idea of using a range of value for the ODP of methyl bromide.

The MBWG contends that EPA has failed to demonstrate that methyl bromide "contributes significantly to harmful effects on the stratospheric ozone layer" under section 602(a). Section 602(a) of the Clean Air Act specifies that the Administrator shall add to the class I list all substances having an ODP of 0.2 or greater. Since EPA has concluded that methyl bromide's ODP exceeds this threshold, application of the less objective "contributes significantly" standard is unnecessary. In any case, however, EPA believes the best current scientific evidence clearly supports adding methyl bromide to the class I list under this standard, as well. It is noteworthy that, because methyl bromide has a relatively short atmospheric lifetime relative to CFC–11, the 0.7 ODP understates the near-term damage methyl bromide causes in comparison to the CFCs. As explained below, the 0.7 ODP reflects the comparative damage of methyl bromide and CFC–11 over a 200-year time period. Over a 10-year time period, the best estimate of methyl bromide's ODP would be 7. This short-term ODP is vastly higher than any other substance not currently on the class I list, and thus supports different treatment than that accorded such other substances (See discussion of IEER petition and HCFCs above.) Therefore, methyl bromide's near-term contribution to ozone depletion over the near-term is much higher than even the

Assessment Update Report reflects this perspective:

"These model results suggest that anthropogenic emissions of (methyl bromide) could have accounted for about one-twentieth to one-tenth of the current observed ozone loss of 4–6%, and could grow to about one-sixth of the predicted loss by the year 2000 if emissions continue to increase at the present rate of about 5–6% per year."

While uncertainties affect this and any model calculations about ozone depletion, this statement further supports the conclusion that, absent steps under the Protocol to limit emissions, man-made methyl bromide plays a significant role in ozone layer damage.

The MBWG next contends that "prior to imposing any ban EPA is obligated to demonstrate, with a high measure of certainty, that termination of this product will be attainable," but provides no legal basis for this obligation. As discussed in the preamble to the March 18 proposal, EPA believes that the Clean Air Act requires that all substances that the Administrator determines have an ODP of 0.2 or above be added to the class I list, without regard to whether a phaseout is attainable. The Clean Air Act separately allows EPA to extend the phaseout schedule under section 602(d) for a seven-year limited time if the otherwise applicable phaseout schedule is unattainable, considering when the substance is added to the list. Indeed the specific limitation of the extension authority to seven years confirms that the issue of whether a phaseout is attainable is not relevant to EPA's decision whether to add the substance to the class I list.

The MBWG further states that EPA's failure to consider the availability of substitutes in setting the phaseout date makes EPA's decision "legally flawed." As discussed extensively in the preamble to the proposal, the Agency believes that, under section 602(c), methyl bromide's significant contribution to stratospheric ozone depletion, and its ozone depletion potential, constitute a sufficient basis for adding this substance to the class I list. While the ultimate phaseout of methyl bromide is a consequence of this listing, the Agency does not believe it has authority to consider the economic impact of the phaseout in determining whether to add methyl bromide to the list.

At the same time, however, the Agency believes that economic impacts are relevant to its decision whether to extend the section explained in the proposal, the Agency may extend the section 604(a) phaseout schedule within specified limits if it is unattainable, considering when the new substance is added to the class I list. The economic impact of a phaseout is integral to the question of whether a phaseout is "unattainable." Based on the unavailability of substitutes for methyl bromide, EPA has concluded that near-term reductions are unattainable and that a freeze on production and consumption is the most stringent interim reduction schedule that can be established. As section 602(d) specifically limits EPA's authority to extend the phaseout schedule to seven years following the year methyl bromide is added to the class I list, EPA may not extend the phaseout date past January 1, 2001 (assuming listing in 1993). EPA does not believe it has discretion to further extend this phaseout date based on economic impacts.

EPA proposed to extend the schedule until January 1, 2000, rather than January 1, 2001. EPA gave two reasons for this position. First, the Agency explained that it did not believe the phaseout should be extended beyond the January 1, 2000 final termination date specified in section 604 for class I substances absent an affirmative basis to believe that termination will be unattainable at that time. Second, EPA explained that it would not have had authority to extend the phaseout beyond January 1, 2000, had the Agency complied with the statutory schedule for responding to the petition to add methyl bromide to the class I list.

Several commenters urged the Agency to extend the final phaseout date until January 1, 2001 as allowed under section 604. These commenters stated that the additional year is important given the limited time currently available to develop alternatives and to have these alternatives approved for use by the required regulatory agencies. EPA agrees with these commenters that the Agency cannot now conclude that these considerations will be any less important in the year 2000 than in the years prior to that time. Thus, EPA now believes that these considerations justify extending the freeze until the 2001 phaseout. Of course, as noted in the proposal, EPA will, in cooperation with the Office of Pesticide Programs and the USDA, monitor the availability of substitutes and could accelerate the phaseout or establish interim reductions, if justifiable based on future information.

The MBWG also stated in its comment that section 612(a) of the Act "requires decisions under subchapter VI actions do not result in increased risks to health and the environment." Section 612(a) requires EPA "to the maximum extent practicable" to take steps to ensure that more harmful substances are not used to replace class I and II substances. But the Agency's decision to list a substance which is to be determined solely based on the criteria specified in section 602(a), which does not include such a general risk standard.

C. Background

1. Initial Identification of Risks of Methyl Bromide

Action to list methyl bromide as a class I substance can be traced back to the international scientific assessment prepared in 1991 for the Parties to the Montreal Protocol. Article 6 of the Montreal Protocol calls for a periodic assessment of scientific, economic, technical, and environmental issues related to ozone depletion. The 1991 Scientific Assessment Report issued in December 1991 first identified methyl bromide as a potential significant contributor to ozone depletion and listed the ozone depletion potential of this compound at 0.6.

2. Petition To List

Following the publication of the assessment, NRDC/FOE/EDF petitioned EPA on December 3, 1991, requesting among other things that the Agency add methyl bromide to the list of class I substances under section 602(c) and phase out its production and consumption on an accelerated basis under section 606. It also requested that the Agency take emergency action under section 303 to reduce methyl bromide production in 1992 by 50 percent, with a total phaseout by January 1, 1993.

Because section 602 provides a timetable for responding to petitions and because no imminent hazard was involved, EPA rejected the petitioners' request for emergency action under section 303 and otherwise responded to the petition in its March 18, 1993, Federal Register proposal.

Section 602(c)(3) specifies that within 180 days of receiving a petition, EPA shall either propose to add the substance to the list of class I or II substances or publish an explanation of the reason for denying the petition. If the decision is to propose listing, EPA is given one year after receipt of the petition to add the substance to the list by rule, or make a final determination not to add the substance to the list. EPA proposed to add methyl bromide to the class I list on March 18, 1993 (58 FR action granting the petition to add methyl bromide to the class I list.

3. Montreal Protocol Actions

The Montreal Protocol Parties at the April 1992 meeting of the Open-Ended Working Group began discussions on possible changes to the Protocol based on the 1991 assessment reports. At this meeting, the United States first proposed adding methyl bromide to the Montreal Protocol based on the concerns raised in the Scientific Assessment Report. The U.S. proposed to phase out production and consumption by the year 2000. In an effort to provide more detailed information for the Parties to consider, the Open-Ended Working Group called on the Chairman of the Assessment Panels to provide additional information on both scientific and technical/economic issues related to controls on methyl bromide.

In response to this request, the Panels prepared an update of the scientific assessment report that focused specifically on methyl bromide. The report drew extensively from material presented at a two-day scientific workshop organized by the Methyl Bromide Global Coalition and held on June 2–3, 1992 in Washington, DC.

The resulting Protocol Assessment Update report concluded that, while substantial uncertainties exist, the current best estimate of the ozone depletion potential of methyl bromide was 0.7 (revised upward from 0.6 contained in the initial Scientific Assessment Report). Furthermore, it concluded that if man-made emissions continued at current rates of increase, atmospheric models predict that man-made methyl bromide would account for 5–10 percent of current depletion and one-sixth of depletion in the year 2000. The report identified as key areas of uncertainty such factors as the potential for additional sinks for methyl bromide and the possibility of the compound breaking down in the atmosphere into less reactive species. These uncertainties are discussed in the section on scientific issues below.

A workshop to review technical issues concerning the use and availability of substitutes for methyl bromide was held from June 16–18, 1992, also in Washington, DC. The workshop was attended by over 90 experts from 20 countries and included sessions on each of the key areas of use of this compound. It concluded that use of methyl bromide could be reduced substantially, but that no single alternative exists as a substitute for all alternatives for some important uses do not currently exist.

A report summarizing the findings of both the scientific and technical workshops was prepared, thoroughly peer reviewed, and issued by the Chairman of the Assessment Panels (Dr. Robert Watson), "Methyl bromide: Its Atmospheric Science, Technology and Economics" in June 1992 (referred to here as Assessment Update). The report served as the basis for continued discussions among the Parties to the Protocol concerning the possibility of action to restrict production and consumption of methyl bromide.

At the Fourth Meeting of the Parties to the Montreal Protocol held in November 1992 in Copenhagen, the issue of what action, if any, to take on methyl bromide was widely debated. A number of nations, including Israel and many developing countries, maintained the position that the scientific evidence was so uncertain and the economic impact potentially so great that any action at this time to add this compound to the Protocol was premature. They advocated that the Parties should agree only to undertake additional studies to evaluate the need for and the nature of any future action. In contrast, the United States and many developed nations argued that action to restrict methyl bromide would make a significant contribution to global efforts to protect the ozone layer and that restrictions now on the production and consumption of this compound with an exemption for essential uses would be the appropriate course of action. The United States proposed phasing out the compound in the year 2000 while other nations favored either a near-term freeze or freeze with a reduction step.

The Parties to the Protocol reached a consensus decision with the adoption of an amendment calling for a freeze on methyl bromide production and consumption beginning in 1995 at 1991 levels with an exemption for quarantine and preshipment applications. The Parties also agreed that in adding methyl bromide to the list of controlled substances as Annex E, that it should be listed with an ozone depletion potential of 0.7.

In addition, the Parties unanimously adopted a non-binding resolution urging nations to take all steps to reduce emissions of methyl bromide and urging the Parties to take further steps to agree on reductions and an appropriate phaseout date based on the next round of Protocol assessments. The scientific and technical assessments have already been initiated and are due to be completed in November 1994. They will serve as the basis for further decisions by the Parties to be taken at their Sixth Meeting in 1995.

4. Domestic Regulatory Action

As part of its efforts to develop information to respond to the petition by the environmental groups to list methyl bromide as a class I substance, on July 27, 1993, EPA issued a request for information under section 114(a) of the Clean Air Act. This letter was sent to key industry and government organizations that potentially had useful information on the uses of methyl bromide, emissions from those uses, the availability of alternatives, and scientific information concerning the ozone depletion potential and impact of methyl bromide on the ozone layer.

EPA received responses from a broad spectrum of the agricultural community which provided useful information on the uses of methyl bromide and the difficulties in identifying viable alternatives. Many of the respondents also questioned the scientific basis for linking their use of methyl bromide to ozone depletion and urged the Agency to delay action pending greater scientific certainty.

On March 18, 1992, EPA responded to the NRDC/EDF/FOE petition in the context of its proposed rule. The key elements of that proposal as it related to methyl bromide are the following:

- Methyl bromide would be added to the list of class I substances and its ODP would be listed as 0.7.
- Production and consumption of the compound would be frozen at 1991 levels beginning on January 1, 1994 and phased out by January 1, 2000.
- No interim reductions in production and consumption were included in the proposal.
- Methyl bromide was established as the only compound in a newly created group six within the list of Class I substances.
- The labeling provisions under section 611 would not apply to agricultural products for which methyl bromide is used need not be labeled under section 611.

EPA believes that its proposal would minimize the impact on the agricultural community of listing methyl bromide as a class I substance. EPA proposed to exercise its authority to extend the phaseout schedule under section 602(d) to a freeze as the most stringent schedule for phaseout it could propose in place of the section 604(a) schedule. This extension would provide maximum flexibility for the agricultural community to identify and shift to alternatives.

With regard to the ODP of methyl bromide, the Agency based its proposal and its evaluation of the ODP on the recommendations of the Protocol's Scientific Assessment report and its update, and the action taken by the Parties to the Montreal Protocol. As stated above, the Protocol's assessment update report represents the most authoritative review of scientific evidence related to methyl bromide's impact on the ozone layer. While the report of that group recognized that important uncertainties related to the compound's ODP remain, they nonetheless provided an estimate of the ODP of methyl bromide as 0.7. The Agency evaluated all the evidence available to it at the time of its proposal and determined that no new or additional information existed that was not available and considered at the time of the assessment and that supported reaching any alternative conclusion. The Agency believes the ODP provided for by that assessment represents the best current scientific evaluation of methyl bromide's ODP. Further discussion of the scientific basis for the 0.7 ODP is contained below.

In proposing to move forward to regulate methyl bromide based on the 0.7 ODP, the Agency fully recognizes that uncertainties remain and that additional information will become available over the next several years and could alter the ODP contained in future assessments. To address this issue, EPA clarified in its proposal that it believes it has the authority under section 602(c)(1) to delist methyl bromide as a class I substance in the event that new information or future action taken under the Montreal Protocol shifts the ODP below 0.2 and other wise demonstrates that methyl bromide does not contribute significantly to harmful effects on the stratospheric ozone layer, including near term effect. EPA explained the rationale behind this position at length in its proposal (58 FR 15037). Essentially, the Agency believes that the restriction on delisting class I substances contained in section 602(c)(4) applies only to substances explicitly listed in the Act itself by Congress and contained in section 602(a). EPA is adding methyl bromide to the class I list under subsection (c) of section 602, and methyl bromide is thus not explicitly "referred to" in subsection (a). EPA believes it would not be covered under the prohibition, contained in section 602(c)(4), against removing a substance from the list.

The Agency reasons that without the ability to delist a substance, EPA would hesitate to add a substance to the class I list until all uncertainties are resolved, despite much evidence of the substance's danger. The chilling effect of requiring absolute certainty prior to listing a substance would appear to run directly counter to Congressional intent that the Agency take reasonable steps to safeguard the ozone layer. Several respondents in their comments support EPA on this interpretation as set out in the proposal.

With regard to the phaseout schedule, the proposal set January 1, 2000 as the phaseout date for production and consumption of this compound. This date was based on language in section 602 that requires that any newly listed substance be phased out no later than seven years after the year in which it is added to the list of class I substances. The proposal acknowledged that if methyl bromide were listed in 1993, that the Agency could postpone its phaseout until 2001. However, for the reasons explained above, EPA has decided to extend the freeze in this final rule until January 1, 2001.

The proposal did not require any interim reductions in production and consumption of methyl bromide and instead jumps directly to the required phaseout. In determining the interim schedule prior to the mandated seven-year phaseout, the Agency is authorized to extend the schedule in section 604(a) if that schedule is unattainable. In its proposal, the Agency stated that it believed the stringent phasedown schedule in 604(a) is, in fact, unattainable based on the current availability of substitutes for methyl bromide. While the Protocol's technology assessment and EPA's own review have identified potential substitutes for many of the major uses of methyl bromide, several years or longer will likely be necessary to resolve possible regulatory and commercial barriers to the widespread use of these alternatives and to shift to these substitutes in a reasonably cost-effective manner. The proposal also stated that a number of near-term steps were being taken to reduce use and emissions and that these efforts would effectively allow for the maintenance of baseline production at 1991 levels without creating any significant economic impact until the year of the phaseout. Finally, the Agency acknowledged that should significant technological progress in shifting to alternatives occur prior to the phaseout, then it would reconsider the interim dates if it determined that interim reductions would be achievable. The Agency further recognized citizens' option under section 606 to petition the Agency to accelerate the reduction schedule based on future information.

EPA proposed to place methyl bromide in a newly created sixth group within the list of class I substances rather than adding it to a previously existing group. In proposing this approach to listing methyl bromide, the Agency was following the historical precedent established both under previous actions under the Clean Air Act and by the Parties to the Protocol in the Copenhagen Amendments. In addition, EPA has placed methyl bromide in a separate group due to its own phaseout schedule.

In a final issue raised in the proposal, the Agency requested comment on whether the statute allows for any exemptions for essential uses from the phaseout of methyl bromide. EPA received comments supporting two different positions on this issue. Some commenters stated that since Title VI is silent on the grant of essential use exemptions for newly listed substances, but allows specified exemptions for currently listed substances, that the Agency has the authority to grant exemptions beyond the phaseout date for any newly listed substances. Other commenters supported the position that since no explicit authority exists and the exemptions listed in section 604 are narrowly defined, that EPA lacks the authority to grant essential uses for newly listed substances such as methyl bromide. EPA's response to these comments is presented below.

D. Today's Final Action

1. Summary

Today's final rule lists methyl bromide as a class I substance with an ozone depletion potential of 0.7. While recognizing that scientific uncertainties remain, EPA believes that the best available scientific evidence warrants this action. In listing methyl bromide as a class I substance in a newly established Group VI, the Agency is freezing production and consumption at 1991 levels for the control period beginning on January 1, 1994. The phaseout of production and consumption is scheduled for January 1, 2001, and no interim reductions in production or consumption are required during the period prior to the phaseout. Consistent with the Agency's interpretation of section 611, products that utilize methyl bromide as part of an agricultural process need not be labeled under that section.

In taking final action on the listing of methyl bromide at this time, the Agency seeks to craft a regulatory approach that is both consistent with the requirements of the CAA and with past and possible future action by the Parties to the Montreal Protocol. The Agency has limited discretion under section 602 to decide when and how to regulate compounds as class I substances. The Agency is obligated under section 602(a) to list any substance the Administrator finds "cause or contributes significantly to harmful effects on the stratospheric ozone layer" as well as "all substances that the Administrator determines have an ozone depletion potential of 0.2 or greater." Once listed, the Agency's authority to extend the statutory phaseout schedule is limited to the situation where that schedule is "unattainable" under section 602(d) and in any event cannot extend beyond 7 years. As discussed in the proposal, the Agency believes the sense of the statutory scheme is that the most stringent attainable schedule should be applied to the newly listed substance. See 58 FR at 15034. EPA believes that maintaining the freeze level until 2001 is the most stringent schedule it can promulgate. EPA cannot now conclude that any faster phaseout schedule is attainable. EPA has considered the economic impact of a methyl bromide phaseout in determining the most stringent schedule of interim reductions it could promulgate.

EPA does not believe further technology forcing through interim reductions is necessary or appropriate. The Agency believes that it should allow the agricultural community the maximum length of time under these circumstances to develop and implement cost-effective alternatives to methyl bromide. Also, while not strictly relevant to what is attainable, the Agency notes that the freeze established today will avoid any unnecessary economic impact in the unlikely event that the scientific understanding of methyl bromide's ODP changes significantly so that it is reduced below 0.2 and otherwise merits reconsideration of the listing based on its contribution to ozone depletion.

The next Montreal Protocol scientific assessment will be completed in November 1994 and the Parties to the Montreal Protocol will again address the issues of methyl bromide limitations and ODP at their Sixth Meeting in 1995. The Agency will review its action today in light of future scientific data and information, the outcome of the updated scientific assessment, and any relevant future actions by the Parties to the Protocol.

2. Decision To List

EPA believes that the scientific evidence warrants the Agency's conclusion that methyl bromide's ODP is greater than 0.2, and that this is most consistent with action being taken under the Montreal Protocol to include methyl bromide's ODP as 0.7. Thus, the statutory requirements for adding methyl bromide to the class I list, in EPA's judgment, have been satisfied. Based on the scientific evidence regarding the ODP and also the evidence that methyl bromide's destructive impact is concentrated in the near-term, EPA believes this action is both legally supportable and environmentally appropriate.

As discussed above in the section on "Legal Authority," EPA believes that the reasoning and conclusions of the Montreal Protocol Scientific Assessment and its update, and actions by the Parties to the Montreal Protocol form an adequate basis for the Administrator's judgment that the threshold requirements for adding methyl bromide to the class I list have been fully satisfied. In particular, a key conclusion of the scientific assessment update was the following: ". . . model results suggest that anthropogenic emissions of CH3Br (methyl bromide) could have accounted for one-twentieth to one-tenth of the current observed ozone loss of four to six percent, and could grow to about one-sixth of the predicted ozone loss by the year 2000 if emissions continue to increase at the present rate of five to six percent per year." This conclusion reached by the Scientific Assessment Panel underscores the potential significant near-term impact of methyl bromide on ozone depletion in the absence of actions to restrict emissions.

This international scientific assessment based on the best scientific evidence available, clearly supports the Agency's conclusion that man-made methyl bromide represents a significant risk to the earth's ozone layer. The Agency does not believe that uncertainty inherent in all ozone depletion model calculations justifies a different conclusion or a "wait and see" approach.

Furthermore, the scientific assessment panel also established the ODP of methyl bromide at 0.7, recognizing that uncertainties exist and that other factors could alter the ODP calculation. This value was adopted by the Parties to the Montreal Protocol at their Fourth Meeting as part of the Copenhagen amendments to the Protocol. At the time these amendments enter into force (likely in 1994), EPA is required by section 602(e) to adopt an ODP consistent with that contained in the Montreal Protocol. Prior to that time, EPA believes that, absent a compelling reason to modify the ODP in favor of a different value, that it is appropriate to move forward with the same value contained in both the Protocol's scientific assessment update and adopted by the Parties. EPA has carefully reviewed the public comments on the science assessment and newly published information contained in the scientific literature that relates to the ODP and impact of methyl bromide on the ozone layer. The Agency does not believe that a substantial case has been made for discarding or overriding the conclusions reached in the Protocol's Assessment Update or to modify on an interim basis the ODP contained in the Copenhagen Amendments to the Protocol that are likely to enter into force next year.

3. Scientific Issues Related to Methyl Bromide

In the preamble to its proposed regulations, EPA discussed at length the scientific basis for its proposal to list methyl bromide. Specifically, it presented the key findings of the Montreal Protocol's Scientific Assessment report and update that dealt with methyl bromide and that represented the most authoritative review of these issues. The Agency also cited the areas of significant scientific uncertainty described in that report, including the possibility of additional oceanic and terrestrial sinks for methyl bromide, the potential for some percentage of atmospheric reactions to lead to the sequestering of bromine in less reactive compounds (i.e., referred to as Hbr branching) or more reactive compounds (i.e., increased HOBr formation), and the possibility that emissions of methyl bromide from man-made activities are smaller than estimated and that natural sources of methyl bromide are larger. EPA received extensive comments on each of these issues, primarily from the Methyl Bromide Working Group (MBWG). These and other related issues are discussed in the following sections.

a. Faster Formation of HOBr. While discussed at the scientific assessment workshop in June 1992, the conclusions of the panel in calculating the ODP of methyl bromide do not take into consideration the faster rate constant of the formation of HOBr from BrO plus HO_2. This faster measurement differs from earlier slower estimates of this rate constant and now provides a measurement basis for the recommendation found in the compendium of rate constants published by the Jet Propulsion Laboratory (JPL) in 1992. However, the 95% confidence limit set forth in this compendium still encompasses the slower rate.

The effect of including the faster reaction would be to raise the ODP of methyl bromide, all other things being equal. The impact of including this faster reaction rate on the ODP of methyl bromide was included in the public comments submitted by the MBWG as calculated by Sze et. al. Based on these model calculations, assuming a 2.1 year atmospheric lifetime of methyl bromide, the ODP would be increased from 0.64 to 0.85. Assuming a lifetime of 1.3 years, the ODP would increase from 0.4 to 0.53.

EPA recognizes that the evidence regarding this rate constant appears to warrant an upward adjustment of the methyl bromide ODP from 0.7, which was calculated without using this faster rate constant. However, since the Protocol scientific assessment addressed this possible faster rate constant as an area of remaining uncertainty and did not include it in its calculations, EPA does not believe it should adopt an upwardly adjusted ODP for methyl bromide as a regulatory matter at this time. Additional review of this issue by the scientific community is underway and will provide a stronger basis for any modifications to the ODP related to this issue in future years. EPA notes that a slight increase in methyl bromide's ODP would not alter the regulatory regime adopted for this compound. Also, the Agency does not believe it should, as a regulatory matter, continually adjust the ODP of any compound as scientific investigation yields preliminary new information that has not been fully accepted by the international assessment process and that may be further modified with additional research.

Rather, the Agency believes that, to the extent there is no regulatory impact, the ODP should be established consistent with the scientific information presented in the two-year cycle of scientific assessments under the Montreal Protocol, and thus correspond to actions taken by the Parties to the Protocol. The Agency notes the mandate in section 602(e) of the Clean Air Act that the ODP specified under the Act "shall be consistent" with the ODP specified under the Protocol supports this approach.

b. Hbr Branching. Assuming the faster rate of formation of HO_2 with BrO as discussed above, an important area of uncertainty is whether and to what extent reaction of HO_2 with BrO leads to the formation of Hbr plus O_3. To the extent such reactions occur in the stratosphere, the ozone depletion potential of methyl bromine would be decreased.

This issue was examined in detail in the update report from the Scientific Assessment Panel. It stated that "a major uncertainty in the calculation of bromide-related ozone loss and ODPs is associated with quantification of the rate of formation of HBr in the stratosphere."

While the assessment panel had before it several calculations assuming different rates of "HBr branching" and included one of these calculations in its report, it nonetheless rejected including these estimates in its final determination of methyl bromide's ODP. The panel report stated two factors as arguments against its inclusion. First, there is no evidence of analogous chlorine reactions producing HCl. Second, while additional data on BrO measurements is necessary to draw any firm conclusions, the assessment report states: "Although the upper range of the observed BrO would appear to be in conflict with a significant HBr source, that lack of definitive data for HBr and the large scatter in observed BrO made it difficult to rule out this possibility."

Comments on these issues were submitted by the Methyl Bromide Working Group. They argue that no basis exists to believe that an analogous reaction with HCl would in any way be relevant to HBr branching; that limited measurements of HCl do exist; and that HBr branching is consistent with recent atmospheric measurements.

The MBWG provided limited data to support the contentions that production of HCl is significant or not relevant to whether HBr formation occurs. Additional research will be important to fully resolve this issue, including more data on observed values of HBr and BrO. Based on the evidence available at the time of assessment, however, the Panel concluded that the inclusion of HBr branching was sufficiently speculative that the Panel excluded it from its best estimate of the ODP of methyl bromide. The assessment panel report states that the higher ODP values for inclusion of a faster BrO plus HO_2 reaction "is not recommended" and "neither is the lower value of the ODP obtained when it is assumed that 10% of the BrO plus HO_2 reaction produces HBr." The rejection of HBr branching by the Panel was based on insufficient data on relevant reaction rates under stratospheric conditions of temperature and pressure and the need for additional studies on the formation of HBr by other reaction such as BrO plus OH and Br plus HO_2 to improve the understanding of partitioning of bromine in the stratosphere. This lack of evidence supporting HBr partitioning along with the belief that no evidence exists that analogous chlorine reactions (ClO plus HO_2 and ClO plus OH) produce HCl were the basis for the Panel's decision not to include HBr branching when they recommended the estimate of the ODP of methyl bromide. For the reasons discussed below, EPA fully concurs with this decision and with the Panel's conclusion.

To evaluate the impact of different degrees of HBr branching on the ODP of methyl bromide, the MBWG commissioned an analysis using a state of the art atmospheric chemistry model. The model calculated the ODP assuming first, an estimated lifetime of methyl bromide of 2.1 years, and second, assuming a significant oceanic sink resulted in an atmospheric lifetime of 1.3 years. Assuming that a 10% branching of HBr occurs, and using the faster rate constant for BrO plus HO_2 (see above), the model calculated an ODP of 0.24 and 0.15 for an atmospheric lifetime of 2.1 years and 1.3 years, respectively. If HBr branching occurred at the rate of 5%, the calculated ODPs are 0.4 and 0.24, for lifetimes of 2.1 and 1.3 years, respectively. The authors then go on to compare the model calculated levels of HBr with the limited data from the field. While stating that 10% HBr branching leads to a 6–7 parts per trillion by volume (pptv) of HBr at 32 km compared to an upper limit of 4 pptv measured by Traub, the authors concluded that despite the inconsistency, branching of as much as 10% cannot be ruled out given the "expected temporal and spatial variability of HBr and the relatively small samples of data from which the upper limits are derived." Finally, the authors state that their model calculation does not take into consideration possible losses of methyl bromide to land surfaces which would further reduce the calculated ODP.

In addressing the basis for the conclusions reached in the Assessment Update report, the MBWG first argues that branching to form HCl is consistent with atmospheric measurements. They cite a paper by Stachnick et al., in Geophysical Research Letters to support this claim. While the paper provides a number of possible explanations for the elevated level of HCl, it does not mention the relevant analogous reaction (HO_2 plus ClO) as a plausible explanation. Furthermore, laboratory studies of OH plus ClO have produced no direct evidence in support of the formation of HCl. (Memorandum from NASA to EPA, August 19, 1993.) The MBWG cites a paper by Lee (J. Chin. Chemical Society) as containing laboratory evidence that HCl is formed by the reaction HO_2 plus ClO. Concerns have been raised that this paper represents the only published work demonstrating this reaction, that internal controls used in the experiment were inadequate, and that efforts to date in the United States to verify this experiment have not been successful. (Memorandum from NASA to EPA August 19, 1993.)

Finally, the MBWG's comments argue that since the scientific community agrees that the possibility of HBr branching cannot be ruled out, it is improper that "EPA in effect does just that, by adopting an ODP value which fails to take this possibility into account." However, when presented with much the same information, for the reasons described above, the scientific assessment panel also deemed it more appropriate to calculate the ODP of methyl bromide without factoring in any specific value for HBr branching. The Agency also believes that the evidence provided by the MBWG is either scientifically flawed or insufficient for the reasons stated above to include HBr branching in its calculation of methyl bromide's ODP. While the Agency recognizes that additional research is necessary to better understand the issue of HBr branching, the evidence available to date does not merit including it in its ODP calculations.

It is important to note that the paper submitted by the MBWG on these issues was also submitted for publication in a scientific journal and has since been modified and resubmitted for publication. (Telephone conversation with author September 23, 1993). It is also worth noting that key aspects of analysis presented in the paper that the MBWG relies upon were also reviewed prior to the issuance of the update report by the Scientific Assessment Panel. As discussed in detail above, the update report concluded that the role of HBr branching was sufficiently speculative that it should not be taken into account in its calculation of ODP. Based on its review of all of the evidence, EPA concurs with the view that inclusion of HBr branch, in the calculation of methyl bromide's ODP is too speculative. Should additional measurements or modeling provide more conclusive evidence in support of HBr branching, then the Agency would consider future changes to reduce the ODP of methyl bromide.

c. *Other Sinks for Methyl Bromide.* In proposing an ODP of 0.7, EPA stated that this calculation was based only on reactions with the OH radical and that an important area of uncertainty was whether other oceanic or landbased sinks for methyl bromide exist. To the extent significant additional sinks for methyl bromide exist, they would result in a lower ODP for this compound.

Similarly, in the update of the Protocol's Scientific Assessment on methyl bromide, the panel concluded that "possible oceanic and terrestrial surface removal processes are one of the major areas of uncertainty in determining the global budget for methyl bromide." EPA received extensive comments from the MBWG and has reviewed several recent papers published related to the broader issue of the global "budget" of methyl bromide.

The comments from the MBWG point out the possible discrepancy between the past commercial sales of methyl bromide and measurements of atmospheric concentrations of this compound. They cite papers by Cicerone (1988) and by Khalil (1993) to argue that while commercial sales increased in the mid-1980s, measured atmospheric concentrations increased only slightly if at all. From this possible anomaly, the MBWB argues that an additional important sink must exist for methyl bromide. The comment fails, however, to reflect additional data presented by Khalil (1993), which concludes that atmospheric concentrations did increase from the period 1988–1992 at the rate of about 3% plus or minus 1% per year. Because these data on production and concentrations do not portray a consistent picture, no firm conclusions can be drawn from them concerning the existence of additional sinks for methyl bromide. The potential for both additional sources and sinks for methyl bromide is an important area of uncertainty and more information should be available in future years.

In order to estimate the potential impact of the oceans as a substantial sink for methyl bromide, the MBWG included information based on modelling performed by Sze as described above. This analysis showed that, even if the oceans were indeed a major sink for methyl bromide, the atmospheric lifetime based on this factor alone would decrease from 2.1 years to 1.3 years, and decrease the ODP to 0.4, still well above the 0.2 threshold.

EPA also received a paper from a research scientist at NOAA that examines the potential role of the oceans in regulating the atmospheric concentrations of methyl bromide (Butler, 1993). This paper was submitted to the docket at the same time it was submitted for publication in a scientific journal. Based on comments received from the journal, this paper has been substantially revised and resubmitted for review and possible publication. (Telephone conversation with author, September 16, 1993). This original paper suggests that any evaluation of the atmospheric lifetime and impact on ozone of methyl bromide must include the role of the oceans. The paper suggests that the oceans are the largest source of methyl bromide, and that they could act as a regulator of the atmospheric concentrations of methyl bromide. Thus, even if man-made emissions of methyl bromide were reduced through regulatory action, this paper suggests that reductions in atmospheric concentrations may not be reduced correspondingly. According to this paper, the oceans could increase their emissions to the atmosphere, largely or in part offsetting any gains from reductions in man-made emissions.

However, recent time series data published by Khalil (1993) suggest that atmospheric concentrations have been slowly increasing over the past four years. This data appears to contradict the hypothesis that atmospheric concentrations would not change if manmade emissions decreased.

To explore his hypothesis, Butler develops a simplified model combining both oceanic and atmospheric responses. The results from this model show the relationship between the atmospheric lifetime of methyl bromide and the saturation anomaly of the compound. The saturation anomaly is calculated by comparing the ratio of measurements of atmospheric concentrations with levels of oceanic concentrations. His analysis suggests that if the value for the saturation anomaly is 100%, then the atmospheric lifetime would be slightly less than 2.0 years. If, however, the value for the saturation anomaly were 300 percent, then the atmospheric lifetime of methyl bromide would be reduced to slightly less than one year.

