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*Last Updated: 04/03/2024*

AN ANALYSIS OF THE IMPLICATIONS OF ALTERNATIVE INTERNATIONAL  
CONTROL STRATEGIES FOR GLOBAL OZONE DEPLETION AND  
THE RISK OF SKIN CANCER IN THE UNITED STATES

PREPARED BY U.S. ENVIRONMENTAL PROTECTION AGENCY

February 1987

## INTRODUCTION

This paper examines the following five questions:

- QUESTION 1: What are the implications of controlling the use of all the fully-halogenated substances (CFC-11, 12, 113, Halon-1211, and Halon-1301<sup>2</sup>) at three different levels:
- 95 percent phase down from 1986 levels;
  - 50 percent phase down from 1986 levels; or
  - freeze at 1986 levels.
- QUESTION 2: What are the implications of excluding the Halons and CFC-113 from control?
- QUESTION 3: What are the implications of having less stringent requirements for developing countries?
- QUESTION 4: How sensitive are the estimates to alternative assumptions regarding trace gas concentration growth and the level of compliance expected to be achieved?
- QUESTION 5: How do the ozone depletion estimates presented here (which are based on a 1-dimensional model) compare to the estimates from a 2-dimensional model?

To answer these questions, the following analytical steps were performed:

- A. Baseline. A baseline set of assumptions about future global use and emissions of ozone depleting substances was adopted. The baseline set of assumptions used in this analysis was 2.5 percent annual growth from 1985 to 2050, followed by no growth thereafter. The resulting annual growth rate averaged over the period from 1985 to 2100 is 1.4 percent. The ozone depleting substances included in this analysis are: CFC-11; CFC-12; CFC-22; CFC-113; carbon tetrachloride (CCl<sub>4</sub>); methyl chloroform (MC); Halon-1211; and Halon-1301<sup>2</sup>. This baseline is within the zero to five percent range suggested at the UNEP workshop in Rome, 1986 (1). Higher and lower baseline growth rates would influence the estimates presented below.
- B. Controls Compliance. For the international control options tested, it is assumed that a global protocol is developed, and that 80 percent compliance is achieved. This assumption implies that countries that account for 80 percent of current use become members of the protocol, and have 100 percent compliance. The remaining countries (that account for 20 percent of current use) do not join or comply, and instead their use continues to grow at the baseline rate. The importance of this compliance assumption is examined in question 4.

X INFORMATION UNAVAILABLE ON CFC 114

\*\* GROWTH OF CCl<sub>4</sub> and methyl chloroform WERE LESS THAN 2.5%; EMISSIONS OF CCl<sub>4</sub> ARE ONLY A SMALL PERCENT OF PRODUCTION; HALONS GROW AT RATE OF 1986 (1986); CFC 113 AT 6.000 (1986)

- C. Trace Gases. A set of assumptions about the growth in the concentrations of other trace gases is adopted. The base set of assumptions include: methane (CH<sub>4</sub>) growth of 0.017 ppm/year (or approximately 1 percent of current levels); nitrous oxide (N<sub>2</sub>O) growth of 0.20 percent per year; and carbon dioxide (CO<sub>2</sub>) growth reported as the 50th percentile estimate in Changing Climate, (NAS, 1983) (2). This CO<sub>2</sub> scenario results in a doubling of atmospheric concentrations from preindustrial levels in about 2060. These trace gas assumptions are similar to those used in previous analyses reviewed by EPA's Science Advisory Board (3). Different assumptions would alter the results presented below. The significance of assuming continued methane growth beyond 2000 is examined in question 4.
- D. Outcomes. The outcomes of the controls in terms of global ozone depletion and skin cancer risk in the United States are estimated. Global ozone depletion was estimated by computing the change in concentration of chlorine, and using the parameterized numerical fit to the LLNL 1-dimensional model of the troposphere and stratosphere developed by Connell (1986) (4). Global ozone depletion is assumed to be zero in 1985. Ozone depletion is arbitrarily held constant after 2100.

Model predictions of ozone depletion may be too high or too low, depending on whether the models are over- or under-predicting the sensitivity of stratospheric ozone to perturbation. Unexpected observations in Antarctica and past changes in reaction kinetics decrease our confidence in model predictions: "surprises" have occurred in the past and will occur in the future.

The increased risk of skin cancer incidence in the United States is computed by evaluating the increased flux of ultraviolet radiation (UV) expected to reach the earth's surface as the result of ozone depletion, and using these estimates of increased flux in dose-response equations that relate skin cancer incidence in the United States to UV exposure. The methods used to evaluate skin cancer risks were presented in the UNEP CCOL draft on effects (5) and in the draft risk assessment published by EPA in 1986 (3). Key assumptions include: increases in UV in response to ozone depletion are defined by the DNA-damage action spectrum; dose-response relationships between UV and skin cancer are based on epidemiological analyses performed by Scotto (6); baseline skin cancer rates are assumed to remain constant in the absence of ozone depletion; demographic patterns in the U.S. are assumed to remain constant after 2000 (this assumption reduces the estimate of baseline and additional cases of skin cancer by underestimating the increase in the number of old people in the U.S. over time -- skin cancer is generally a disease of old age); additional cases of skin cancer are estimated for people alive today and born before 2075.

Each of the five questions is examined below.

QUESTION 1:

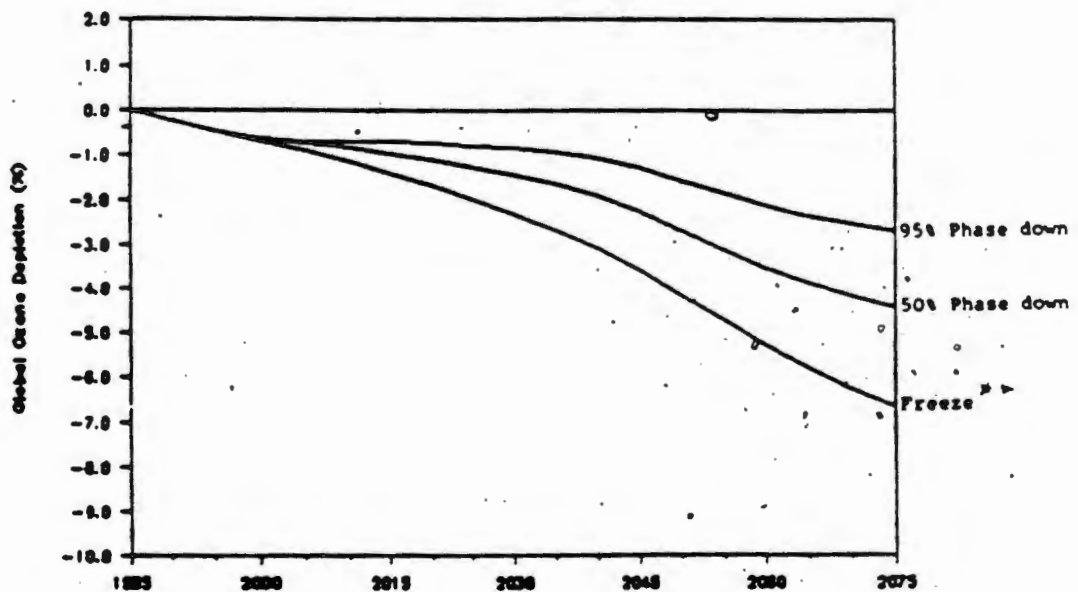
What are the implications of controlling the use of all the fully-halogenated substances (CFC-11, 12, 113, Halon-1211, and Halon-1301) at three different levels:

- Case 1: 95 percent phase down from 1986 levels as follows: freeze at 1986 levels in 1990, 25 percent reduction by 1993, 50 percent reduction by 1996, and 95 percent reduction by 2002;
- Case 2: 50 percent phase down from 1986 levels as follows: freeze at 1986 levels in 1990, 25 percent reduction by 1993, and 50 percent reduction by 1996; or
- Case 3: freeze at 1986 levels starting in 1990.

ANSWER:

The projected amount of global ozone depletion varies across the three cases of controls defined above. Exhibit 1 displays the estimates of ozone depletion from 1985 to 2075. By 2075 the additional ozone depletion due to reducing the stringency from a 95 percent phase down to a 50 percent phase down is approximately 1.7 percent. Further relaxing the requirements to a freeze at 1986 levels adds about 2.3 percent more.

EXHIBIT 1  
OZONE DEPLETION ASSOCIATED WITH THREE LEVELS OF GLOBAL CONTROL  
(see text for assumptions)



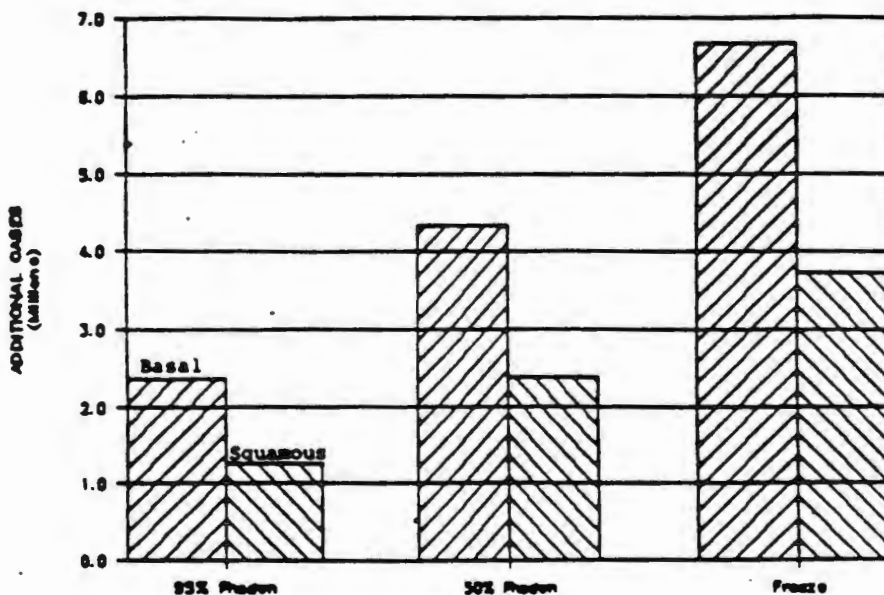
ASSUMES 80% COMPLIANCE

\* BETWEEN 1986 and 1990 growth is 2.5%, then reverts to 1986 levels.