Only limited and somewhat conflicting data exist of measurements of the saturation anomaly of methyl bromide. Khalil (1993) reports on data from two shipboard experiments that occurred in 1983 and 1987. Based on measurements taken on these voyages, he estimated a saturation anomaly of 40–80 percent. This value would be consistent with an atmospheric lifetime of methyl bromide of just over 2 years. In contrast, a paper by Singh (1993) reports on data from a different oceanic experiment conducted in 1981–82 which produced values for the saturation anomaly at 180–240 percent, which would lead to an atmospheric lifetime of methyl bromide of 1–1.2 years.

Without additional data, it is impossible to reconcile the range in values provided by the two limited data sets. However, in the explanation of his data, Singh (1993) suggests that it may not be appropriate to generalize to the entire ocean from the data he collected in the eastern Pacific. He points to productivity maps that suggest the sampled area is 2–4 times more productive than the oceans as a whole. The model developed by Butler is necessarily simplified (given the paucity of data) and models the oceans as a whole. Nonetheless, additional data is essential to narrow the uncertainties raised in Bulter's analysis. Given the data available to date, the Agency does not believe it is prudent to modify the current regulatory strategy based on the hypothesis that the saturation anomaly across the entire oceans would be substantially greater than that obtained in the measurements reported by Khalil.

Finally, the MBWG comments also suggest that terrestrial sinks could be significant and further reduce the ODP of methyl bromide. While methyl bromide acts as a strong methylating agent, no published data exist concerning the possible magnitude of losses through land-based surface removal. The commenter essentially cited information contained in a presentation made on this issue at the Scientific Workshop on methyl bromide by Kolb. This presentation focused primarily on what studies could be done to evaluate land-based sinks and contained no data specifically demonstrating that such a sink exists for methyl bromide. Since no additional information is presented in support of modifying the ODP to reflect this factor, EPA must reach the same conclusion as the Scientific Assessment Panel, that an insufficient basis exists for altering the ODP based on the existence of land-based sinks. Should additional information be developed demonstrating that surface losses are an important sink for methyl bromide, the calculation of its ODP could be modified accordingly in the future.

d. Natural and Man-Made Emissions. In addition to emissions from human activities, the oceans also represent a significant source of emissions of methyl bromide. The relative role of emissions from natural versus man-made sources of methyl bromide is one of the key areas of uncertainty and has important implications for the effectiveness of measures to safeguard stratospheric ozone. Also, the total amount of emissions is relevant to the issue of atmospheric lifetime and therefore the calculation of ODP.

Based on their review of relevant data on this issue, the Protocol's Scientific Assessment update concluded that man-made emissions amounted to 25% percent plus or minus 10% of total methyl bromide in the atmosphere. This calculation assumes that the atmospheric lifetime of methyl bromide is two years and calculates that corresponding total emissions are roughly 75–110 thousand metric tonnes annually to obtain the measured atmospheric abundance of 9–13 pptv. Of this amount, roughly 25 thousand tonnes would be from man-made sources and the remaining roughly 75 thousand tonnes would be from natural sources.

In their comments, the MBWG pointed out that if a one-year atmospheric lifetime were assumed instead of two years, that the percent contribution from man-made sources would be cut in half. However, if the lifetime of methyl bromide were a year, annual emissions would have to double to 150–220 thousand metric tonnes in order to maintain the measured atmospheric abundance of 9–13 pptv. While that amount cannot be ruled out, Khalil (1993), in the most extensive review of the methyl bromide budget published to date, estimated that emissions from the oceans amount to only 35 thousand metric tonnes. In another paper on this issue, Singh (1993) estimated that emissions from the oceans are on the order of 60 (40–80) thousand metric tonnes/year. While both papers point out the substantial uncertainties and limited availability of data to calculate the methyl bromide budget, based on the information available to these investigators, they calculated that in the absence of other significant sources, emissions from the oceans appear to be well below the amount required to support a one-year atmospheric lifetime of methyl bromide. However, a related area of uncertainty is whether methyl bromide from the burning of biomass could also represent a significant source of man-made emissions. (Khalil, 1993).

Finally, the MBWG's comments discuss a number of possible alternative explanations for the north-south gradient that exists in measurements of methyl bromide's atmospheric abundance. The science assessment update suggests that this gradient reflects a significant source of methyl bromide from agricultural sources primarily in the northern hemisphere consistent with commercial sales and use of this compound. While direct measurements of emissions of methyl bromide from agricultural applications, of course, provide clearer evidence of the role of man-made methyl bromide, the existence of an interhemispheric gradient with higher concentration in the north may be an indirect confirmation that such emissions occur. This evidence tends to counter the contention by some agricultural groups that methyl bromide injected into the soil largely breaks down prior to its release into the atmosphere.

The comments by the MBWG suggested that the gradient could occur for a number of other reasons including: the fact that the oceans constitute a far greater percentage of the Southern hemisphere total mass and, therefore, constitute a larger sink in that half of the globe; that northern hemispheric oceans are biologically active and represent a larger natural source of emissions; that the larger land mass in the northern hemisphere represents a larger land sink; that the gradient in north to south of the OH radical is responsible for the gradient in methyl bromide abundances; and that large emissions of methyl bromide from biomass burning in the southern hemisphere is the reason it does not demonstrate a hemispheric gradient. Each of these hypotheses is presented in the comments as an equally feasible explanation for the interhemispheric gradient of methyl bromide. Without presenting any convincing arguments for any of these alternative hypotheses, the MBWG's comments state that "it is unscientific for EPA to simply pick one hypothesis 'out of the hat' and to dismiss all other plausible explanations for the interhemispheric gradient." The possible explanation of the interhemispheric gradient included in EPA's proposal was identified by the Protocol's Scientific Assessment Panel as the most plausible explanation. The panel stated that the interhemispheric gradient was clear from the available atmospheric measurements and "most probably indicated an excess source in the Northern Hemisphere." It reached this tentative conclusion rather than the ones preferred by the MBWG because it had data on methyl bromide use indicating higher emissions in the north than the south. Either no data, or inconclusive or conflicting data, was all that was available for each of the alternative hypotheses presented by the MBWG. While additional data will help clarify this issue in future assessments, the Agency believes that no additional information was presented in the comments to justify disagreeing with the statement on the possible cause of the interhemispheric gradient contained in the assessment panel update report.

One final area of uncertainty relates to the burning of leaded gasoline as another possible source of man-made methyl bromide. While the use of leaded gasoline is decreasing in favor of unleaded gasoline, this source may prove to be a significant source of methyl bromide in the short-term. The source of the methyl bromide in leaded fuel is ethylene dibromide (EDB), a material that is added to the fuel as a lead scavenger (0.015g EDB/liter fuel). Limited data exists suggesting that the exhaust of a vehicle using leaded fuel may contain some 22–44% organic bromines, with the portion of this emitted as methyl bromide varying between 54–82%. Additional studies will be required to fully evaluate the situation. However, in the United States, leaded fuel usage is only 1 percent or less of total fuel usage, making the atmospheric contribution of methyl bromide from this source negligible. However, to the extent leaded fuel, is still used in other parts of the world, it is an important issue for calculating the methyl bromide budget and for possible future international controls.

e. Summary of ODP Discussion. Both the Protocol's Scientific Assessment Update on methyl bromide and the discussion of methyl bromide's ODP in the preamble to EPA's proposed action identify a number of important uncertainties concerning the ODP. EPA received extensive comments related to these uncertainties and some commenters suggested that because, in their view, the ODP is likely to fall below 0.2, the Agency should delay taking any action.

In reviewing these comments, EPA believes most if not all of these uncertainties were reviewed by the Scientific Assessment Panel in their update report. While recognizing that the ODP may change in the future as additional information becomes available, the panel concluded that 0.7 was the current best estimate for the ODP of methyl bromide. It explicitly rejected both higher and lower estimates based on the same factors commenters on EPA's proposal have since raised.

The comments further demonstrate that any single factor alone, even in an extreme case, is unlikely to reduce the ODP below 0.2. Thus, even the high value for HBr branching (10 percent) alone would reduce the ODP to only 0.24. To reduce the ODP below 0.2 would require both a substantial oceanic sink and significant HBr branching.

To put the 0.2 ODP value in context, it is important to note that compounds with values below 0.2 are also being severely regulated under both the Montreal Protocol and CAA regulations. For example, methyl chloroform has an ODP of 0.12 (based on the latest scientific assessment) and is being phased out by January 1, 1996 both under the Protocol and CAA regulations. HCFC–141b has an ODP of 0.11 and is scheduled for phaseout in today's regulations by 2003. Thus, even if the ODP of methyl bromide were to drop below 0.2, the compound could still be regulated in much the same time frame established by today's rule.

Finally, the above discussion of the ODP has focused exclusively on steady-state values for the ODP of methyl bromide. The steady-state value calculates the impact of the compound on ozone relative to CFC–11 over a period of several hundred years. To the extent that the greatest concerns about the impact of ozone depletion will occur over the next ten years after which peak depletion will be declining, EPA also considers the ODP over that shorter time period important. Because of its shorter atmospheric lifetime compared to CFC–11 (2 years compared to 60 years), the short-term impact of methyl bromide on ozone is substantially greater than its impact calculated over a much longer period of time. The scientific assessment update report calculates the ODP of methyl bromide over a period of 10 years at 7.0. The Agency believes it is important to consider that short-term reduction in risks to the ozone layer is an important part of its efforts under Title VI of the CAA, (See section on HCFCs and IEER petition, above). EPA believes methyl bromide "contributes significantly to harmful efforts on the stratospheric ozone layer" to an extent much greater than reflected in its steady-state ODP. Methyl bromides short-term effect, even if the steady state ODP is proven to be just below 0.2, would still be much higher than any substance not currently on the class I list, and could well still merit listing based on its substantial contribution to stratospheric ozone depletion.

4. Uses and Substitutes for Methyl Bromide

Methyl bromide is a broad spectrum pesticide which is widely used as a fumigant in the control of insects, nematodes, weeds, pathogens, and rodents. It is primarily utilized for soil fumigation (80 percent of world-wide use), commodity and quarantine treatment (15 percent of use), and structural fumigation (5 percent of use). Because of its relatively low price, and its physical and chemical attributes, it is used world-wide in many different situations. Due to the versatility of this chemical, there is no single alternative treatment that can duplicate the action of methyl bromide in all its many applications. It is possible, however, to consider alternative chemicals and production methods that can replace methyl bromide to a significant degree in numerous situations.

In the last several months, activities related to several alternatives have been initiated. While additional research field tests and regulatory approvals will be necessary to define efficacy and applicability and may take considerable time, these initial steps represent an important beginning. Specifically, carbonyl sulfide has been identified by researchers in Australia as a potentially effective pest control material for commodity pests such as beetles, fruit flies, moths, mites and termites, as well as a soil fumigant for nematodes. Whether or not registration is sought for this material in the U.S. remains an important issue. Enzone has just recently been approved for registration for use as a pesticide for nematode and disease control on grapes and citrus in the United States. In addition, new application methods are currently being field tested for metam sodium which show significant improvement in coverage and penetration. And in 1994, Telone will likely be investigated in large scale field trials in California, with the intention of a possible future reentry of use in that state. Several researchers have recently began developing a system utilizing carbon dioxide in combination with reduced dosages of existing fumigant agents in structural and commodity applications to achieve control levels better than what has been seen with methyl bromide alone. In addition, EPA expects an application to be filled shortly with the EPA Office of Pesticide Programs for the use of Dazomet as a soil fumigant for a number of high value applications which now use methyl bromide. While none of these alternatives are likely to make significant near-term inroads into the use of methyl bromide, depending on the outcome of additional efforts, they could contribute to the transition by 2001.

a. The NAPIAP Study. The United States Department of Agriculture (USDA) issued a document in April 1993 entitled, "The Biologic and Economic Assessment of Methyl Bromide," which was prepared by the National Agriculture Pesticide Impact Assessment Program (NAPIAP), and which will henceforth be referred to as the NAPIAP assessment. The NAPIAP assessment was intended to evaluate the impact on American agriculture from an immediate ban of methyl bromide.

EPA believes that the report represents a useful analysis if methyl bromide were banned immediately, but that it was not designed nor intended to evaluate the proposed phaseout of this compound in the year 2000. Because it looks at the impact of an immediate ban, it assures little use of replacement materials by the agricultural community.

The NAPIAP assessment considered an acceptable alternative to methyl bromide to be one that duplicates its biocidal actions. This serves to restrict the range of materials which the NAPIAP report considered to replace methyl bromide. Methyl bromide is used to control pests which would otherwise cause crop damage and economic losses. However, it is not necessary (and probably not possible) to duplicate methyl bromide's broad spectrum efficacy to achieve pest control. EPA believes, nonetheless, that it is possible to manage the pests currently controlled by methyl bromide with other chemical pest control tools, as well as nonchemical and cultural means.

Many years of research have perfected the use of methyl bromide as a soil and commodity fumigant. It is reasonable to expect that major research efforts will be needed to improve the performances of metam-sodium, dazomet, 1,3-dichloropropene and other alternative pest control techniques. For example, preplant methyl bromide fumigation has shaped the way in which research, breeding programs, and commercial practices are pursued with strawberry cultivation in California. Strawberry cultures were bred and selected in soils fumigated with methyl bromide. Under these circumstances, there has been no need to maintain or improve resistance to minor root pathogens, let alone major diseases such as Verticillium. Very little is known about cultivar resistance to root diseases because commercial strawberries are grown under "near axenic" soil conditions. Researchers are likely to overcome at least part of the impacts of the methyl bromide phaseout by focusing on different strawberry cultures and developing appropriate pest management practices.

b. Comments. Several individuals and groups submitted comments to EPA on substitutes and alternatives to methyl bromide. In many cases, those in the agricultural community indicated they believed that alternatives to this material were extremely "limited", which would result in a situation where pests currently controlled by methyl bromide would be left uncontrolled, causing severe economic losses. EPA acknowledges that there is no chemical currently in existence nor envisioned in the short-term which will duplicate the broad spectrum biocidal action of methyl bromide. However, EPA believes that in order to prevent crop damage, and keep pests below the economic damage threshold, it is not necessary to duplicate the broad spectrum efficacy of methyl bromide. There are, in existence and under development, both chemical and non-chemical pest control tools which can manage insects, weeds, nematodes, and plant diseases. In pest management cases where alternatives are not currently available, EPA supports research, such as that now being spearheaded by the USDA, to identify and implement good alternative pest control materials and methods.

EPA agrees with comments that stated that methyl bromide is a crop protection tool that currently satisfies a number of important needs. If other tools can satisfy these needs, however, they will be accepted and utilized by the agricultural community. In this light, a fumigant with analogous broadspectrum biocidal characteristics as methyl bromide is not essential to combat pests which cause crop damage and yield losses. Better utilization of existing chemical pesticides, together with non-chemicals and cultural methods, can address a many of the pest problems now managed by methyl bromide. Therefore, alternatives to methyl bromide need not be identical to this chemical in order to manage pests that can cause crop loss.

Comments were raised concerning materials that have potential to be used in place of methyl bromide and that must be evaluated on a case-by-case, crop-by-crop basis, appraising efficacy against the target pest, practical feasibility in a particular crop, economic viability, health and environmental risks, and regulatory issues. Several chemical and non-chemical pesticides exist today that are effective against insects, weeds, nematodes, and plant diseases. These will need to undergo further research to determine if they are practical field replacements for pests now controlled by methyl bromide. These materials are not general biocides like methyl bromide, but are action-specific to a particular set of pests. Therefore, it is likely that these materials will need to be used in combination with each other, and in conjunction with a good integrated pest management program, to replace the use of methyl bromide. Research is currently underway on both the governmental and academic levels, as well as in the private sector, to ensure that alternative materials and methods will be viable and available before methyl bromide is phased out.

A number of individuals and associations commented on the potential negative health effects of increased UV–B radiation, supporting the phaseout of methyl bromide to ensure protection of the ozone layer, thereby protecting human health and the environment in general. EPA agrees with this assessment, believing that the benefits to be expected with the phaseout of this chemical are considerably greater than any short-term costs.

Several commenters discussed the health and environmental problems that increased UV–B radiation would cause, the toxicity of methyl bromide, especially regarding the potential for worker exposure. The Physicians for Social Responsibility commented that methyl bromide appears to produce lasting neural behavioral deficits that are likely to impair cognitive functions even when used under conditions currently judged to be acceptable. They also noted that since this chemical is a potent alkylating agent and mutagenic, it may be carcinogenic.

Several commenters stated that once methyl bromide has been listed as a class I ozone depleting substance, EPA should implement other pertinent sections of the CAA Title VI, notably sections 608 and 610. Section 608 concerns emissions control, which in the case of methyl bromide would require users to reduce emissions as much as technologically possible in the interim. Section 610 allows for a ban on non-essential uses of class I substances, which would require users to immediately implement existing replacements for aerosol applications of methyl bromide. However, after careful review and due consideration, EPA believes that it is premature to consider additional regulations at this time.

Some commenters have raised concerns over regulatory issues, citing the time and cost involved in processing and registering pesticides with EPA. It is an EPA requirement to thoroughly test any material which will be utilized as a pesticide to evaluate the potential for unreasonable adverse health and environmental. See, 40 CFR part l (58). This can take many years, depending upon the type of material and the complexity of testing needed. However, despite the time involved, pesticides are registered, and do become commercially available. While this issue may slow the short-term accessibility of some materials and is one reason for not requiring interim reductions, it should not be a significant long-term barrier to the development of methyl bromide replacements.

c. Soil Fumigation. One of the most common uses of methyl bromide is as a soil fumigant. It is utilized to control nematodes, pathogens, insects, and weeds which reside in the soil and uncontrolled, can cause significant crop loss. Methyl bromide, especially when combined with chloropicrin, can thoroughly eliminate these pests from the soil. However, since this material will no longer be available, other pest control means will need to be developed and utilized to allow farmers to produce consistent and quality produce. EPA recognizes that this process will involve considerable research on existing and developing pesticides, as well as the registration of new pesticides. The process of pesticide registration includes both health and environmental testing, and may compromise the near-term utilization of some of these materials.

Several individual farmers and grower organizations commented on the potential lack of pest control materials with which to replace methyl bromide. As discussed above, EPA believes that alternatives to this chemical should be judged not upon their ability to duplicate the biocidal action of methyl bromide, but upon their ability to effectively and economically control pests currently managed by methyl bromide. In this light, methyl bromide, while effective, is not the only material registered with EPA which can control plant pathogens, nematodes, weeds, and insects. In this light, materials which are currently registered on other crops for other uses may have applications for as alternatives to methyl bromide.

Several chemical pesticides are currently on the market which effectively control insects, weeds, nematodes, and plant diseases, and therefore have good potential to replace methyl bromide in specific soil pest control situations. Application methods for many of these materials will need to be modified in order to manage pests now exclusively controlled by methyl bromide. EPA recognizes that several years of research will be required before good alternatives to methyl bromide will be available to the agricultural community.

Among the existing chemical pesticides that can replace methyl bromide, the methyl isothiocyanate (MIT) generators (Metam Sodium and Dazomet), and 1,3-dichloropropene (1,3–D, Telone) have the greatest potential to manage pests currently controlled by methyl bromide. These materials are not, and should not be construed to be equivalent to methyl bromide. In order to achieve full control of the wide spectrum of soil pests that can decrease yield, these pesticides will often need to be augmented by other chemical pesticides, non-chemical materials and cultural practices (e.g., development of resistant stock, and shift in cropping practices).

Both the MIT generators and 1,3–D will need to undergo field research on soil incorporation and general application methods to ensure that the chemical is well distributed at rates and depths needed to control target pests. Research will be required to delineate efficacious dosages, application procedures and reentry periods. Several commenters noted that these substitutes need better delivery systems to adequately replace methyl bromide. These pesticides are undergoing a review of application methods on both the Federal and state (California and Florida) levels with regard to worker exposure. It is likely that registration reinstatement will involve modifications in the use of these materials to insure safe and efficacious applications. Many commenters from the agricultural community noted the effectiveness of replacement materials for specific crop applications (see Background and Summary Document).

In addition, as numerous comments pointed out, there are several outstanding regulatory and registration issues regarding these pesticides. For example, Dazomet is not yet registered for food crops in the U.S., and Telone is not currently permitted in California. EPA believes that, given the time allowed before the phase out of methyl bromide, many of the near-term developmental and regulatory hurdles may be overcome and the necessary adaptations may be made with these and other materials.

One advantage of the current and potential methyl bromide replacement materials is that they are, in general, far more selective than methyl bromide. The broad spectrum activity of methyl bromide, often considered an advantage, thoroughly sterilizes the soil, destroying both the pest organisms, as well as those that are a beneficial part of the soil ecology. Replacement pesticides are on the whole more selective since they affect only specific pest classes, thereby having potentially less impact on the overall soil fauna and flora. However, several comments expressed concern regarding the possibility that, in order to achieve good control of economic pests, replacement pesticide application rates and frequency of application may cause secondary environmental problems. EPA believes that through the use of improved application techniques now under development (e.g., deeper injections, thicker tarps, use of carrier agents), it is likely that effectiveness could be increased while dosage, and thereby risks to ozone depletion, can be reduced.

Other chemicals that are already on the market and may have potential when combined with other materials and practices include chloropicrin and carbon disulfide, as well as nonfumigant nematicides (carbofuran, oxamyl, fenamiphos, ethoprop, aldicarb, etc.) combined with fungicides (benomyl, metalaxyl, etc). Chloropicrin, currently used in combination with methyl bromide, may prove to be efficacious when used with other pesticides. Each pest situation and control method needed will have to be evaluated in relation to the target pest, the crop grown, the temporal and geographic effects, and the existing integrated pest management program.

Several pesticides are currently in the developmental stage, and will need significant laboratory and field research before reaching the marketplace and before their value as methyl bromide substitutes can be fully assessed. These include the inorganic azides, bromonitromethane, nemamort, and carbonyl sulfide, among others. These materials are currently in the developmental stage, and will require further evaluation before their potential as substitutes can be determined.

There are numerous methods for managing soil pests that are nonchemical in nature. While some of these methods are already used to manage economic pests, many of these techniques will need to be field tested on the specific target pests now controlled by methyl bromide, and therefore are part of a longer-term solution. These include crop rotation, the use of organic amendments, steam, solar heating, biological control agents, various cultural practices, plant breeding, biotechnology, grafting, and the physical destruction of pests and their habitat. Although these pest control methods cannot control all economic pests when used singly, when part of an overall integrated pest management program, these and other techniques may be effective in reducing pest numbers. Research will be needed on these and other methods to determine their effectiveness in reducing pest numbers.

Since many of the replacement pest control methods may be new to growers reliant on methyl bromide, an agricultural extension program will likely be required during the initial stages of implementation. Several commenters noted existing limitations for many of the proposed replacements, and noted that cost and supplemental effort may render some replacements infeasible in the short-term. While this may seem true in the short-term, new and better application methods of existing chemicals may dramatically help both the short- and long-term situation.

Other commenters discussed the process by which methyl bromide use can increase the amount of soil nitrogen available to plants, indicating that this will not be possible without the use of this chemical. However, there are numerous ways to add nitrogen, as well as other nutrients, to the soil through the use of commercially available fertilizers, as well as organic amendments and crop rotation programs. A program of good soil management can supply plant nutrients without increased pollution or ground water contamination, resulting in healthier plants which are more resistant to pests than those which are stressed due to poor nourishment.

The issue of seed bed disease protection was raised by commenters who perceive that yields would substantially decrease without methyl bromide. EPA believes that several of the existing fungicides, along with those in development, may adequately prevent the spread of disease and a significant decline in production. While research will be necessary to define dosages and application procedures, it is highly probable that efficacious and economically viable materials will be in place by the phaseout date.

EPA agrees with several comments that cite the beneficial health effects of fresh fruits and vegetables. However, there is no evidence to support the assertion that fruits and vegetables will no longer be available following the phaseout of methyl bromide. EPA expects that both currently available control strategies, and those which are in development, may be utilized to control pests and minimize crop loss when methyl bromide is no longer available.

d. *Commodity Fumigation.* Methyl bromide is currently used to treat both food and nonfood commodities prior to shipment, during shipment, and while in storage. It is utilized as an effective quarantine tool to prevent exotic pest invasions and to assure that pests specific to a particular area are not carried to new regions. In this regard, incoming fruits and vegetables, as well as other commodities, are treated if suspected of harboring economic pests, or if the commodity origin is an area where such pests are known to exist. Commodities in storage or in transport are also treated to ensure that the material is not destroyed by pests. About five to eight percent of methyl bromide use is in commodity fumigation and is utilized primarily for insect pests, but also for disease and rodent control.

EPA received several comments expressing the concern that a good chemical fumigant does not exist for use in place of methyl bromide. EPA acknowledges that a single chemical which duplicates the action of methyl bromide is not now available for use. However, various chemical and non-chemical treatments are available today which can effectively control commodity pests, and promising alternatives appear possible in the future (e.g., nitrogen). Although many of the transport and storage systems currently in use will have to be modified to accommodate the change, EPA believes it is likely that existing and potential alternatives will prove both efficacious and cost effective once implemented.

Some comments discussed the potential losses which may occur in commodities not treated with methyl bromide. This was discussed especially with regard to fresh fruits and vegetables. EPA believes that pest control materials and methods exist today, or are under development, which could potentially replace methyl bromide in many of the commodity applications. EPA acknowledges that as of this date, there are some quarantine use areas where replacements do not currently exist. As the final phaseout date approaches, EPA will work with concerned parties to ensure that quarantine integrity is not compromised.

Several comments were received that discussed the regulatory issues that will be impacted by the phaseout. The United States Department of Agriculture, Animal Plant Health Inspection Service (USDA/APHIS) regulations, which require the use of methyl bromide on certain imported commodities, was seen as a case in point. In addition, similar regulations in other countries, most notably Japan, were also seen as a potential issue. As alternatives to methyl bromide are established, governmental bodies that set agricultural quarantine regulations will need to adapt and change such regulations in a way which best protects domestic agriculture and imported commodities. Therefore, EPA agrees that this is an important issue and one that could take many years to address.

In a related issue, commenters discussed the registration of pesticides. Several commenters expressed concern regarding the possibility that pesticides that have important but minor uses may not be supported for registration or reregistration. In addition, some comments stated that the EPA pesticide registration process is so lengthy and costly that few new pesticides will be available before methyl bromide is phased out. EPA is aware of this concern, and understands that the testing needed to ensure registration of a viable pesticide can appear formidable. Because of this issue, EPA has set up a special task force in the Office of Pesticide Programs to coordinate and track methyl bromide substitution activities, and, if possible, to ease or accelerate the regulatory process for pesticides that are considered alternatives to methyl bromide.

A number of comments were received concerning the prospects of utilizing irradiation as an alternative to methyl bromide. Most notably, commenters believed that the capital cost and time required to irradiate would render this substitute infeasible.

Some considered this option as the replacement for all methyl bromide commodity treatments. EPA believes this is an unlikely, and certainly costly scenario. Several comments discussed the issue of public acceptance, speculating that this pest control would be widely rejected. While public apprehension to irradiation currently exists, with additional research and public education, this option could potentially become more attractive over time.

EPA is aware that significant research is ongoing on other attractive alternatives for commodity and quarantine applications. Particular attention is being paid to controlled atmospheres as a potentially attractive alternative to the use of methyl bromide. For example, new, less expensive and more flexible systems for using nitrogen in a controlled atmosphere are now being marketed. However, for controlled atmosphere to be a viable quarantine/commodity pest control technique, it will require approval by the countries to which commodities are being exported to. In addition, the potential for the recovery and recycling of methyl bromide is being investigated. EPA supports this effort as an important short-term solution.

Existing fumigants may also replace methyl bromide in certain applications. Among the chemical pesticides which may be potential replacements are phosphine, propylene oxide, hydrogen cyanide, ethyl formate, and ethylene oxide. Non-chemical pest control tools such as irradiation, controlled atmosphere, heat and cold treatments, pest-free zones, physical isolation, microbials, biological control, and host resistance may be potential integrated replacement materials as well. Research will be necessary to define the activity of these materials, as well as what human or environmental hazards could exist. In addition, research in basic pest biology, identification, and survey methods will need to be examined to ensure the availability of management tools over the long-term.

Many comments received on this use area stated that single alternatives such as phosphine, temperature treatments, and controlled atmospheres, among others, could not be used on all commodities now treated with methyl bromide. EPA understands and agrees that research must be conducted to define what commodity can be treated, with what protocol, against what pest, and under what circumstances. Nevertheless, EPA believes that this is achievable, and with research commodity pests can be managed without methyl bromide. Commenters also noted that the aeration time needed with phosphine and holding time with heat, cold and controlled atmospheres can be longer than what is needed with methyl bromide. EPA acknowledges that this will take considerable adjustment on the part of shipping and storage firms, but does not believe this is an insurmountable barrier. Adaptations of existing technologies (e.g., combinations using heat or carbon dioxide) might reduce dose and time of exposure requirements.

EPA received comments in support of the phaseout of methyl bromide, with special regard to worker-exposure issues in commodity processing facilities. Several examples were given of workers who had been adversely affected by this material. The commenters strongly support efforts to strengthen worker-exposure and safety regulations, and thus requested that EPA accelerate the phaseout process and require that commodities treated with methyl bromide be labeled. EPA recognizes that the phaseout of methyl bromide in order to protect stratospheric ozone could also have collateral benefits by reducing occupational exposure to this chemical. Of course, worker exposure to methyl bromide substitutes may continue to be a concern in some cases. In any event, EPA does not believe reduction in worker exposure is a basis to accelerate the phaseout under Title VI. Nor is this a basis to require labelling under Title VI. As explained below, EPA does not believe the section 611 labelling requirement applies to agricultural products fumigated with methyl bromide.

e. *Structural Fumigation.* Methyl bromide has been utilized to effectively control wood destroying and boring insects in buildings, as well as rodents and other pests in food processing facilities. Although this use accounts for less than five percent of the total global usage, it has been considered a significant pest control tool due to its effectiveness.

EPA received comments on the potential for alternatives to replace methyl bromide for structural treatments. Most of them compared existing alternatives with methyl bromide. While methyl bromide is a good biocide, replacements will not necessarily need to duplicate its effectiveness in order to be good structural pest control tools. As with other chemical and non-chemical replacements, pest control tools in this use area will need to be thoroughly evaluated in regard to pest control efficacy, practical feasibility, and economic viability. It is essential that research be done on alternatives to the use of methyl bromide in the milling industry and the food processing industry to insure that chemical residue problems are addressed.

Several options exist with regard to pest problems in dwellings, with sulfuryl fluoride the principal chemical alternative. In this area, methods to reduce methyl bromide dosage by combining the pesticide with carbon dioxide, have shown good success. Contact pesticides which control certain wood boring pests include diazinon, carbaryl, permethrin, cypermethrin, fenvalerate, propoxur and borate which is now registered in the United States for control of termites and other wood destroying insects, and is currently being successfully utilized on a commercial basis. Non-chemical treatments include heat and cold treatments and the use of microwaves. Due to these developments, EPA believes it is likely that methyl bromide use will decline significantly, and this sector will not be adversely impacted to a significant degree by the phaseout.

The principal methyl bromide replacement for commodity storage warehouses and food production facilities is phosphine. While this material is not applicable in all situations due to its ability to corrode certain metals, when it is combined with carbon dioxide the amount of phosphine needed can be significantly reduced, which in turn diminishes the potential for phosphine-induced metal corrosion. As discussed in the proposal (58 FR 15014), other treatments include heat, cold, modified atmospheres, and inert dust. Additional research will be required in this area to ensure that all current users of methyl bromide will have acceptable replacements by 2001. Here, target pests and control options must be well defined in order to utilize pest control materials which are specific to the situation.

5. Analysis of Costs and Benefits

EPA received comments that in the March proposal it had not adequately addressed the costs and benefits of action to phase out methyl bromide. On the contrary, EPA included extensive documents in the docket which examined the uses of methyl bromide and the applicability and costs of various alternatives. (See for example, Preliminary Use and Substitutes Analysis of Methyl Bromide in Agricultural and Other Uses (June, 1992) and Montreal Protocol Assessment Update on Methyl Bromide: Science, Technology and Economics, UNEP (1993)). In the case of health and environmental impacts, the Protocol's assessment update provides significant information on the likely impact of continued use of methyl bromide on stratospheric ozone.

In comments received on the proposed rule, the MBWG conducted its own cost-benefit analysis ("Comparing the Costs and Benefits of EPA's proposed Phaseout of Methyl Bromide"). This analysis purports to calculate benefits based on EPA's methodology and findings used in past regulatory impact analysis. It calculates costs based primarily on an economic impact study performed by NAPIAP and discussed in detail in the previous section of this notice. The MBWG study concludes that the benefits of the methyl bromide phaseout in 2000 would be $19–29 million dollars and the costs would be $5–9 billion. This analysis is flawed for many reasons. The benefits calculations are drawn from an analysis of the impact of increased emissions of CFC–11. This scenario completely excludes the impact of bromine on stratospheric ozone depletion and therefore very substantially understates the magnitude of depletion. The benefits of avoided ozone depletion from CFC–11 occur over a period of 200 years, whereas the benefits from decreased emissions of methyl bromide occur within five to ten years. This factor is omitted from the MBWG's analysis. The analysis of the costs of phasing out methyl bromide dramatically overstates estimates for the reasons discussed in detail above in the critique of the NAPIAP study. The cost estimates assume an immediate phaseout, assume no additional alternatives are available in 2000, assume that no improvements in the use of existing alternatives are feasible, and assume that the market response by farmers is in some cases simply to abandon their fields.