\* DIFFERENCES BETWEEN THIS RESULT AND WHO (1990) are primarily due to linear METHANE INCREASE RATHER THAN COMPOUND, 80% RATHER THAN 100% COMPLIANCE

The implications of these levels of ozone depletion for skin cancer incidence in the U.S. are displayed in Exhibit 2. The ozone depletion associated with the freeze results in about 10.4 million additional cases of basal and squamous cell cancers among people alive today and born through 2075 in the U.S. The ozone depletion associated with the 95 percent phase down results in about 3.6 million additional cases. The difference, about 6.8 million cases, is attributed to moving from a freeze to a 95 percent phase down. The estimates for the 50 percent phase down are between the estimates for the other two cases.

EXHIBIT 2  
ADDITIONAL CASES OF BASAL AND SQUAMOUS CELL SKIN CANCER IN THE U.S.  
FOR THREE LEVELS OF GLOBAL CONTROL  
(see text for assumptions)



**QUESTION 2:**

What are the implications of excluding Halon-1211, Halon-1301 and CFC-113 from control in the phase down and freeze cases?

**ANSWER:**

The following cases were analyzed:

PHASE DOWN:

- Case 1: the 95 percent phase down of all fully-halogenated compounds;
- Case 4: the 95 percent phase down of CFC-11, 12, and 113 (exclude Halon-1211 and Halon-1301);
- Case 5: the 95 percent phase down of CFC-11 and CFC-12 (exclude CFC-113, Halon-1211 and Halon-1301).

FREEZE:

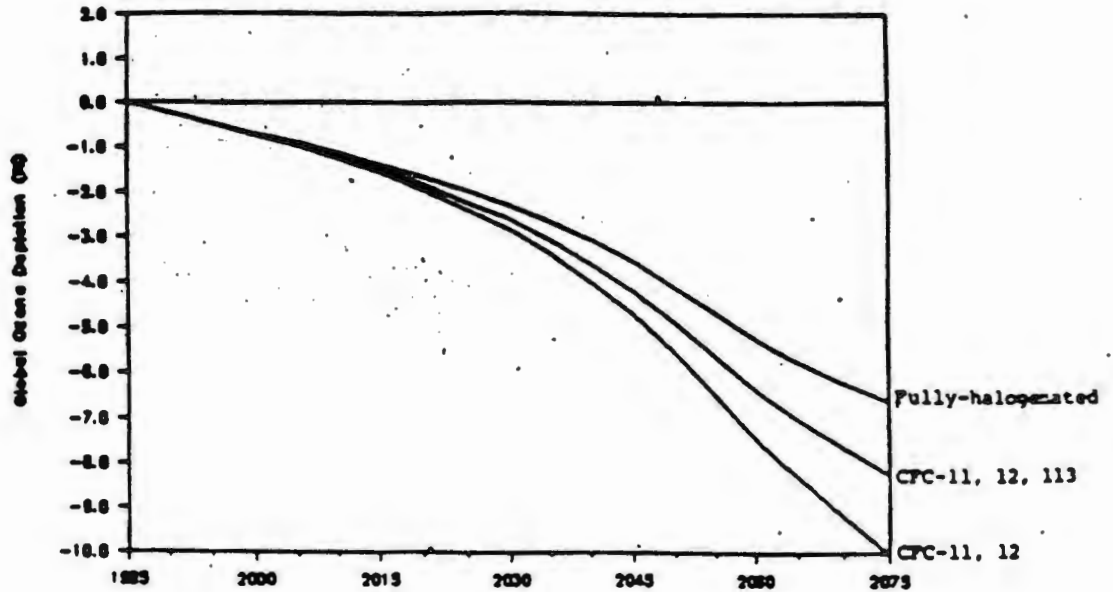
- Case 3: all fully-halogenated compounds;
- Case 6: CFC-11, 12, and 113 (exclude the Halons);
- Case 7: CFC-11 and CFC-12 (exclude CFC-113 and the Halons).

Excluding the Halons and CFC-113 from the controls increases the estimates of global ozone depletion. Exhibits 3 and 4 show the estimates of ozone depletion and skin cancer risks for the three phase down cases. Excluding the Halons from the phase down increases the estimate of ozone depletion by 2075 by about 1.8 percent. Further excluding CFC-113 results in an additional 1.8 percent by 2075. The implications for skin cancer risks are shown in Exhibit 4.

Exhibits 5 and 6 show the implications of excluding CFC-113 and the Halons from the freeze. Excluding the Halons results in an additional 1.7 percent depletion by 2075, and further excluding CFC-113 results in about the same increase.

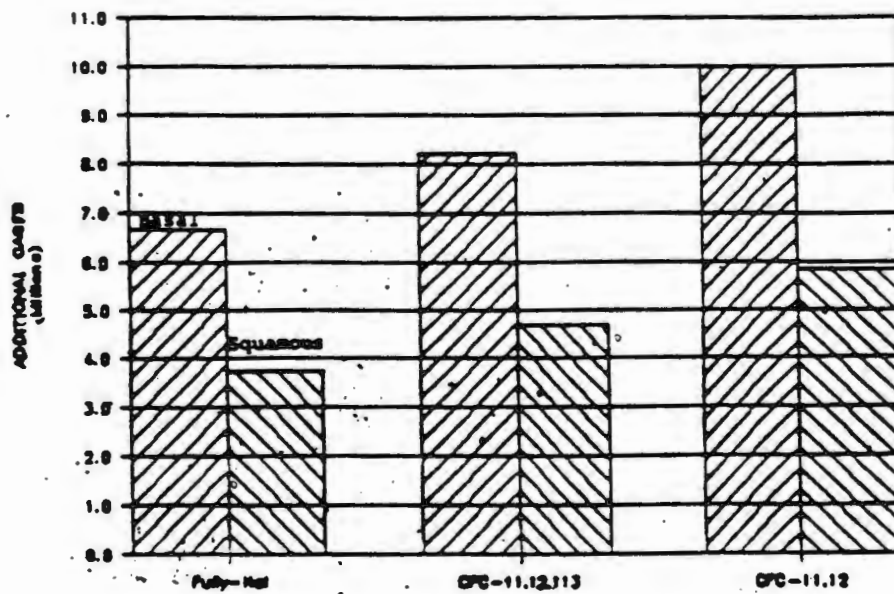
Of note is that by 2075, the level of ozone depletion expected under a phase down of CFC-11 and CFC-12 only is about the same as the ozone depletion expected for the freeze on all fully-halogenated compounds.

**EXHIBIT 5**  
**OZONE DEPLETION ASSOCIATED FOR THREE LEVELS OF CHEMICAL COVERAGE**  
**AND A FREEZE AT 1986 LEVELS**  
(see text for assumptions)



ASSUMES 50% COMPLIANCE

**EXHIBIT 6**  
**ADDITIONAL CASES OF BASAL AND SQUAMOUS CELL SKIN CANCER IN THE U.S.**  
**FOR THREE LEVELS OF CHEMICAL COVERAGE AND A FREEZE AT 1986 LEVELS**  
(see text for assumptions)





**QUESTION 3:**

What are the implications of having less stringent requirements for developing countries?

**ANSWER:**

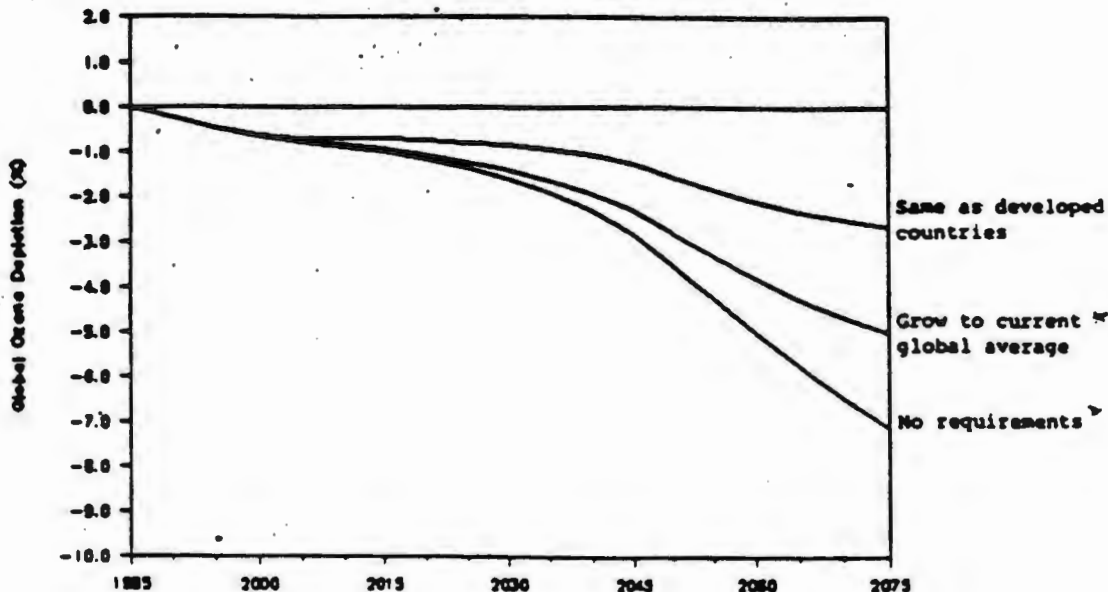
Developing nations are expected to require increasing access to CFCs and Halons as they experience economic growth. If they are allowed to use CFCs up to the current world average per capita, they will not be required to make reductions in the near term. The implications for ozone depletion of allowing this growth was evaluated by examining the following cases:

- Case 1: the 95 percent phase down of all fully-halogenated compounds, with the same requirements for developing countries.
- Case 8: the 95 percent phase down of all fully-halogenated compounds, with developing countries permitted to have growth in use up to the current average per capita use in the world.
- Case 9: the 95 percent phase down of all fully-halogenated compounds, with no requirements for developing countries.

The developing nations are defined as: Centrally-planned Asia; Middle East; Africa; Latin America; South America; and Southeast Asia. The current global average use per capita is estimated as: CFC-11 and CFC-12: 0.17 kg; CFC-113: 0.03 kg; and Halon-1211 and Halon-1301: 0.004 kg.