EPA conducted an extensive review of the costs and benefits of its final action on methyl bromide (see, "The Cost and Cost-Effectiveness of the Proposed Phaseout of Methyl Bromide," EPA, 1993). This study includes the latest information on the costs and effectiveness of potential new alternatives by the year 2001 and on the costs and benefits of improved utilization of existing alternatives. The Agency estimates the total costs of a phaseout from 1994–2010 to be $1.7–2.3 billion. The benefits analysis contained in this report reflects the key assumptions about manmade emissions, impact on ozone of bromine, and likely growth in use absent regulations that are contained in the Protocol assessment update report. Based on this reasonable set of assumptions, EPA calculates the benefits of the final rule phasing out methyl bromide to be between $244 and $952 billion. (The benefits for the phaseout of methyl bromide between 1994 and 2010 is between $14 and 56 billion). These benefits result primarily from avoided cases of non-melanoma skin cancer. The range in values results from different estimates for the value associated with a human life.

6. Group Assignment and Baseline Year

Whenever a substance is added to the list of class I substances, section 602(c)(1) provides that the Agency assign it to an existing group or create a new group. The Agency proposed to create a new group (Group VI) following the historical precedent of actions both under the Montreal Protocol and the CAA.

Since the Agency did not receive any substantive comments on this aspect of its proposal, today's final rule adopts that approach. For the reasons summarized above and elaborated on in the proposal, methyl bromide will be listed as Group VI within the list of class I substances.

EPA proposed using 1991 as the base year for determining the level at which to set the production and consumption cap. This was chosen because it is the last year prior to discussions to regulate this compound and therefore avoids the possibility of companies increasing production in an effort to increase their baseline. The same reasoning was used in setting the appropriate year for other substances covered in both the CAA and the Montreal Protocol. The baseline established in the Montreal Protocol for methyl bromide is also 1991.

The only comment on this issue supported this year as the baseline. For the reasons stated above, today's final rule adopts 1991 as the baseline. In a separate notice (58 FR 40048), EPA had requested data to support the development of both a 1991 consumption and production baselines for allocating allowances. EPA published proposed allowances based on 1991 levels on November 9, 1993 in the **Federal Register**. The Agency intends to publish final allowances before the end of the calendar year in order to implement the freeze established in this rule beginning January 1, 1994.

In an important distinction between the Montreal Protocol and this rule, EPA has not excluded quarantine and preshipment uses from its baseline and from the coverage of this regulation. Thus, the Agency intends to maintain records on both the baseline and annual production and consumption without the exemption of quarantine and preshipment uses as required under the CAA and with those exemptions as specified in the Copenhagen Amendments to the Montreal Protocol.

7. Interim Reductions and Phaseout Schedule

EPA is obligated under the CAA to impose the schedule of reductions called for in section 604 unless under section 602(d) it can demonstrate that such a schedule is unattainable. In its place, the Act appears to require the Agency to adopt the most stringent attainable phaseout schedule.

The proposed schedule for methyl bromide was to freeze production in 1994 and to maintain that level until the 2000 phaseout. EPA's rationale behind this schedule was that some near-term alternatives for methyl bromide existed, but for many of these, additional testing and government approval would be required, which could take several years. Moreover, additional time is essential to allow for the testing of newly developed substitutes and to allow for a comparison of different alternatives to determine which would be most beneficial in terms of efficacy and in terms of impact on the environment.

The Agency received many comments on the issue of interim reductions. One group of commenters urged the Agency to make deep reductions in the early years because of the availability of substitutes and other methods of reducing use. Many other commenters pointed to the lack of currently available alternatives and argued against any interim reduction steps.

EPA recognizes that in some cases alternatives are already available and could be shifted to in the near-term. The Agency encourages methyl bromide users to make these shifts. Moreover, recent requirements in California seek to reduce use and emissions through reduced dosage, deeper injections and thicker tarps in an effort to reduce ambient exposures and reduce health risks. These efforts will also reduce use, as much as 10–20% according to one commenter. However, the Agency expects that such reductions in use will primarily serve to offset the historic growth rate in the use of methyl bromide. While EPA encourages these and other near-term efforts to reduce use and emissions, the Agency does not believe at this time that an adequate case exists for relying on these measures as the basis for interim cuts, and instead believes that they will primarily offset increasing demand for methyl bromide.

While the Agency believes that several alternative fumigants, including such compounds as metam sodium, telone, and dazomet could be widely used as replacements for methyl bromide, it recognizes that some time will be required for this shift to occur. Regulatory hurdles, equipment modifications, more extensive field testing, and improved application techniques are all reasons why the Agency cannot now conclude that a more stringent near-term schedule be un is attainable. Furthermore, as discussed, many non-fumigant alternatives may also be viable options to replace methyl bromide. These alternatives, including soil sterilization, crop rotation, and plant breeding, will take several years or longer to develop and evaluate. In order to allow for these alternatives to be fully developed and evaluated, and to provide adequate time for regulatory approvals through EPA and USDA, today's final rule does not impose any interim reductions on production or consumption of methyl bromide prior to the phaseout.

Consistent with the provisions of section 602(d), today's final action allows the full seven years after January 1 of the year after the compound is listed for a phaseout. For the reasons discussed earlier in this notice, the phaseout of methyl bromide would be required by January 1, 2001 instead of 2000 as proposed.

EPA received many comments calling for EPA to allow the maximum time permitted under the statute. These comments generally argued that the additional time is needed to allow for the development and approval of alternatives. Given the considerable uncertainties in knowing how long it will take for a full complement of alternatives to be developed and implemented, the Agency believes it would be prudent at this time to permit the additional year prior to the phaseout. However, the Agency will continue to review the development and implementation of alternatives and could decide at some future date that an earlier phaseout is attainable.

8. Labeling

Today's rule does not directly deal with labeling requirements under section 611; once a compound is listed as class I, then labeling would be required one year after the designation becomes effective (see, 40 CFR 82.102). EPA has determined that activities involved in growing, harvesting, storing and transporting food are part of an agricultural process that falls outside the intent of Congress to require labeling on products "manufactured with" a class I or II substance. Thus, containers of methyl bromide would be required to be labeled beginning on January 1, 1995, but products treated with methyl bromide would not require labeling.

EPA received comments both supporting this interpretation of its labeling rule and arguing that labeling of these products was clearly intended by Congress and that providing this information to consumers was precisely the intent of section 611.

EPA recognizes that the general purpose of alerting consumers that certain goods were produced in a manner that may cause harm to stratospheric ozone could apply to certain agricultural products for which methyl bromide is used. Nevertheless, the Agency believes that the section 611 requirement that products "manufactured with" a class I or II substance should reasonably be interpreted to not apply to agricultural products as such products are grown and not manufactured.

The ordinary sense of the phrase "manufactured with" does not include agriculture. The dictionary defines "manufacture" to mean making something made "from raw materials by hand or by machinery." (Webster's Ninth New Collegiate Dictionary (1983)). Fruits and vegetables are generally not made from raw materials by hand or machinery. EPA further believes that labeling products raises issues that Congress did not foresee in enacting section 611. For example, applying the labeling provision to agricultural products for which methyl bromide is used is practically more difficult than labeling of most manufactured products. Raw agricultural products are ordinarily not packaged in the same manner as other manufactured products. In many if not most cases, consumers purchase fruits and vegetables without any packaging at all. Labeling such produce would be particularly difficult.

9. Essential Uses

EPA asked for comment in its proposal on whether it has the statutory authority under section 604 to grant essential use exemptions for methyl bromide. EPA received one comment on this issue suggesting that it has such authority and that limits on essential uses specified in section 604 deal only with those compounds already listed and should not in any way restrict the Agency's flexibility in crafting essential uses for newly listed substances. Another commenter suggested that the Agency should go back to Congress for explicit authority to grant essential uses.

EPA believes that it is premature at this time to attempt to resolve this issue. If, as the phaseout date approaches, it becomes clear that important uses are still without substitutes, the Agency anticipates it would seek an appropriate remedy.

V. Addition of Hydrobromofluorocarbons (HBFCs) to the List of Class I Substances and to the Phaseout Schedule

In today's rule, the Agency is adding hydrobromofluorocarbons(HBFCs) as group VII, class I controlled substances. These chemicals have a parallel chemical structure to the HCFCs, with bromine atoms taking the place of chlorine atoms. Multiple ODPs of these chemicals were agreed to by the Parties of the Montreal Protocol as part of the 1992 Amendment which phases out these compounds by January 1, 1996. As explained in other parts of this rule, the Agency expects these amendments to enter into force during the first few months of 1994. The multiple values contained in the Protocol Amendment on the ODPs of the listed HCFCs do not reflect scientific uncertainties. The upper value of the ODP range provided is the estimate for the isomer with the highest ODP, and the lower value is the estimate of the ODP for the isomer with the lowest ODP. The Parties to the Protocol at their meeting in Copenhagen agreed that the ODP for these chemicals shall be the upper value in the range, and that these chemicals should be phased out by January 1, 1996. All the upper ODP values for the HBFCs ODPs exceed 0.2.

As provided under section 602(e) of the Clean Air Act, the ODP of a substance specified under section 602 shall be consistent with the ODP specified for that substance under the Protocol. Also section 602(a) provides that the Administrator shall add to the class I list all substances that the Administrator determines to have an ODP of 0.2 or greater. The Agency is assigning ODPs to the HBFCs based on the isomers with the highest ODP, consistent with the approach taken under the protocol. Because such ODPs are above 0.2, the Agency is adding the HBFCs to the class I list. The Agency has assigned HBFCs to group VII of the class I chemicals.

Once listed, these chemicals are subject to the phaseout schedule specified in section 604 of the Clean Air Act. However, section 606(a)(3) provides authority for accelerating the phaseout of class I substances on the grounds that the Montreal Protocol is modified to include a schedule that is more stringent than the schedule otherwise applicable under title VI. Section 614 provides that in case of conflict between any provision of title VI and any provision of the Montreal Protocol, the more stringent provision shall govern. Therefore, the Agency is adopting the schedule agreed to by the Parties in Copenhagen to phase out these chemicals by January 1, 1996.

Furthermore, EPA had proposed, and today makes final, a freeze on the production and consumption of HBFCs, starting January 1, 1994 at 1991 baseline levels. The Agency is aware of only one HBFC in production, HBFC–22B1, used as a fire suppressant with an ODP of 0.74. Use of this chemical is extremely limited, and it is only manufactured by one company. As a result, EPA does not anticipate any significant economic consequences from the phaseout of HBFCs.

EPA published a **Federal Register** notice requesting data on 1991 production and consumption of HBFCs for the purposes of establishing baselines and allowances. Based on responses to that request, EPA published proposed allowances on November 9, 1993, and intends to publish final allowances before the end of the year to implement the freeze beginning January 1, 1994.

VI. Trade Restrictions

A. Description of Proposed and Final Requirements

In order to implement the requirements of the Clean Air Act, the decisions of the 4th Meeting of the Parties to the Montreal Protocol, and the London and Copenhagen Amendments to the Montreal Protocol, EPA proposed and is today requiring a number of restrictions on trade with foreign states that are not Parties to the Protocol or its amendments. The trade restrictions being promulgated by this rule add to existing trade restrictions promulgated in 1990 (see 40 CFR 82.4(d)). Specifically, today's actions require a ban on bulk exports of controlled substances from the U.S. of Annex A substances (Class I, Groups I and II) to foreign states that are not Party to the 1987 Montreal Protocol. While this provision will not be legally effective until the effective date of today's rulemaking, EPA had asked U.S. companies to comply with this trade ban. All indications suggest compliance has occurred. Today's rule also imposes a ban on bulk imports and exports of controlled substances listed in Annex B to the Protocol (Class I, Groups III, IV, and V) from and to foreign states, respectively, that are non-Parties to the London Amendment. While this provision also will not be legally effective until the effective date of today's rulemaking, EPA has asked all relevant companies to ban the import and export of these chemicals effective August 10, 1993, the effective date of the relevant Protocol provision. Finally, today's rulemaking imposes a ban on imports from foreign states not Party to the 1987 Montreal Protocol of specified products listed in Annex D to the Protocol that contain the controlled substances specified in Annex A (Group I and II, Class I controlled substances). This provision will become effective January 10, 1994. The EPA proposal notified all companies of the applicability of these provisions.

The Montreal Protocol provides, and EPA is also allowing an exception from the trade bans for foreign states that are not Party to the Protocol, but have been determined by a Meeting of the Parties to the Protocol to be in compliance with Articles 2A to 2E and 4 of the Protocol. This includes countries that have complied with the terms of decision IV/17c of the 4th Meeting of the Parties to the Montreal Protocol, which provisionally determined compliance until the 5th Meeting of the Parties (November, 1993 Bangkok) for certain non-Parties that submitted specified data by March 31, 1993. A list of those qualifying countries can be found in appendix C, Annex 2 of this rule. An updated list of countries which are Party to the Protocol and its amendments can be found in appendix C, Annex 1. Over the last several months, the number of Parties to the Protocol has been increasing at a relatively fast pace. As a consequence, EPA will update the list of Parties to the Protocol every other month. One commenter noted that EPA must make this list available as readily and easily as possible. A dated list of Protocol Parties and Parties qualifying for an exemption from the Protocol's trade bans can be obtained by calling EPA's

Stratospheric Protection Hotline at 1-800-296-1996. The Agency will update this list every two months, and companies may trade with the newly added countries without EPA rulemaking.

Finally, in the proposed rule, EPA asked for comment on whether the information requirements currently in place for trade in bulk chemicals should be applied to the importation of controlled products. As noted below, one commenter stated that the recordkeeping and reporting requirements discussed in the proposal were unduly burdensome, and that EPA should rely on U.S. Custom's records for this information. EPA had not formally proposed recordkeeping and has decided not to impose such information requirements. Since the publication of the proposed rule, the number of Protocol Parties has risen from 91 to 126, and there is every indication that additional Parties will be joining shortly. The current list of countries complying with the Protocol includes all known producers, and since all Protocol Parties are under an obligation to ban the export of controlled substances to non-Parties, the possibility that non-Parties would be producing and exporting products which contain controlled substances is narrow. Given these circumstances, EPA believes that it would be overly burdensome to require such information for importation of controlled products.

B. Response to Major Comments

One commenter misunderstood EPA's description of the relationship of Taiwan to the Montreal Protocol. In the proposed rule, EPA affirmed that the trade provisions of the Protocol only apply to "a State not party to the Protocol," and noted that Taiwan, which did not fall under this Protocol category as a state, had nonetheless submitted data to the Protocol secretariat indicating that it was in compliance with the control provisions of the Protocol. The commenter asked for clarification as to what action EPA would take if Taiwan were found at some future date to be out of compliance with those provisions. Should that situation arise, EPA would review its options and would take actions consistent with U.S. laws and policies to strongly encourage full and prompt compliance with the Montreal Protocol.

C. Legal Authority

As discussed in more detail in the proposal, section 615 of the Clean Air Act provides EPA with the authority to promulgate these trade restrictions. That section authorizes the Agency to promulgate regulations, if in the Administrator's judgment, any substance, practice, process, or activity may reasonably be anticipated to affect the stratosphere and such effect may reasonably be anticipated to endanger public health or welfare. These trade bans imposed by this rulemaking would prevent shipments of ozone depleting substances from the U.S. to countries with no regulatory infrastructure to control their use. Limiting access in this way will reduce their release of such substances into the atmosphere, thereby, reducing effects on public health and welfare. Moreover, the bans on imports to the U.S. from non-Party foreign states of controlled substances and products would help discourage shifts of production to non-Party foreign states to the Protocol by eliminating the U.S. as a market for such production.

D. Definitions

As proposed, in this final rule, EPA has further defined Parties to the Protocol in the regulation to distinguish Parties complying with the original 1987 Montreal Protocol, the 1990 London Amendments and the 1992 Copenhagen Amendments.

E. Foreign States not Party to the Protocol

Article 4 of the Montreal Protocol provides foreign states which are not Party to the Protocol with a mechanism to demonstrate compliance with key Protocol provisions and seek exemption from the Protocol's trade measures against non-Parties. Specifically, paragraph 8 of Article 4 states that trade with non-Parties will be permitted if a meeting of the Parties finds those states to be in full compliance with Articles 2, 2A to 2E and 4 of the Protocol. It is anticipated that once granted, such status will be reviewed by each subsequent meeting of the Parties to ensure continuing compliance with the relevant Protocol provisions.

At the 4th Meeting of the Parties, the Parties reviewed the data submission of Colombia, and based on their demonstration of compliance, decided to suspend measures against that non-Party. Additionally, by Decision 4/17C, the Parties decided to determine provisionally, pending a final decision at the 5th Meeting of the Parties, that any foreign state non-Party to the Protocol which submitted data by March 31, 1993, was in compliance with the relevant provisions and could be exempt from the trade restrictions until the 5th Meeting of the Parties when that data could be reviewed. Fourteen non-Parties to the Montreal Protocol submitted data based on that decision. Additionally, eight non-Parties to the London Amendment to the Protocol submitted data. Due to the timing of their submissions, EPA was not able to list in the proposed rule those countries with interim status as a Foreign State not Party to the Montreal Protocol but complying with Montreal Protocol and/or the London Amendment.

VII. Changes in Definition of Production

A. Definition of Production

In the March 18 proposal, EPA proposed to define "production" as the manufacture of a controlled substance from any raw material or feedstock chemical, but not to include: "(1) The manufacture of a controlled substance that is subsequently transformed; (2) the reuse or recycling of a controlled substance; or (3) amounts that are destroyed by the approved technologies." The current definition of "production" excludes controlled substances that are subsequently transformed and the reuse or recycling of a controlled substance.

In today's rule, in response to a variety of comments to be discussed in this section, the definition of production is revised to mean "the manufacture of a controlled substance from any raw material or feedstock, but does not include:

(1) The manufacture of a controlled substance that is to be subsequently transformed;

(2) The reuse or recycling of a controlled substance;

(3) The manufacture of a controlled substance that is subsequently destroyed by one of the five approved technologies, to the extent that destruction is considered to have occurred under this rule; and

(4) Controlled substances that are vented or spilled unintentionally."

Several commenters indicated that after the phaseout, production allowances would no longer be available to produce controlled substances intended to be transformed or destroyed, using the current system of expending production allowances and applying to EPA to receive allowance reimbursement for controlled substances that are transformed. In response to those comments, along with revising the definition of production, EPA is also revising its approach to requiring production and consumption allowances in cases where controlled substances are to be transformed or destroyed.

Under today's rule, production and consumption allowances are required only for the "production" of controlled substances that will result in emissive uses. As a result, producers of ozone-depleting chemicals that are to be used as feedstock do not need to expend allowances to manufacture these chemicals. That is also true for producers of such substances that are manufactured for production processes that will result in their destruction. Similarly, allowances are not required when importing reused or recycled substances. The changes in the definition of production will serve to facilitate business operations by eliminating the need for EPA's paperwork related to refunding and trading allowances in these limited situations. The Agency believes that these changes will assist industry in their business operations, but have no significant impact upon the ozone layer.

1. Transformation

a. Changes in Treatment of Transformation. Under the current regulations, producers expend production and consumption allowances when producing and importers expend consumption allowances when importing controlled ozone-depleting substances (except for carbon tetrachloride produced as a feedstock). When the chemicals are sold to a second party and subsequently transformed, new allowances are provided to that second party transformer upon request. These allowances are then traded back to the producing company by the transforming firm.

Several commenters, although agreeing with the proposed definition of production, indicated that the current administrative procedures for dealing with transformation and destruction under the allowance system should be modified. Since, only after a company transformed the controlled substance and submitted documentation to EPA that transformation occurred, would EPA "refund" those allowances expended, commenters indicated that allowances should not be required for the production of ozone-depleting substances that are to be transformed or destroyed.

Commenters further indicated that these requirements pose significant burdens upon industry. The paperwork and staff time, both for industry and EPA, to grant and trade allowances is excessive, and it may be months before a producer had allowances returned. The EPA recognizes that as the number of allowances becomes smaller with the annual reduction schedule, producers will become hard pressed for available allowances. It is not EPA's intent to hinder business operations that are allowed under the Montreal Protocol (i.e., production for transformation is not limited). Finally, EPA recognizes that under the current program, no manufacturer could produce past 1995 except for essential uses and exports to Article 5 countries, since no allowances will be available.

Consequently, EPA's procedures of the allowance system for ozone-depleting substances are now changed. In essence, the Agency is now extending the system previously applicable only to carbon tetrachloride transformation to other controlled substances. Because controlled substances that are transformed are excluded from the definition of production, producers that transform or sell to purchasers that transform do not need allowances for such production. Companies that buy these chemicals for transformation purposes will no longer need to request allowance redemptions once transformation has occurred, and thus will no longer need to trade those allowances back to the producers. This change would be imperative once U.S. production and imports of controlled substances is fully phased out. Without such changes, companies would be unable to produce controlled substances that were to be transformed or later destroyed after use.

The Agency does recognize that some production may have been intended for emissive uses and allowances expended, to produce those chemicals but they are later transformed. In these cases, EPA intends to allow persons to redeem those allowances where persons certify that transformation has occurred (see discussion on certifications below).

b. Recordkeeping and Reporting Changes Relative to Transformation. In addition to the simplification of the program to eliminate the unnecessary requesting and trading of allowances, EPA will require only annual reports from companies that transformed ozone-depleting chemicals. To track transformation on a quarterly basis, EPA will rely upon producers' quarterly reports which will record the volume of chemical sold for transformations. The Agency found tracking transformation between producers' reports and transformers' reports difficult. Generally, chemicals, once produced, are sold, used, or put into inventory. In some cases, companies will stretch out inventory over years. This makes it difficult for EPA to match production intended for transformation to when it is actually consumed or transformed. Consequently, EPA has decided to eliminate the transformer's quarterly report. However, EPA has not eliminated recordkeeping by companies that consume these chemicals as feedstock. EPA will audit transformers to ensure compliance with the requirements of this regulation. Transformers must maintain the following records as is currently required under the existing program: dated records of the quantity and level of each controlled substance transformed; copies of the invoices or receipts documenting the sale or transfer of the controlled substance to the person; dated records of the names, commercial uses, quantities of the resulting chemicals, and dated records of shipments to purchasers of the resulting chemicals; dated records of all shipments of controlled substances received by the person, and the identity of the producer or importer of the controlled substances; and dated records of inventories of controlled substances at each plant on the first day of each quarter.

Companies that purchase class I controlled substances and then transform those controlled substances must report the annual volume transformed within 45 days of the end of the control period.

In the case where production and/or consumption allowances are expended and the substance is later transformed, a person who transforms may receive allowances for transformation of controlled substances. The person must submit the following information: the identity and address of the person who transformed the substance; the quantity and level of controlled substance transformed; a copy of the invoice or receipt documenting the sale of the controlled substance; the name, quantity and verification of the commercial use of the resulting chemical transformed; and signature of the certifying party. The person must also certify that the production of the controlled substance expended either production and/or consumption allowance. The Agency believes that this information is necessary to ensure that transformation has occurred.

2. Destruction

In today's action, the Agency is implementing in its regulation a recent decision of the Parties in Copenhagen that addressed destruction (Decision IV/11), removing controlled substances to be destroyed under certain conditions from the definition of "production." As will be described below, EPA believes that the implementation of this decision is consistent with House-Senate Conference Report that accompanied the Clean Air Act Amendments of 1990, and will provide more clarity as to the definition of production and the conditions under which destruction is allowed. Today's rule eliminates from the definition of production those ozone-depleting chemicals that are to be destroyed, similar to the manner in which transformation of such chemicals falls outside of the definition of production. The Agency believes that this change poses insignificant environmental harm and lessens the administrative burden of the current regulation.

a. Elimination of Coincidental Unavoidable Byproducts Provision. As a result of actions by the Parties to the Protocol regarding destruction, the need for the current coincidental unavoidable byproducts (CUBP) provision is eliminated. Under the current regulations, that provision allows for an exemption from production restrictions for any controlled substance that is a coincidental unavoidable byproduct and is subsequently contained and destroyed by the maximum achievable control technology, or MACT. With today's rule eliminating those quantities of controlled substances destroyed from the definition of production, the CUBP provision becomes unnecessary and duplicative. Therefore, as proposed, today's rule deletes the CUBP provision of the current phaseout regulations. Commenters supported the striking of the CUBP provision, given the treatment to be afforded through the destruction and insignificant quantities (see discussion below) provisions outlined in the proposal and followed through in today's final rulemaking.

b. Destruction—Background. Under the existing Protocol, "production" of controlled substances is defined as "the amount of controlled substances produced, minus the amount destroyed by technologies to be approved by the Parties." At the Fourth Meeting of the Parties to the Montreal Protocol, the Parties approved five destruction technologies to be used for destroying controlled substances.

With the approval of the five destruction technologies—liquid injection incineration, reactor cracking, gaseous/fume oxidation, rotary kiln incinerators, and cement kilns, Parties to the Protocol can now subtract from the definition of production that amount of controlled substance(s) that is destroyed by these means, under certain conditions discussed below.

Liquid injection incinerators are typically single-chamber units with waste burners. They may also include liquid injection stages of a multiple-chamber incinerator. These incinerators are used to destroy wastes with a low ash content and can be used to destroy sludge, slurry, vapor, or combustible liquid. Liquid wastes are burned in suspension after being injected through burners and atomized to fine droplets.

A reactor cracking process uses a cylindrical graphite, water-cooled reactor and an oxygen-hydrogen burner system. Since 1983, this process has treated waste gases resulting from the production of CFCs. The gases are converted to hydrofluoric acid, hydrochloric acid, carbon dioxide, chlorine, and water. The two acids are usable in-house and/or marketable, and the chlorine is scrubbed, leaving only water vapor, oxygen, and carbon dioxide as waste gases.

Gaseous/fume oxidation destroys waste vapor streams, most often volatile organic compounds. A combustion temperature of around 1100 degrees centigrade is needed to destroy most ozone-depleting compounds. Acid gas scrubbers are required for incineration of halogenated waste vapors, such as those from controlled substances. Fume incinerators can be direct flame incinerators, consisting of the combustion chamber and a burner, or recuperative fume incinerators that use heat exchangers to preheat the waste vapor feed stream or the combustion air. Fume incinerators are usually found in chemical process or manufacturing plants.

Rotary kiln incinerators can handle a wide variety of both solid and liquid wastes. Rotary kiln incinerators typically have at least two combustion chambers, the afterburner ensuring that complete combustion of exhaust gases takes place. Liquid wastes can be fed either into the rotary kiln area or directly into the afterburner chamber. If fed into the afterburner chamber, the liquid is atomized in the burner or combustion zone.

Cement kilns, under proper operation, can destroy most organic chemical wastes. Tests have been conducted using CFC–113, with a destruction efficiency of greater than 99.99 percent demonstrated. Destruction of ozone-depleting substances in cement kilns appears beneficial.

c. Definition of Destruction/Change in Definition of Production. In today's rulemaking, the Agency defines "destruction" as "the expiration of a controlled substance to the destruction efficiency actually achieved, unless considered completely destroyed as defined by this section. Such destruction does not result in a commercially useful end product and uses one of the following controlled processes. . ." The Agency believes it has the authority to develop this definition to be consistent with the Protocol. While section 601 (11) of the CAA does not require EPA to exclude quantities of controlled substances that are destroyed from the definition of "production," EPA believes it has the discretionary authority to exclude from the definition of "production" controlled substances that are destroyed through the use of the technologies approved by the Protocol Parties at the Copenhagen meeting. Section 601 (11) provides that the terms 'produce', 'produced', and 'production', refer to the manufacture of a substance from any raw material or feedstock chemical, but such terms do not include amounts of substances that are transformed or reused.

EPA notes that the Conference Report of the 1990 Clean Air Act Amendments stated that the "conference agreement does not include a requirement to construe the term 'production' in a manner consistent with the Protocol. The Protocol's exclusion for manufactured substances that are subsequently destroyed is too broad and does not include adequate safeguards to preclude abuse." The Conference Report then proceeded to state that "[i]n the course of implementing this Act, however, EPA shall consider whether an exclusion will be allowed on a case-by-case basis for the manufacture of controlled substances that are: (1) Coincidental, unavoidable byproducts of a manufacturing process; and (2) immediately contained and destroyed by the producer using maximum available control technologies." EPA proceeded to establish a process that exempted such production as CUBP, as discussed above, in the July 30, 1992 final rule (57 FR 33754).

While section 601 (11) of the CAA does not contain language requiring EPA to follow the Protocol in terms of excluding destroyed controlled substances from production, it also does not contain language precluding EPA from following the Protocol Parties' approach to destruction. Moreover, the Conference Report assumes that EPA has the authority to exclude quantities that are destroyed from production. Otherwise, Congress could not have directed EPA to consider excluding only certain types of destroyed production. EPA believes that while it is not required to follow the approach of the Protocol Parties regarding destruction, it has the authority to do so at this juncture because the approach adopted by the Parties, in specifically approving the five destruction technologies, adequately satisfies the concerns expressed in the Conference Report. Those concerns were expressed at a time when it was not known how the

Parties would treat destruction; by specifically approving these five technologies, the Parties have satisfied the concern of the House-Senate Conference Committee that the Protocol's exclusion associated with destruction is too broad. Furthermore, by requiring reliable documentation of the amount destroyed, EPA's implementing regulations further address the concerns raised in the conference language.

The Agency believes that with the adoption of this definition of destruction, a modified definition of production consistent with the Protocol's decision to approve the five destruction technologies, and the recordkeeping and reporting requirements described below, the concern regarding destruction expressed in the Conference Report language is adequately addressed.

d. Treatment of Destruction. Today's rule, with its definition of destruction, treats destruction in a manner parallel to the treatment of transformation in this final rule. Those substances that are produced for use in production processes that result in their destruction, using one of the five approved destruction technologies, are exempt from the definition of production. Therefore, production and consumption allowances are not required for production and importation of controlled substances that are to be destroyed.

It is important to note that EPA modified the method adopted in this rule for treating transformation and thus, destruction, from the proposed rule in response to comments. While producers or importers transforming or destroying carbon tetrachloride would not have been required to hold allowances to produce or import under the proposal, producers and importers of other controlled substances, and non-producers were required to apply for allowance credits after transformation or destruction had taken place. EPA made this decision due to the number of comments it received requesting this treatment. The Agency believes that as long as there are adequate safeguards to ensure that the chemical is eventually destroyed, then this administrative change would have no impact on the environment. The Agency has acknowledged that these requirements would have needed amending to implement the complete phaseout successfully. In today's final rule, in cases where the producer or an importer knows that any controlled substance is to be transformed or destroyed by the producer or importer itself or by a non-producer of the controlled substance, that substance will not fall under the definition of "production" and "consumption," negating the requirement for production and/or consumption allowances.

This rule does allow persons other than producers or importers to receive allowances when they destroy the controlled substance. Where allowances are expended in producing a substance that is sold for emissive use and that substance is later destroyed by one of the five approved technologies, the final rule is requiring that a certification be submitted to the Agency by the person requesting the allowances who destroyed the substance that allowances had been expended for the production or import of this controlled substance.

The person requesting these allowances should provide the following information: the identity and address of the person who destroyed the substance; the name, quantity and volume of controlled substance destroyed; copy of the invoice or receipt documenting the sale of the controlled substance to the person; and the destruction unit's efficiency. Finally, the person shall submit a certification that allowances had been expended for the production or import of this controlled substance. The Agency believes that this information, similar to the information required for receipt of allowances for transformation, is necessary to ensure that destruction has occurred.

As will be discussed below, EPA is also requiring that each person who intends (knowing at the time of purchase) to destroy controlled substances submit to the producer or importer from whom they purchase those substances a verification that the substances they purchase will be destroyed. The purchaser or importer will keep this verification on file. Also discussed below, EPA is requiring that a one-time report be submitted by those who destroy controlled substances, stating the destruction unit's destruction efficiency and the methods used to record the volume destroyed and those used to determine destruction efficiency as well as other federal or state regulations governing the destruction technology. The combination of these two one-time (unless information in verification or report changes) requirements will supply adequate information to EPA and to the producer/importer, such that destruction can be confirmed. This will minimize the amount of information the person destroying will need to submit to the producer/importer after substances are actually destroyed.

All companies that destroy class I controlled substances must report volume destroyed during the control period within 45 days of the end of the control period.

As will be explained in greater detail below, a substance will be considered completely destroyed if it is destroyed by one of the five technologies at a demonstrable destruction efficiency of 98 percent or greater. Substances destroyed by one of the five technologies at a destruction efficiency of less than 98 percent will be considered destroyed only to that percentage; thus, only that percentage of the substance that is to be destroyed will be exempt from the definition of production. The remaining percentage will fall under the definition of production and thus require production and/or consumption allowances to produce or import.

This differs slightly from the treatment of transformation in this final rulemaking, in that substances transformed, meaning entirely consumed except for trace quantities, are exempt from the definition of production. There are no provisions for less than full transformation, except for trace quantities. A destruction exemption can be obtained, however, for whatever percentage is demonstrated to be destroyed by one of the approved technologies.

e. Response to Major Comments. EPA received numerous comments relative to its proposal to grant credits or exempt a controlled substance from the definition of "production" for destruction of the covered substances. Of those, only one stated that the Agency should not grant such credits or exemptions. The specific concern of this commenter centered around the potential ability of a company to transfer production credits among chemicals. According to the commenter, if a company had a surplus of one substance, destroyed that surplus, received credits, then used those credits to produce another substance, the Agency could be creating a disincentive to move out of those substances.

In this final rulemaking, EPA allows transfers of allowances to occur only within a Group (eg., Group I, which includes CFC–11, –12, –113, –114, and –115). CFC allowances could not be traded for halon credits, as this commenter suggested. (Indeed, production of halons will be phased out in 1994, and therefore, no trades would occur among individual halons.) Additionally, all transfers of allowances among chemicals within a group must be adjusted according to the ODP of each substances. The Agency thus believes that, even in the event of an unlikely scenario described by the commenter, the implementation of these decisions will result in no environmental damage, yet will minimize disruptions for companies that require controlled substances past the phaseout date.

Companies will only receive a destruction exemption for the volume of controlled substances that have been destroyed by one of these five approved destruction technologies, unless a 98 percent or greater destruction efficiency is achieved; only then would a full destruction exemption be granted. Because the environmental goal of this rule, as well as the whole of title VI, is to minimize and ultimately eliminate emissions of ozone-depleting chemicals, treating destruction in the same manner as transformation is treated in this final rule merely recognizes a process that destroys potential emissions of these substances consistent with these environmental goals.