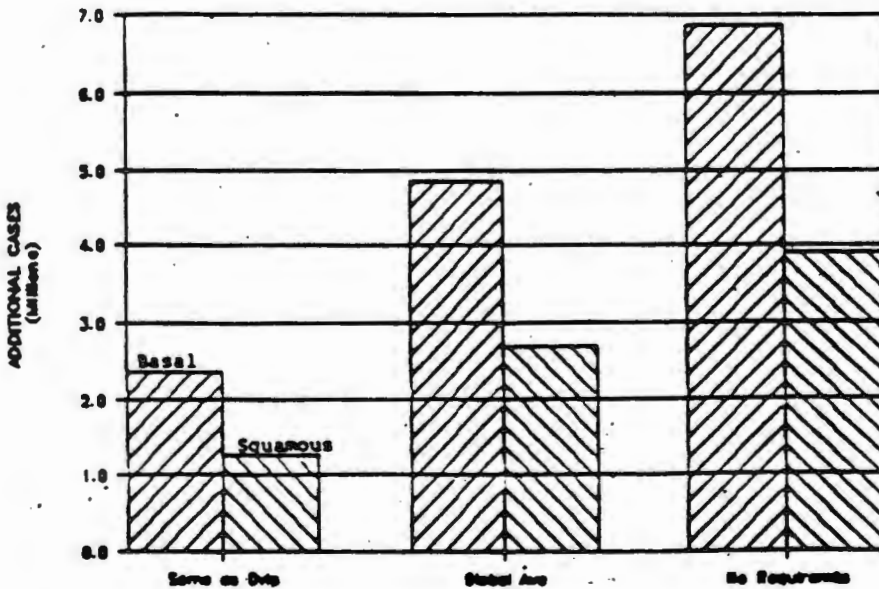
The results for these cases are shown in Exhibit 7. By 2075 the increase in the estimate of ozone depletion is about 2.3 percent if developing nations are permitted to grow to the current per capita use levels. If no requirements are placed on developing nations, the increase in the ozone depletion estimate for 2075 is an additional 2.1 percent. Exhibit 8 displays the estimates of the skin cancer risks in the U.S. associated with these cases.

EXHIBIT 7  
OZONE DEPLETION FOR THREE LEVELS  
OF REQUIREMENTS FOR DEVELOPING COUNTRIES  
FOR A 95 PERCENT PHASE DOWN  
(see text for assumptions)



Assumes 90% compliance.

EXHIBIT 8  
ADDITIONAL CASES OF BASAL AND SQUAMOUS CELL SKIN CANCER IN THE U.S.  
FOR THREE LEVELS OF REQUIREMENTS FOR DEVELOPING COUNTRIES  
FOR A 95 PERCENT PHASE DOWN  
(see text for assumptions)



\* Graph shows that some developing nations exceed 2kg per capita.

#### QUESTION 4:

How sensitive are the ozone depletion estimates to alternative assumptions regarding trace gas concentration growth and the level of compliance expected to be achieved?

#### ANSWER:

The level of trace gas concentration growth and potential compliance with international controls are both uncertain. The estimates of ozone depletion are sensitive to both factors.

Methane (CH<sub>4</sub>) can counter ozone depletion by: (1) interfering with chlorine's catalytic destruction of stratospheric ozone; and (2) creating ozone in the troposphere (where it is a pollutant). CH<sub>4</sub> is also a strong greenhouse gas, and is expected to lead to an increase in water vapor in the stratosphere, which will also add to the greenhouse effect.

The sources and sinks of CH<sub>4</sub> are uncertain, making projections of future concentrations uncertain. Indications are that CH<sub>4</sub> concentrations have been growing at a rate of approximately 0.017 ppm/year in the recent past. However, several sources of CH<sub>4</sub> may be subject to possible exhaustion or human control, including: livestock; rice; forest burning; CO emissions from automobiles; and wetland emissions (during clearing). Conversely, emissions from some sources may be uncontrollable and temperature dependent (e.g., emissions from tundra).

Exhibit 9 displays the implications of assuming that CH<sub>4</sub> concentrations stop increasing in the year 2000. The following four cases are shown:

- Case 1: the 95 percent phase down of fully-halogenated compounds assuming CH<sub>4</sub> concentrations continue to grow.
- Case 10: the 95 percent phase down of fully-halogenated compounds assuming CH<sub>4</sub> concentrations stop growing in 2000.
- Case 3: the freeze of fully-halogenated compounds at 1986 levels assuming CH<sub>4</sub> concentrations continue to grow.
- Case 11: the freeze of fully halogenated compounds at 1986 levels assuming CH<sub>4</sub> concentrations stop growing in 2000.

As shown in the exhibit, if CH<sub>4</sub> does not continue to grow, ozone depletion will be greater.

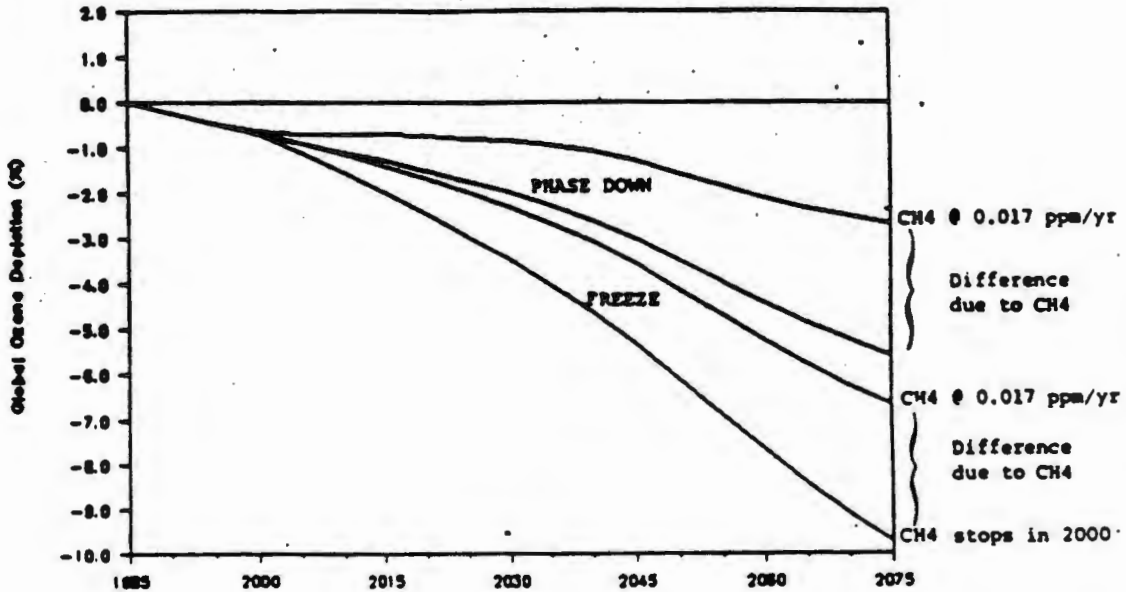
The level of compliance that may be expected will also have a significant influence on the level of ozone depletion that may result from a given set of controls. The base set of assumptions used in this analysis is that only 80 percent compliance may be expected. This implies that 20 percent of the baseline growth in use and emissions proceeds unchecked. Higher levels of compliance would result in lower estimates of ozone depletion (and vice versa).

Exhibit 10 displays the implications of assuming 100 percent compliance instead of 80 percent (note that 100 percent compliance may be unlikely to be achieved). The following four cases are shown:

- Case 1: the 95 percent phase down of all fully-halogenated compounds assuming 80 percent compliance.
- Case 12: the 95 percent phase down of all fully-halogenated compounds assuming 100 percent compliance.
- Case 3: the freeze of all fully-halogenated compounds at 1986 levels assuming 80 percent compliance.
- Case 13: the freeze of all fully-halogenated compounds at 1986 levels assuming 100 percent compliance.

As shown in the exhibit, 100 percent compliance would result in less ozone depletion, up to nearly 3.0 percent less by 2075 in the case of the phase down, and over 3.0 percent by 2075 in the case of the freeze.

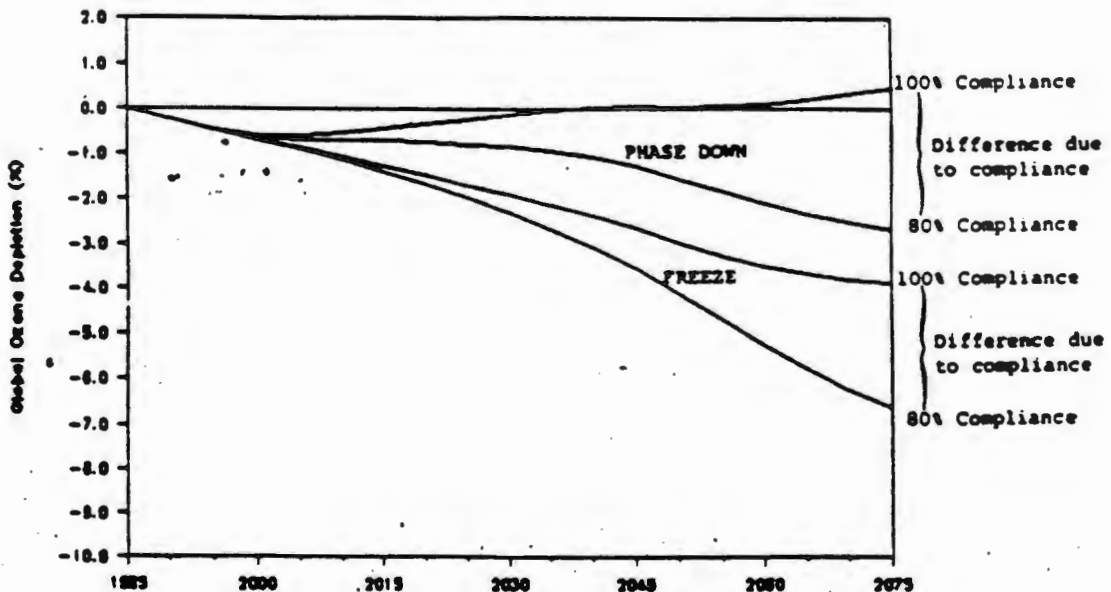
EXHIBIT 9  
OZONE DEPLETION FOR TWO METHANE ASSUMPTIONS  
AND FOR A FREEZE AND A 95 PERCENT PHASE DOWN  
(see text for assumptions)



ASSUMES 20% COMPLIANCE

EXHIBIT 10  
ADDITIONAL CASES OF BASAL AND SQUAMOUS CELL SKIN CANCER IN THE U.S.  
FOR TWO COMPLIANCE ASSUMPTIONS  
AND FOR A FREEZE AND A 95 PERCENT PHASE DOWN  
(see text for assumptions)

OZONE DEPLETION



**QUESTION 5:**

How do the ozone depletion estimates presented here (which are based on a 1-dimensional model) compare to the estimates from a 2-dimensional model?