The Agency received comments claiming that it is unreasonable to exclude from the definition of destruction those processes where heat or energy that may be commercially useful is produced as a byproduct of destruction. EPA agrees. The intent of the destruction process is to destroy the substance, for which a byproduct in the way of heat or energy may be produced, rather than production of an end product being the goal of the destruction activity. Heat or energy are in fact potential byproducts of the process of destruction, rather than end products of the substance(s) itself. Therefore, EPA does not consider heat or energy produced as a byproduct of destruction to be considered an end product. As a result, the production of heat or energy as a byproduct of an approved destruction technology under this section does not preclude the substance or substances from falling under the definition of destruction.

One commenter suggested that the Agency clarify that any other destruction process that is later approved by the Parties to the Protocol and added to this list of five destruction technologies should also be deemed an acceptable destruction technology under this rule. While EPA does not believe it appropriate to authorize the use of as yet unapproved destruction technologies, it intends to propose authorizing use of additional destruction technologies through future rulemakings, as such technologies are approved by the Parties.

Another commenter pointed out that, although listed properly in the Preamble, the regulatory text of this rulemaking listed the destruction technologies incorrectly, splitting out liquid injection incineration into two technologies—liquid injection and incineration. The regulatory text has now been corrected to include liquid injection incineration as one technology.

One commenter stated that controls of emissions of these substances by product recovery devices should be treated in the same manner as destruction via one of these five approved technologies. Another commenter stated that RCRA boilers and industrial furnaces should also be covered by the exemption. Both claimed that the end results would be avoidances of emissions. In keeping with the intent of Congress, where concerns centered around too broad an exemption of a substance from the definition of production as a result of destruction, and in maintaining consistency with the decision reached by the Parties to the Protocol, the Agency is today allowing destruction exemptions only for those five destruction technologies approved by the Parties.

Another commenter requested that EPA clarify that an incidental use of a substance prior to destruction, adequately contained so as to prevent any emissions, not disqualify it from receiving destruction credits/exemptions. EPA expects that these substances will be used in a production process prior to being sent for destruction. Consequently, where uses of a substance occur in a contained environment and that substance is subsequently destroyed, the destruction exemption described in this section would apply.

Another commenter requested that the Agency clarify that off-site disposal is equally acceptable in taking advantage of this destruction credit. If handled according to applicable requirements, off-site destruction should ensure the same environmental benefits as on-site destruction. Consequently, as long as the requirements of this section are met, including all reporting and recordkeeping requirements, off-site destruction will be treated in the same manner as on-site destruction.

A commenter expressed concern over the manner in which fugitive emissions are treated and accounted for. EPA has not counted fugitive emissions of controlled substances in its current definitions of "controlled substance" or "production." The Agency believes that, with the accelerated phaseout of these substances, the higher costs associated,

concerns, producers and manufacturers have economic incentives to reduce fugitive emissions of controlled substances to a minimum. Additionally, major sources under section 112 of the Clean Air Act will have requirements imposed that will necessitate minimizing emissions of covered controlled substances. For these reasons, in keeping with past practice, fugitive emissions are not included in today's definitions of "controlled substance" or "production." If EPA's expectations turn out to be wrong, and fugitive emissions are not kept to a minimum, EPA will revisit the matter in a subsequent rulemaking.

f. Degree of Exemption/Credit Afforded for Destruction. Under the current regulations, companies could only claim the CUBP exemption for carbon tetrachloride and methyl chloroform destroyed at a 99.99 percent efficiency. The Agency had developed this destruction efficiency for these two chemicals, as well as others, when they were characterized as hazardous wastes under 40 CFR 343(a) and 40 CFR 266.104, pursuant to the Resource Conservation and Recovery Act (RCRA, 42 U.S.C. 6901 *et seq*). In the July 30, 1992 rulemaking for the protection of stratospheric ozone (57 FR 33754), the Agency adopted this definition of MACT in § 82.4(e)(1)(v) to exempt CUBP from production limits. However, today's rule eliminates the CUBP provision and the Agency has now focused on developing standards for destruction of controlled substances in order to exempt those substances from the definition of "production," making use of the Agency's experiences with MACT under the CUBP provision, RCRA regulations, and proposed CAA section 112 regulations.

Under RCRA, the Agency currently requires that industries that incinerate hazardous waste covered by the RCRA regulations meet "at stack" standards of 99.99 percent, or four nines. In addition to these "at stack" standards, RCRA also establishes performance standards to control fugitive emissions of hazardous substances which can occur at other point sources, such as waste storage facilities (§ 264.345(d)). While there are currently no quantified controls for such emissions, EPA is developing such standards for point sources under the CAA section 112 rule.

Of the substances regulated by RCRA, the only controlled substances covered are methyl chloroform and carbon tetrachloride. The remaining controlled substances are regulated under RCRA only when they are blended with hazardous waste, such as used solvents, The Agency is today making available the granting of full exemption from production, or full allowance credits, based on the destruction of controlled substances when they are covered by, and operated in compliance with, RCRA section 343(a) and 40 CFR 266.104. If the Agency were to exempt from the definition of production only that volume destroyed, 99.99 percent in the case of RCRA permitted facilities, the company would never be able to redeem the full amount of the chemical used, and would eventually be unable to obtain sufficient volumes to operate efficiently.

Under some situations, these chemicals are not covered by RCRA regulations, but will be covered by regulations to be promulgated under section 112 of the Clean Air Act. The Agency published a proposed rule (known as the Hazardous Organic NESHAPS [HON] rule) on December 31, 1992 (57 FR 62608) to implement section 112, stating that companies are required to control air emissions occurring in chemical manufacturing processes to the established MACT levels. The HON proposal covers approximately 400 manufacturing processes associated with the Synthetic Organic Manufacturing Industry (SOCMI), as well as seven non-SOCMI source categories. The Clean Air Act contained a list of 189 hazardous air pollutants (HAPS) of which a portion are known to be emitted by the above mentioned industries. Of those listed, the only controlled substances are methyl chloroform (MCF), carbon tetrachloride (CCl4) and methyl bromide (listed as a class I substance in today's accelerated phaseout rule).

The HON proposal covers five kinds of emission points within such facilities where these substances are emitted, including process vents, wastewater streams, transfer operations, storage tanks, and equipment leaks. The Agency proposed that each emissions source would require a "reference control technology" with specific applicability criteria, such as a 98% control efficiency with vapor incinerators for process vents and 95% for storage tanks. The HON proposes performance standards for operating the technologies, as well as criteria for the design of the control equipment.

The Agency proposed that when organic hazardous air pollutants are released through process vent sources, companies may route these emissions to a gaseous/fume oxidation incinerator for destruction. The Agency has proposed that such incinerators operate with an efficiency of 98 percent.

For the purposes of this rulemaking, the Agency establishes that when other regulations apply, such as ones promulgated under section 112 of the Clean Air Act, rather than RCRA, and the 98 percent destruction efficiency is achieved by vapor incinerators to which emissions of controlled substances are routed, the Agency will grant the full exemption or allotment of allowances for substances that are destroyed under these conditions.

Several commenters claimed that there may be situations whereby a destruction efficiency of at least 98 per[illegible]s achieved through one of the ap[illegible] destruction technologies, but the process does not fall under the jurisdiction of RCRA or section 112 regulations. In such cases, the commenters argued, the full exemption for destruction should be granted. EPA agrees. EPA recognizes that there may be a situation in which, for example, a facility in which destruction at or above a 98 percent efficiency level takes place is not a major source and thus, is not covered by section 112 regulations—nor is it regulated under RCRA for the disposal of hazardous wastes. Therefore, if a facility using one of these approved destruction technologies does not fall within the jurisdiction of RCRA or section 112 regulations, but achieves at least a 98 percent destruction efficiency and fulfills the requirements of this section (which include documentation of destruction efficiency and the methods for determining that efficiency), a full exemption can be granted for destruction.

Another commenter requested that the Agency define "completely destroy" in order to clarify situations in which full credit will be granted through destruction of these substances. Consequently, EPA has added a definition of "completely destroy" which covers destruction of 98 percent or greater of the substance that is sent for destruction, using one of the five approved destruction technologies.

The Agency recognizes that these five approved destruction technologies, although capable under test situations of destroying controlled substances at a 99.99 percent efficiency rate, may not be as efficient as is required for carbon tetrachloride and methyl chloroform covered under either RCRA or the proposed section 112 regulations. If the destruction efficiency in destroying these controlled substances, including carbon tetrachloride and methyl chloroform, is below 98 percent, then EPA will exempt from production only those volumes that have indeed been destroyed. For example, if an approved technology destroys only 80 percent of the chemical, then the Agency will only exempt the portion destroyed from the requirement to hold production allowances. Under such a program, companies that do not completely destroy their controlled substances would be unable to recoup, through allowances, their full volume of controlled substances needed to operate. Once the phaseout occurs, such companies will need to destroy close to 100 percent of the controlled substance, depending on technical limitations, in order to continue to operate at intended capacity.

g. Standards for Destruction. In cases where a destruction unit falls under the jurisdiction of RCRA or section 112 regulations, standards are required for those units pertaining to destruction efficiency, combustion efficiency, flow, monitoring, etc. For purposes of this rulemaking, those units must fulfill the requirements of the relevant regulations under which they are otherwise regulated; the Agency finds no rationale for developing additional standards for the destruction of such controlled substances in these regulations.

In cases where a destruction unit is not covered by one of these other regulations, consistent with the decision of the Parties to the Protocol, the Agency encourages the adoption of the minimum standards and subsequent recordkeeping requirements set forth in chapter 5.5 of the Ad-Hoc Technical Advisory Committee on ODS Destruction Technologies as the minimum requirements to be met under this section. The Ad-Hoc Technical Advisory Committee on ODS Destruction Technologies presents a list of minimum standards for pollutants emitted during destruction with stack concentrations for hydrochloric acid, hydrofluoric acid, particulate, and carbon monoxide.

The report entitled, Ad-Hoc Technical Advisory Committee on ODS Destruction Technologies, also recommends that atmospheric releases of controlled substances shall be monitored at all facilities with air emission discharges. For controlled substances, this report recommends use of flow meters or continuously recording weighing equipment for individual containers. The Agency recognizes that flow meters are not always compatible with certain equipment. However, EPA requires that a means be available with which to monitor potential releases and actual destruction. Therefore, where flow meters or continuously recording weighing equipment is not feasible, at a minimum, containers are to be weighed "full" and "empty" to establish quantities destroyed.

h. Comments on Reporting and Recordkeeping Associated with Destruction. The Agency is requiring, consistent with the proposal, that producers or importers of controlled substances for use in a production process that will result in destruction, using one of the approved technologies, maintain dated records of the quantity of controlled substances produced and sold for use in processes that result in destruction, and any applicable verifications from purchasers that the substance is to be destroyed. The Agency requires this recordkeeping in order to verify exemptions from production due to destruction.

Also consistent with the proposal, producers and importers of controlled substances must report to the Agency the amount of that substance sold to each person who then subsequently destroys the chemical and any applicable certification showing that the purchaser of the controlled substance intends to destroy the chemical.

Companies that both produce controlled substances and destroy those same substances must report the volume destroyed on their quarterly production report in a manner similar to that required for transformation. The final rule requires the same recordkeeping of persons who purchase controlled substances and subsequently destroy them as those outlined in the proposal.

The Agency received comments expressing concern that IRS certificates indicating feedstock use do not address the issue of destruction, making the certificates meaningless as a reporting requirement for destruction. None of the IRS certificates relating to controlled substances require information on those substances intended to be destroyed or actually destroyed. Consequently, these certificates are useful for substances to be transformed, but not for those to be destroyed. As a result, EPA is requiring purchasers who intend to destroy controlled substances to provide producers or importers from whom they purchase a one-time verification (unless any aspect of the information in the verification changes, thus requiring a revision) that includes the following information: the identity and address of the person intending to destroy the substance, indication of whether those controlled substances will be completely destroyed, as defined in § 82.3 of this rule, or less than completely destroyed, in which case the destruction efficiency at which such substances will be destroyed must be included; period of time over which the person intends to destroy controlled substances; and signature of the certifying party. The Agency believes that this information, similar to the information required for receipt of allowances for transformation, is necessary to ensure that destruction will occur. Without such verification information, a determination that the substances are to be destroyed and that the producer is thus able to avoid expending production allowances for such substances would not be possible.

Companies that purchase controlled substances that are subsequently destroyed must keep the following records: the identity and address of the person destroying the substance; the quantity and level of controlled substance destroyed; a copy of the invoice or receipt documenting the sale of the controlled substance; dated records of substance received by the person and the identity of the person from whom the controlled substance was purchased; dated records of inventories of controlled substances at each plant on the first day of each quarter; and a copy of the certification of intent to destroy, if applicable.

Several commenters stated that the proposed reporting and recordkeeping requirements, complemented by the recordkeeping requirements of other applicable regulatory regimes, would suffice for purposes of this section, and that more detailed requirements than what was proposed would be duplicative and unnecessary. As discussed above, these approved destruction technologies are often regulated under other statutes, such as RCRA, or are expected to be regulated under section 112 of the Clean Air Act. The implementing regulations for these statutes have detailed recordkeeping and reporting requirements to ensure that destruction has taken place. The Agency agrees and believes that these regimes provide adequate standards as well as recordkeeping requirements; the Agency believes that the recordkeeping information outlined in the paragraph above would be maintained in response to these various recordkeeping requirements. At a minimum, regardless of the regime under which a facility is regulated, the recordkeeping and reporting requirements outlined in this section are necessary in order to determine compliance with this final rule.

The Agency requested comments in the proposal on whether all companies that intend to destroy controlled substances should submit a one-time report to the Agency describing their methods used to record the volume destroyed and to determine destruction efficiency ratings. Two comments received by the Agency supported the one-time reporting of these methods. One commenter stated that the Agency should ask for the volume destroyed but not the method used in making that determination. EPA believes that in order to judge adequately whether the reported volume destroyed is accurate, it must know the destruction efficiency and understand the method that is used to determine volume and degree of destruction. Therefore, EPA will require the one-time report on the unit's destruction efficiency, and the methods used to record volume destroyed and to determine destruction efficiency rating.

The Parties to the Protocol in Copenhagen agreed that all Parties were to submit annual data on ozone-depleting chemicals destroyed. To comply with this agreement, the Agency requires an annual reporting requirement that all persons who destroy Class I and Class II chemicals report to EPA the volume destroyed if such a report had not been submitted to the Agency by the end of 120 days after the effective date of this rule.

Another commenter that produces controlled substances only as CUBPs stated that the recordkeeping required under the destruction provision is more burdensome than the recordkeeping for CUBP production. EPA clarifies in this response that the producer of coincidentally produced byproducts would fall outside of the allowance requirements through either the insignificant quantity exemption of this section or due to the destruction of that which is produced. EPA believes that the recordkeeping and reporting requirements associated with the destruction exemption are minimal and not overly burdensome to a producer of coincidentally produced byproducts. Therefore, EPA, with this rule, establishes the reporting and recordkeeping requirements as proposed for controlled substances that are destroyed.

3. Spills. The definition of production in both the current rule and the proposed regulations accompanying the March 18 proposal includes spilled or vented controlled substances equal to or in excess of one hundred pounds per event.

The Agency received a number of comments on this aspect of the definition of production. Allowances are currently required in cases of a spill or venting that exceeds 100 pounds. Commenters requested that EPA delete this part of the definition of production. Producers of ozone-depleting substances who currently hold allowances indicated that this provision may place companies in non-compliance after the phaseout, since allowances to cover spills would not be available. Once the phaseout is completed, there will be no means by which to comply with this requirement. Furthermore, commenters indicated that this provision does not allow for unusual circumstances. For example, a company that needs to quickly and safely shut down a manufacturing process may need to vent controlled substances. Commenters suggested that the Agency should rely on emission reduction rules promulgated under other authority by EPA to deal with venting or spill situations, rather than the "zero emission" program that would be in place after the phaseout.

The Agency agrees that requiring allowances for vents and spills over 100 pounds would lead to unintentional noncompliance following the production phaseout, since allowances will no longer be available. With this action, EPA is deleting spills from the definition of production. Therefore, allowances will not be expended in cases of spills or venting of any amount. Spills had been included in the definition of production to limit release of ozone-depleting chemicals. EPA believed that companies could avoid compliance action by the Agency if they over-produced and then spilled this excess production. Although such action is still possible, the Agency is beginning to address these implementation issues in preparation for the phaseout. With the phaseout, companies would not be placed in situations where they would over-produce. Once the phaseout occurs, companies will only produce for exempted uses. However, the Agency requires in today's rule that companies keep records of spills in excess of 100 pounds. EPA will monitor the frequency of spills through plant inspections and Section 114 information requests when appropriate.

While the purpose of the definition of production is not to control vents and spills, but to determine the need for allowances for production of controlled substances, EPA agrees with commenters that other existing and proposed EPA regulations governing controls of spills and venting are designed to provide control of such emissions. The Agency believes that the proposed Hazardous Organic National Emission Standard for Hazardous Air Pollutants (HON) authorized under section 112(d) of the Clean Air Act will be an appropriate mechanism for controlling venting of several of these substances. These regulations are to be published by EPA in early 1994. Furthermore, current regulations governing the accidental release of chemicals are designed to require appropriate action in the event of spills.

B. Imports

In this final rule, EPA is modifying the requirements of allowances for imports to make them consistent with the requirements of production allowances established in this rule. Under the system currently in place, importers expend consumption allowances to import controlled substances intended for transformation, and to import used or recycled controlled substances. However, under the regulations promulgated with today's notice, importers will not need to expend consumption allowances for controlled substances intended for transformation or destruction, or for ozone-depleting substances that are used or recycled. Several commenters requested this change to ensure consistency in the treatment of chemicals that are produced and chemicals that are imported. In addition, transformers or destroyers of imports for which consumption allowances were expended may redeem consumption allowances and trade them back to the importer.

C. International Issues

1. Exports

Under current regulations, there is no distinction made between exports for emissive uses and exports for transformation. Commenters have noted that under current regulations, these substances will no longer be able to be produced, despite an intent to transform or destroy, since there will be no allowances available after the phaseout. These commenters claim that this situation could severely affect the U.S. global market for feedstock, since several class I chemicals are feedstocks in production of alternatives. Without this change, commenters claim that many producers would be shut out of the international markets.

Nevertheless, EPA recognizes that industry must ensure that adequate controls are in place to verify that the export is indeed transformed or destroyed. Tracking and verifying that exports are transformed or destroyed proves to be much more difficult than for imports and domestically produced and sold controlled substances. Consequently, EPA retains its current process for handling exports. Allowances will be required for all exports regardless of whether they are bound for emissive uses or transformation or destruction. However, EPA recognizes the problems that this system would impose upon exporters after the phaseout in 1996. Therefore, the Agency intends to issue a supplemental rule prior to the phaseout of class I chemicals scheduled for the end of 1995 under this rule, in order to address issues involving allowances for exports.

2. Transfers of Production Rights Between Nations

The phaseout regulations currently in effect provide for the granting of production allowances commensurate with any production rights transferred by foreign companies to companies in the United States. However, under the existing regulations, consumption rights are not also granted as a part of these trades. Under the existing program, EPA only granted production allowances because consumption allowances would be redeemed after production had been exported. The Agency had used this mechanism to ensure that the production had in fact been exported. This approach was reasonable prior to the adoption of the phaseout schedule. However, EPA recognizes that as the United States approaches the phaseout date, consumption allowances will become more limited and companies may be unable to wait until consumption allowances are redeemed for the export. Commenters have indicated that these provisions make the trading of production rights from foreign countries to companies in the U.S. of little if any use, because both production and consumption allowances are required in order to produce controlled substances for domestic consumption.

In response to this concern, the Agency will grant consumption allowances equal to the level of production allowances for a trade from another Party to the Protocol. The company receiving these allowances must certify that this production is intended for export. However, when the United States trades production to another country, EPA will only lower the production allowances for the company involved in the trade. The corresponding consumption allowances would be retained in order to be used to import the production transferred abroad.

D. Insignificant Quantities

In today's action, the Agency is implementing in its regulation a recent decision of the Parties in Copenhagen that addressed "insignificant quantities" (Decision IV/12). Today's rule exempts from the definition of "controlled substance" a substance produced in "insignificant quantities." The Agency believes that this change poses insignificant environmental harm and lessens the administrative burden of the current regulation and thus changes its definition of controlled substance in today's rule to exempt insignificant quantities.

1. Insignificant Quantities of Substances Other Than Methyl Bromide

EPA is also implementing the Parties' decision on insignificant quantities. During the Fourth meeting of the Parties to the Montreal Protocol held in Copenhagen November 23–25, 1992, the Parties approved a decision (Decision IV/12) stating that the definition of "controlled substance" will not include insignificant quantities of those substances under certain conditions. Specifically, it stated that in the following situations, insignificant quantities of controlled substances shall not be considered to be covered by the definition of "controlled substances":

- insignificant quantities originating from inadvertent or coincidental production during a manufacturing process; or,
- insignificant quantities originating from use of controlled substances as process agents (including unreacted feedstocks) which are present in chemical substances or products as trace impurities.

Since these activities are excluded from the definition of controlled substances, and thus could not be counted against production or consumption, production and consumption allowances are not required in order to produce or import these substances.

In either of these situations, the Parties recognized that insignificant quantities of controlled substances may result or remain in a product after processing. In taking this decision, the Parties understood that the existence or creation of controlled substances in these contexts were an essential consequence of continued production of various products (Section 2.10.4, UNEP report of the Technology and Economic Assessment Panel), were likely to be insignificant in quantity, and in fact, had not heretofore been included in the definition of controlled substance, or taken into account by countries in their implementation of the current definition. Thus, the decision clarified the fact that CFCs and other compounds covered by the Montreal Protocol as controlled substances that are created or found in these contexts are not included within the scope of the Protocol's definition of controlled substance. Nevertheless, the Decision calls on the Parties to endeavor to take steps to minimize such emissions.

Pursuant to the decision of the Parties and comments received supporting this proposed action, EPA today is exempting from the definition of "controlled substances" insignificant quantities of controlled substances that originate from inadvertent or coincidental production during a manufacturing process, from unreacted feedstock, or from their use as process agents and residual presence in chemical substances or products as trace impurities. This exemption will apply so long as the substances produced in this manner are not themselves, as distinct products, offered for commercial sale.

One commenter asked for clearer language explaining inadvertent production. EPA interprets inadvertent production to be production that occurs unintentionally as a result of a chemical reaction in the production process. Because the production is inadvertent, the substance itself is neither made for, nor offered for, commercial sale. Inadvertent production occurs in small quantities, since production of inadvertent substances constitutes inefficiencies in the production process and manufacturers work to keep such inadvertent production to a minimum.

EPA carefully considered the environmental implications of this decision and its relationship to current regulations. First, as it relates to environmental protection, EPA studied available information, and has determined that the quantities of controlled substance emissions associated with the above noted situations are small. Estimates indicate that they are on the order of 500 ODP-weighted metric tons worldwide. In the U.S., in many cases, these small emissions are reduced even further by regulatory treatment under other EPA requirements. An example of the size of related production can be found in trace impurities of carbon tetrachloride remaining in finished products made in the U.S. This residual is estimated to amount to 32 metric tons per year. Levels of inadvertent production of controlled substances are also very small. For example, some carbon tetrachloride is produced during the manufacture of chloroethanes. The worldwide estimate of levels expected to be emitted during these processes are estimated to be on the order of 100–200 ODP MT. However, carbon tetrachloride produced in this manner is generally not emitted; rather it is recycled within the plant, or, as required by RCRA, destroyed by an appropriate technology. A further factor which will help to reduce related emissions is the phaseout itself. By the year 2000, emissions from these situations are expected to constitute less then .1% of the amount of controlled substances produced in their baseline year. The realization of the small quantities involved was a factor in the Parties decision to exclude the insignificant quantities resulting from these processes from the definition of controlled substances. (UNEP OzL Pro. 4 CRP 2ter).

Regarding present regulatory treatment, § 82.4(e) of EPA's current regulations provided an exemption from control for Group IV or V substances, if those substances were produced as a coincidental unavoidable byproduct of a manufacturing process, and were immediately contained and destroyed. In light of the regulations EPA is promulgating today concerning incidental production and destruction, EPA is today repealing the current requirements of § 82.4(e), effective with the 1994 control period. This action is being taken to align EPA regulations with Montreal Protocol requirements that will be adhered to internationally, and to eliminate the ambiguity of certain situations that may or may not have met the requirements of § 82.4(e).

With this rule, all companies that meet these conditions are exempt from production and consumption control and do not need to file exemption requests. Finally, it fashions a more workable allowance system that will be necessary as the U.S. moves forward toward a more rapid phaseout.

One commenter expressed concern, given the elimination of the coincidental unavoidable byproduct provision, that no guidance is given for what constitutes an insignificant quantity. EPA clarifies in this response that the producer of coincidentally produced byproducts would either fall outside of the allowance requirements through the insignificant quantity exemption of this section or due to the destruction of that which is produced. While the Agency believes that a specific number or percentage that constitutes an insignificant quantity cannot be defined in terms of volume or concentration for all instances, those coincidentally produced byproducts that fall outside of the insignificant quantity realm as determined by the commenter can be exempted from the definition of production as a result of destruction of the byproduct.

In taking these actions, EPA is mindful of the portion of the Parties' decision that urges all Parties to take steps to minimize emissions associated with inadvertent and trace quantity production. In this regard, EPA reserves the right to implement measures to reduce such emissions in the event it finds that they are or have become significant.

In conclusion, today's rule, in implementing the decision of the Parties to the Protocol on insignificant quantities, removes from the definition of "controlled substance" those substances that are:

- insignificant quantities originating from inadvertent or coincidental production during a manufacturing process; or
- insignificant quantities originating from use of controlled substances as process agents (including unreacted feedstocks) which are present in chemical substances or products as trace impurities.

2. Insignificant Production of Methyl Bromide

Several commenters noted that in the preamble to the proposed rulemaking, EPA misstated that methyl bromide was inadvertently produced in the production of polyethylene. In fact, methyl bromide is an inadvertent byproduct of the manufacture of terephthalic acid (TPA) and dimethyl terapthalate (DMT), feedstocks which are used in the production of polyethylene terephthalate.

While supporting EPA's proposal to exempt inadvertent production of methyl bromide from the definition of controlled substances, one commenter disagreed with EPA's conclusion that "substantial" emissions of methyl bromide are inadvertently produced during the manufacture of TPA/DMT. This commenter noted that emissions of methyl bromide during the production of these chemicals ranges from .0001 to .0007 pounds of TPA/DMT produced, making them non-substantial. On the other hand, one commenter noted that inadvertent methyl bromide emissions reported to the toxic release inventory showed that byproduct emissions in 1990, which can also come from methyl bromide manufacturing, totaled over 1.5 million pounds, and therefore, should not be exempted from control as an insignificant quantity.

EPA's statement in the proposal regarding the magnitude of emissions of methyl bromide are produced stemmed from the total quantity of related emissions. Data provided from the 3 domestic manufacturers of TPA/DMT which emit methyl bromide estimated 1990 methyl bromide emissions amounted to 2.5 million pounds. EPA will continue to work with the industry to reduce these emissions and to monitor these emissions to determine if regulatory action is needed in the future.

As noted in the comments of several TPA/DMT producers, the 3 domestic producers of TPA/DMT have committed to achieve a 20% plus reduction in their emissions by 1997, and an 85% plus reduction by 2000. Several commenters noted the cost of requiring industry to make these reductions using presently available technology. Given the fact that the rules being promulgated today do not require any reductions in methyl bromide emissions until the year 2001, and the industry has committed to make short term reductions, EPA believes that it is prudent to let industry investigate new and innovative measures which will allow it to meet this commitment at the lowest possible costs. EPA will, however, continue its discussion with this industry in order to monitor, carefully, progress toward their commitment. EPA is committed to taking necessary actions to ensure that related emissions are indeed insignificant.

Several commenters noted that equity dictated that similar commitments to reduce inadvertent production of methyl bromide should be made globally to ensure that US manufactures are not put at a competitive disadvantage for having to comply with these provisions. The EPA will help to ensure that this matter is considered by the Parties to the Protocol in a manner which preserves the lead time which will be useful in the investigation of technological reduction options.

VIII. Other Issues

A. Definition of Importer

The March 18 Notice proposed a revision to the definition of "importer" to include the actual owner, the consignee, and the transferee of the import. The Agency proposed this revision to ensure that requirements imposed on importers affected the parties most directly responsible for the import.

EPA proposed to define "Importer" to mean any person who imports a controlled substance, or a controlled product into the United States. "Importer" includes the person primarily liable for the payment of any duties on the merchandise or an authorized agent acting on his or her behalf. The term could also include, as appropriate:

(1) The consignee;
(2) The importer of record;
(3) The actual owner; or
(4) The transferee, if the right to draw merchandise in a bonded warehouse has been transferred.

Several commenters stated that this definition was unsatisfactory because it continued to list "importers of record" as legally responsible for conforming to the regulations. The commenters were concerned that since custom brokers often act as importers of record, they would be legally liable transactions. The commenters believed that brokers, since they act solely for the purpose of facilitating the entry of goods, should be exempted from liability in cases where they are acting as an importer of record. Commenters further suggested that customs brokers, even when they are "importers of record," are financially uninterested parties in those instances where they are merely acting as nominal importers.

The commenters also suggested that, as an alternative, the proposed regulations be modified to include a hierarchy of persons to be held responsible for imports. The commenters believed that such an enforcement hierarchy will indicate that the customs broker would be held responsible for regulatory compliance only in those situations where there is no owner/purchaser and no consignee set forth on the entry form and/or located in the United States. The following hierarchy was suggested:

(1) Owner;
(2) Purchaser;
(3) Consignee;
(4) Transferee; and
(5) Customs broker (if acting as the importer of record).

In response EPA however, has decided not to change its definition of "importer" from the one proposed. EPA will consider adopting a hierarchy, such as the one suggested by the commenters, as part of its enforcement strategy for this program. EPA does not agree that all customs brokers listed as "importers of record" are financially uninterested parties. As indicated by the comments to the proposed rule, customs brokers provide services which facilitate the entry of merchandise into the United States. The brokers are a part of the chain of persons that participate in an import transaction, and fees are charged for the services that are provided. As a result, EPA views customs brokers as knowledgeable professionals regarding import matters. In light of these considerations, EPA has included customs brokers who act as importers of record in its list of persons responsible for import of controlled substances.

It should also be noted that only one party to an import transaction needs to hold consumption allowances for the importation of a controlled substance. This issue was raised by a commenter who is concerned that allowances are frequently held by the owners or purchasers of controlled substances and not by the importer of record. Under this regulation, only one of the several parties included in the definition of importer needs to hold and expend consumption allowances for a particular transaction. However, the other parties involved in that transaction need to be aware of the import requirements promulgated under this rule. Therefore, while the "importer of record" need not hold consumption allowances, it is a part of its function to determine that the necessary allowances are being held and expended.

B. Tracking Essential Uses

Several commenters indicated that additional changes may need to be made in the tracking procedures in order to accommodate any essential use exemptions that are granted under the Montreal Protocol. EPA agrees that any granted essential use exemptions will necessitate changes in the tracking system. Changes such as these will be proposed and finalized in a rulemaking to be initiated at a later date when provisions to allow production for specified essential uses are established.

C. Addition of HCFCs to the EPCRA Section 313 List

The March 18 Notice indicated that the Agency published a **Federal Register** action on June 24, 1992 (57 FR 28159) proposing to add HCFCs to the list of toxic chemicals subject to reporting under EPCRA section 313. In that proposal EPA also solicited comments on alternative options for listing the HCFCs, such as listing those HCFCs known to be in production or commercially viable individually and providing some mechanism, such as a Significant New Use Rule, to add HCFCs that come into production in the future. In this proposal, EPA also identified five HCFCs as currently in production or commercially available. These are: HCFC–141b, HCFC–22, HCFC–142b, HCFC–123, and HCFC–124. Comments regarding this proposed rule are currently being analyzed and the Agency expects to issue a final rule on this matter in the near future.

D. Environmental Impact Statement

One commenter stated that EPA is obligated to prepare an environmental impact statement (EIS) under the National Environmental Policy Act of 1969 (NEPA), 42 U.S.C. 4321 *et seq.*, for its action to regulate methyl bromide. While EPA has extensively considered the environmental impacts of this action, section 7(c)(1) of the Energy Supply and Environmental Coordination Act (ESECA), 15 U.S.C. 793(c)(1), exempts EPA from preparing an EIS under NEPA. That provision states: "No action taken under the Clean Air Act shall be deemed a major Federal action significantly affecting the quality of the human environment within the meaning of the National Environmental Policy Act of 1069." The Agency further notes that its policy statement published on May 7, 1974 does not obligate the Agency to prepare an EIS. See 39 FR 16186. In that policy statement, EPA recognized, prior to enactment of section 7(c)(1) of the ESECA, that "[t]he Federal Courts of Appeals have held that the Agency need not prepare environmental impact statements for its environmentally protective activities." *Id.* While EPA announced that it would voluntarily prepare EISs for certain major regulatory actions specified in the policy statement (not including actions under the subsequently enacted title VI of the Clean Air Act), the Agency made clear that "[t]he voluntary preparation of impact statements in no way legally subjects the Agency to NEPA's requirements." *Id.*

E. Recycled and Used Controlled Substances

The Agency proposed to exclude recycled and used ozone-depleting substances when calculating consumption. EPA proposed this change to conform the U.S.'s treatment of used and recycled controlled substance with a recent decision (Decision IV/24) in Copenhagen by the Parties to exclude such chemicals from the calculation of consumption. EPA received support from three commenters on this proposed change.

Prior to this Protocol decision and this rulemaking, used and recycled controlled substances did count as part of a country's consumption. Within the United States, importers were required to hold consumption allowances to import used or recycled controlled substances. In turn, an exporter could receive additional consumption allowances for the export of used or recycled controlled substances.

With this rule, the importation of used or recycled controlled substances will not require consumption allowances, and therefore will be unrestricted. Similarly, the exporters of used or recycled controlled substances will not receive consumption allowances for such export.

EPA did not describe specific recordkeeping requirements in the proposal, but asked for comment on the need for further revisions "to effectuate this intent of the Parties." One commenter suggested that importers and exporters make some certification that the shipment is "being done properly and legally". Although the commenter did not describe specifics on how this could be done, the Agency believes that it would be reasonable to require that importers and exporters state on all bills of lading and invoices covering shipments of used or recycled controlled substances that the "shipped product is a used or recycled controlled substance as defined in 40 CFR 82.3". EPA believes that such documentation represents a minimal reporting burden and should provide adequate control to safeguard against fraud.

EPA proposed that importers and exporters of recycled halons and HCFCs report on an annual basis to EPA. EPA proposed to require this data in order to report these volumes to UNEP as required by the Protocol. The Agency received no comments on this provision and therefore requires such reports within 45 days after the end of each control period.

F. Transhipments

The Agency proposed to exclude transhipments of bulk controlled substances from the consumption limits for the United States. EPA proposed this exclusion to implement Decision IV/14 of the Parties. Transhipments are shipments of bulk chemicals from one party to another through the United States that are not repackaged within the United States. The United States serves only as a shipping corridor for the controlled substances. EPA did not receive any comments on this issue. With this final rule, the Agency excludes transhipments from the consumption limits. Companies that tranship must keep records that the transhipment does not enter interstate commerce in the United States.

G. Publication of the Regulatory Text

Some commenters have suggested EPA was obligated to publish proposed regulatory text. EPA believes its March 18 proposal that explained the basis and purpose of its intended actions and notified the public of the availability of the regulatory text was legally sufficient.

Section 307(d) of the Clean Air Act applies to "promulgation or revision of regulations under title VI (relating to stratosphere and ozone protection)" to govern the rulemaking procedures here. See section 307((d)(1)(I). That subsection specifically provides that: 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. * * * 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 title V (the Administrative Procedure Act, or APA) provides, in turn, that "general notice of proposed rule making shall be published in the **Federal Register**. * * * The notice shall include— * * * either the terms or substance of proposed rule or a description of the subjects and issued involved."

Clean Air Act section 307(d) nowhere mentions publication of the torms of substance of a proposed rule. Furthermore, APA section 553(b) clearly offers an agency the choice of whether to include the terms of substance of the proposal or a description of the subjects and issues involved. EPA's extensive discussion of the subjects and issues involved in its proposal, published on March 18, thus satisfies the publication requirements of the Clear Air Act and APA.

In any case, the published rule provided adequate notice to apprise interested parties of the subject of the rulemaking in order to afford them a meaningful opportunity to participate and comment on the issues involved. *See, e.g., Florida Power & Light Co.* v. *United States*, 846 F.2d 765 (D.C. Cir. 1988); *South Carolina ex rel. Tindal* v. *Block*, 717 F.2d 874, 885 (4th Cir. 1983); *Small Refiners Lead Phase-Down Task Force* v. *EPA*, 705 f.2D 506, 547 (D.C. Cir. 1983) (cases summarizing purpose of notice to provide opportunity to comment). There is no question that EPA's published proposal sufficiently alerted interested parties of the likely alternatives being considered within the scope of the proceedings for the final rule. *See Spartan Radiocasting Co.* v. *FCC*, 619 f.2d 314, 321 ((4th Cir. 1980) (proposal must notify persons of likely alternatives su that they know whether their interests are at stake); *see also Bonney Motor Express, Inc.* v. *United States*, 640 F.2d 646, 650 (5th Cir. 1981)(final rule can be substantially different from proposal if proposal fairly apprised interested parties of subject and issues before the Agency).

EPA did in fact notify the public in the published proposal that regulatory language could be obtained through the EPA hotline, and provided a telephone number for obtaining it. See 58 FR 15014 (March 18, 1993). The regulatory language was available before the public hearing held on April 2, 1993, and the public of course also had an opportunity to comment on the proposed regulatory language by the close of the comment period on May 19.

IX. Changes From the Proposal and Current Program

This section discusses the changes EPA has made in this final rule and how they differ from the proposed rule and the current program.

§ 82.1 Purpose and Scope.

This section changes slightly from the current rule to include the new definition of consumption, and the trade provisions. There are no changes from the proposal.

§ 82.2 Effective date.

January 1, 1994, is the effective date for this rule, except for §§ 82.4(d) and 82.3(h) and (l) which are effective January 10, 1994. The effective date for the listing of methyl bromide as a class I controlled substance is December 10, 1993.

§ 82.3 Definitions.

Section 82.3 contains some modifications to definitions or additions to definitions. In the final rule, a new subsection (g) has been inserted, defining "completely destroy", which means to cause the expiration of a controlled substance at a destruction efficiency of 98 percent or greater, using one of the destruction technologies approved by the Parties.

A new paragraph (h) was inserted in § 82.3 in the proposed rule and is retained in this final rule, defining "complying with the Protocol" to mean when referring to a foreign state not Party to the 1987 Montreal Protocol, the London Amendments, or the Copenhagen Amendments, as indicated in appendix C to this subpart by a meeting of the Parties as noted in the records of the Directorate of the United Nations Secretariat to be in full compliance with the provisions of the Montreal Protocol specified in Article 4 paragraph 8 of the Montreal Protocol.

A new paragraph (i) was inserted in the proposed rule and is retained in this final rule, defining "consumption" to mean the production plus imports minus exports of a controlled substance (other than transhipments, or recycled or used controlled substances).

A new paragraph (l) was inserted in the proposed rule and is retained in the final rule, defining "controlled product" as a product that contains a controlled substance listed as a class I, Group I or II substance in appendix A of the rule, and that belongs to one or more of six categories of products, which include automobile and truck air-conditioning units, domestic and commercial refrigeration and air-conditioning/heat pump equipment, aerosol products (except medical aerosols), portable fire extinguishers, insulation boards, panels and pipe covers, and pre-polymers. The definition also states that controlled products include, but are not limited to, those products listed in appendix D to this subpart.

Current paragraph (i), defining "controlled substance," was modified in the proposal and in this final rule, with the modified definition of "controlled substance" becoming paragraph (m). Also added to the new definition is a sentence explaining that inadvertent or coincidental creation of insignificant quantities of listed substances, (1) during a chemical process, (2) resulting from unreacted feedstock, or (3) from the controlled substance's use as a process agent present in the chemical as a trace impurity substance being manufactured are not deemed controlled substances. Furthermore, the definition is modified to explain that class I substances are now divided into seven, rather than five groups.

The definition of "CUBP," paragraph (j) in the current rule, is removed from this final rule.

A new paragraph (o) was inserted in the proposed rule and in this final rule to define "destruction" as the expiration of a controlled substance that does not result in a commercially useful end product and that uses one of the five destruction technologies (listed in the definition) approved by the Parties to the Protocol. In the final rule, an additional clarification is added, inserting "to the destruction efficiency actually achieved, unless considered completely destroyed under the rule" after the phrase "expiration of a controlled substance."

A new paragraph (t) was inserted in the proposed and final rules, defining "foreign state not Party to or Non-Party" as a foreign state that has not deposited instruments of ratification, acceptance, or other form of approval with the Directorate of the United Nations Secretariat, evidencing the foreign state's ratification of the provisions of the 1987 Montreal Protocol, the London Amendments, or of the Copenhagen Amendments, as specified.

The definition of "import", new paragraph (u), was modified in the proposal to add to the exemptions from the definition, "bringing a controlled product into the U.S. when transported in a consignment of personal or household effects or in a similar non-commercial situation normally exempted from U.S. Customs attention."

In the proposal, the current definition of "importer" was stricken, with a revised definition inserted (new paragraph (v)). The revised definition of importer is any person who imports a controlled substance or a controlled product into the United States. The definition elaborates that importer includes the person primarily liable for the payment of any duties on the merchandise or an authorized agent acting on his behalf. The term also includes, as appropriate, the consignee; the importer of record; the actual owner, if such a declaration and superseding bond has been filed; or the transferee, if the right to draw merchandise in a bonded warehouse has been transferred.

A new paragraph (w) was inserted into the proposed and final rules, defining "London Amendments" as the Montreal Protocol, as amended at the Second Meeting of the Parties to the Montreal Protocol in London in 1990.

Paragraph (p) of the current rule, defining "MACT," is stricken from this final rule.

A new paragraph (y) was inserted into the proposed rule and in the final rule, defining "1987 Montreal Protocol" as the Montreal Protocol, as originally adopted by the Parties in 1987.

The definition of "Party" (paragraph (aa)) was expanded in the proposal and retained as such in the final rule. In the new definition, "any foreign state" is substituted for "any nation." Added to the end of the current definition is the following: "(pursuant to instruments of ratification, acceptance, or approval deposited with the Depository of the United Nations Secretariat), as having ratified the specified control measure in effect under the Montreal Protocol. Thus, for purposes of the trade bans specified in § 82.4(d)(2) pursuant to the London Amendments, only those foreign states that are listed in Appendix C to this subpart as having ratified both the 1987 Montreal Protocol and the London Amendments shall be deemed to be Parties."

In the proposal, the definition of "production" (paragraph (ee)) was modified to add to exemptions from the definition, those amounts that are destroyed by the approved technologies. The final rule additionally exempts those amounts that are spilled or vented unintentionally, rather than only those amounts less than 100 pounds per event, as in the current rule and in the March 18, 1993 proposal.

A new paragraph (hh) was added in the proposal and final, defining "transhipment" as the continuous shipment of a controlled substance from a foreign state of origin through the United States or its territories to a second foreign state of final destination.

The definition of "unexpended consumption allowances" (paragraph (ii)) was modified in the proposed rule and in the final rule to exclude transhipments in the part of the calculation where controlled substances that the person has produced or imported are subtracted from the total level of that person's consumption allowances held.

The final rule adds paragraph (kk) to define used or recycled control substances as controlled substances that have seen service in their intended use systems.

All paragraphs are re-lettered accordingly.

§ 82.4 Prohibitions.

This section of the current rule has been replaced with new regulatory language. EPA has modified § 82.4(a) to exempt the production of controlled substances that will either be transformed or destroyed from the production allowance limit. This exemption is expanded from that proposed in the March 18 notice to include not only Group IV class I controlled substances, but all class I controlled substances.

Similarly, § 82.4(b) which limits production and importation through consumption allowances provides for the same expanded exemptions as § 82.4(a).

Section 82.4(c) states the conditions when consumption allowances and production allowances are used in conjunction to produce controlled substances. As with the current program, only consumption allowances are needed to import. This section restates the exemptions for production and consumption for controlled substances that are transformed or eventually destroyed, or those for exempted uses under § 82.4(k).

Section 82.4(d) has not changed since the proposal. EPA has expanded the existing § 82.4(d) to include not only the prohibition on the export or import of a Group I and Group II, class I controlled substance to and from a foreign state not party to the Protocol (or complying with the Protocol), but also the prohibition on the export or import of Groups III, IV, and V, class I controlled substances to or from foreign states not party to the London Amendments (or complying with the London Amendments). Also, the proposal, and today's final rule, includes the prohibition on the importation of certain products containing group I and II, class I controlled substances, from foreign states not party to the Montreal Protocol (or complying with the Montreal Protocol).

EPA has dropped existing and proposed § 82.4(e) from this final rule. This subparagraph had described the accounting procedures that the Agency would perform to calculate the level of transformation of Group IV, class I controlled substance done in the proceeding control period, that would be attributed to the control period. As already noted, EPA found this accounting procedure cumbersome, and will no longer require this calculation.

The proceeding subparagraphs that address class II controls are re-alphabetized. Proposed § 82.4(f) becomes (e). The Agency has further modified the proposed restrictions on production of HCFC–141b to exempt destruction, transformation, or for exemptions stated in § 82.4(l) (for medical devices or exports to a developing countries). The proposal restricted all production. Similarly, proposed § 82.4(g) becomes (f), and provides exemptions to the prohibition for the import of HCFC–141b effective January 1, 2003. These exemptions include import for the purposes of transformation, destruction, or for the exemptions in § 82.4(l).

Proposed § 82.4(h) becomes (g) with the re-lettering. The proposal had limited production HCFC–22 and HCFC–142b to the level of consumption and production baseline allowances allocated under § 82.5(h) (reserved) and § 82.6(h) reserved. The Agency has modified this to allow exemptions under § 82.4(l) (medical devices and exports to developing countries). The final rule does not allocate either production or consumption allowances at this time, but states that these HCFCs may only be produced or imported for the purposes of servicing existing equipment, and for transformation or destruction.

Proposed § 82.4(j) is now § 82.4(h) and, which now restricts the production and consumption of HCFC–22 and HCFC–142b starting in the year 2020 to only uses that transform or destroy these chemicals, or for exemptions in § 82.4(l).

Proposed § 82.4(k) becomes § 82.4(i). EPA has modified this section to restrict production and consumption of any other class II controlled substance that had not been previously controlled to baseline production and consumption allowances defined in § 82.5(h) or for feedstock use or transformation, for uses that eventually destroy the controlled substance, for use as a refrigerant in equipment manufactured prior to 2020 or for exemptions in § 82.4(l).

Proposed § 82.4(l) becomes § 82.4(j) and has been substantially modified. This paragraph prohibits the production or importation of any class II controlled substance in 2030 and beyond except for uses as a feedstock, where it is destroyed, or for exemptions in § 82.4(l).

Proposed § 82.4(n) becomes (k) and is reserved for exemptions for essential uses for class I controlled substances.

EPA has added an additional paragraph (l) that will state exemptions to the class II bans. As allowed under the Clean Air Act, excess production and consumption may be used for medical devices or for export to developing countries. These paragraphs are reserved.

§ 82.5 Apportionment of Baseline Production Allowances.

This section remains as part of the current program but now includes paragraphs for Groups VI and VII, class I controlled substances.

§ 82.6 Apportionment of Baseline Consumption Allowances.

This section remains as part of the current program but now includes paragraphs for Groups VI and VII, class I controlled substances. These paragraphs are reserved.

§ 82.7 Grant and phased reduction of baseline production and consumption allowances for class I controlled substances.

This section amends the current program to accelerate the phaseout in the production and consumption of class I chemicals. This section has not changed from the proposal except that the phaseout date for methyl bromide is 2001, not 2000 as proposed.

§ 82.8 Grant and freeze of baseline production and consumption allowances for class II controlled substances.

This section continues to be reserved. The Agency had proposed a reduction schedule for the class II chemicals that was tied to an allowance system. In the development of the final rule, as described elsewhere, EPA controls class II chemicals under § 82.4 of this rule through an allowances program. However, EPA will most likely amend this rule in the future when the decision to have an allowance system in place to control class II controlled substances.

§ 82.9 Availability of production allowances in addition to baseline production allowances.

The Agency had not proposed changes to § 82.9(a). However, during the comment period, EPA received comments that the dates cited in this section had not changed to accommodate the accelerated phaseout of class I chemicals. EPA has not accelerated these dates in this final rule but intends to propose such changes in the near future.

The Agency had not proposed any changes to § 82.9(b). However, in this final rule, EPA will increase consumption allowances for a company equal to production allowances it would receive in a trade of production from another Party to the Protocol, and that such a trade of production allowances now requires a signed statement from a person that the increased production is intended for export to the Party trading its production.

The Agency had proposed dropping the provisions of § 82.9(c), and to establish a system where allowances could be redeemed for controlled substances that were transformed or destroyed. EPA has further modified this requirement to require persons requesting additional allowances to certify that allowances had been expended for the production of the controlled substances transformed or destroyed. The Agency also stipulates requirements for "complete destruction" of controlled substances.

§ 82.10 Availability of consumption allowances in addition to baseline allowances.

For § 82.10(a), The Agency proposed and makes final today the ability for exporters to receive additional consumption allowances for exports, except for controlled substances that are transhipped. However, EPA has expanded this exclusion to used or recycled controlled substances. The Agency had not included this exclusion in the proposed regulatory text, but had discussed this exclusion in the preamble.

EPA proposed to change § 82.10(b) to allow persons who transformed or destroyed all class I chemicals, including groups VI and VII, to receive additional consumption allowances upon proof that, indeed, the chemicals had been destroyed or transformed. EPA has modified this provision to require a certification that production and/or consumption allowances were expended in the production or import of the destroyed or transformed controlled substances requirements in § 82.10(b)(1) that include the identity and address of the person, the name, level and quantity of the volume transformed or destroyed, invoice documenting sale of the controlled substance and the name of the resulting chemical of the transformation, and the efficiency of the relevant destruction process.

Section 82.10(b)(2) remains as proposed, providing for Agency review of these transactions. EPA has added further clarification of "completely destroyed", allowing for 100 percent redemption of allowances for 98 percent destruction of controlled substances.

Finally, the current § 82.10(c) is eliminated, and replaced by another provision that grants persons increased consumption allowances, when such persons receive production allowances for trades of production from another Party to the Protocol. This paragraph complements § 82.9(b), and requires identical information. The Agency assumes that compliance with § 82.9(b) is compliance with § 82.10(c).

§ 82.11 Exports to Article 5 Parties.

This section remains as proposed. However, EPA has broadened the exclusion to used or recycled controlled substances. The reporting requirements remain the same as the current program.

§ 82.12 Transfers.

This section remains as proposed. EPA has deleted the requirement that a statement be included that the trade is for the purposes of reimbursing a producer or an importer for allowances expended.

§ 82.13 Recordkeeping and Reporting.

Section 82.13(a) changes the effective date to January 1, 1993, from the January 1, 1992 effective date of the current phaseout rule. Final § 82.13(f) differs from the proposal and only applies to class I substances. Paragraph (f)(2), requiring reporting on by-products not destroyed is deleted, because the destruction provisions cover this aspect in other paragraphs.

The newly-numbered paragraph (f)(2) adds dated records of the quantity of each controlled substance produced at each facility to the records that producers must maintain. Currently section (f)(2) refers only to Group IV references and has been eliminated, because all controlled substances are now being treated in a similar manner. Requirements for maintaining dated records of the sale of controlled substances for feedstock or destruction and copies of certifications that the substance will be transformed or destroyed are added.

Producers' reporting requirements currently in § 82.13(f)(4) are now found in § 82.13(f)(3). They now require production information for each quarter by company, rather than by plant, as in the current rule and the March 18, 1993 proposal. New subparagraph (3)(i) now only requires that production be reported, specifying the quantity of any controlled substance used for feedstock purposes; the phrase "for controlled and noncontrolled substances for each plant and totaled by class I controlled substance for all plants owned by the producer" has been deleted from that sentence in current subparagraph (4)(i). New subparagraph (3)(ii) adds "for use in processes resulting in destruction" to the requirement in current (4)(ii) that requires that the amount of production for feedstock use be reported. The phrase "for each plant, totaled by controlled substance for all plants for that quarter and for the control period to date" is deleted from current subparagraph (4)(iii), and current subparagraph (4)(iv) is deleted. Current subparagraph (4)(v) becomes (3)(iv). References to "at each plant" are removed. Additionally, "or eventual destruction" is added to current (4)(vii), now the new (3)(vi). Current (4)(viii), now (3)(vii), adds the requirement that a purchaser's destruction verification, in the case of destruction, be submitted, showing that the controlled substance is to be destroyed.

Paragraph (5) now becomes paragraph (4).

Recordkeeping for importers, paragraph (g), is changed as follows:

Subparagraph (g)(1)(i) refers only to class I controlled substances. A new (g)(1)(ii) is added requiring that records be maintained on the quantity of controlled substances imported for transformation or destruction, and the quantity sold for each use. Current subparagraphs (ii), (iii), and (iv) now become (iii), (iv), and (v). Current subparagraph (v), which asks for port of exit, is deleted. Destruction was added in the proposal to the required dated records documenting sale of controlled substances for feedstock use; the addition is retained in the final rule. Added to the records to be maintained under (g)(1) are IRS certifications or destruction verifications that the controlled substances are to be transformed or destroyed, respectively.

Paragraph (g)(2) refers now to "class I controlled substance" and adds destruction to those reporting requirements that address substances imported or sold for feedstock and certifications that transformation is to occur. A new subparagraph (x) is added, requiring that the quantity of recyclable and recycled controlled substances imported during the quarter be reported.

Paragraph (h) refers to how the class I controlled substances modification is retained in this final rule to change references to class I substances to controlled substances.

Paragraph (i) was modified in the proposal and such modification is retained in this final rule to include destruction information to the recordkeeping requirements in this paragraph wherever transformation is addressed, in a manner parallel to transformation (i.e., "transform or destroy"), except where requirements only apply to transformation; such requirements then specify as such in the final rule. Any references to "Group IV" are stricken, so that the requirements apply to all controlled substances, as specified in this paragraph. A new recordkeeping requirement has been added to paragraph (i): copy of the relevant certifications of intent to transform or destroy, where substances were sold for transformation or destruction purposes.

Paragraph (j), having been retained in the proposal, is stricken in the final rule.

Paragraph (k) was stricken in the proposal and remains stricken in this final rule.

A new paragraph (j) is added in the final rule that requires those who destroy controlled substances to provide EPA with a one-time report stating the destruction unit's destruction efficiency and the methods used to record the volume destroyed and those used to determine destruction efficiency.

A new paragraph (k) is inserted into the final rule that requires those who purchase and subsequently destroy class I controlled substances to provide the producer from whom they purchase the substances with a one-time (unless circumstances change) verification that the controlled substances they purchase will be destroyed. Any changes related to the verification will require a revised verification.

A new paragraph (l) is added in the final rule that requires persons who purchase controlled substances intended for transformation to provide the producer or importer with the IRS certification that the controlled substances are to be used in a process resulting in transformation.

A new paragraph (m) is added to the final rule requiring persons who transform or destroy controlled substances to report annually to EPA the volume of those substances transformed or destroyed.

A new paragraph (n) requires every person who produces, imports or exports class II chemicals must report its quarterly level of production, imports and exports of these chemicals within 45 days of the end of each quarter.

Paragraph (o) contains new requirements that those who import or export used or recycled controlled substances label their bill of lading or invoice indicating that the controlled substance is used or recycled.

A new paragraph (p) requires companies that import or export used or recycled Group II, class I controlled substances, or used or recycled class II controlled substances must report annually.

Finally paragraph (q) requires records for transhipments.

X. Impact of Final Action

The Agency developed a cost-benefit analysis of various possible phaseout schedules presented in the petitions and in the comments as well as the schedule for the accelerated phaseout of ozone-depleting compounds finalized by EPA today. In all the scenarios analyzing the various reduction schedules, the analysis yielded net incremental benefits of the same order of magnitude for all the options with the Alliance schedule yielding the least net incremental benefits over the current 2000 year phaseout, and the NRDC and EPA's proposed schedule yielding the most net incremental benefits, depending on the valuation of benefits. Given the uncertainties implicit in any cost benefit analysis of this kind, the net incremental benefits of these scenarios are approximately equal with the lower bound estimate of $175 billion to a higher bound estimate of $790 billion (at a 2 percent discount rate).

The analysis includes cost assumptions for HCFC replacements. However, these costs are only hypothetical, assuming that HCFC replacements are between 10% and 30% more expensive than the HCFC themselves. EPA needed to make such assumptions since HCFC replacements have not been yet been identified for some important uses. When high replacements costs are used, the net incremental benefits range from $164 billion to $776 billion (at a 2 percent discount rate).

As such analysis indicates that various schedules yield comparable net benefits, the Agency chose as the schedule that it is finalizing today, with limited modifications, the schedule adopted in Copenhagen over both the NRDC schedule and the Alliance schedule based on EPA's judgement on the availability of technologies and infrastructure support. Although the cost-benefit analysis suggests that the NRDC schedule is a possible option, the analysis performed on that scenario assumes the widespread use of various technologies that are dependent on a supporting industry infrastructure that may not be present. It is the Agency's judgement that although such technologies are available, the deployment of these technologies may incur significant but unaccounted for costs, as industry would need to adopt controls quickly without full knowledge of possible cost implications of their actions, and full support of an infrastructure necessary to support that technology.

For example, the RIA analysis indicates that retrofit of air-conditioning and refrigeration equipment must occur under all schedules. However, the NRDC schedule requires extensive retrofitting with total costs approaching $9 billion (at a 2 percent discount rate). The retrofit cost under EPA's proposed schedule would be substantially lower.

Furthermore, all of the phaseout schedules considered would require significant recycling and recovery at disposal. Although this will occur, the infrastructure necessary to provide recycling services, as well as to establish the bank of halons and CFCs, is under development, and would be severely strained under any accelerated phaseout. However, the Agency believes that its proposed schedule provides sufficient lead time for this infrastructure to develop.

The Agency is also finalizing a less stringent schedule for the phaseout of HCFCs rather than the schedules suggested in comments by environmental groups for these chemicals. Although the cost-benefit analysis indicates that the NRDC schedule may yield higher net benefits, assuming different valuation of benefits, the RIA does not calculate the possible adverse effects of the rapid phaseout of HCFCs required under such a schedule. The Agency believes that too short a period for the allowable use of HCFCs would further encourage the continued use of CFCs in the short-term by making the use of HCFCs as an alternative unattractive. It could also force the industry to move to untested alternatives that may pose unknown adverse environmental and health effects. For this reason the Agency is finalizing today a less stringent phaseout of HCFCs. The cost of the Alliance petition and EPA's schedule for HCFCs are comparable.

EPA has also used a discount rate of 4.5% as well as 7% in valuing future costs and benefits. When such a discount rate is used, the incremental cost of the accelerated phaseout (over the Clean Air Act phaseout) is $21 billion, with benefits ranging from $31 billion to $124 billion. At a 7% discount rate, the incremental costs are $12 billion, with benefits ranging from $8 billion to $24 billion.

EPA also examined the cost and benefits for a 2001 phaseout date for methyl bromide. The Agency has stated that a number of possible alternatives exist for users of methyl bromide, but that time is required for commercialization and use. EPA's cost analysis of these alternatives examined their likely range of costs, and coupled those assumptions with a monte carlo analysis, presenting a set of costs, (median, mean, minimum and maximum costs) that could be expected with the methyl bromide phaseout. This analysis indicates that the minimum social cost is approximately $7 million while the maximum cost is roughly $16 billion. The mean cost is a little more than $2 billion while the medium cost was estimated to be $1.7 billion. These are the total social costs between 1994 and 2010. These costs were discounted at 2%.

EPA calculated the benefits of phasing out of methyl bromide by 2001 between the years 1994 and 2011. EPA estimates benefits for this period to range from $14 billion to 56 billion, at a 2 percent discount rate. The Agency estimated that costs at a 4.5% discount rate would be $1.2 billion with benefits ranging from $4 billion to $16 billion. At a 7% discount rate, the costs would be $.8 billion with benefits ranging from $1.6 to $6.4 billion.

XI. Additional Information

A. Executive Order 12866

Under Executive Order 12866 (58 FR 51735 (October 4, 1993)), the Agency must determine whether the regulatory action is "significant" and therefore subject to OMB review and the requirements of the Executive Order. The Order defines "significant regulatory action" as one that is likely to result in a rule that may:

(1) Have an annual effect on the economy of $100 million or more or adversely affect in a material way the economy, a sector of the economy, productivity, competition, jobs, the environment, public health or safety, or State, local or tribal governments or communities;

(2) Create a serious inconsistency or otherwise interfere with an action taken or planned by another agency;

(3) Materially alter the budgetary impact of entitlements, grants, user fees, loan programs or the rights and obligations of recipients thereof; or

(4) Raise novel legal or policy issues arising out of legal mandates, the President's priorities, or the principles set forth in the Executive Order.

Pursuant to the terms of the Executive Order 12866, it has been determined that this rule is a "significant regulatory action" because the final rule has an annual effect on the economy of $100 million or more. As such this action was submitted to OMB for review. Changes made in response to OMB suggestions or recommendations will be documented in the public record.

B. Regulatory Flexibility Act

In the proposed rulemaking, the EPA certified, pursuant to section 605(b) of the Regulatory Flexibility Act (5 U.S.C. 605(b)), that the proposal would not have "a significant impact on a substantial number of small entities." During the public comment period, the Agency received comments suggesting that this regulatory flexibility "certification" was not appropriate because the proposal failed to include a regulatory flexibility analysis on the impact of methyl bromide phaseout on small businesses (especially small farmers).

However, a regulatory flexibility analysis is required only for small entities which are directly regulated by rulemaking. *See Mid-Tex Electric Cooperative, Inc.* v. *FERC*, 773 F.2d 327 (D.C. Cir. 1985) (agency's certification need only consider the rule's impact on regulated entities and not indirect impact on small entities not regulated). The current rulemaking directly regulates only producers and importers of ozone depleting chemicals, by limiting the production and importation of such chemicals, including methyl bromide. As indicated in the proposed rulemaking, the Agency did analyze which producers and importers would be directly regulated by the rulemaking: no small entities would be directly subject to the rulemaking. There are only three producers and one importer of methyl bromide, and only one producer and importer of HBFCs. Since none of these entities qualify as small businesses within the meaning of the Regulatory Flexibility Act, no Regulatory Flexibility Act analysis is needed for either the proposed or final rule. Accordingly pursuant to section 605(b) of the Act, 5 U.S.C. 605(b), this rulemaking will not have a significant economic impact on a substantial number of small entities. EPA hereby makes this certification for this final rule.

Nonetheless, the Agency, in fact, did give consideration to the impact of the phaseouts on users, both large and small, even though they will not be directly regulated by the rulemaking. This is out of concern for user sectors, which will need to find replacements for controlled substances. For CFCs, EPA has prepared an analysis to examine specifically the effect on the phaseout of existing small businesses.

(The Agency is not at this time able to quantify the impact of the long-term phaseout of class II chemicals.) For these chemicals, EPA examined the impact of the phaseout on the user communities which may face increased costs during the phaseout of these chemicals. (All companies regulated under 40 CFR part 82, subpart A that produce or import are either not small businesses as defined by the Small Business Administration, or will simply produce or import the Class I alternatives, not incurring any additional cost to their business.) In its analysis of these impacts, EPA believed that the most affected sectors, household refrigeration, mobile airconditioners, chillers and process refrigeration, would need to retire or retrofit existing equipment but that consumers, rather than business, would bear the final costs. In some cases, such as industrial process refrigeration or chillers, retrofits will be such a small cost relative to operation costs that the impact will be minimal. For the other sectors, sterilization, solvent cleaning, portable fire extinguisher, and foam blowing, the alternative technologies are now readily available, and business closures are not expected in these sectors.

With regard to methyl bromide, the Agency's proposed rulemaking did not discuss the specific impacts on small businesses per se. However, the proposal did extensively consider the question of the impact of phaseout on users with regard to availability of alternatives. As a result for methyl bromide, EPA believes it has adopted an approach that mitigates the impact on users, including small businesses, to the greatest extent permissible, consistent with our legislative mandates.

As noted on page 15034 of the proposal, and in today's document, a newly listed class I substance is automatically subject to the section 604(a) phaseout schedule unless: (1) The Administrator accelerates that schedule pursuant to section 606; or (2) the Administrator determines that the 604(a) schedule is unattainable and extends the schedule pursuant to section 602(d).

Under section 602(d), in the case of any substance added to the list of class I or II, the Administrator may extend any schedule or compliance deadline contained in section 604 or section 605 to a later date than specified in such sections if such schedule is unattainable, considering when such substance is added to the list. However, an extension under section 602(d) may not extend the termination of production date for a class I substance to a date more than 7 years after January 1 of the year after the year that it is listed as a class I substance. With today's notice, the United States will phase out production and consumption of methyl bromide by January 1, 2001, a full seven years after the January 1, following listing. As noted in the proposal as well in today's document, EPA believes this is the most flexible regulatory program allowable under the Clean Air Act. Moreover, by not requiring interim reductions prior to the phaseout, EPA is further minimizing the impact of this rule on methyl bromide users.

This final rule also notes that the labeling requirements of section 611 of the Clean Air Act Amendments do not pertain to the crops and produce that had been fumigated with methyl bromide. Although products that are manufactured with a class I substance are required to be labeled, the Agency has interpreted the phrase "manufactured with" as "the mechanical or chemical transformation of materials or substances into new products or to assemble component products". EPA believes that agricultural processes are excluded from this definition of "manufactured", and that crops and produce do not need to be labeled under section 611 of the Clean Air Act. This interpretation of the labeling requirement alleviates further regulatory burden on users of methyl bromide.

Finally, the Agency states that it will continue to monitor the development of substitutes over the next seven years, and that some solution to provide essential use exemptions may be explored if there are no substitutes, in order to prevent undue impacts on small businesses.

Given the time frame and restrictions contained in the regulation of methyl bromide, an assessment of its impact on small businesses must look closely at both near-term and long-term impacts. For the next seven years, production will be frozen at 1991 levels. Because of on-going efforts to reduce occupational and ambient levels of methyl bromide, its use in many soil fumigation and structural applications has recently been decreasing. As a result, maintaining the 1991 production levels through 2001 should not have any economic impact on current users of methyl bromide.

Seven years from now, after the production phaseout in 2001, the impact on users will largely be driven by the costs and availability of alternatives. It is extremely difficult to quantify the long-term impact of the phaseout given the existence of a wide range of potential alternatives either currently available or potentially available by the year 2001. While the document prepared by the United States Department of Agriculture (USDA) entitled, "The Biologic and Economic Assessment of Methyl Bromide," attempts to calculate the costs of a methyl bromide phaseout, as discussed earlier, this analysis focused on an immediate ban and not a phaseout in 2001. Given the number of potential alternative chemicals and non-chemicals already under review, the potential exists for additional alternatives to be available in 2001.