**ANSWER:**

The results of a 2-D model developed by Isaksen (7) show larger depletion than the 1-D model used in this analysis. Results from the 2-D model were available for the following scenario:

- Case 14: CFC-11, 12 and 113 emissions are reduced to 75 percent of their 1986 values by 1997 and then held constant (assuming 100 percent compliance). CFC-113 is modeled as having the ozone-depleting characteristics of CFC-12. Carbon tetrachloride emissions are held fixed at their 1985 levels, and methyl chloroform, Halon-1211, and Halon-1301 are omitted. N2O concentrations grow at 0.25 percent per year, and CH4 concentrations grow at 1 percent per year (compounded). CO2 concentrations increase in the same manner as the other scenarios.

Exhibit 11 shows the results for this case, from both the 1-D and 2-D models (note that the scale of this graph is different from the scales of the other graphs in this paper). The 2-D model shows about 1.5 percent more depletion than the 1-D model for this scenario by 2050. Whereas the 1-D model shows increased ozone abundance, the 2-D model indicates depletion.

It should be observed that estimates of global ozone depletion do not completely characterize the total column ozone changes that may occur over different latitudes. Exhibit 12 shows the total column ozone depletion from Isaksen's 2-D model in 2000, by latitude and month of the year. (Note that this exhibit compares the results for the year 2000 to conditions estimated for 1960, not 1985 used in other exhibits. Global depletion from 1960 to 2000 is estimated as about 2.1 percent.) It is of note that depletion in 2000 (relative to 1960) exceeds 4 percent for some latitudes during the spring. A reduction in CFC emissions of 95 percent (with 80 percent compliance) in the year 2000 would approximately stabilize concentrations of CFCs at that time, thereby arresting additional depletion without relying on the continued increase in concentrations of methane and other greenhouse gases.

EXHIBIT 11  
OZONE DEPLETION ESTIMATES FROM A 1-D MODEL  
AND A 2-D MODEL  
(see text for assumptions)

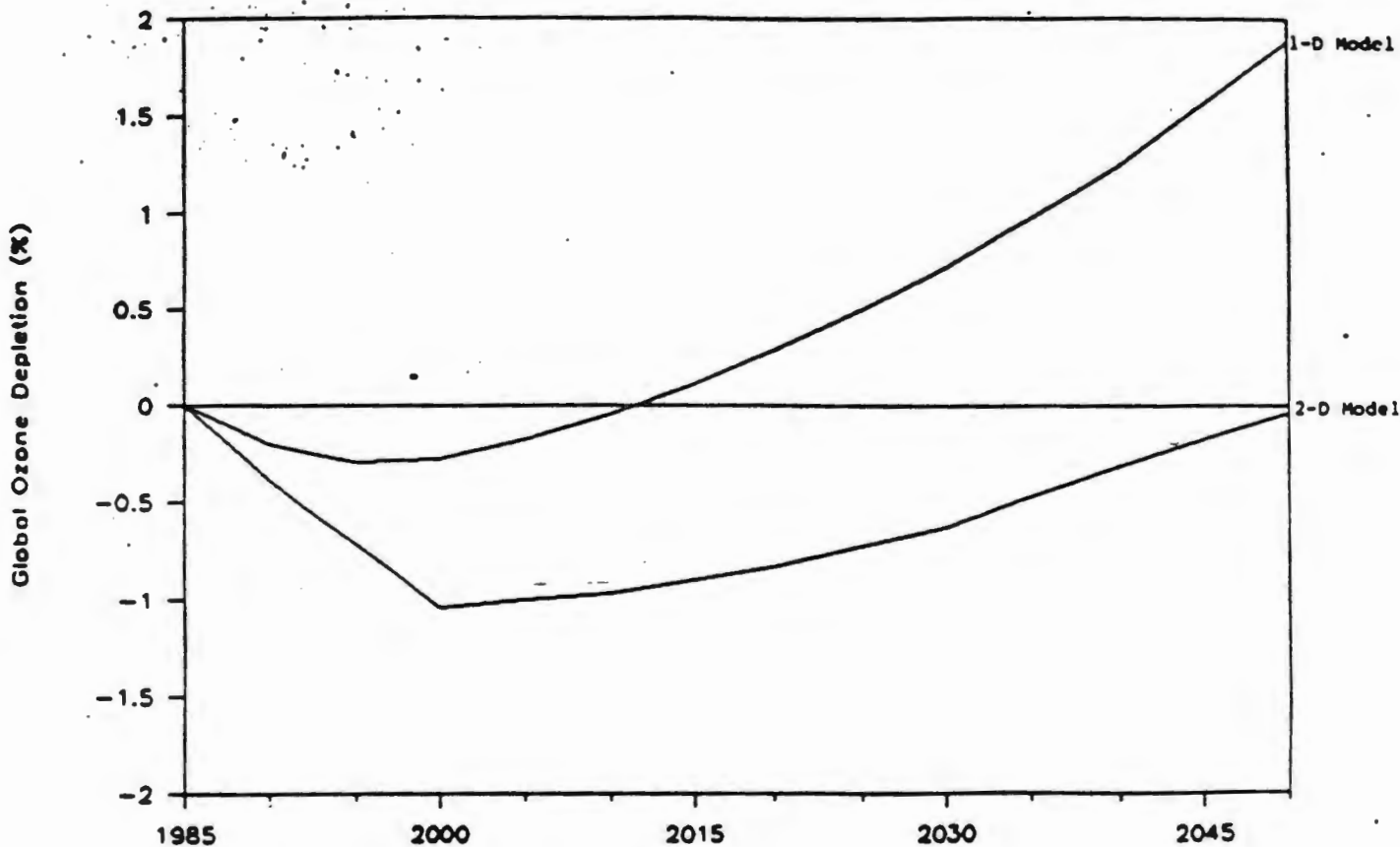
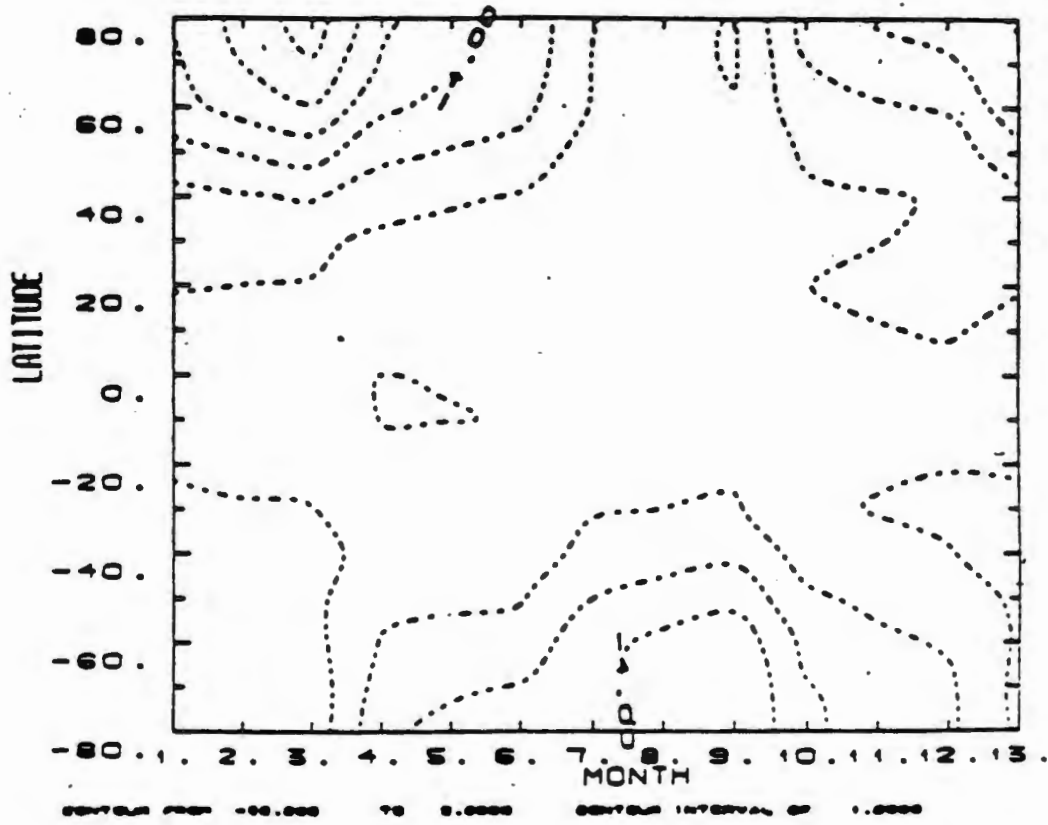


EXHIBIT 12  
ISAKSEN'S 2-D MODEL RESULTS BY  
LATITUDE AND MONTH  
(2000 compared to 1960)