Some alternatives available and used after 2001 may indeed prove to be more expensive than methyl bromide which may result in lower profits to users if these costs cannot be passed on to consumers. However, EPA has found that the impacts from regulatory actions which remove pesticides from the market are mitigated over time as new pest control technologies are introduced and adjustments are made to compensate for the loss of the pesticide through alternative pest control practices. It is reasonable to expect that research efforts already underway to improve the performance and acceptability of metam sodium, dazomet, 1,3-dichloropropene and other chemical and non-chemical alternative pest control techniques will result in minimizing the impact of a methyl bromide phaseout to small entities. When used in combination, and in conjunction with a good integrated pest management program, these materials should be able to replace many if not all of the major uses of methyl bromide. Research is currently underway on both the governmental and academic levels, as well as in the private sector, to ensure that alternative materials and methods will be viable and available before methyl bromide is phased out.

EPA has also considered the economic impact that the removal of methyl bromide may have on the American agricultural community. To estimate the total social cost of the phaseout, forecasting must include the incremental cost and likely prevalence of the various methyl bromide alternatives in each end use. The result of such an analysis, including the future costs of likely alternatives, applications rates, market share, and efficacy of each alternative, can be extremely variable due to marked differences in the characteristics of various crops, soil types, and climatic conditions in various parts of the country. To reflect the uncertainty associated with a number of these key factors, EPA's analysis was performed using a "monte carlo" technique. This analysis resulted in an estimated total social cost of the phaseout of this chemical (between 1994 and 2010) varies between a low of $24 million, and a high of $12.2 billion, with a median total cumulative cost through 2010 of $1.3 billion. EPA believes that all scenarios except the "high cost" case represent acceptable impacts. Moreover, the high costs case represents a scenario in which a strong case could be made for pursuing an essential use provision for those applications where economically viable alternatives do not exist.

As the agricultural research community and the private sector explore viable alternative chemicals and growing methods that can substitute for methyl bromide, it is likely that the majority of current use areas will find economically viable and environmentally sound substitutes prior to the 2001 phaseout. EPA, along with USDA, intend to continue to work closely with the agricultural community to support the expedited development and review of these alternatives. Furthermore, the Agency intends to assess throughout the period leading up to the phaseout the extent to which substitutes may not become available for important uses of methyl bromide and to take timely steps to ensure that, if necessary, to pursue an appropriate measures to allow for essential uses.

C. Paperwork Reduction Act

The information collection requirements in this rule have been approved by the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 *et seq.* and have been assigned control number 2060–170.

This collection of information has an estimated reporting burden estimated to vary from 2 to 15 hours per response with an average of 9 hours per response and an estimated annual recordkeeping burden averaging 250 hours per respondent. These estimates include time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reduction of this burden to Chief, Information Policy Branch; EPA; 401 M Street, SW. (Mail Code 2136); Washington, DC 20460; and to the Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503, marked "Attention: Desk Officer for EPA".

References

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WMO, UNEP, NASA, NOAA, U.K. DEP, "Scientific Assessment of Ozone Depletion: 1991."

Lists of Subjects in 40 CFR Part 82

Environmental protection, Administrative practice and procedure, Air pollution control, Chemicals, Chlorofluorocarbons, Exports, Imports, Ozone Layer, Reporting and recordkeeping requirements, Stratospheric ozone.

Dated: November 30, 1993.

Carol M. Browner,

Administrator.

Part 82, title 40, chapter I of the Code of Federal Regulations is amended as follows:

PART 82—PROTECTION OF STRATOSPHERIC OZONE

1. The authority citation for part 82 continues to read as follows:

Authority: 42 U.S.C. 7414, 7671–7671q.

2. Part 82 is amended by revising subpart A to read as follows:

Subpart A—Production and Consumption Controls

Sec.

Subpart A—Production and Consumption Controls

§ 82.1 Purpose and scope.

(a) The purpose of the regulations in this subpart is to implement the Montreal Protocol on Substances that Deplete the Ozone Layer and sections 602, 603, 604, 605, 607 and 616 of the Clean Air Act Amendments of 1990, Public Law 101–549. The Protocol and section 604 impose limits on the production and consumption (defined as production plus imports minus exports, excluding transhipments and used or recycled controlled substances) of certain ozone depleting substances, according to specified schedules. The Protocol also requires each nation that becomes a Party to the agreement to impose certain restrictions on trade in ozone depleting substances with non-Parties.

(b) This subpart applies to any person that produces, transforms, destroys, imports or exports a controlled substance or imports a controlled product.

§ 82.2 Effective date.

(a) The regulations under this subpart take effect January 1, 1994, except for § 82.3 (h) and (l) and § 82.4(d) that are effective January 10, 1994. The listing of methyl bromide and HBFCs as a class I controlled substances is effective December 10, 1993.

(b) The regulations under this part that were effective prior to January 1, 1994 continue to apply for purposes of enforcing the provisions that were applicable prior to January 1, 1994.

§ 82.3 Definitions.

As used in this subpart, the term:

(a) *Administrator* means the Administrator of the Environmental Protection Agency or his authorized representative.

(b) *Baseline consumption allowances* means the consumption allowances apportioned under § 82.6.

(c) *Baseline production allowances* means the production allowances apportioned under § 82.5.

(d) *Calculated level* means the weighted amount of a controlled substance determined by multiplying the amount (in kilograms) of the controlled substance by that substance's ozone depletion weight listed in appendix A or appendix B of this subpart.

(e) *Class I* refers to the controlled substances listed in appendix A of this subpart.

(f) *Class II* refers to the controlled substances listed in appendix B of this subpart.

(g) *Completely destroy* means to cause the expiration of a controlled substance at a destruction efficiency of 98 percent or greater, using one of the destruction technologies approved by the Parties.

(h) *Complying with the Protocol,* when referring to a foreign state not Party to the 1987 Montreal Protocol, the London Amendments, or the Copenhagen Amendments, means that the non-Party has been determined as complying with the Protocol, as indicated in appendix C of this subpart, by a meeting of the Parties as noted in the records of the directorate of the United Nations Secretariat.

(i) *Consumption* means the production plus imports minus exports of a controlled substance (other than transhipments, or recycled or used controlled substances).

(j) *Consumption allowances* means the privileges granted by this subpart to produce and import class I controlled substances; however, consumption allowances may be used to produce class I controlled substances only in conjunction with production allowances. A person's consumption allowances are the total of the allowances he obtains under §§ 82.7, 82.6 and 82.10, as may be modified under § 82.12 (transfer of allowances).

(k) *Control period* means the period from January 1, 1992 through December 31, 1992, and each twelve-month period from January 1 through December 31, thereafter.

(l) (1) *Controlled product* means a product that contains a controlled substance listed as a Class I, Group I or II substance in appendix A of this subpart, and that belongs to one or more of the following six categories of products:

(i) Automobile and truck air conditioning units (whether incorporated in vehicles or not);

(ii) Domestic and commercial refrigeration and air conditioning/heat pump equipment (whether containing controlled substances as a refrigerant and/or in insulating material of the product), e.g. Refrigerators, Freezers, Dehumidifiers, Water coolers, Ice machines, Air conditioning and heat pump units;

(iii) Aerosol products, except medical aerosols;

(iv) Portable fire extinguishers;

(v) Insulation boards, panels and pipe covers; and

(vi) Pre-polymers.

(2) Controlled products include, but are not limited to, those products listed in appendix D of this subpart.

(m) *Controlled substance* means any substance listed in appendix A or appendix B of this subpart, whether existing alone or in a mixture, but excluding any such substance or mixture that is in a manufactured product other than a container used for the transportation or storage of the substance or mixture. Thus, any amount of a listed substance in appendix A or appendix B of this subpart which is not part of a use system containing the substance is a controlled substance. If a listed substance or mixture must first be transferred from a bulk container to another container, vessel, or piece of equipment in order to realize its intended use, the listed substance or mixture is a "controlled substance". The inadvertent or coincidental creation of insignificant quantities of a listed substance in appendix A or appendix B of this subpart: (1) During a chemical manufacturing process, (2) resulting from unreacted feedstock, or (3) from the listed substance's use as a process agent present as a trace quantity in the chemical substance being manufactured, is not deemed a controlled substance. Controlled substances are divided into two classes, Class I in appendix A of this subpart, and Class II listed in appendix B of this subpart. Class I substances are further divided into seven groups, Group I, Group II, Group III, Group IV, Group V, Group VI, and Group VII as set forth in appendix A of this subpart.

(n) *Copenhagen Amendments* means the Montreal Protocol on Substances That Deplete the Ozone Layer, as amended at the Fourth Meeting of the Parties to the Montreal Protocol in Copenhagen in 1992.

(o) *Destruction* means the expiration of a controlled substance to the destruction efficiency actually achieved, unless considered completely destroyed as defined in this section. Such destruction does not result in a commercially useful end product and uses one of the following controlled processes approved by the Parties to the Protocol:

(1) Liquid injection incineration;

(2) Reactor cracking;

(3) Gaseous/fume oxidation;

(4) Rotary kiln incineration; or

(5) Cement kiln.

(p) *Export* means the transport of virgin, used, or recycled controlled substances from inside the United States or its territories to persons outside the United States or its territories, excluding United States military bases and ships for on-board use.

(q) *Exporter* means the person who contracts to sell controlled substances for export or transfers controlled substances to his affiliate in another country.

(r) *Facility* means any process equipment (e.g., reactor, distillation column) used to convert raw materials or feedstock chemicals into controlled substances or consume controlled substances in the production of other chemicals.

(s) *Foreign state* means an entity which is recognized as a sovereign nation or country other than the United States of America.

(t) *Foreign state not Party to* or *Non-Party* means a foreign state that has not deposited instruments of ratification, acceptance, or other form of approval with the Directorate of the United Nations Secretariat, evidencing the foreign state's ratification of the provisions of the 1987 Montreal Protocol the London Amendments, or of the Copenhagen Amendments, as specified.

(u) *Import* means to land on, bring into, or introduce into, or attempt to land on, bring into, or introduce into any place subject to the jurisdiction of the United States whether or not such landing, bringing, or introduction constitutes an importation within the meaning of the customs laws of the United States, with the following exemptions:

(1) Off-loading used or excess controlled substances or controlled

(2) Bringing controlled substances into the U.S. from Mexico where the controlled substance had been admitted into Mexico in bond and was of U.S. origin; and

(3) Bringing a controlled product into the U.S. when transported in a consignment of personal or household effects or in a similar non-commercial situation normally exempted from U.S. Customs attention.

(v) *Importer* means any person who imports a controlled substance or a controlled product into the United States. "Importer" includes the person primarily liable for the payment of any duties on the merchandise or an authorized agent acting on his or her behalf. The term also includes, as appropriate:

(1) The consignee;

(2) The importer of record;

(3) The actual owner; or

(4) The transferee, if the right to draw merchandise in a bonded warehouse has been transferred.

(w) *London Amendments* means the Montreal Protocol, as amended at the Second Meeting of the Parties to the Montreal Protocol in London in 1990.

(x) *Montreal Protocol* means the Montreal Protocol on Substances that Deplete the Ozone Layer, a protocol to the Vienna Convention for the Protection of the Ozone Layer, including adjustments adopted by the Parties thereto and amendments that have entered into force.

(y) *1987 Montreal Protocol* means the Montreal Protocol, as originally adopted by the Parties in 1987.

(z) *Nations complying with, but not joining, the Protocol* means any nation listed in appendix C , Annex 2, of this subpart.

(aa) *Party* means any foreign state that is listed in appendix C of this subpart (pursuant to instruments of ratification, acceptance, or approval deposited with the Depositary of the United Nations Secretariat), as having ratified the specified control measure in effect under the Montreal Protocol. Thus, for purposes of the trade bans specified in § 82.4(d)(2) pursuant to the London Amendments, only those foreign states that are listed in appendix C of this subpart as having ratified both the 1987 Montreal Protocol and the London Amendments shall be deemed to be Parties.

(bb) *Person* means any individual or legal entity, including an individual, corporation, partnership, association, state, municipality, political subdivision of a state, Indian tribe; any agency, department, or instrumentality of the United States; and any officer, agent, or employee thereof.

(cc) *Plant* means one or more facilities at the same location owned by or under common control of the same person.

(dd) *Potential production allowances* means the production allowances obtained under § 82.9(a).

(ee) *Production* means the manufacture of a controlled substance from any raw material or feedstock chemical, but does not include:

(1) The manufacture of a controlled substance that is subsequently transformed;

(2) The reuse or recycling of a controlled substance;

(3) Amounts that are destroyed by the approved technologies; or

(4) Amounts that are spilled or vented unintentionally.

(ff) *Production allowances* means the privileges granted by this subpart to produce controlled substances; however, production allowances may be used to produce controlled substances only in conjunction with consumption allowances. A person's production allowances are the total of the allowances he obtains under §§ 82.7, 82.5 and 82.9 as may be modified under § 82.12 (transfer of allowances).

(gg) *Transform* means to use and entirely consume (except for trace quantities) a controlled substance in the manufacture of other chemicals for commercial purposes.

(hh) *Transhipment* means the continuous shipment of a controlled substance from a foreign state of origin through the United States or its territories to a second foreign state of final destination.

(ii) *Unexpended consumption allowances* means consumption allowances that have not been used. At any time in any control period a person's unexpended consumption allowances are the total of the level of consumption allowances the person has authorization under this subpart to hold at that time for that control period, minus the level of controlled substances that the person has produced or imported (not including transhipments and used or recycled controlled substances) in that control period until that time.

(jj) *Unexpended production allowances* means production allowances that have not been used. At any time in any control period a person's unexpended production allowances are the total of the level of production allowances he has authorization under this subpart to hold at that time for that control period, minus the level of controlled substances that the person has produced in that control period until that time.

(kk) *Used or recycled controlled substances* means controlled substances that have been recovered from their intended use systems.

§ 82.4 Prohibitions.

(a) No person may produce, at any time in any control period, any class I controlled substance (except for controlled substances that are transformed or destroyed or substances that are produced pursuant to an exemption as specified in paragraph (k) of this section) in excess of the amount of unexpended production allowances for that substance held by that person under the authority of this subpart at that time for that control period. Every kilogram of excess production constitutes a separate violation of this subpart.

(b) No person may produce or (except for transhipments, or for used or recycled controlled substances) import, at any time in any control period, any class I controlled substance (except for controlled substances that are transformed, destroyed, or substances that are produced or imported pursuant to an exemption as specified in paragraph (k) of this section) in excess of the amount of unexpended consumption allowances held by that person under the authority of this subpart at that time for that control period. Every kilogram of excess production or importation (other than transhipments or used and recycled controlled substances) constitutes a separate violation of this subpart.

(c) A person may not use production allowances to produce a quantity of a class I controlled substance (with the exceptions set forth in paragraph (a) of this section) unless he holds under the authority of this subpart at the same time consumption allowances sufficient to cover that quantity of class I controlled substances nor may a person use consumption allowances to produce a quantity of class I controlled substances (with the exceptions set forth in paragraph (a) of this section) unless the person holds under authority of this subpart at the same time production allowances sufficient to cover that quantity of class I controlled substances. However, only consumption allowances are required to import class I controlled substances with the exceptions set forth in paragraph (b) of this section.

(d) No person may:

(1) Import or export any quantity of a controlled substance listed in Class I, Group I or Group II, in appendix A of this subpart from or to any foreign state not listed as a Party to the 1987 Montreal Protocol unless that foreign state is complying with the 1987

Montreal Protocol (As noted in appendix C, Annex 2 of this subpart);

(2) Import or export any quantity of a controlled substance listed in Class I, Group III, Group IV or Group V, in appendix A of this subpart, from or to any foreign state not Party to the London Amendments (as noted in appendix C, Annex 1, of this subpart), unless that foreign state is complying with the London Amendments (as noted in appendix C, Annex 2, of this subpart); or

(3) Import a controlled product from any foreign state not Party to the 1987 Montreal Protocol (as noted in appendix C, Annex 1, of this subpart), unless that foreign state is complying with the Protocol (as noted in appendix C, Annex 2, of this subpart).

(4) Every kilogram of a controlled substance, and every controlled product, imported or exported in contravention of this subpart constitutes a separate violation of this subpart.

(e) Effective January 1, 2003, no person may produce HCFC–141b except in a process resulting in its transformation, use in a process resulting in destruction, or for exceptions stated in paragraph (l) of this section.

(f) Effective January 1, 2003, no person may import HCFC–141b except for use in a process resulting in its transformation, use in a process resulting in destruction, or for exceptions stated in paragraph (l) of this section.

(g) Effective January 1, 2010, no person may produce or consume (excluding used or recycled controlled substances, or transhipments) HCFC–22 or HCFC–142b for any purpose other than for use in a process resulting in their transformation, use in a process resulting in their destruction, for use in equipment manufactured prior to January 1, 2010, or for exceptions stated in paragraph (l) of this section in excess of baseline allowances allocated §§ 82.5(h) and 82.6(h).

(h) Effective January 1, 2020, no person may produce or consume HCFC–22 or HCFC–142b (excluding used or recycled controlled substances, or transhipments) for any purpose other than for use in a process resulting in their transformation, use in a process resulting in their destruction or for exceptions stated in paragraph (l) of this section.

(i) Effective January 1, 2015, no person may produce or consume class II substance (excluding used or recycled controlled substances, or transhipments) not previously controlled, for any purpose other than for use in a process resulting in its transformation, use in a process resulting in their destruction, as a refrigerant in equipment manufactured before January 1, 2020, or for exceptions stated in paragraph (l) of this section, in excess of baseline production and consumption levels defined in §§ 82.5(h) and 82.6(h).

(j) Effective January 1, 2030 no person may produce or import class II substances, (excluding used or recycled controlled substances, or transhipments) for any purpose other than for use in a process resulting in their transformation, use in a process resulting in their destruction, or for exceptions stated in paragraph (l) of this section.

(k) The following exemptions apply to the production and consumption restrictions under paragraphs (a) and (b) of this section: [Reserved]

(l) The following exemptions apply to the production and consumption restrictions under paragraphs (e), (f), (g), (h), (i) and (j) of this section:

(1) Medical Devices [Reserved]

(2) Exports to developing countries [Reserved]

§ 82.5 Apportionment of baseline production allowances.

Persons who produced controlled substances in Group I or Group II in 1986 are apportioned baseline production allowances as set forth in paragraphs (a) and (b) of this section. Persons who produced controlled substances in Group III, IV, or V in 1989 are apportioned baseline production allowances as set forth in paragraphs (c), (d), and (e) of this section. Persons who produced controlled substances in Group VI and VII in 1991 are apportioned baseline allowances as set forth in paragraphs (f) and (g) of this section.

Controlled Substance	Person	Allowances (kg)
(a) For Group I controlled substances:		
CFC–11	Allied-Signal, Inc	23,082,358
	E.I. DuPont de Nemours & Co	33,830,000
	Elf Atochem, N.A	21,821,500
	Laroche Chemicals	12,856,364
CFC–12	Allied-Signal, Inc	35,699,776
	E.I. DuPont de Nemours & Co	64,849,000
	Elf Atochem, N.A	31,089,807
	Laroche Chemicals	15,330,909
CFC–113	Allied-Signal, Inc	21,788,896
	E.I. DuPont de Nemours & Co	58,553,000
CFC–114	Allied-Signal, Inc	1,488,569
	E.I. DuPont de Nemours & Co	4,194,000
CFC–115	E.I. DuPont de Nemours & Co	4,176,000
(b) For Group II controlled substances:		
Halon-1211	Great Lakes Chemical Corp	826,487
	ICI Americas, Inc	2,135,484
Halon-1301	E.I. DuPont de Nemours & Co	3,220,000
	Great Lakes Chemical Corp	1,766,850
Halon-2402		
(c) For Group III controlled substances:		
CFC–13	Allied-Signal, Inc	127,125
	E.I. DuPont de Nemours & Co	187,831
	Elf Atochem, N.A	3,992
	Great Lakes Chemical Corp	56,381
	Laroche Chemicals	29,025
CFC–111		
CFC–112		

Controlled Substance	Person	Allowances (kg)
CFC-211	E.I. DuPont de Nemours & Co	11
CFC-212	E.I. DuPont de Nemours & Co	11
CFC-213	E.I. DuPont de Nemours & Co	11
CFC-214	E.I. DuPont de Nemours & Co	11
CFC-215	E.I. DuPont de Nemours & Co	511
	Halocarbon Products Corp	1,270
CFC-216	E.I. DuPont de Nemours & Co	170,574
CFC-217	E.I. DuPont de Nemours & Co	511
(d) For Group IV controlled substances:		
CCl_4	Akzo Chemicals, Inc	7,873,615
	Degussa Corporation	26,546
	Dow Chemical Company, USA	18,967,747
	E.I. DuPont de Nemours & Co	9,099
	Hanlin Chemicals-WV, Inc	219,616
	ICI Americas, Inc	853,714
	Occidental Chemical Corp	1,059,358
	Vulcan Chemicals	21,931,987
(e) For Group V controlled substances:		
Methyl chloroform	Dow Chemical Company, USA	168,030,117
	E.I. DuPont de Nemours & Co	2
	PPG Industries, Inc	57,450,719
	Vulcan Chemicals	89,689,064

(f) For Group VI controlled substances: [Reserved]

(g) For Group VII controlled substances: [Reserved]

(h) For class II controlled substances: [Reserved]

§ 82.6 Apportionment of baseline consumption allowances.

Persons who produced, imported, or produced and imported controlled substances in Group I or Group II in 1986 are apportioned chemical-specific baseline consumption allowances as set forth in paragraphs (a) and (b) of this section. Persons who produced, imported, or produced and imported controlled substances in Group III, Group IV, or Group V in 1989 are apportioned chemical-specific baseline consumption allowances as set forth in paragraphs (c), (d), and (e) of this section. Persons who produced, imported, or produced and imported controlled substances in Group VI or VII in 1991 are apportioned chemical specific baseline consumption allowances as set forth in paragraphs (f) and (g) of this section.

Controlled substance	Person	Allowances (kg)
(a) For Group I controlled substances:		
CFC-11	Allied-Signal, Inc	22,683,833
	E.I. DuPont de Nemours & Co	32,054,283
	Elf Atochem, N.A	21,740,194
	Hoechst Celanese Corporation	165,396
	ICI Americas, Inc	1,673,436
	Kali-Chemie Corporation	82,500
	Laroche Chemicals	12,695,726
	National Refrigerants, Inc	693,707
	Refricentro, Inc.	160,697
	Sumitomo Corporation of America	5,800
CFC-12	Allied-Signal, Inc	35,236,397
	E.I. DuPont de Nemours & Co	61,098,726
	Elf Atochem, N.A	32,403,869
	Hoechst Celanese Corporation	138,865
	ICI Americas, Inc	1,264,980
	Kali-Chemie Corporation	355,440
	Laroche Chemicals	15,281,553
	National Refrigerants, Inc	2,375,384
	Refricentro, Inc	242,526
CFC-113	Allied-Signal, Inc.18,241,928.	
	E.I. DuPont de Nemours & Co	49,602,858
	Elf Atochem, N.A	244,908
	Holchem	265,199
	ICI Americas, Inc	2,399,700
	Refricentro, Inc	37,385
	Sumitomo Corporation of America	280,163
CFC-114	Allied-Signal, Inc	1,429,582
	E.I. DuPont de Nemours & Co	3,686,103
	Elf Atochem, N.A	22,880
	ICI Americas, Inc	32,930
CFC-115	E.I. DuPont de Nemours & Co	2,764,109
	Elf Atochem, N.A	633,007

Controlled substance	Person	Allowances (kg)
	Hoechst Celanese Corporation	8,893
	ICI Americas, Inc	2,366,351
	Laroche Chemicals	135,520
	Refricentro, Inc	27,337
(b) For Group II controlled substances:		
Halon-1211	Elf Atochem, N.A	411,292
	Great Lakes Chemical Corp	772,775
	ICI Americas, Inc	2,116,641
	Kali-Chemie Corporation	330,000
Halon-1301	E.I. DuPont de Nemours & Co	2,772,917
	Elf Atochem, N.A	89,255
	Great Lakes Chemical Corp	1,744,132
	Kali-Chemie Corporation	54,380
Halon-2402	Ausimont	34,400
	Great Lakes Chemical Corp	15,900
(c) For Group III controlled substances:		
CFC–13	Allied-Signal, Inc	127,124
	E.I. DuPont de Nemours & Co	158,508
	Elf Atochem, N.A	3,992
	Great Lakes Chemical Corp	56,239
	ICI Americas, Inc	5,855
	Laroche Chemicals	29,025
	National Refrigerants, Inc	16,665
CFC–111		
CFC–112	Sumitomo Corporation of America	5,912
	TG (USA) Corporation	9,253
CFC–211	E.I. DuPont de Nemours & Co	11
CFC–212	E.I. DuPont de Nemours & Co	11
CFC–213	E.I. DuPont de Nemours & Co	11
CFC–214	E.I. DuPont de Nemours & Co	11
CFC–215	E.I. DuPont de Nemours & Co	511
	Halocarbon Products Corp	1,270
CFC–216	E.I. DuPont de Nemours & Co	170,574
CFC–217	E.I. DuPont de Nemours & Co	511
(d)For Group IV controlled substances:		
$CC1_4$	Crescent Chemical Co	56
	Degussa Corporation	12,466
	Dow Chemical Company, USA	8,170,561
	E.I. DuPont de Nemours & Co	26,537
	Elf Atochem, N.A	41
	Hanlin Chemicals-WV, Inc	103,133
	Hoechst Celanese Corporation	3
	ICC Chemical Corp	1,173,723
	ICI Americas, Inc	855,466
	Occidental Chemical Corp	497,478
	Sumitomo Corporation of America	9
(e) For Group V controlled substances:		
Methyl Chloroform	3V Chemical Corp	3,528
	Actex, Inc	50,171
	Atochem North America	74,355
	Dow Chemical Company, USA	125,200,200
	E.I. DuPont de Nemours & Co	2
	IBM	2,026
	ICI Americas, Inc	14,179,850
	Laidlaw	420,207
	PPG Industries	45,254,115
	Sumitomo	1,954
	TG (USA) Corporation	7,073
	Unitor Ships Service, Inc	14,746
	Vulcan Chemicals	70,765,072
(f) For Group VI controlled substances: [Reserved]		
(g) For Group VII controlled substances: [Reserved]		
(h) For Class II controlled substances: [Reserved]		

§ 82.7 Grant and phased reduction of baseline production and consumption allowances for class I controlled substances.

For each control period specified in the following table, each person is granted the specified percentage of the baseline production and consumption allowances apportioned to him under §§ 82.5 and 82.6.

Control period	Class I substances in groups I and III (percent)	Class I substances in group II (percent)	Class I substances in group IV (percent)	Class I substances in group V (percent)	Class I substances in group VI (percent)	Class I substances in group VII (percent)
1994	25	0	50	50	100	100
1995	25	0	15	30	100	100
1996	0	0	0	0	100	0
1997	0	0	0	0	100	0
1998	0	0	0	0	100	0
1999	0	0	0	0	100	0
2000	0	0	0	0	100	0
2001	0	0	0	0	0	0

§ 82.8 Grant and phased reduction of baseline production and consumption allowances for class II controlled substances. [Reserved]

§ 82.9 Availability of production allowances in addition to baseline production allowances.

(a) Every person apportioned baseline production allowances for class I controlled substances under § 82.5 (a) through (e) is also granted potential production allowances equal to:

(1) 10 percent of his apportionment under § 82.5 for each control period ending before January 1, 2000; and

(2) 15 percent of his apportionment under § 82.5 for each control period beginning after December 31, 1999 and ending before January 1, 2011 (January 1, 2013 in the case of methyl chloroform).

(3) A person may convert potential production allowances, either granted under this paragraph (a) or obtained under § 82.12 (transfer of allowances), to production allowances only to the extent authorized by the Administrator under § 82.11 (Exports to Article 5 Parties). A person may obtain authorizations to convert potential production allowances to production allowances by requesting issuance of a notice under § 82.11 or by completing a transfer of authorizations under § 82.12.

(b) A person may also increase or decrease its production allowances by trading with another Party to the Protocol. A nation listed in appendix C, Annex 1 of this subpart (Parties to the Montreal Protocol) must agree either to transfer to the person for the current control period some amount of production that the nation is permitted under the Montreal Protocol or to receive from the person for the current control period some amount of production that the person is permitted under this subpart. A request for production allowances shall also be considered a request for consumption allowances under § 82.10(c).

(1) For trades from a Party, the person must obtain from the principal diplomatic representative in that nation's embassy in the United States a signed document stating that the appropriate authority within that nation has established or revised production limits for the nation to equal the lesser of the maximum production that the nation is allowed under the Protocol minus the amount transferred, the maximum production that is allowed under the nation's applicable domestic law minus the amount transferred, or the average of the nation's actual national production level for the three years prior to the transfer minus the production allowances transferred. The person must submit to the Administrator a transfer request that includes a true copy of this document and that sets forth the following:

(i) The identity and address of the person;

(ii) The identity of the Party;

(iii) The names and telephone numbers of contact persons for the person and for the Party;

(iv) The chemical type and level of production being transferred;

(v) The control period(s) to which the transfer applies; and

(vi) A signed statement by the person that this increased production is intended as an export to the Party.

(2) For trades to a Party, a person must submit a transfer request that sets forth the following:

(i) The identity and address of the person;

(ii) The identity of the Party;

(iii) The names and telephone numbers of contact persons for the person and for the Party;

(iv) The chemical type and level of allowable production to be transferred; and

(v) The control period(s) to which the transfer applies.

(3) After receiving a transfer request that meets the requirements of paragraph (b)(2) of this section, the Administrator may, at his discretion, consider the following factors in deciding whether to approve such a transfer:

(i) Possible creation of economic hardship;

(ii) Possible effects on trade;

(iii) Potential environmental implications; and

(iv) The total amount of unexpended production allowances held by United States entities.

(4) The Administrator will issue the person a notice either granting or deducting production allowances and specifying the control periods to which the transfer applies, provided that the request meets the requirement of paragraph (b)(1) of this section for trades from Parties and paragraph (b)(2) of this section for trades to Parties, unless the Administrator has decided to disapprove the trade under paragraph (b)(3) of this section for trades to Parties. For a trade from a Party, the Administrator will issue a notice that revises the allowances held by the person to equal the unexpended production allowances held by the person under this subpart plus the level of allowable production transferred from the Party. For a trade to a Party, the Administrator will issue a notice that revises the production limit for the person to equal the lesser of:

(i) The unexpended production allowances held by the person under this subpart minus the amount transferred; or

(ii) The unexpended production allowances held by the person under this subpart minus the amount by which the United States average annual production of the controlled substance being traded for the three years prior to the transfer is less than the total allowable production allowable for that substance under this subpart minus the amount transferred. The change in allowances will be effective on the date that the notice is issued.

(5) If after one person obtains approval for a trade of allowable production of a controlled substance to a Party, one or more other persons obtain approval for trades involving the same controlled substance and the same control period, the Administrator will issue notices revising the production limits for each of the other persons trading that controlled substance in that control period to equal the lesser of:

(i) The unexpended production allowances held by the person under this subpart minus the amount transferred; or

(ii) The unexpended production allowances held by the person under this subpart minus (the amount by which the United States average annual production of the controlled substance being traded for the three years prior to the transfer is less than the total allowable production for that substance under this subpart) multiplied by the amount transferred divided by (the total amount transferred by all the other persons trading the same controlled substance in the same control period) minus the amount transferred by that person.

(iii) The Administrator will also issue a notice revising the production limit for each person who previously obtained approval of a trade of that substance in that control period to equal the unexpended production allowances held by the person under this subpart plus the amount by which the United States average annual production of the controlled substance being traded for the three years prior to the transfer is less than the total allowable production under this subpart multiplied by the amount transferred by that person divided by (the amount transferred by all of the persons that have traded that controlled substance in that control period). The change in production allowances will be effective on the date that the notice is issued.

(c) A person may obtain production allowances for that controlled substance equal to the amount of that controlled substance produced in the United States that was transformed or destroyed within the United States in cases where production allowances were expended to produce such substance in accordance with the provisions of this paragraph. A request for production allowances under this section will be considered a request for consumption allowances under § 82.10(b).

(1) A person must submit a request for production allowances that includes the following:

(i) The identity and address of the person;

(ii) The name, quantity, and level of controlled substance transformed or the name, quantity and volume destroyed;

(iii) A copy of the invoice or receipt documenting the sale of the controlled substance to the person;

(iv) A certification that production allowances were expended for the production of the controlled substance;

(v) If the controlled substance is transformed, the name, quantity, and verification of the commercial use of the resulting chemical transformed; and

(vi) If the controlled substance is destroyed, the efficiency of the destruction process.

(2) The Administrator will review the information and documentation submitted under paragraph (c)(1) of this section and will assess the quantity of class I controlled substance that the documentation and information verifies was transformed or destroyed. The Administrator will issue the person production allowances equivalent to the controlled substances that the Administrator determines were transformed or destroyed. For controlled substances completely destroyed under this subpart, the Agency will grant allowances equal to 100 percent of volume intended for destruction. For those controlled substances destroyed at less than a 98 percent destruction efficiency, the Agency will grant allowances commensurate with that percent of destruction efficiency that is actually achieved. The grant of allowances will be effective on the date that the notice is issued.

(3) If the Administrator determines that the request for production allowances does not satisfactorily substantiate that the person transformed or destroyed controlled substances as claimed, or that modified allowances were not expended, the Administrator will issue a notice disallowing the request for additional production allowances. Within ten working days after receipt of notification, the person may file a notice of appeal, with supporting reasons, with the Administrator. The Administrator may affirm the disallowance or grant an allowance, as he finds appropriate in light of the available evidence. If no appeal is taken by the tenth day after notification, the disallowance will be final on that day.

§ 82.10 Availability of consumption allowances in addition to baseline consumption allowances.

(a) Any person may obtain, in accordance with the provisions of this section, consumption allowances equivalent to the level of class I controlled substances (other than used or recycled controlled substances or a transshipment) that the person has exported from the United States and its territories to a Party (as listed in appendix C, Annex 1 of this subpart), other than a transshipment.