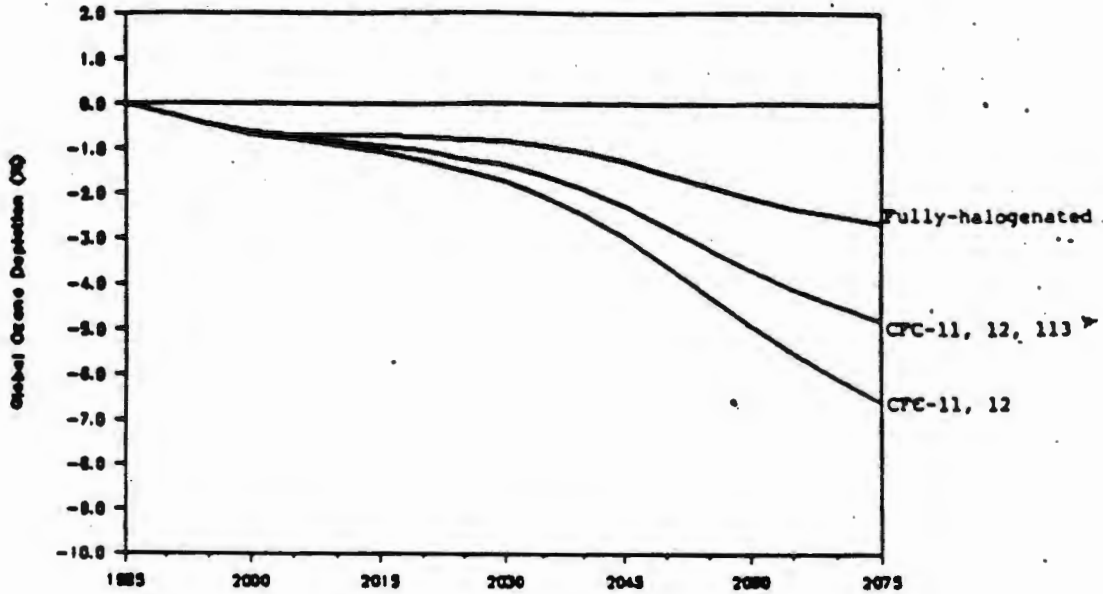




## REFERENCES

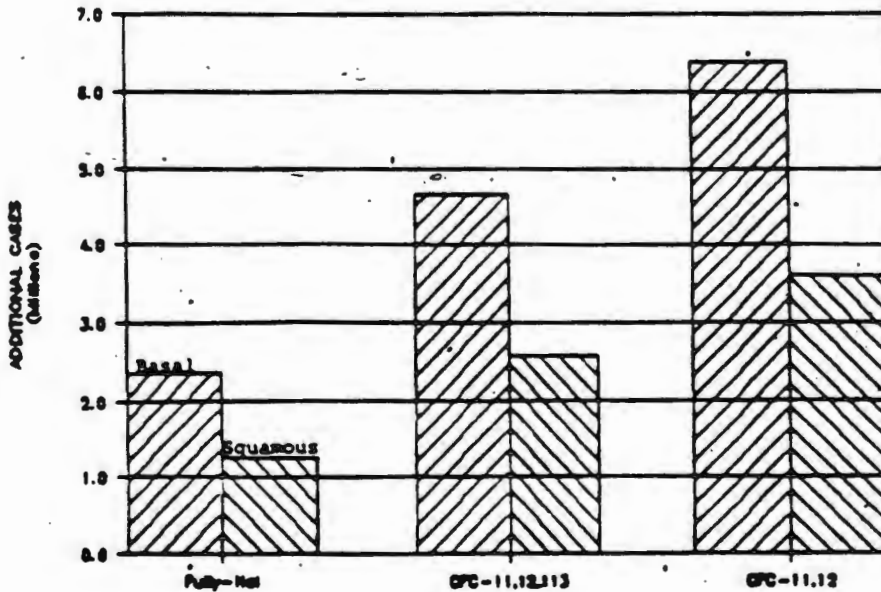
1. United Nations Environment Programme (1986), Report of the First Part of the Workshop on the Control of Chlorofluorocarbons, UNEP/WG.148/2, 12 July 1986, held in Rome, Italy, 26-30 May 1986.
2. National Academy of Sciences (1983), Changing Climate: Report of the Carbon Dioxide Assessment Committee, National Academy of Sciences, Washington, D.C.
3. U.S. Environmental Protection Agency (1986), An Assessment of the Risks of Stratospheric Ozone Modification, draft document prepared for the Science Advisory Board.
4. Connell, P.S. (1986), "A Parameterized Numerical Fit to Total Column Ozone Changes Calculated by the LLNL 1-D Model of the Troposphere and Stratosphere," Lawrence Livermore National Laboratory, Livermore, CA. (REPORT AVAILABLE FROM LLNL)
5. See final report of the Coordinating Committee on the Ozone Layer, UNEP, on effects of stratospheric ozone depletion and global climate change, 1986.
6. For a discussion of skin cancer incidence and ultraviolet radiation see chapters 7 and 8 and Appendix A of U.S. Environmental Protection Agency (1986), An Assessment of the Risks of Stratospheric Ozone Modification, draft document prepared for the Science Advisory Board.
7. For a description of the Stordal/Isaksen 2-D model, see Stordal, F.S., I.S.A. Isaksen, and K. Hornveth (1985), "A Diabatic Circulation Two-dimensional Model with Photochemistry: Simulations of Ozone and Ground-Based Tracers," Journal of Geophysical Research, 90, 5757. Recent model results are presented in Stordal, F.S. and I.S.A. Isaksen (1986), "Ozone Perturbations due to Increases in N<sub>2</sub>O, CH<sub>4</sub>, and Chlorofluorocarbons: Two-dimensional Time Dependent Calculations," in U.S. EPA and UNEP (1986), Effects of Changes in Stratospheric Ozone and Global Climate. Volume I: Overview, U.S. EPA, Washington, D.C.

EXHIBIT 3  
OZONE DEPLETION FOR THREE LEVELS OF CHEMICAL COVERAGE  
AND A 95 PERCENT PHASE DOWN  
(see text for assumptions)



ASSUMES 50% COMPLIANCE

EXHIBIT 4  
ADDITIONAL CASES OF BASAL AND SQUAMOUS CELL SKIN CANCER IN THE U.S.  
FOR THREE LEVELS OF CHEMICAL COVERAGE AND A 95 PERCENT PHASE DOWN  
(see text for assumptions)



\* USGS MODEL PARAMETERIZATION OF BRONCHIAL WHICH HAS GREATER UNCERTAINTY THAN OTHER GASES.



United States Department of State

*Bureau of Oceans and International  
Environmental and Scientific Affairs*

*Washington, D.C. 20520*

February 2, 1987

UNCLASSIFIED *10/14/80*

(LIMITED OFFICIAL USE attached)

To: EPA - Bill Long  
NASA - Bob Watson  
NOAA - Joe Fletcher  
Commerce - Michael T. Kelly  
USTR - Bruce Wilson  
DOE - Ted Williams  
DPC - Ralph Bledsoe ✓  
OMB - Randy Davis  
CEQ - Coleman Nee  
EB/TDC/OT - Kevin McGuire  
EB/IFD/OIA - Sharon Villarosa  
L/OES - David Colson  
L/EBC - Gerald Rosen  
E - Martin Bailey

From: OES/E - John H. Rouse, Acting *JH*

Subject: Ozone Layer Protection Protocol Negotiations

The next round of negotiations for a protocol to control chemicals which deplete stratospheric ozone will be held in Vienna February 23-27. Protection of the ozone layer is a complex and difficult issue involving diverse interests of many agencies. We want to be sure those interests are reflected in our preparations for the negotiations.

Meetings

Representatives of all interested agencies will meet:

Tuesday, February 3, 2:00 p.m., Room 7835

Thursday, February 12, 9:30 a.m., Room 7835

Thursday, February 19, 2:30 p.m., Room 1105

Please arrange for appropriate representation from your agency for these meetings.

On February 3, we will review the status of work in preparation for the negotiations, air any concerns, and task additional work as appropriate. On February 12 we will review the draft position paper.

The trade work group will also meet on February 5 with representatives of interest groups (see enclosed memo).

Delegation

We need to review the size of the U.S. delegation, in view of requirements of the Office of International Conferences and of the disproportionate size of our group in Geneva. For each individual your agency believes should be a member of the delegation, please provide by Friday, February 6 a letter from a policy-level official of your agency to Ambassador Negro Ponte naming the individual, title, and justification for agency representation on the delegation. This letter will be required for accreditation of any delegation member.

Enclosures:

Nairobi 2786  
State 16544  
86 Paris 56660  
Benedick 12/1/86 plenary statement  
U.S. proposed protocol text  
Negro Ponte testimony, 1/28/87  
Potter testimony, 1/28/87  
Butcher trade meeting memo, 1/29/87  
Circular 175, 11/28/86

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ATTENTION OES/ENR AND IO/T

E. O. 12356: N/A  
SUBJECT: WORKING GROUP ON PROTOCOL ON CONTROL OF  
CHLOROFLUOROCARBONS

1. U. S. PERM REP TO UNITED NATIONS ENVIRONMENT PROGRAM  
(UNEP) TODAY (JAN. 23) RECEIVED FOLLOWING MESSAGE SIGNED  
BY UNEP ASSISTANT EXECUTIVE DIRECTOR GOLUBEV AND DATED  
JAN 20 WITH A REQUEST THAT IT BE CABLED TO SECSTATE;  
QUOTE HONOURED TO INFORM YOU THAT THE SECOND SESSION OF  
THE AD HOC WORKING GROUP OF LEGAL AND TECHNICAL EXPERTS  
TO DEVELOP A PROTOCOL ON THE CONTROL OF  
CHLOROFLUOROCARBONS (VIENNA) WILL TAKE PLACE FROM 23 TO  
27 FEBRUARY 1987. SESSION WILL BE OPENED AT 10 AM ON  
MONDAY, 23 FEBRUARY AT THE VIENNA INTERNATIONAL CENTRE.  
THE FOLLOWING AGENDA IS PROPOSED.

AAA OPENING OF SESSION  
BBB ELECTION OF OFFICERS AND ADOPTION OF AGENDA  
CCC REVIEW OF PROGRESS AT THE FIRST VIENNA GROUP SESSION  
DDD FURTHER CONSIDERATION OF THE FIFTH REVISED DRAFT  
- PROTOCOL ON THE CONTROL OF CHLOROFLUOROCARBONS  
EEE ADOPTION OF REPORT AND PLANS FOR FUTURE WORK  
FFF ANY OTHER BUSINESS  
GGG CLOSURE OF THE MEETING

A REPORT OF THE FIRST SESSION OF THE VIENNA GROUP IS  
BEING SENT TO YOU UNDER SEPARATE COVER.