(1) The exporter of the class I controlled substances must submit to the Administrator a request for consumption allowances setting forth the following:

(i) The identities and addresses of the exporter and the recipient of the exports;

(ii) The exporter's Employer Identification Number;

(iii) The names and telephone numbers of contact persons for the exporter and the recipient;

(iv) The quantity and type of controlled substances exported;

(v) The source of the controlled substance and the date purchased;

(vi) The date on which and the port from which the controlled substances were exported from the United States or its territories;

(vii) The country to which the controlled substances were exported;

(viii) The bill of lading and the invoice indicating the net quantity of controlled substances shipped and documenting the sale of the controlled substances to the purchaser; and

(ix) The commodity code of the controlled substance exported.

(2) The Administrator will review the information and documentation submitted under paragraph (a)(1) of this section, and will assess the quantity of controlled substances that the documentation verifies was exported. The Administrator will issue the exporter consumption allowances equivalent to the level of controlled substances that the Administrator determined was exported. The grant of the consumption allowances will be effective on the date the notice is issued.

(b) A person may obtain consumption allowances for that controlled substance equal to the amount of a controlled substance either produced in or imported into the United States that was transformed or destroyed in the United States in the case where consumption allowance were expended to produce or import such substance in accordance with the provisions of this paragraph.

(1) A person must submit a request for consumption allowances that includes the following:

(i) The identity and address of the person;

(ii) The name, quantity, and level of controlled substance transformed or the name, quantity and volume destroyed;

(iii) A copy of the invoice or receipt documenting the sale of the controlled substance to the person;

(iv) A certification that production and/or consumption allowances were expended for the production and/or import of the controlled substance;

(v) If the controlled substance is transformed, the name, quantity, and verification of the commercial use of the resulting chemical transformed; and

(vi) If the controlled substance is destroyed, the efficiency of the destruction process.

(2) The Administrator will review the information and documentation submitted under paragraph (b)(1) of this section and will assess the quantity of controlled substance that the documentation and information verified was transformed or destroyed. The Administrator will issue to the person consumption allowances equivalent to the level of controlled substances that the Administrator determines was transformed or destroyed. For controlled substances completely destroyed under this subpart, the Agency will grant allowances equal to 100 percent of volume intended for destruction. For those controlled substances destroyed at less than a 98 percent destruction efficiency, the Agency will grant allowances commensurate with that percent of destruction efficiency that is actually achieved. The grant of allowances will be effective on the date that the notice is issued.

(3) If the Administrator determines that the request for consumption allowances does not satisfactorily substantiate that the person transformed or destroyed controlled substances as claimed, or that production or consumption allowances had not been expended, the Administrator will issue a notice disallowing the request for additional consumption allowances. Within ten working days after receipt of notification, the person may file a notice of appeal, with supporting reasons, with the Administrator. The Administrator may affirm or vacate the disallowance. If no appeal is taken by the tenth day after notification, the disallowance will be final on that day.

(c) A person may also increase its consumption allowances by receiving production from another Party to the Protocol. A nation listed in appendix C, Annex 1 of this subpart (Parties to the Montreal Protocol) must agree to transfer to the person for the current control period some amount of production that the nation is permitted under the Montreal Protocol. A request for consumption allowances shall also be considered a request for production allowances under § 82.9(b). For trades from a Party, the person must obtain from the principal diplomatic representative in that nation's embassy in the United States a signed document stating that the appropriate authority within that nation has established or revised production limits for the nation to equal the lesser of the maximum production that the nation is allowed under the Protocol minus the amount transferred, the maximum production that is allowed under the nation's applicable domestic law minus the amount transferred, or the average of the nation's actual national production level for the three years prior to the transfer minus the production allowances transferred. The person must submit to the Administrator a transfer request that includes a true copy of this document and that sets forth the following:

(1) The identity and address of the person;

(2) The identity of the Party;

(3) The names and telephone numbers of contact persons for the person and for the Party;

(4) The chemical type and level of production being transferred;

(5) The control period(s) to which the transfer applies; and

(6) A signed statement by the person that this increased production is intended as an export to the Party.

§ 82.11 Exports to Article 5 Parties.

In accordance with the provisions of this section, any person may obtain authorizations to convert potential production allowances to production allowances by exporting class I controlled substances (not including transshipments, or used or recycled controlled substances) to foreign states listed in appendix E to this subpart (Article 5 Parties). Authorizations obtained under this section will be valid only during the control period in which the controlled substance departed the United States. A request for authorizations under this section will be considered a request for consumption allowances under § 82.10(a) as well.

(a) The exporter must submit to the Administrator a request for authority to convert potential production allowance to production allowances. That request must set forth the following:

(1) The identities and addresses of the exporter and the recipient of the exports;

(2) The exporter's Employee Identification Number;

(3) The names and telephone numbers of contact persons for the exporter and for the recipient;

(4) The quantity and the type of controlled substances exported, its source and date purchased;

(5) The date on which and the port from which the controlled substances were exported from the United States or its territories;

(6) The country to which the controlled substances were exported;

(7) A copy of the bill of lading and invoice indicating the net quantity shipped and documenting the sale of the controlled substances to the purchaser;

(8) The commodity code of the controlled substance exported; and

(9) A copy of the contract covering the sale of the controlled substances to the recipient that contains provisions forbidding the reexport of the controlled substance in bulk form and subjecting the recipient or any transferee of the recipient to liquidated damages equal to the resale price of the controlled substances if they are reexported in bulk form.

(b) The Administrator will review the information and documentation submitted under paragraph (a) of this section, and assess the quantity of controlled substances that the documentation verifies were exported to an Article 5 Party. Based on that assessment, the Administrator will issue the exporter a notice authorizing the conversion of a specified quantity of potential production allowances to production allowances in a specified control year, and granting consumption allowances in the same amount for the same control year. The authorizations may be used to convert potential production allowances to production allowances as soon as the date on which the notice is issued.

§ 82.12 Transfers.

(a) *Inter-company transfers.* Any person ("transferor") may transfer to any other person ("transferee") any amount of the transferor's consumption allowances, production allowances, potential production allowances, or authorizations to convert potential production allowances to production allowances, as follows:

(1) The transferor must submit to the Administrator a transfer claim setting forth the following:

(i) The identities and addresses of the transferor and the transferee;

(ii) The name and telephone numbers of contact persons for the transferor and the transferee;

(iii) The type of allowances or authorizations being transferred, including the names of the controlled substances for which allowances are to be transferred;

(iv) The group of controlled substances to which the allowances or authorizations being transferred pertains;

(v) The amount of allowances or authorizations being transferred;

(vi) The control period(s) for which the allowances or authorizations are being transferred;

(vii) The amount of unexpended allowances or authorizations of the type and for the control period being transferred that the transferor holds under authority of this subpart as of the date the claim is submitted to EPA; and

(viii) The amount of the one-percent offset applied to the unweighted amount traded that will be deducted from the transferor's allowance balance (except for trades of potential production allowances, authorizations to convert, or trades from transformers and destroyers to producers or importers for the purpose of allowance reimbursement).

(2) The Administrator will determine whether the records maintained by EPA, taking into account any previous transfers and any production, allowable imports and exports of controlled substances reported by the transferor, indicate that the transferor possesses, as of the date the transfer claim is processed, unexpended allowances or authorizations sufficient to cover the transfer claim (i.e., the amount to be transferred plus, in the case of transferors of production or consumption allowances, one percent of that amount). Within three working days of receiving a complete transfer claim, the Administrator will take action to notify the transferor and transferee as follows:

(i) If EPA's records show that the transferor has sufficient unexpended allowances or authorizations to cover the transfer claim or if review of available information is insufficient to make a determination, the Administrator will issue a notice indicating that EPA does not object to the transfer and will reduce the transferor's balance of unexpended allowances or authorizations by the amount to be transferred plus, in the case of transfers of production or consumption allowances, one percent of that amount. When EPA issues a no objection notice, the transferor and the transferee may proceed with the transfer. However, if EPA ultimately finds that the transferor did not have sufficient unexpended allowances or authorizations to cover the claim, the transferor and transferee will be held liable for any violations of the regulations of this subpart that occur as a result of, or in conjunction with, the improper transfer.

(ii) If EPA's records show that the transferor has insufficient unexpended allowances or authorizations to cover the transfer claim, or that the transferor has failed to respond to one or more Agency requests to supply information needed to make a determination, the Administrator will issue a notice disallowing the transfer. Within 10 working days after receipt of notification, either party may file a notice of appeal, with supporting reasons, with the Administrator. The Administrator may affirm or vacate the disallowance. If no appeal is taken by the tenth working day after notification, the disallowance shall be final on that day.

(3) In the event that the Administrator does not respond to a transfer claim within the three working days specified in paragraph (b)(2) of this section, the transferor and transferee may proceed with the transfer. EPA will reduce the transferor's balance of unexpended allowances or authorizations by the amount to be transferred plus, in the case of transfers of production or consumption allowances, one percent of that amount. However, if EPA ultimately finds that the transferor did not have sufficient unexpended allowances or authorizations to cover the claim, the transferor and transferee will be held liable for any violations of the regulations of this subpart that occur as a result of, or in conjunction with, the improper transfer.

(b) *Inter-pollutant conversions.* Any person ("convertor") may convert consumption allowances, production allowances, potential production allowances, or authorizations to convert potential production allowances to production allowances for one class I controlled substance to the same type of allowance for another class I controlled substance within the group of controlled substances as the first as follows:

(1) The convertor must submit to the Administrator a conversion claim setting forth the following:

(i) The identity and address of the convertor;

(ii) The name and telephone number of a contact person for the convertor;

(iii) The type of allowances or authorizations being converted, including the names of the controlled substances for which allowances are to be converted;

(iv) The group of controlled substances to which the allowances or authorizations being converted pertains;

(v) The amount and type of allowances to be converted;

(vi) The amount of allowances to be subtracted from the convertor's unexpended allowances for the first controlled substance, to be equal to 101 percent of the amount of allowances converted (except for conversions of authorizations to convert potential production allowances and conversions of potential production allowances);

(vii) The amount of allowances or authorizations to be added to the convertor's unexpended allowances or authorizations for the second controlled substance, to be equal to the amount of allowances for the first controlled substance being converted multiplied by the quotient of the ozone depletion factor of the first controlled substance divided by the ozone depletion factor of the second controlled substance, as listed in appendix A of this subpart;

(viii) The control period(s) for which the allowances or authorizations are being converted; and

(ix) The amount of unexpended allowances or authorizations of the type and for the control period being converted that the convertor holds under authority of this subpart as of the date the claim is submitted to EPA.

(2) The Administrator will determine whether the records maintained by EPA, taking into account any previous conversions, any transfers, and any production, imports (not including transhipments, or used and recycled controlled substances), or exports (not including transhipments, or used and recycled controlled substances) of controlled substances reported by the convertor, indicate that the convertor possesses, as of the date the conversion claim is processed, unexpended allowances or authorizations sufficient to cover the conversion claim (i.e., the amount to be converted plus, in the case of conversions of production or consumption allowances, one percent of that amount). Within three working days of receiving a complete conversion claim, the Administrator will take action to notify the convertor as follows:

(i) If EPA's records show that the convertor has sufficient unexpended allowances or authorizations to cover the conversion claim or if review of available information is insufficient to make a determination, the Administrator will issue a notice indicating that EPA does not object to the conversion and will reduce the convertor's balance of unexpended allowances or authorizations by the amount to be converted plus, in the case of conversions of production or consumption allowances, one percent of that amount. When EPA issues a no objection notice, the convertor may proceed with the conversion. However, if EPA ultimately finds that the convertor did not have sufficient unexpended allowances or authorizations to cover the claim, the convertor will be held liable for any violations of the regulations of this subpart that occur as a result of, or in conjunction with, the improper conversion.

(ii) If EPA's records show that the convertor has insufficient unexpended allowances or authorizations to cover the conversion claim, or that the convertor has failed to respond to one or more Agency requests to supply information needed to make a determination, the Administrator will issue a notice disallowing the conversion. Within 10 working days after receipt of notification, the convertor may file a notice of appeal, with supporting reasons, with the Administrator. The Administrator may affirm or vacate the disallowance. If no appeal is taken by the tenth working day after notification, the disallowance shall be final on that day.

(3) In the event that the Administrator does not respond to a conversion claim within the three working days specified in paragraph (b)(2) of this section, the convertor may proceed with the conversion. EPA will reduce the convertor's balance of unexpended allowances by the amount to be converted plus, in the case of conversions of production or consumption allowances, one percent of that amount. However, if EPA ultimately finds that the convertor did not have sufficient unexpended allowances or authorizations to cover the claims, the convertor will be held liable for any violations of the regulations of this subpart that occur as a result of, or in conjunction with, the improper conversion.

(c) *Inter-company transfers and Inter-pollutant conversions.* If a person requests an inter-company transfer and an inter-pollutant conversion simultaneously, the amount subtracted from the convertor-transferor's unexpended allowances for the first controlled substance will be equal to 101 percent of the amount of allowances converted and transferred in the case of transfer-conversions of production or consumption allowances.

§ 82.13 Record-keeping and reporting requirements.

(a) Unless otherwise specified, the recordkeeping and reporting requirements set forth in this section take effect on January 1, 1994.

(b) Reports and records required by this section may be used for purposes of compliance determinations. These requirements are not intended as a limitation on the use of other evidence admissible under the Federal Rules of Evidence.

(c) Unless otherwise specified, reports required by this section must be mailed to the Administrator within 45 days of the end of the applicable reporting period.

(d) Records and copies of reports required by this section must be retained for three years.

(e) In reports required by this section, quantities of controlled substances must be stated in terms of kilograms.

(f) Every person ("producer") who produces class I controlled substances during a control period must comply with the following recordkeeping and reporting requirements:

(1) Within 120 days of December 10, 1993, or within 120 days of the date that a producer first produces a class I controlled substance, whichever is later, every producer who has not already done so must submit to the Administrator a report describing:

(i) The method by which the producer in practice measures daily quantities of controlled substances produced;

(ii) Conversion factors by which the daily records as currently maintained can be converted into kilograms of controlled substances produced, including any constants or assumptions used in making those calculations (e.g., tank specifications, ambient temperature or pressure, density of the controlled substance);

(iii) Internal accounting procedures for determining plant-wide production;

(iv) The quantity of any fugitive losses accounted for in the production figures; and

(v) The estimated percent efficiency of the production process for the controlled substance.

Within 60 days of any change in the measurement procedures or the information specified in the report in paragraph (b), the producer must submit a report specifying the revised data or procedures to the Administrator.

(2) Every producer of a class I controlled substance during a control period must maintain the following records:

(i) Dated records of the quantity of each controlled substance produced at each facility;

(ii) Dated records of the quantity of controlled substances produced for use in processes that result in their transformation or for use in processes that result in their destruction and quantity sold for use in processes that result in their transformation or for use in processes that result in their destruction;

(iii) Copies of invoices or receipts documenting sale of controlled substance for use in processes resulting in their transformation or for use in processes resulting in destruction;

(iv) Dated records of the quantity of each controlled substance used at each facility as feedstocks or destroyed in the manufacture of a controlled substance or in the manufacture of any other substance, and any controlled substance introduced into the production process of the same controlled substance at each facility;

(v) Dated records identifying the quantity of each chemical not a controlled substance produced within each facility also producing one or more controlled substances;

(vi) Dated records of the quantity of raw materials and feedstock chemicals used at each facility for the production of controlled substances;

(vii) Dated records of the shipments of each controlled substance produced at each plant;

(viii) The quantity of controlled substances, the date received, and names and addresses of the source of recyclable or recoverable materials containing controlled substances which are recovered at each plant;

(ix) Records of the date, the controlled substance, and the estimated quantity of any spill or release of a controlled substance that equals or exceeds 100 pounds; and

(x) Copies of IRS certification that the controlled substance will be transformed or the verification that it will be destroyed.

(3) For each quarter, each producer of a class I controlled substance must provide the Administrator with a report containing the following information:

(i) The production by company in that quarter of each controlled substance, specifying the quantity of any controlled substance used in processing, resulting in its transformation by the producer;

(ii) The amount of production for use in processes resulting in destruction of controlled substances by the producer;

(iii) The levels of production (expended allowances) for each controlled substance;

(iv) The producer's total of expended and unexpended consumption allowances, potential production allowances, production allowances, and authorizations to convert potential production allowances to production allowances, as of the end of that quarter;

(v) The quantity, the date received, and names and addresses of the sources of recyclable and recoverable materials containing the controlled substances which are recovered;

(vi) The amount of controlled substance sold or transferred during the quarter to a person other than the producer for use in processes resulting in its transformation or eventual destruction; and

(vii) Internal Revenue Service Certificates in the case of transformation, or the purchaser's destruction verification in the case of destruction, showing that the purchaser or recipient of a controlled substance intends to either transform or destroy the controlled substance.

(4) For any person who fails to maintain the records required by this paragraph (f), or to submit the report required by this paragraph (f), the Administrator may assume that the person has produced at full capacity during the period for which records were not kept, for purposes of determining whether the person has violated the prohibitions at § 82.4.

(g) Importers of class I controlled substances during a control period must comply with recordkeeping and reporting requirements specified in this section.

(1) Any importer of a class I controlled substance must maintain the following records:

(i) The quantity of each controlled substance imported, either alone or in mixtures, including the percentage of each mixture which consists of a controlled substance;

(ii) The quantity of controlled substances other than transhipments or used or recycled substances imported for use in processes resulting in their transformation or destruction and quantity sold for use in processes that result in their destruction or transformation;

(iii) The date on which the controlled substances were imported;

(iv) The port of entry through which the controlled substances passed;

(v) The country from which the imported controlled substances were imported;

(vi) The commodity code for the controlled substances shipped;

(vii) The importer number for the shipment;

(viii) A copy of the bill of lading for the import;

(ix) The invoice for the import;

(x) The quantity of imports of used and recycled class I controlled substances and class II controlled substances;

(xi) The U.S. Customs entry form;

(xii) Dated records documenting the sale or transfer of controlled substances for use in process resulting in transformation or destruction; and

(xiii) Copies of IRS certifications that the controlled substance will be transformed or destruction verifications that it will be destroyed.

(2) *Reporting Requirements-Importers.* For each quarter, every importer of a class I controlled substance must submit to the Administrator a report containing the following information:

(i) Summaries of the records required in paragraphs (g)(1) (i) through (vii) of this section for the previous quarter;

(ii) The total quantity imported in kilograms of each controlled substance for that quarter;

(iii) The levels of import (expended consumption allowances) of controlled substances for that quarter and totaled by chemical for the control-period-to-date;

(iv) The importer's total sum of expended and unexpended consumption allowances by chemical as of the end of that quarter;

(v) The amount of controlled substances imported for use in processes resulting in their transformation or destruction;

(vi) The amount of controlled substances sold or transferred during the quarter to each person for use in processes resulting in their transformation or eventual destruction;

(vii) Internal Revenue Service Certificates showing that the purchaser or recipient of imported controlled substances intends to transform those substances or destruction verifications showing that purchaser or recipient intends to destroy the controlled substances.

(h) *Reporting Requirements-Exporters.* For any exports of class I controlled substances not reported under § 82.10 (additional consumption allowances) or § 82.11 (Exports to Parties), the exporter who exported a class I controlled substances must submit to the Administrator the following information within 45 days after the end of the control period in which the unreported exports left the United States:

(1) The names and addresses of the exporter and the recipient of the exports;

(2) The exporter's Employee Identification Number;

(3) The type and quantity of each controlled substance exported and what percentage, if any, of the controlled substance are recycled or used;

(4) The date on which and the port from which the controlled substances were exported from the United States or its territories;

(5) The country to which the controlled substances were exported; and

(6) The commodity code of the controlled substance shipped.

(i) Every person who has requested additional production allowances under § 82.9(c) or consumption allowances under § 82.10(b) or who transforms or destroys class I controlled substances not produced by that person must maintain the following:

(1) Dated records of the quantity and level of each controlled substance transformed or destroyed;

(2) Copies of the invoices or receipts documenting the sale or transfer of the controlled substance to the person;

(3) In the case where those controlled substances are transformed, dated records of the names, commercial use, and quantities of the resulting chemical(s);

(4) In the case where those controlled substances are transformed, dated records of shipments to purchasers of the resulting chemical(s);

(5) Dated records of all shipments of controlled substances received by the person, and the identity of the producer or importer of the controlled substances;

(6) Dated records of inventories of controlled substances at each plant on the first day of each quarter; and

(7) A copy of the person's IRS certification of intent to transform or the purchaser's destruction verification of intent to destroy, in the case where substances were purchased for transformation or destruction purposes.

(j) Persons who destroy class I controlled substances shall provide EPA with a one-time report stating the destruction unit's destruction efficiency and the methods used to record the volume destroyed and those used to determine destruction efficiency and the name of other relevant Federal or state regulations that may apply to the destruction process. Any changes to the unit's destruction efficiency or methods used to record volume destroyed and to determine destruction efficiency must be reflected in a revision to this report to be submitted to EPA within 60 days of the change.

(k) Persons who purchase and subsequently destroy controlled class I substances shall provide the producer or importer from whom they purchase controlled substances to be destroyed with a verification that controlled substances will be used in processes that result in their destruction.

(1) The verification shall include the following:

(i) Identity and address of the person intending to destroy controlled substances;

(ii) Indication of whether those controlled substances will be completely destroyed, as defined in § 82.3, or less than completely destroyed, in which case the destruction efficiency at which such substances will be destroyed must be included;

(iii) Period of time over which the person intends to destroy controlled substances; and

(iv) Signature of the verifying person.

(2) If, at any time, any aspects of this verification change, the person must submit a revised verification reflecting such changes to the producer from whom that person purchases controlled substances intended for destruction.

(l) Persons who purchase class I controlled substances and who subsequently transform such controlled substances shall provide the producer or importer with the IRS certification that the controlled substances are to be used in processes resulting in their transformation.

(m) Any person who transforms or destroys class I controlled substances must report the names and quantities of class I controlled substances transformed and destroyed for each control period within 45 days of the end of such control period.

(n) Every person who produces, imports, or exports class II chemicals must report its quarterly level of production, imports, and exports of these chemicals within 45 days of the end of each quarter.

(o) Persons who import or export used or recycled controlled substances must label their bill of lading or invoice indicating that the controlled substance is used or recycled.

(p) Every person who imports or exports used or recycled group II, class I controlled substances, or class II controlled substances must report its annual level within 45 days of the end of the control period.

(q) Every person who transships a controlled substance must maintain records that indicate that the controlled substance shipment originated in one country destined for another country, and does not enter interstate commerce with the United States.

Appendix A to Subpart A—Class 1 Controlled Substances

	ODP
A. Group I:	
CFC–1_3-Trichlorofluoromethane (CFC–11)	1.0
CF_2C1_2-Dichlorodifluoromethane (CFC–12)	1.0
$C_2F_3C1_3$-Trichlorotrifluoroethane (CFC–113)	0.8
$C_2F_4C1_2$-Dichlorotetrafluoroethane (CFC–114)	1.0
C_2F_5C1-Monochloropentaf luoroethane (CFC–115)	0.6
C_2F_5C1–Monochloropentafluoroethane	
All isomers of the above chamicals	
B. Group II:	
CF_2C1Br-Bromochlorodifluoromethane (Halon-1211)	3.0
CF_3Br-Bromotrifluoromethane (Halon-1301)	10.0
$C_2F_4Br_2$-Dibromotetrafluoroethane (Halon-2402)	6.0
All isomers of the above chemicals	
C. Group III:	
CF_3C1-Chlorotrifluoromethane (CFC–13)	1.0
C_2FC1_5- (CFC–111)	1.0
$C_2F_2C1_4$- (CFC–112)	1.0
C_3FC1_7- (CFC–211)	1.0
$C_3F_2C1_6$- (CFC–212)	1.0
$C_3F_3C1_5$- (CFC–213)	1.0
$C_3F_4C1_4$- (CFC–214)	1.0
$C_3F_5C1_3$- (CFC–215)	1.0
$C_3F_6C1_2$- (CFC–216)	1.0
C_3F_7C1- (CFC–217)	1.0
All isomers of the above chemicals	
D. Group IV:	
$CC1_4$-Carbon Tetrachloride	1.1
E. Group V:	
$C_2H_3C1_3$-1,1,1 Trichloroethane. (Methyl chloroform)	0.1
All isomers of the above chemical except l,l,2-trichloromethane	
F. Group VI:	
CH3Br—Bromomethane (Methyl Bromide)	0.7
G. Group VII:	

	ODP
$CHFBR_2$	1.00
CHF_2Br (HBFC–22B1)	0.74
CH_2FBr	0.73
C_2HFBr_4	0.3–0.8
$C_2HF_2Br_3$	0.5–1.8
$C_2HF_3Br_2$	0.4–1.6
C_2HF_4Br	0.7–1.2
$C_2H_2FBr_3$	0.1–1.1
$C_2H_2F_2Br_2$	0.2–1.5
$C_2H_2F_3Br$	0.7–1.6
$C_2H_3FBr_2$	0.1–1.7
$C_2H_3F_2Br$	0.2–1.1
C_2H_4FBr	0.07–0.1
C_3HFBr_6	0.3–1.5
$C_3HF_2Br_5$	0.2–1.9
$C_3HF_3Br_4$	0.3–1.8
$C_3HF_4Br_3$	0.5–2.2
$C_3HF_5Br_2$	0.9–2.0
C_3HF_6Br	0.7–3.3
$C_3H_2FBR_5$	0.1–1.9
$C_3H_2F_2BR_4$	0.2–2.1
$C_3H_2F_3Br_3$	0.2–5.6
$C_3H_2F_4Br2$	0.3–7.5
$C_3H_2F_5BR$	0.9–1.4
$C_3H_3FBR_4$	0.08–1.9
$C_3H_3F_2Br_3$	0.1–3.1
$C_3H_3F_3Br_2$	0.1–2.5
$C_3H_3F_4Br$	0.3–4.4
$C_3H_4FBr_3$	0.03–0.3
$C_3H_4F_2Br_2$	0.1–1.0
$C_3H_4F_3Br$	0.07–0.8
$C_3H_5FBr_2$	0.04–0.4
$C_3H_5F_2Br$	0.07–0.8
C_3H_6FB	0.02–0.7

Appendix B to Subpart A—Class II Controlled Substances

	ODP
$CHFC1_2$-Dichlorofluoromethane (HCFC–21)	[res.]
CHF_2C1-Chlorodifluoromethane (HCFC–22)	0.05
CH_2FC1-Chlorofluoromethane (HCFC–31)	[res.]
C_2HFC1_4- (HCFC–121)	[res.]
$C_2HF_2C1_3$- (HCFC–122)	[res.]
$C_2HF_3C1_2$- (HCFC–123)	0.02
C_2HF_4C1- (HCFC–124)	0.02
$C_2H_2FC1_3$- (HCFC–131)	[res.]
$C_2H_2F_2C1_2$- (HCFC–132b)	[res.]
$C_2H_2F_3C1$- (HCFC–133a)	[res.]
$C_2H_3FC1_2$- (HCFC–141b)	0.12
$C_2H_3F_2C1$- (HCFC–142b)	0.06
C_3HFC1_6- (HCFC–221)	[res.]
$C_3HF_2C1_5$- (HCFC–222)	[res.]
$C_3HF_3C1_4$- (HCFC–223)	[res.]
$C_3HF_4C1_3$- (HCFC–224)	[res.]
$C_3HF_5C1_2$- (HCFC–225ca)	[res.]

	ODP
$C_3HF_5C1_2$ (HCFC-225cb)	[res.]
C_3HF_6C1- (HCFC-226)	[res.]
$C_3H_2FC1_5$- (HCFC-231)	[res.]
$C_3H_2F_2C1_4$- (HCFC-232)	[res.]
$C_3H_2F_3C1_3$- (HCFC-233)	[res.]
$C_3H_2F_4C1_2$- (HCFC-234)	[res.]
$C_3H_2F_5C1$- (HCFC-235)	[res.]
$C_3H_3FC1_4$- (HCFC-241)	[res.]
$C_3H_3F_2C1_3$- (HCFC-242)	[res.]
$C_3H_3F_3C1_2$- (HCFC-243)	[res.]
$C_3H_3F_4C1$- (HCFC-244)	[res.]
$C_3H_4FC1_3$- (HCFC-251)	[res.]
$C_3H_4F_2C1_2$- (HCFC-252)	[res.]
$C_3H_4F_3C1$- (HCFC-253)	[res.]
$C_3H_5FC1_2$- (HCFC-261)	[res.]
$C_3H_5F_2C1$- (HCFC-262)	[res.]
C_3H_6FC1- (HCFC-271)	[res.]
All isomers of the above chemicals	

Appendix C to Subpart A—Annex 1–Parties to the Montreal Protocol:

Foreign state	Montreal protocol	London amendments	Copenhagen amendments
Algeria	✓	✓	
Antigua and Barbuda	✓	✓	✓
Argentina	✓	✓	
Australia	✓	✓	
Austria	✓	✓	
Bahamas	✓	✓	✓
Bahrain	✓	✓	
Bangladesh	✓		
Barbados	✓		
Belarus	✓		
Belgium	✓	✓	
Benin	✓		
Bosnia and Herzegovina	✓		
Botswana	✓		
Brazil	✓	✓	
Burnei	✓		
Bulgaria	✓		
Burkina Faso	✓		
Cameroon	✓	✓	
Canada	✓	✓	
Central African Republic	✓		
Chile	✓	✓	
China	✓	✓	
Costa Rica	✓		
Cote Ivoire	✓		
Croatia	✓		
Cuba	✓		
Cyprus	✓		
Czech Republic	✓		
Denmark	✓	✓	
Dominica	✓	✓	

Foreign state	Montreal protocol	London amendments	Copenhagen amendments
Dominican Republic	✓		
Ecuador	✓	✓	
Egypt	✓	✓	
El Salvador	✓		
European E.C.	✓	✓	
Fiji	✓		
Finland	✓	✓	
France	✓	✓	
Gambia	✓		
Germany	✓	✓	
Ghana	✓	✓	
Greece	✓	✓	
Grenada	✓		
Guatemala	✓		
Guinea	✓	✓	
Hungary	✓		
Iceland	✓	✓	
India	✓	✓	
Indonesia	✓	✓	
Iran	✓		
Ireland	✓	✓	
Israel	✓	✓	
Italy	✓	✓	
Jamaica	✓	✓	
Japan	✓	✓	
Jordan	✓		
Kenya	✓		
Kiribati	✓		
Korea, Republic of	✓	✓	
Kuwait	✓		
Lebanon	✓	✓	
Libya	✓		
Liechtenstein	✓		
Luxembourg	✓	✓	
Malawi	✓		
Malaysia	✓	✓	✓
Maldives	✓	✓	
Malta	✓		
Marshall Islands	✓	✓	✓
Mauritius	✓	✓	
Mexico	✓	✓	
Monaco	✓	✓	
Namibia	✓		
Netherlands	✓	✓	
New Zealand	✓	✓	✓
Nicaragua	✓		
Niger	✓		
Nigeria	✓		
Norway	✓	✓	✓
Pakistan	✓	✓	
Panama	✓		
Papua New Guinea	✓	✓	
Paraguay	✓	✓	
Peru	✓	✓	
Philippines	✓	✓	
Poland	✓		
Portugal	✓	✓	
Romania	✓	✓	
Russian Federation	✓	✓	
Saint Kitts and Nevis	✓		
Samoa	✓		
Saudi Arabia	✓	✓	
Senegal	✓	✓	
Seychelles	✓	✓	
Singapore	✓	✓	
Slovenia	✓	✓	
Solomon Islands	✓	✓	
South Africa	✓	✓	
Spain	✓	✓	
Sri Lanka	✓	✓	
Sudan	✓		

Foreign state	Montreal protocol	London amendments	Copenhagen amendments
Swaziland	✓		
Sweden	✓		
Switzerland	✓	✓	✓
Syrian Arab Republic	✓	✓	
Tanzania	✓		
Thailand	✓	✓	
Togo	✓	✓	
Trinidad and Tobago	✓		
Tunisia	✓		
Turkey	✓	✓	
Tuvalu	✓		
Uganda	✓		
Ukranian SSR	✓		
United Arab Emirates	✓		
United Kingdom	✓		
United States	✓	✓	
Uruguay	✓	✓	
Uzbekistan	✓		
Venezuela	✓		
Zambia	✓	✓	
Zimbabwe	✓		

Appendix C to Subpart A,[1]—Annex 2—Nations Complying With, but not Parties to, the Protocol: Colombia

Appendix D to Subpart A—Harmonized Tariff Schedule

Description of Products that May Contain Controlled Substances in Appendix A, Class I Groups I and II

This Appendix is based on information provided by the Ozone Secretariat of the United Nations Ozone Environment Programme. The Appendix lists available U.S. harmonized tariff schedule codes identifying headings and subheadings for Annex D products that may contain controlled substances.

The Harmonized Tariff Schedule of the United States uses a enumeration system to identify products imported and exported to and from the U.S. This system relies on a four digit heading, a four digit subheading and additional two digit statistical suffix to characterize products. The United States uses the suffix for its own statistical records and analyses. This Appendix lists only headings and subheadings.

While some can be readily associated with harmonized system codes, many products cannot be tied to HS classifications unless their exact composition and the presentation are known. It should be noted that the specified HS classifications represent the most likely headings and subheadings which may contain substances controlled by the Montreal Protocol. The codes given should only be used as a starting point; further verification is needed to ascertain whether or not the products actually contain controlled substances.

Category 1. Automobile and Truck Air Conditioning Units—(Whether Incorporated in Vehicles or Not)

There are no separate code numbers for air conditioning units specially used in automobiles and trucks. Although a code has been proposed for car air conditioners, it is not yet officially listed in the Harmonized Tariff Schedule (see category 2). The following codes apply to the vehicles potentially containing air conditioning units.

Heading/Subheading and Article Description

8701.(10, 20, 30, 90)[2]—Tractors

8702—Public-transport type passenger motor vehicles.

8702.10—With compression-ignition internal-combustion piston engine (diesel or semi-diesel).

8702.90—Other.

8703—Motor cars and other motor vehicles principally designed for the transport of persons (other than those of heading 8702), including station wagons and racing cars.