PLEASE INFORM ME OF THE NAME (S) OF YOUR REPRESENTATIVE  
(S) AS SOON AS POSSIBLE. HIGHEST CONSIDERATION. UNQUOTE.  
0750) CONSTABLE

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	PH-10	EAP-00	STR-17	<u>QES-09</u>	ACDA-12	USIE-00	DOEE-00
	CEG-01	PRS-01	SPPR-03	OIG-01	/112 R		

DRAFTED BY: EPA/DIA: JLOSEY  
 APPROVED BY: EUR: LWILKINSON  
 QES/E: REBLNEDICK  
 EUR/RPE: MCARTLR-TRIPP  
 DOC: MKELLY (SUBS)  
 EPA/DIA: BLLONG

10/T: KFIEDLER  
 USTR: IFULLER (SUBS)  
 EB/OT/DCT: KMGUIRE  
 QES/LNH: JROUSL/SBUTCHER

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 TO EC COLLECTIVE PRIORITY  
 AMEMBASSY STOCKHOLM PRIORITY  
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 INFO AMEMBASSY NAIROBI  
 AMEMBASSY BUENOS AIRES  
 AMEMBASSY CANBERRA  
 AMEMBASSY VIENNA  
 AMEMBASSY TOKYO  
 AMEMBASSY CAIRO  
 AMEMBASSY BUDAPEST  
 AMEMBASSY MEXICO  
 AMEMBASSY MANILA  
 AMEMBASSY BERN  
 AMEMBASSY MOSCOW  
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 AMEMBASSY OTTAWA  
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BRUSSELS ALSO FOR USEC, PARIS ALSO FOR USOECD

E.O. 12356: N/A  
 TAGS: SENV, OTRA, UNEP, EC  
 SUBJECT: OZONE LAYER PROTECTION NEGOTIATIONS

REF: (A) 86 PARIS 56660  
 (B) STATE 349396  
 (C) STATE 346714

1. THIS IS AN ACTION CABLE: SEE PARA 5-7.

2. SUMMARY: PROTECTION OF THE OZONE LAYER HAS BECOME A FOCUS OF SUBSTANTIAL ENVIRONMENTAL, ECONOMIC AND POLITICAL INTEREST IN THE UNITED STATES, WITH INTENSE INTEREST BEING SHOWN BY CONGRESS, CITIZENS' GROUPS, AND PRIVATE INDUSTRY. FIRST SESSION OF UNEP-SPONSORED NEGOTIATIONS ON AN OZONE LAYER PROTOCOL (DEC. 1 - 5, GENEVA) ATTRACTED CONSIDERABLE DOMESTIC AND INTERNATIONAL MEDIA ATTENTION: I.E., ARTICLES IN WSJ AND NYT, AND LEAD EDITORIALS IN WASH-POST, NYT, AND INT (12-8-86) -- WITH VERY POSITIVE REACTION TO USG POSITION IN NEGOTIATIONS. AT THE DLG. SESSION, USG DIFFERED WITH EC ON THE CONTENTS OF THE PROTOCOL AND ON THE NEGOTIATING TIMETABLE (SEE

REFTEL A). USG BELIEVES THAT ULTIMATELY EC ACCEPTANCE WILL BE NEEDED FOR A PROTOCOL TO BE EFFECTIVE (EC CFC PRODUCTION IS ABOUT 40 PERCENT OF WORLD TOTAL). MISSION ASSISTANCE AT EC POLICY LEVEL, AND EMBASSY ASSISTANCE AT EQUIVALENT LEVELS OF BOTH FOREIGN AND ENVIRONMENT MINISTERS, COULD PROVE CRITICAL IN STIMULATING MOVEMENT IN EC POSITION. DEPARTMENT HOPES MISSION/EMBASSIES CAN ENGAGE IN CONTINUING DIALOGUE ON THESE ISSUES WITH RELEVANT OFFICIALS OVER THE NEXT FEW WEEKS. END SUMMARY.

3. PROTOCOL CONTENTS: DIFFERENCES BETWEEN EC AND USG POSITIONS ARE DETAILED IN REFTEL. FROM USG VIEWPOINT, THE PRIMARY DEFICIENCIES OF EC POSITION ARE: (A) FAILURE TO ADDRESS LONGER TERM (EC CALLS FOR A FREEZE AND UNSPECIFIED "REASSESSMENT"); USG SUPPORTS PHASED REDUCTIONS SUBJECT TO PERIODIC SCIENTIFIC REVIEW; (B) LIMITED COVERAGE (EC WOULD ONLY CONTROL CFC 11 AND 12; USG WOULD CONTROL ALL MAJOR OZONE DEPLETERS); (C) FAILURE TO ADDRESS EXPORTS/IMPORTS AND NON-PARTIES' PRODUCTION OF OZONE-DEPLETING CHEMICALS (WHICH COULD ALLOW EVASION OF CONTROLS AND UNFAIR TRADE ADVANTAGES).

4. NEGOTIATING TIMETABLE: UNEP SCHEDULE OF FIRST WORKING GROUP SESSION IN DEC. '86, SECOND SESSION IN FEB. '87, AND DIPLOMATIC CONFERENCE IN APRIL '87 HAS BEEN PLANNED SINCE SEPT 1985. HOWEVER, AT DEC. SESSION, EC DELEGATIONS ASKED THAT SECOND SESSION BE POSTPONED UNTIL AFTER EC ENVIRONMENT MINISTERS MEETING MARCH 20, SO THEY COULD OBTAIN FURTHER NEGOTIATING AUTHORITY. (FYI: OUR UNDERSTANDING IS THAT MINISTERIAL LEVEL MEETING IS NOT NECESSARY TO OBTAIN FURTHER NEGOTIATING AUTHORITY, AND THAT A MEETING OF EC PERMREPS WOULD SUFFICE).

- USG AND SEVERAL OTHER DELEGATIONS STRONGLY SUPPORTED UNEP TIMETABLE, ON THE GROUNDS THAT: (A) TIMETABLE HAD BEEN PROPOSED BY UNEP OVER A YEAR AGO; (B) THE EC JUST HAD AN ENVIRONMENT MINISTERS MEETING (NOV. 24), WHICH (WE BELIEVE) GAVE THEM A SUFFICIENTLY FLEXIBLE MANDATE TO NEGOTIATE; AND (C) (NOT STATED PUBLICLY AT DEC. MEETING) DEFERRING TO THE EC WOULD SET BAD PRECEDENT OF SUBORDINATING INTERNATIONAL MEETING SCHEDULES TO THE EC'S REGULAR BI-ANNUAL MEETING SCHEDULE.

- BECAUSE THERE WAS NO CONSENSUS DURING DECEMBER WORKING GROUP ON THE DATE OF THE NEXT MEETING, IT WAS AGREED THAT UNEP EXEC DIR TOLBA WOULD MAKE THE FINAL DECISION. WE UNDERSTAND THAT TOLBA URGED EC TO STICK WITH THE FEBRUARY DATE, AND THAT THE EC HAS NOW AGREED. FURTHER, WE HAVE HEARD THAT EC WILL HOLD A MEETING FEBRUARY 13 TO CONCERT ITS POSITION.

- REGARDING THE REST OF THE SCHEDULE, THE USG CONTINUES TO BELIEVE THAT THE DIPLOMATIC CONFERENCE SHOULD BE HELD IN APRIL.

5. FOR US MISSION EC: MISSION IS REQUESTED TO CONTACT EC COMMISSIONER CLINTON DAVIS AND CONSULT WITH OTHER PERMREPS AND OTHER EC OFFICIALS AS APPROPRIATE TO: (A) ASCERTAIN CURRENT EC THINKING ON THE PROTOCOL NEGOTIATIONS: E.G., THEIR VIEW ON RESULTS OF DEC. SESSION AND POSSIBLE CHANGES IN EC POSITION. (YOU MAY DRAW ON REFTELS FOR BACKGROUND ON THE ISSUES INVOLVED.)

(B) CONFIRM THAT EC IS PLANNING ON FEBRUARY 23-27 NEGOTIATING DATES AND WILL BE PREPARED TO PARTICIPATE FULLY. IF THERE IS ANY DOUBT ABOUT THIS, CONVEY ABOVE USG VIEWS REGARDING NEGOTIATING SCHEDULE, URGING EC TO INTERPRET ITS EXISTING NEGOTIATING AUTHORITY MORE FLEXIBLY OR OBTAIN MORE EXPLICIT AUTHORITY THROUGH OTHER AVAILABLE EC MECHANISMS. THE ALTERNATIVE WOULD BE FOR

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MAJOR INTERNATIONAL NEGOTIATIONS TO BE SHACKLED TO THE EC'S SEMIANNUAL DECISION-MAKING PROCESS, WHICH IS UNACCEPTABLE TO USG AND OTHERS. WILL FEB 13 MEETING BE MINISTERS, PERHAPS, OR EXPERTS?

- (C) INDICATE USG DISAPPOINTMENT IN EC POSITION AT DECEMBER SESSION AND ENCOURAGE MOVEMENT, IN PARTICULAR ON LONGER TERM REDUCTIONS, TRADE PROVISIONS, AND THE SCOPE OF CHEMICALS COVERED.

- (D) NOTE USG DISAPPOINTMENT IN NON-ATTENDANCE OF BELGIUM, GREECE, SPAIN, AND PORTUGAL AT DEC. SESSION. (ANY INSIGHTS THAT MIGHT BE GLEANED ON THEIR POSITIONS WOULD BE USEFUL, SINCE SOME EC PARTICIPANTS INDICATED THAT THESE COUNTRIES WERE A CONSTRAINT ON EC MOVEMENT.)

IN ADDITION, WOULD APPRECIATE YOUR VIEWS AND SUGGESTIONS ON HOW USG AND OTHERS MIGHT ENCOURAGE EC TO BECOME MORE RESPONSIVE, AND ANY BACKGROUND ISSUE CAN PROVIDE ON EC MOTIVES AND CONSTRAINTS. MISSION'S ASSISTANCE IS GREATLY APPRECIATED.

6. FOR EC CAPITALS: PLEASE DRAW UPON ABOVE POINTS WITH HOST GOVERNMENT, INCLUDING FOREIGN MINISTRIES AS WELL AS ENVIRONMENT AGENCIES, AT APPROPRIATE HIGH LEVELS TO INFLUENCE POSITION ON WHAT U.S. REGARDS AS A MAJOR INTERNATIONAL ENVIRONMENTAL ISSUE.

7. FOR STOCKHOLM, OSLO, HELSINKI: DRAWING ON ABOVE AS BACKGROUND, PLEASE CONSULT WITH HOST GOVERNMENT ON THEIR VIEWS AND STATUS OF THEIR EFFORTS IN CONSULTING WITH EC MEMBERS AND OTHERS, ENCOURAGING ACTIVE EFFORTS BY NORDICS. WE WILL BE IN TOUCH WITH NORDICS SHORTLY REGARDING CONSULTATIONS PRIOR TO NEXT NEGOTIATING SESSION. SHULZ

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ACTION DES-09

INFO	LOG-00	COPY-01	ADS-00	AID-00	INR-10	EUR-00	SS-00
	QIC-02	AF-00	CIAE-00	EB-03	DINT-05	DODE-00	N-01
	HUD-02	IO-19	EXIM-06	NEA-07	NSF-02	ARA-00	NSAE-00
	L-03	LAB-04	TRSE-00	PM-10	EAP-00	OPIC-07	CEA-01
	DOE-00	OMB-01	STR-17	SIL-01	NHS-06	AGRE-00	FRB-01
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P 091653Z DEC 86  
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TO SECSTATE WASHDC PRIORITY 2982  
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OECD COLLECTIVE  
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AMEMBASSY BRASILIA  
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USOEC

FOR DES, IO/SCT AND E  
PASS EPA FOR THOMAS AND GREEN  
USDOC FOR M. KELLEY AND E. SHYKIND  
USDOC FOR NOAA T. CALIO  
WHITEHOUSE FOR DPC T. HARRIS  
WHITEHOUSE FOR CEO A. HILL  
NASA FOR R. WATSON  
USTR FOR REINSTEIN  
DOE FOR T. WILLIAMS  
NAIRCHI ALSO FOR UNEP PERH REP  
BRUSSELS FOR USEC

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E.O. 12356: N/A  
TAGS: SEMV, UNEP, OTRA  
SUBJECT: UNEP NEGOTIATIONS ON PROTOCOL TO PROTECT  
OZONE LAYER, GENEVA, DECEMBER 1-5, 1986 (DELEGATION  
REPORT)  
REF: A) STATE 364665, B) STATE 349396, C) STATE 255252  
(TOTAL)

1. SUMMARY: FIRST ROUND OF RESUMED NEGOTIATIONS BY  
QUOTE AD HOC GROUP OF GOVERNMENT-DESIGNATED LEGAL AND  
TECHNICAL EXPERTS FOR PREPARATION OF A PROTOCOL ON  
CHLOROFLUOROCARBONS TO THE VIENNA CONVENTION FOR THE  
PROTECTION OF THE OZONE LAYER UNQUOTE CONCLUDED EARLY  
FRIDAY AFTERNOON (DECEMBER 5). REPRESENTATIVES FROM  
ALL REGIONAL BLOCS AGREED THAT NEW MEASURES MUST BE  
TAKEN IN NEAR-TERM TO CONTROL EMISSIONS OF OZONE  
DEPLETING CHEMICALS. HOWEVER, WHILE DIFFERENCES OVER  
THE SCOPE, STRINGENCY AND TIME-PHASING OF CONTROL  
MEASURES WERE NARROWED, THEY WERE NOT RESOLVED.

DISCUSSIONS HELPED CLARIFY SPECIFICS AND RATIONALE OF  
VARIOUS PROPOSALS; DELINEATED ISSUES RELATED TO CONTROL  
STRATEGIES, TRADE ASPECTS, AND DEVELOPING COUNTRY  
PARTICIPATION THAT REQUIRE FURTHER ANALYSIS BY THE U.S.  
AND OTHERS; ESTABLISHED THAT EUROPEAN COMMUNITIES (EC),  
JAPAN AND USSR ARE PREPARED TO MOVE BEYOND  
PREVIOUSLY-HELD POSITIONS (ALTHOUGH HOW FAR IS YET TO  
BE DETERMINED); AND REVEALED UNEXPECTEDLY STRONG  
DEVELOPING COUNTRY SUPPORT FOR A PROTOCOL AND U.S.  
POSITIONS IN GENERAL (ALCEIT FROM A SPARSE LDC  
TURNOUT). PROSPECTS FOR NEXT SESSION HEAVILY DEPENDENT  
UPON EUROPEAN COMMUNITIES' WILLINGNESS TO CONSIDER  
CONTROL MEASURES OVER LONG TERM, AND UNEP'S ABILITY TO  
PREPARE ADEQUATE BASIS FOR DISCUSSIONS, INCLUDING  
ATTRACTING PARTICIPATION BY MORE GOVERNMENTS. OVERALL,  
USDEL BELIEVES IMPORTANCE OF THIS INITIAL ROUND OF  
NEGOTIATIONS CAPTURED VERY WELL IN WASHINGTON POST  
EDITORIAL OVER WEEKEND WHICH OBSERVED THAT QUOTE ALL  
THE MOVEMENT IS IN THE RIGHT DIRECTION UNQUOTE. END  
SUMMARY.

2. PARTICIPATION: WEEK-LONG NEGOTIATING SESSION  
ATTRACTED SOME 120 PARTICIPANTS FROM 25 GOVERNMENTS AND  
THE COMMISSION FOR THE EUROPEAN COMMUNITIES, 5 OTHER  
INTERGOVERNMENTAL ORGANIZATIONS (UNEP, OECD, WHO, ECF,  
AND COUNCIL OF EUROPE), AND NINE NONGOVERNMENTAL  
INTERNATIONAL BODIES, INCLUDING INTERNATIONAL CHAMBER  
OF COMMERCE, EUROPEAN CHEMICAL INDUSTRY AND AEROSOL  
ASSOCIATIONS, ENVIRONMENTAL DEFENSE FUND, WORLD  
RESOURCES INSTITUTE AND NATURAL RESOURCES DEFENSE  
COUNCIL. GOVERNMENT PARTICIPATION WAS ONLY ONE-HALF OF  
UNEP'S EARLIER ESTIMATE (OF 55): (ARGENTINA,  
AUSTRALIA, AUSTRIA, BELGIUM, BRAZIL, CANADA, DENMARK,  
EGYPT, FINLAND, FRANCE, FRG, HUNGARY, ITALY, JAPAN,  
MEXICO, NETHERLANDS, NORWAY, PHILIPPINES, PORTUGAL,  
SWEDEN, SWITZERLAND, USSR, USA, UK, AND URUGUAY)

FOLLOWING WERE NOTABLE ABSENCES: CHINA, INDIA, KENYA,  
NIGERIA, AND EC MEMBERS IRELAND, SPAIN, AND GREECE.  
BELGIUM, NEW CHAIR OF COUNCIL OF EUROPEAN COMMUNITIES  
BEGINNING ON 1 JANUARY, WAS REPRESENTED (ON LIMITED  
BASIS ONLY) BY GENEVA MISSION OFFICER, AS WAS MEXICO.  
LARGE AMERICAN CONTINGENT PRESENT. IN ADDITION TO  
OFFICIAL DELEGATION (HEADED BY STATE DEPARTMENT DEPUTY  
ASSISTANT SECRETARY RICHARD BENEDICK), SESSION  
ATTRACTED SIX CONGRESSIONAL STAFFERS, FIVE INDUSTRY  
REPRESENTATIVES AND FOUR PRIVATE ENVIRONMENTAL  
ORGANIZATIONS.

3. ATMOSPHERICS: MEETING ABLY RUN BY ELECTED BUREAU  
WINFRED LANG (AUSTRIA) CHAIRMAN; VLADIMIR ZAKHAROV  
(USSR) AND AHMED IBRAHIM (EGYPT) VICE-CHAIRMAN; GERALDO  
MASCIMENTO-SILVA (BRAZIL) RAPPORTEUR. UNEP DEPUTY  
EXECUTIVE DIRECTOR WILLIAM MANSFIELD SET GOOD TONE IN  
OPENING STATEMENT WHICH EMPHASIZED ACCUMULATING  
SCIENTIFIC EVIDENCE OF THREAT TO GLOBAL ECOSYSTEM, AND  
THE SOLID FOUNDATION AND MOMENTUM WHICH THE PAST TWO  
YEARS OF INTERNATIONAL SCIENTIFIC MEETINGS AND  
CONSULTATIONS HAD CREATED. MANSFIELD'S QUOTE RISING  
TIDE IN THE AFFAIRS OF MEN UNQUOTE WAS SOMEWHAT  
STEMMED, HOWEVER, BY UNEP'S FAILURE TO HAVE KEY DRAFT  
PROTOCOL TEXTS (BY U.S. AND CANADA) AVAILABLE FOR  
DISTRIBUTION UNTIL SECOND DAY, AND SUBSEQUENT INABILITY  
TO PRODUCE TRANSLATIONS OF MEETING ROOM PAPERS QUICKLY  
IN ALL LANGUAGES. (USSR RESERVED ON FINAL REPORT IN  
ABSENCE OF RUSSIAN VERSION.)

4. MEETING WAS VERY USEFUL IN DEFINING A COMMON  
UNDERSTANDING OF KEY CONCERNS AND OPTIONS ON WHICH AN  
EFFECTIVE SECOND SESSION DEPENDS. SEVERAL DELEGATES

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EXPRESSED STRONG SUPPORT FOR U.S. TRADE ARTICLE. EC PROPOSAL CALLED FOR STUDY ONLY. INFORMAL DISCUSSIONS REVEALED BROAD INTEREST IN INCLUDING TRADE PROVISION IN PROTOCOL TO PROVIDE NECESSARY TEETH AND SAFEGUARDS, AND ALSO IN EXAMINING THE FEASIBILITY OF HAVING IT INCLUDE PRODUCTS WHICH CONTAIN OR ARE MADE WITH CONTROLLED CHEMICALS.

(F) DEVELOPING COUNTRY TREATMENT - NORDIC AND USSR PROPOSALS BOTH EXEMPTED LDGS FROM CONTRACT PROVISIONS, SOVIETS PROVIDING COMPLETE EXEMPTION WHILE NORDICS APPLYING PROVISIONS ONLY TO PARTIES WITH PER CAPITA USE ABOVE 0.2 KG. CANADA INDICATED SUPPORT FOR EXEMPTION OF ANY COUNTRY WITH PER CAPITA USE BELOW WORLD AVERAGE (0.16 KG.). ARGENTINA ARGUED STRONGLY FOR A QUOTE POLLUTER PAYS APPROACH UNQUOTE, WITHOUT ELABORATING. (ARGENTINE REPRESENTATIVE VERY HELPFUL AND SUPPORTIVE OF U.S. POSITIONS THROUGHOUT, AS WAS EGYPTIAN DELEGATE.)