8703.10—Vehicles specially designed for traveling on snow; golf carts and similar vehicles; includes subheading 10.10 and 10.50.

8703.(21, 22, 23, 24)—Other vehicles, with spark-ignition internal combustion reciprocating engines.

8703.(31, 32, 33, 90)—Other vehicles, with compression-ignition internal combustion piston engine (diesel or semi-diesel).

8704—Motor vehicles for the transport of goods.

8704.10.(10, 50)—Dumpers designed for off-highway use.

8704.(21, 22, 23)—Other, with compression-ignition internal combustion piston engine (diesel or semi-diesel).

8704.(31, 32, 90)—Other, with compression-ignition internal combustion piston engine.

8705—Special purpose motor vehicles, other than those principally designed for the transport of persons or goods (for example, wreckers, mobile cranes, fire fighting vehicles, concrete mixers, road sweepers, spraying vehicles, mobile workshops, mobile radiological units).

8705.10—Crane lorries.

8705.20—Mobile drilling derricks.

8705.30—Fire fighting vehicles.

8705.90—Other.

Category 2. Domestic and Commercial Refrigeration and Air Conditioning/Heat Pump Equipment

Domestic and commercial air conditioning and refrigeration equipment fall primarily under headings 8415 and 8418.

Heading/Subheading and Article Description

8415—Air conditioning machines, comprising a motor-driven fan and elements for changing the temperature and humidity, including those machines in which the humidity cannot be separately regulated.

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[1] Regarding Taiwan, see preamble discussion VI (Trade Restrictions)

[2] At this time vehicle air conditioning units are considered components of vehicles or are classified under the general category for air conditioning and refrigeration equipment. Vehicles containing air conditioners are therefore considered products containing controlled substances.

8415.20—Proposed code for air conditioning of a kind used for persons, in motor vehicles.
8415.10.00—A/C window or wall types, self-contained.
8415.81.00—Other, except parts, incorporating a refrigerating unit and a valve for reversal of the cooling/heat cycle.
8415.82.00—Other, incorporating a refrigerating unit; Self-contained machines and remote condenser type air conditioners (not for year-round use); Year-round units (for heating and cooling); Air Conditioning evaporator coils; Dehumidifiers; and other air conditioning machines incorporating a refrigerating unit.
8415.83—Automotive air conditioners.
8418—Refrigerators, freezers and other refrigerating or freezing equipment, electric or other; heat pumps, other than air conditioning machines of heading 8415; parts thereof.
8418.10.00—Combined refrigerator-freezers, fitted with separate external doors.
8418.21.00—Refrigerators, household type, compression type.
8418.22.00—Absorption type, electrical.
8418.29.00—Other.
8418.30.00—Freezers of the chest type.
8418.40—Freezers of the upright type.
8418.50.0040—Other refrigerating or freezing chests, cabinets, display counters, showcases and similar refrigerating or freezing furniture.
8418.61.00—Other refrigerating or freezing equipment; heat pumps.
8418.69—Other Icemaking machines; drinking water coolers, self-contained; soda fountain and beer dispensing equipment; centrifugal liquid chilling refrigerating units; absorption liquid chilling units; reciprocating liquid chilling units; and other refrigerating or freezing equipment (household or other).
8479.89.10—Dehumidifiers (other than those under 8415 or 8424 classified as "machines and mechanical appliances having individual functions, not specified or included elsewhere").

Category 3. Aerosol Products

An array of different products use controlled substances as aerosols and in aerosol applications. Not all aerosol applications use controlled substances, however. The codes given below represent the most likely classifications for products containing controlled substances. The product codes listed include:[3]

- Varnishes.
- Perfumes.
- Preparations for use on hair.
- Preparations for oral and dental hygiene.
- Shaving preparations.
- Personal deodorants, bath preparations.
- Prepared room deodorizers.
- Soaps.
- Lubricants.
- Polishes and creams.
- Explosives.
- Insecticides, fungicides, herbicides, disinfectants.
- Arms and ammunition.
- Household products such as footwear or leather polishes.
- Other miscellaneous products.

Heading/Subheading and Article Description

3208—Paints and varnishes[4] (including enamels and lacquers) based on synthetic polymers of chemically modified natural polymers, dispersed or dissolved in a non-aqueous medium.
3208.10—Based on polyesters.
3208.20—Based on acrylic or vinyl polymers.
3208.90—Other.
3209—Paints and varnishes (including enamels and lacquers) based on synthetic polymers or chemically modified natural polymers, dispersed or dissolved in a an aqueous medium.
3209.10—Based on acrylic or vinyl polymers.
3209.90—Other.
3210.00—Other paints and varnishes (including enamels, lacquers and distempers) and prepared water pigments of a kind used for finishing leather.
3212.90—Dyes and other coloring matter put up in forms or packings for retail sale.
3303.00—Perfumes and toilet waters.
3304.30—Manicure or pedicure preparations.
3305.10—Shampoos.
3305.20—Preparations for permanent waving or straightening.
3305.30—Hair lacquers.
3305.90—Other hair preparations.
3306.10—Dentrifices.
3306.90—Other dental (this may include breath sprays).
3307.10—Pre-shave, shaving or aftershave preparations.
3307.20—Personal deodorants and antiperspirants.
3307.30—Perfumed bath salts and other bath preparations.
3307.49 Other (this may include preparations for perfuming or deodorizing rooms, including odoriferous preparations used during religious rites, whether or not perfumed or having disinfectant properties).
3307.90—Other (this may include depilatory products and other perfumery, cosmetic or toilet preparations, not elsewhere specified or included).
3403—Lubricating preparations (including cuttingoil preparations, bolt or nut release preparations, anti-rust or anti-corrosion preparations and mould release preparations, based on lubricants and preparations of a kind used for [illegible] oil or grease treatment of textile materials, leather, fur skins or other materials, but excluding preparations containing, as basic constituents, 70 percent or more by weight of petroleum oils or of oils obtained from bituminous minerals.
3402—Organic surface-active agents (other than soap); surface-active preparations, washing preparations and cleaning operations, whether or not containing soap, other than those of 3401.
3402.20—Preparations put up for retail sale.
3402.19—Other preparations containing petroleum oils or oils obtained from bituminous minerals.
3403—Lubricating preparations consisting of mixtures containing silicone greases or oils, as the case may be.
2710.00—Preparations not elsewhere specified or included, containing by weight 70 percent or more of petroleum oils or of oils obtained from bituminous minerals, these oils being the basic constituents of the preparations.
3403.11—Lubricants containing petroleum oils or oils obtained from bituminous minerals used for preparations from the treatment of textile materials, leather, fur skins or other materials.
3403.19—Other preparations containing petroleum oils or oils obtained from bituminous minerals.
3405—Polishes and creams, for footwear, furniture, floors, coachwork, glass or metal, scouring pastes and

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[3] Other categories of products that may contain controlled substances are listed below. EPA is currently working to match them with appropriate codes. They include: coatings and electronic equipment (e.g., electrical motors), coatings or cleaning fluids for aircraft maintenance, mold release agents (e.g. for production of plastic or elastomeric materials), water and oil repellant (potentially under HS 3402), spray undercoats (potentially under "paints and varnishes"), spot removers, brake cleaners, safety sprays (e.g., mace cans), animal repellant, noise horns (e.g., for use on boats), weld inspection developers, freezants, gum removers, intruder alarms, tire inflators, dusters (for electronic and non-electronic applications), spray shoe polish, and suede protectors.

[4] Although paints do not generally use contain controlled substances, some varnishes use CFC 113 and 1,1,1, trichlorethane as solvents.

powders and similar preparations excluding waxes of heading 3404.
3405.10—Polishes and creams for footwear or leather.
3405.20—Polishes for wooden furniture, floors or other woodwork.
36—Explosives.
3808—Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant-growth regulators, disinfectants and similar products, put up in forms or packings for retail sale or as preparations or articles (for example, sulphur-treated bands, wicks and candles, and fly papers).
3808.10—Insecticides.
3808.20—Fungicides.
3808.30—Herbicides, anti-sprouting products and plant growth regulators.
3808.40—Disinfectants.
3808.90—Other insecticides, fungicides.
3809.10—Finishing agents, dye carriers to accelerate the dyeing or fixing of dye-stuffs and other products and preparations (for example, dressings and mordants) of a kind used in the textile, paper, leather or like industries, not elsewhere specified or included, with a basis of amylaceous substances.
3814—Organic composite solvents and thinners (not elsewhere specified or included) and the prepared paint or varnish removers.
3910—Silicones in primary forms.
930[illegible]—Other arms (for example, spring, air or gas guns and pistols, truncheons), excluding those of heading No. 93.07. Thus, aerosol spray cans containing tear gas may be classified under this subheading.
0404.90—Products consisting of natural milk constituents, whether or not containing added sugar or other sweetening matter, not elsewhere specified or included.
1517.90—Edible mixtures or preparations of animal or vegetable fats or oils or of fractions of different fats or oils of this chapter, other than edible fats or oils or their fractions of heading No. 15.16.
2106.90—Food preparations not elsewhere specified or included.

Category 4. Portable Fire Extinguishers

Heading/Subheading and Article Description

8424—Mechanical appliances (whether or not hand operated) for projecting, dispersing, or spraying liquids or powders; fire extinguishers whether or not charged, spray guns and similar appliances; steam or sand blasting machines and similar jet projecting machines. *
8424.10—Fire extinguishers, whether or not charged.

Category 5. Insulation Boards, Panels and Pipe Covers

These goods have to be classified according to their composition and presentation. For example, if the insulation materials are made of polyurethane, polystyrene, polyolefin and phenolic plastics, then they may be classified Chapter 39, for "Plastics and articles thereof". The exact description of the products at issue is necessary before a classification can be given.[5]

Heading/Subheading and Article Description

3917.21 to 3917 39—Tubes, pipes and hoses of plastics.
3920.10 to 3920.99—Plates, sheets, film, foil and strip made of plastics, noncellular and not reinforced, laminated, supported or similarly combine with other materials.
3921.11 to 3921.90—Other plates, sheets, film, foil and strip, made of plastics.
3925.90—Builders' ware made of plastics, not elsewhere specified or included.
3926.90—Articles made of plastics, not elsewhere specified or included.

Category 6. Pre-Polymers

According to the Explanatory Notes to the Harmonized Commodity Description and Coding System, "prepolymers are products which are characterized by some repetition of monomer units although they may contain unreacted monomers. Prepolymers are not normally used as such but are intended to be transformed into higher molecular weight polymers by further polymerization. Therefore the term does not cover finished products, such as di-isobutylenes or mixed polyethylene glycols with very low molecular weight. Examples are epoxides based with epichlorohydrin, and polymeric isocyanates."

Heading/Subheading and Article Description

3901—Pre-polymers based on ethylene (in primary forms).
3902—Pre-polymers based on propylene or other olefins (in primary forms).
3903, 3907, 3909—Pre-polymers based on styrene (in primary forms), epoxide and phenols.

Appendix E to Subpart A—Article 5 Parties

Algeria, Antigua and Barbuda, Argentina, Bahrain, Bangladesh, Barbados, Benin, Botswana, Brazil, Burkina Faso, Cameroon, Central African Republic, Chile, China, Costa Rica, Cote Ivoire, Croatia, Cuba, Cyprus, Dominica, Dominican Republic, Ecuador, Egypt, El Salvador, Fiji, Gambia, Ghana, Grenada, Guatemala, Guinea, India, Indonesia, Iran, Jamaica, Jordan, Kenya, Kiribati, Lebanon, Libya, Malawi, Malasia, Maldives, Marshall Islands, Mauritius, Mexico, Namibia, Nicaragua, Niger, Nigeria, Pakistan, Panama, Papua New Guinea, Paraguay, Peru, Philippines, Romania, Saint Kitts and Nevis, Samoa, Senegal, Seychelles, Slovenia, Sri Lanka, Sudan, Swaziland, Syrian Arab Republic, Tanzania, Thailand, Togo, Trinidad and Tobago, Tunisia, Turkey, Tuvalu, Uganda, Uruguay, Venezuela, Zambia, Zimbabwe.

Appendix F to Subpart A—Listing of Ozone Depleting Chemicals

Controlled substance	ODP	AT L	CLP	BLP
A. Class I 1. Group I:				
$CFC1_3$–Trichlorofluoromethane (CFC–11)	1.0	60.0	1.0	0.00
CF_2C1_2–Dichlorodifluoromethane (CFC–12)	1.0	120.0	1.5	0.00
$C_2F_3C1_3$–Trichlorotrifluoroethane (CFC–113)	0.8	90.0	1.11	0.00
$C_2F_4C1_2$–Dichlorotetrafluoroethane (CFC–114)	1.0	200.00	1.8	0.00
C_2F_5–C1Monochloropentafluoroethane (CFC–115)	0.6	400.0	2.0	0.00
All isomers of the above chemicals [reserved]				
2. Group II:				
CF_2 C1Br-Bromochlorodifluoromethane (Halon–1211)	3.0	12	0.06	0.13

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[5] This category may include insulating board for building panels and windows and doors. It also includes rigid appliance insulation for pipes, tanks, trucks, trailers, containers, train cars & ships, refrigerators, freezers, beverage vending machines, bulk beverage dispensers, water coolers and heaters and ice machines.

Controlled substance	ODP	AT L	CLP	BLP
	−18	−.08	−.03	
CF_3 Br Bromotrifluoromethane (Halon–1301)	10.0	72	0.00	1.00
	−107			
C_2F_4 Br_2 Dibromotetrafluoroethane (Halon–2402)	6.0	23	0.00	0.30
	−28		−.37	
All isomers of the above chemicals [reserved]				
3. Group III:				
CF_3C1–Chlorotrifluoromethane (CFC–13)	1.0	120	0.83	0.00
	−250	−1.83		
C_2FC1_5–(CFC–111)	1.0	60	1.04	0.00
	−90	−1.56		
$C_2F_2C1_4$–(CFC–112)	1.0	60	0.90	0.00
	−90	−1.35		
C_3FC1_7–(CFC–211)	1.0	100	1.76	0.00
	−500	−8.81		
$C_3F_2C1_6$–(CFC–212)	1.0	100	1.60	0.00
	−500	−7.98		
$C_3F_3C1_5$–(CFC–213)	1.0	100	1.41	0.00
	−500	−7.06		
$C_3F_4C1_4$–(CFC–214)	1.0	100	1.20	0.00
	−500	−6.01		
$C_3F_5C1_3$–(CFC–215)	1.0	100	0.96	0.00
	−500	−4.82		
$C_3F_6C1_2$–(CFC–216)	1.0	100	0.69	0.00
	−500	−3.45		
C_3F_7C1–(CFC–217)	1.0	100	0.37	0.00
	−500	−1.87		
All isomers of the above chemicals [reserved]				
4. Group IV:				
$CC1_4$–Carbon Tetrachloride	1.1	50.0	1.0	0.00
5. Group V:				
$C_2H_3C1_3$–1,1,1 Trichloroethane (Methyl chloroform)	0.1	6.3	0.11	0.00
All isomers of the above chemical except 1,1,2-trichloroethane [reserved]				
6. Group VI:				
CH3Br–Bromomethane (Methyl Bromide)	0.7		[reserved]	
7. Group VII:				
$CHFBR_2$–	1.00		[reserved]	
CHF_2Br(HBFC–22B1)	0.74		[reserved]	
CH_2FBr	0.73		[reserved]	
C_2HFBr_4	0.3 – 0.8		[reserved]	
$C_2HF_2Br_3$	0.5 – 1.8		[reserved]	
$C_2HF_3Br_2$	0.4 – 1.6		[reserved]	
C_2HF_4Br	0.7 – 1.2		[reserved]	
$C_2H_2FBr_3$	0.1 – 1.1		[reserved]	
$C_2H_2F_2Br_2$	0.2 – 1.5		[reserved]	
$C_2H_2F_3Br$	0.7 – 1.6		[reserved]	
$C_2H_3FBr_2$	0.1 – 1.7		[reserved]	
$C_2H_3F_2Br$	0.2 – 1.1		[reserved]	
C_2H_4 Br	0.07 – 0.1		[reserved]	
C_3HFBr_6	0.3 – 1.5		[reserved]	
$C_3HF_2Br_5$	0.2 – 1.9		[reserved]	
$C_3HF_3Br_4$	0.3 – 1.8		[reserved]	
$C_3HF_4Br_3$	0.5 – 2.2		[reserved]	
$C_3HF_5Br_2$	0.9 – 2.0		[reserved]	
C_3HF_6Br	0.7 – 3.3		[reserved]	
$C_3H_2FBR_5$	0.1 – 1.9		[reserved]	
$C_3H_2F_2BR_4$	0.2 – 2.1		[reserved]	
$C_3H_2F_3Br_3$	0.2 – 5.6		[reserved]	
$C_3H_2F_4Br_2$	0.3 – 7.5		[reserved]	
$C_3H_2F_5BR$	0.9 – 1.4		[reserved]	
$C_3H_3FBR_4$	0.08 – 1.9		[reserved]	
$C_3H_3F_2Br_5$	0.1 – 3.1		[reserved]	
$C_3H_3F_3Br_2$	0.1 – 2.5		[reserved]	
$C_3H_3F_4Br$	0.3 – 4.4		[reserved]	
$C_3H_4FBr_3$	0.03 – 0.3		[reserved]	
$C_3H_4F_2Br_2$	0.1 – 1.0		[reserved]	
$C_3H_4F_3Br$	0.07 – 0.8		[reserved]	
$C_3H_5FBr_2$	0.04 – 0.4		[reserved]	
$C_3H_5F_2Br$	0.07 – 0.8		[reserved]	
C_3H_6FB	0.02 – 0.7		[reserved]	
B. Class II:				
$CHFC1_2$–DiChlorofluoromethane (HCFC–21)	[res.]	2.1	0.03	0.00
CHF_2C1–Chlorodifluoromethane (HCFC–22)	0.05	15.3	0.14	0.00
CH_2FC1–Chlorofluoromethane (HCFC–31)	[res.]	1.44	0.02	0.00

Controlled substance	ODP	AT L	CLP	BLP
C_2HFC1_4–(HCFC–121)	[res.]	0.6	0.01	0.00
$C_2HF_2C1_3$–(HCFC–122)	[res.]	1.4	0.02	0.00
$C_2HF_3C1_2$–(HCFC–123)	0.02	1.6	0.016	0.00
C_2HF_4C1–(HCFC–124)	0.02	6.6	0.04	0.00
$C_2H_2FC1_3$–(HCFC–131)	[res.]	4.0	0.06	0.00
$C_2H_2F_2C1_2$–(HCFC–132b)	[res.]	4.2	0.05	0.00
$C_2H_2F_3C1$–(HCFC–133a)	[res.]	4.8	0.03	0.00
$C_2H_3FC1_2$–(HCFC–141b)	0.12	10.0	0.10	0.00
$C_2H_3F_2C1$–(HCFC–142b)	0.06	19.1	0.14	0.00
C_3HFC1_6–(HCFC–221)	[reserved]			0.00
$C_3HF_2C1_5$–(HCFC–222)	[reserved]			0.00
$C_3HF_3C1_4$–(HCFC–223)	[reserved]			0.00
$C_3HF_4C1_3$–(HCFC–224)	[reserved]			0.00
$C_3HF_5C1_2$–(HCFC–225ca)	[res.]	1.5	0.01	0.00
	−1.7			
(HCFC–225Cb)	[res.]	5.1	0.04	0.00
C_3HF_6C1–(HCFC–226)	[reserved]			0.00
$C_3H_2FC1_5$–(HCFC–231)	[reserved]			0.00
$C_3H_2F_2C1_4$–(HCFC–232)	[reserved]			0.00
$C_3H_2F_3C1_3$–(HCFC–233)	[reserved]			0.00
$C_3H_2F_4C1_2$–(HCFC–234)	[reserved]			0.00
$C_3H_2F_5C1$–(HCFC–235)	[reserved]			0.00
$C_3H_3FC1_4$–(HCFC–241)	[reserved]			0.00
$C_3H_3F_2C1_3$–(HCFC–242)	[reserved]			0.00
$C_3H_3F_3C1_2$–(HCFC–243)	[reserved]			0.00
$C_3H_3F_4C1$–(HCFC–244)	[reserved]			0.00
$C_3H_4FC1_3$–(HCFC–251)	[reserved]			0.00
$C_3H_4F_2C1_2$–(HCFC–252)	[reserved]			0.00
$C_3H_4F_3C1$–(HCFC–253)	[reserved]			0.00
$C_3H_5FC1_2$–(HCFC–261)	[reserved]			0.00
$C_2H_5F_2C1$–(HCFC–262)	[reserved]			0.00
C_3H_6FC1–(HCFC–271)	[reserved]			0.00
All isomers of the above chemicals [reserved]				

[FR Doc. 93–29886 Filed 12–3–93; 4:29 pm]

BILLING CODE 6560–50–P

Attachment 3

JOHN D. DINGELL, MICHIGAN, CHAIRMAN

ROY ROWLAND, GEORGIA
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FRED UPTON, MICHIGAN

REID P. F. STUART, STAFF DIRECTOR/CHIEF COUNSEL
STEPHEN F. SIMS, DEPUTY STAFF DIRECTOR

U.S. House of Representatives
Subcommittee on Oversight and Investigations
of the
Committee on Energy and Commerce
Washington, DC 20515-6116

October 21, 1992

The Honorable James D. Watkins,
  Admiral, USN, Retired
Secretary of Energy
Department of Energy
Forrestal Building
1000 Independence Avenue, S.W.
Washington, D.C. 20585

Dear Admiral Watkins:

As you are well aware, URENCO is an international uranium enrichment consortium that proposes to build and operate a commercial centrifuge uranium enrichment facility in the United States. Pursuant to its responsibilities under Rules X and XI of the Rules of the U.S. House of Representatives, the Subcommittee on Oversight and Investigations has been conducting for some time an inquiry relative to the Department of Energy's (DOE) reported determination that it will be permissible to transfer Restricted Data to URENCO without a bilateral agreement authorizing such transfer. The Subcommittee is monitoring compliance with the Atomic Energy Act and attempting to assess whether URENCO's involvement with the proposed enrichment facility presents a problem from the standpoint of national security and nuclear proliferation.

On January 24, 1992, the Subcommittee staff was briefed, at my request, on the URENCO issue. The briefing was conducted by George L. McFadden, Jr., Director of the Office of Security Affairs, and Mark Schroeder, Deputy General Counsel for Energy Resources and Legislation. Other DOE officials also participated. Mr. Schroeder was added to the briefing team specifically because the Subcommittee staff had made it plain to the Department that the Subcommittee was particularly concerned about the legal issues the URENCO matter raised. The information supplied at this briefing was, like all information supplied to Federal investigators in the course of an official inquiry, subject to the responsibilities and penalties of Title 18 of The U.S. Code.

Recent revelations have raised the most serious concerns about the truthfulness of the representations made to the Subcommittee during this briefing and in its aftermath.

At the January 24 briefing, Mr. Schroeder told the Subcommittee staff categorically that *no* written legal opinions or documents had been prepared by the DOE General Counsel's office to support the DOE's determination that a bilateral agreement for cooperation would not be required. He said that necessary legal advice had been rendered orally to the Secretary and Deputy Secretary. Mr. Schroeder also told the staff that the DOE's determination was never put in writing. When the Minority staff counsel expressed surprise that an attorney would not memorialize such a decision in any way, Mr. Schroeder further volunteered that such an occurrence was not unusual at DOE.

Interestingly, similar claims may have been made to General McFadden. The General has told Subcommittee staff that when he requested documents to prepare himself for the briefing, he was told by the Office of General Counsel that no documents were available.

When Mr. Schroeder was telephoned by the Subcommittee staff on January 27, 1992, he further indicated that the communication of the DOE's determination to the State Department occurred orally and was never reduced to writing.

It is thus with considerable consternation that the Subcommittee has learned that Mr. Schroeder's statements to the Subcommittee staff were untrue and that Mr. Schroeder may have known that his statements were untrue at the time he made them.

In May 1992 -- over three months after Mr. Schroeder met with staff and so emphatically denied the existence of the legal opinions or analyses -- the Subcommittee learned, not from the DOE but from other sources, that legal opinions had in fact been prepared by the DOE. Only *after* the State Department notified the DOE that it had transmitted URENCO documents mentioning DOE's legal opinions to the Subcommittee did Eric J. Fygi, Acting General Counsel of DOE, suddenly transmit a stack of draft legal memoranda on the URENCO matter, amounting to some 23 different items. Had the Subcommittee not learned of the existance of these documents from other sources, one may reasonably infer that the DOE would have continued to pretend that the documents did not exist. That DOE's attempted deception was a deliberate decision is further suggested by the great speed with which DOE was able to gather and send the documents once it knew that others had disclosed their existence -- locating, identifying, and transmitting in a matter of only a few days the documents whose very existence it had previously denied. Moreover, the Acting General Counsel's transmittal letter implicitly acknowledges that the DOE transmittal was prompted by the State Department's actions and admits, in striking contradiction to Mr. Schroeder's statements at the January 24 meeting, that DOE had indeed prepared legal analyses.

> "I have been advised that, in its May 4, 1992 response [the letter was actually dated May 1] to your request of February 19, 1992, the Department of State has provided the Subcommittee some documents that include reference to preliminary drafts of legal analyses prepared in this office. These materials were prepared early in the process whereby this Department and the Department of State considered legal questions ... this office did prepare drafts of material through which it weighed certain of the preliminary legal analysis prepared in the Department of State."

Unfortunately, the Acting General Counsel fails to explain why the analyses were not previously provided to the Subcommittee or why the Deputy General Counsel for Energy Resources and Legislation, i.e., Mr. Schroeder, untruthfully told Subcommittee staff that such analyses did not exist.

This omission is particularly troublesome given that review of the documents indicates that Mr. Schroeder was personally involved in the creation of some of them. For example, a copy of a memorandum on the subject, "Legal Requirements for Access by URENCO, Ltd. to Operating Data Generated by the Louisiana Energy Services Uranium Enrichment Plant", was transmitted from "M. Schroeder, GC-10", to Chuck Oleszycki on January 24, 1990. The transmittal included a handwritten comment (that appears to be signed "MCS") which specifies that "in addition to the first Holifield reference (the one at p. 41 of Committee Report), there are three other page references (highlighted in red [on] pages 9 & 13), which we need."

A different version of a memorandum on the same legal subject is attached to a transmittal note dated January 15, 1991 from "Mark C. Schroeder, GC-10", to Eric Fygi, Marc Johnston, Tom Todd, and Chuck Oleszycki, which includes the remarks "Re: Urenco Restricted Data" and "Let me have your comments, if any, on the attached."

Yet another document, a note for "Mark Schroeder" from Deputy General Counsel Fygi, dated January 4, 1991, consists of seven typed pages of very specific and detailed comments and advice on the "Draft Urenco Opinion." In this memorandum, Mr. Fygi suggests specific sentences to insert or delete, recommends the addition of certain material in footnotes, frets that "the reader does not see the plain words of section 144 until he or she reaches page 8," discusses the merits of some of the contentions advanced, advises that the use of adjectives be pared back, and, generally, makes manifest that he has gone over the manuscript with a fine tooth comb to advise and guide Mr. Schroeder.

Review of the DOE and State Department documents establishes that the DOE legal analyses were transmitted to the State Department and reviewed by State Department personnel.

Finally, documents obtained by the Subcommittee establish strong reason to believe that the DOE has not, even now, produced all the documents relevant to the development of the URENCO legal opinion.

In recent weeks, Mr. Schroeder has proffered to staff, during a September 18, 1992 meeting on another matter, the claim that his January 24 representations were "misconstrued." At a second unrelated meeting on October 2, 1992, the Minority Counsel invited Mr. Schroeder to explain in what way he had been "misconstrued". Mr. Schroeder replied, "I think that was clarified in the correspondence." The correspondence that the Subcommittee has received from the Department provides no explanation whatsoever. Under the circumstances, these explanations are wholly inadequate.

I am also troubled by how recent revelations may bear on the correspondence which you and I exchanged subsequent to the January 24 meeting in which Subcommittee staff were misinformed that the DOE had prepared no legal analyses relative to the URENCO issue. You will recall that I wrote you on February 6, 1992, shortly after the meeting, expressing my surprise and concern that the Department would reach an interpretation on an important issue under the Atomic Energy Act "without a formal legal opinion or any decisional memoranda." You replied that you were "wholly satisfied" that the Department is "faithfully serving the objectives of the Atomic Energy Act." You also asserted that even "to suggest that such a formality is required to repatriate information already well-known to the recipient strikes me as illogical, if not absurd." At the same time, you declined to provide a chronology of the DOE's decisionmaking regarding URENCO on the grounds that it "is not possible to reconstruct with any confidence ... the events ...."

Needless to say, the recent turn of events can only cause me the greatest possible concern. Accordingly, I request that you respond fully and truthfully to the following questions and requests for information.

(1) Please explain how, why, and at whose initiative or direction Deputy General Counsel Schroeder misinformed the staff that no legal analyses existed when, quite obviously, they did.

(2) With whom did Mr. Schroeder meet or talk in preparation for his briefing of Subcommittee staff?

(3) Was Deputy General Counsel Fygi aware of the plan to misinform Subcommittee staff that no written legal analyses existed?

(4) Please list the names and job titles of all persons involved in researching and drafting the legal analyses.

(5) Please list the names and job titles of all persons who reviewed the legal analyses.

(6) As to each legal analysis, please state whether the Deputy General Counsel for Energy Resources and Legislation (a) assisted in its preparation, (b) reviewed it, (c) saw it, or (d) was informed as to its existence.

(7) Please explain why and by whom General McFadden was misinformed that no documents were available for his review.

(8) Please state precisely when you became aware of the existence of the documents. Were you aware of their existence at the time of your letters to me? If you were, had you read the analyses at the time of your letters to me? Is there any aspect of the Department's assertions to the Subcommittee that you would like to revise or correct in light of the now-acknowledged existence of these documents? For example, do you still believe that even "to suggest" the need for the legal formality is "illogical, if not absurd"?

(9) What procedures does the Department have in place to ensure that information supplied to Congressional Committees is truthful or accurate? What information is supplied to Departmental employees and officials

participating in Congressional briefings relative to their legal duty to provide truthful information? What improvements are contemplated to ensure that an incident such as this does not recur?

(10) What direction are you supplying to the Inspector General in regards to this matter?

In addition, please review carefully your records for any and all items containing, discussing or in any way relating to the URENCO legal analysis and the communication of this information to the State Department. Please include these documents with your response, which will be appreciated and expected by the close of business, Friday, November 6, 1992.

The Subcommittee staff will be contacting the DOE to request interviews with DOE personnel in connection with this inquiry. Your cooperation in this regard will be greatly appreciated.

If you have any questions about this matter, please contact Subcommittee investigators Jeffrey C. Crater or Jeffrey L. Hodges at 225-5365, or Subcommittee Counsel Janina A. Jaruzelski at 225-4441.

Sincerely,

John D. Dingell
Chairman
Subcommittee on
Oversight and Investigations

cc: The Honorable Thomas J. Bliley, Jr.
Ranking Republican Member
Subcommittee on Oversight and Investigations

The Honorable Lawrence S. Eagleburger
Acting Secretary of State
Department of State

The Honorable Ivan Selin
Chairman
Nuclear Regulatory Commission

The Honorable John C. Layton
Inspector General
Department of Energy

UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

[redacted]

Attachment 4

September 22, 1992

Docket No: 70-3070

Louisiana Energy Services, L.P.
ATTN: W. Howard Arnold
President
2121 K Street, N.W.
Suite 850
Washington, DC 20037

Gentlemen:

Since disposition of depleted uranium (DU) tails is an important decommissioning licensing issue for the proposed Claiborne Enrichment Center, the Nuclear Regulatory Commission performed an assessment of the issues involved. Our evaluation assumes that the bulk of DU tails will eventually be disposed of as a waste. We examined the acceptability of disposal of the LES enrichment plant tails, as depleted UF_4, in a licensed 10 CFR Part 61 disposal facility as suggested by LES's "Depleted Uranium Hexafluoride Management Study." We have completed our review of this proposal. Based on our analysis, we have reached the following conclusions.

The preferred chemical form for final disposition of the DU tails is U_3O_8 regardless of U-235 concentration. Even if stored tails were later further processed and depleted of U-235, the bulk of DU tails must still be disposed of. Compared with UF_4, U_3O_8 is the more stable physicochemical form and the more compatible, as regards to safety, with long-term disposition of tails. Conversion of the DUF_6 to DUF_4 for final disposition is not acceptable because its physicochemical, long-term stability is incompatible with final disposal under 10 CFR Part 61.

The Environmental Impact Statement (EIS) supporting 10 CFR Part 61 did not contemplate large volumes of DU tails. Our analysis, using methodology similar to that used for the Part 61 EIS, concludes that near-surface disposal of such large quantities of DU tails is not appropriate, both because of its potential radiological impact and its chemical toxicity. However, other disposal alternatives under 10 CFR Part 61 may be viable; e.g., deep mine disposal. Therefore, disposal options, other than near-surface disposal, must be considered for the DU tails. Disposal options must be accompanied with supporting analyses. The analyses should include funding provisions for storage, tails conversion to the oxide form, final disposition and, if applicable, transportation costs.

Your analyses should also consider an appropriate schedule for conversion and disposal. Since you are proposing to start production in phases, which may take several years, the conversion of DUF_6 to DU_3O_8, or other suitable waste form, should start 10 to 15 years after initiating production, or after generating 80,000 tons of tails, whichever is reached first.

In summary, demonstration of viable means of DU tails ultimate disposition and provision for financial assurance are needed. It is recognized that the total volume of waste to be generated for the LES Claiborne Enrichment Center is part of a much larger national inventory. Therefore, LES DU tails disposition may be addressed as part of the national inventory disposal scheme.

We would be pleased to discuss these matters further with you after you have considered them. If you have any questions, please contact Dr. Lidia A. Roche' at (301) 504-2695.

Sincerely,

Jerry J. Swift for

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