1. NEXT WORKING GROUP MEETING: UNEP SECRETARIAT ANNOUNCED THAT NEXT MEETING HAS BEEN SCHEDULED FOR FEBRUARY 23-27, 1987. HOWEVER, EC (WITH JAPANESE SUPPORT) ASKED FOR POSTPONEMENT UNTIL APRIL, SINCE EC COUNCIL WILL NOT MEET UNTIL MARCH 20. USSR FURTHER COMPLICATED SITUATION BY SAYING THAT NO FURTHER SESSION SHOULD BE HELD UNTIL UNEP'S GOVERNING COUNCIL (WHICH CONVENES IN MID-JUNE) CAN CLARIFY WORKING GROUP'S MANDATE REGARDING SCOPE OF CHEMICALS TO BE CONSIDERED. U.S., NORDICS, CANADA AND ARGENTINA STRONGLY ARGUED THAT FEBRUARY DATE (KNOWN TO ALL PARTIES FOR OVER A YEAR) SHOULD BE MAINTAINED. RESULT WAS THAT WORKING GROUP REFERRED THE ISSUE TO UNEP EXECUTIVE DIRECTOR TOLBA FOR RESOLUTION. STREATOR

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United Nations Environment Program

Protocol on Protection of the Ozone Layer

Plenary Statement by the Representative of the United States

Ambassador Richard Elliot Benedick  
Deputy Assistant Secretary of State

Geneva, December 1, 1986

Two years ago in Vienna the nations of the world took the unprecedented and momentous step of addressing an environmental risk of global significance before its actual impact was experienced by mankind. Many of you here today can take pride in the Convention that emerged from that effort.

We also recognize, however, that our success in achieving a framework Convention was tempered by our inability to reach agreement on specific measures to control the chemical substances which have been associated with ozone layer depletion. We have an opportunity this week to begin to rectify that situation. Indeed, as government officials charged with the health and well being of the citizens of our respective nations, we must not shrink from this challenge.

In Vienna, we set in motion a process to arrive at this point with improved insights into the nature and impacts of the ozone depletion issue. A series of international workshops (Rome, Leesburg) have been held. The Coordinating Committee on the Ozone Layer has done its work. And the United States and other nations have carried out and shared the results of increasingly sophisticated modeling, monitoring and research.

- 1) Agreement on a meaningful near-term first step to reduce significantly the risk of stratospheric ozone depletion and associated environmental and human health impacts.
- 2) Agreement on a long-term strategy and goals for coping with the problem.
- 3) Agreement on a carefully scheduled plan for achieving the long-term goals, including periodic reassessment and appropriate modification of the strategy in response to new scientific and economic information.

I hope that, as we go forward this week, these objectives can be addressed. I hope that we can agree on a relatively simple and cost-effective approach that will provide incentives and clear targets to governments and industry for rapidly developing and using new technologies for emission controls, recycling practices, and safer substitute chemicals. Finally, I hope that lengthy negotiations can be avoided, and that a reasonable and defensible formula can be found on which most or all of the concerned governments can agree.

In this spirit, the United States offers, for the consideration of this body, a proposal which we hope will stimulate thoughtful and interesting discussion. I would emphasize that this proposal

is submitted in response to a call by the UNEP Secretariat, as a basis for discussion and not as a preconceived solution to all of the complex issues involved. We will be listening carefully to your reactions, we will respect your own ideas, and we hope to learn from the discussion. In a word, the United States delegation is in a flexible, attentive position.

This United States proposal, which is reflected, as the Secretariat requested, in a draft protocol text which has been circulated, consists of three major elements:

- I. A near-term freeze on the growth of emissions, at or near 1986 levels, of those substances which are most damaging to the ozone layer because of their chemistry and their long atmospheric life;
- II. A long-term, scheduled reduction of emissions of these substances, down to the point of eliminating emissions from all but some limited uses for which no substitutes are commercially available -- such reduction could be as much as 95 percent; and
- III. A plan for periodically examining progress made, including provision for modifying the schedule, or removing or adding chemicals, based on new scientific knowledge and economic factors.

These elements would provide a margin of safety against increasing harm to the ozone layer, while needed scientific research continues. This approach would also aid industrial planning, in order to minimize the costs of reducing reliance on these chemicals, while allowing time for adjustment.

At the same time, we endorse a concerted, coordinated international scientific program of monitoring and analysis, in order to advance our knowledge of stratospheric processes and the effects on human health and ecology of changes in the stratosphere.

Nearly three months ago, in the deer park at Leesburg, Virginia, I expressed my confidence to the UNEP workshop that the participants in this December negotiating session would bring to Geneva the ingenuity, good will, and sense of responsibility that characterized the "spirit of Leesburg."

In discussions I have had with a number of you in the weeks since Leesburg, I believe that spirit continues to prevail.

Let us work together in that spirit this week.

Thank you, Mr. Chairman.

United States Proposed Protocol Text

UNEP Negotiations on an Ozone Layer Protocol

December 1-5, 1986  
Geneva, Switzerland

The United States believes that the potential risks to the stratospheric ozone layer from certain man-made chemicals require early and concerted action by the international community. Since the adoption in Vienna in March 1985 of the Ozone Layer Convention, an intensive scientific research and technical analysis effort has been carried out and is continuing, as reflected in the recent series of UNEP-Sponsored workshops. The results continue to indicate the emergence of a serious environmental problem of global proportions.

The United States further believes that governments should pursue three broad objectives during the course of the negotiations, to be embodied and elaborated in the final protocol. These are:

- A. Agreement on a meaningful near-term first step to reduce significantly the risk of stratospheric ozone depletion and associated environmental and human health impacts.
- B. Agreement on a long-term strategy and goals for coping with the problem successfully.
- C. Agreement on a carefully-scheduled plan for achieving the long-term goals, including periodic reassessment and appropriate modification of the strategy and goals in response to new scientific and economic information.

In response to UNEP's invitation, the U.S. has prepared for discussion purposes a draft text based on the U.S. views statement which we recently circulated. This text is for the operative articles only, and is designed for incorporation into the protocol text developed during the previous round of negotiations (i.e., it would replace Articles II through V of the fourth revised draft text).

The United States believes that what is required is a straightforward, cost-effective approach that will provide technology incentives and clear targets to governments and industry for developing and introducing new technologies for chemical conservation, recycling and substitution. The U.S. believes that its proposed text provides such an approach.



U.S. DRAFT PROTOCOL TEXT: OPERATIVE ARTICLES

Article II: Control Measures

1. Within [ ] year after entry into force of this Protocol, each Party shall ensure that its aggregate annual emissions of fully-halogenated alkanes does not exceed its 1986 level.
2. Within [ ] years after entry into force of this Protocol, each Party shall ensure that its aggregate annual emissions of fully-halogenated alkanes is reduced by [20] percent from its 1986 level.
3. Within [ ] years after entry into force of this Protocol, each Party shall ensure that its aggregate annual emissions of fully-halogenated alkanes is reduced by [50] percent from its 1986 level.
4. Within [ ] years after entry into force of this Protocol, each Party shall ensure that its aggregate annual emissions of fully-halogenated alkanes is reduced by [95] percent from its 1986 level.
5. The right of any Party to adopt control measures more stringent than contained herein is not restricted by this Article.

Article III: Calculation of Aggregate  
Annual Emissions

1. For the purposes of Article II, each Party shall calculate its aggregate annual emissions by taking its:
  - a. aggregate annual production;
  - [b. plus aggregate annual bulk imports;]
  - [c. minus aggregate annual bulk exports to other Parties;]
  - [d. minus aggregate annual amount of fully-halogenated alkanes which have been destroyed or permanently encapsulated.]
2. To calculate the aggregate amounts specified in the subparagraphs of paragraph 1, each Party shall multiply the amount of each fully-halogenated alkane by its ozone depletion weight, as specified in Annex A, and then add the products.

Article IV: Assessment and Adjustment  
of Control Measures

1. The Parties shall cooperate in establishing an international monitoring network for detecting, or aiding in the prediction of, modification of the ozone layer.
2. At least one year before implementing the reductions specified in paragraphs 2, 3, and 4, respectively, of Article II, the Parties shall convene an ad hoc panel of scientific experts, with composition and terms of reference determined by the Parties, to review advances in scientific understanding of modification of the ozone layer and the potential health, environmental, and climatic effects of such modification.
3. In light of such scientific review, the Parties shall jointly assess and may adjust the stringency, timing, and scope of the control measures in Article II and the ozone depletion weights in Annex A.
4. Any such adjustment shall be made by amending Article II and/or Annex A as provided in Article 9 of the Convention, except that such amendment would not be subject to the six month advance notice requirement of paragraph 2 of that Article.

Article V: Control of Trade

1. Within [ ] years after entry into force of this Protocol, each Party shall ban the import of fully-halogenated alkanes in bulk from any state not party to this Protocol [, unless such state is in full compliance with Article II and this Article and has submitted information to that effect as specified in paragraph 1 of Article VI].
2. Within [ ] years after entry into force of this Protocol, each Party shall ban:
  - a. the export of technologies to the territory of non-parties
  - [b. direct investment in facilities in the territory of non-parties]for producing fully-halogenated alkanes [, unless such state is in full compliance with Article II and this Article and has submitted information to that effect as specified in paragraph 1 of Article VI].
3. The Parties shall jointly study the feasibility of restricting imports of products containing or produced with fully-halogenated alkanes from any state not party to this Protocol.



Article VI: Reporting of Information

1. Each Party shall submit annually to the Secretariat data showing its calculation of aggregate annual emissions of fully-halogenated alkanes, as specified in Article III, using the format developed by the Secretariat pursuant to paragraph 3a.
2. Each Party shall submit to the Secretariat appropriate information to indicate its compliance with Article V.
3. The Secretariat shall:
  - a. develop and distribute to all Parties a standard format for reporting such data as indicated by paragraph 1;
  - b. take appropriate measures to ensure the confidentiality of all data submitted to it pursuant to paragraph 1, except for the aggregate annual emissions figures;
  - c. compile and distribute annually to all Parties a report of the aggregate annual emissions figures and other information submitted to it pursuant to paragraph 2.

Statement of  
Ambassador John D. Negroponte,  
Assistant Secretary of State  
for  
Oceans and International Environmental and Scientific Affairs  
to the  
Subcommittee on Toxic Substances and Environmental Oversight  
Senate Committee on Environment and Public Works

January 28, 1987

The United States, along with other nations of the world, is engaged in an historic effort to undertake cooperative measures to prevent potentially serious adverse effects from depletion of stratospheric ozone. The Vienna Convention for the Protection of the Ozone Layer, signed in March 1985 under the auspices of the United Nations Environment Program (UNEP) and ratified by the United States in August 1986, was an important first step. But, as many of the members of this Committee noted in speaking in favor of ratification of the Convention, additional concrete measures are necessary. We are now engaged in negotiations under UNEP auspices on a protocol to the Convention which would provide for regulatory controls on ozone-depleting chemicals.

Laying the Foundation of Common Understanding of the Issue

Between the adoption of the Convention in Vienna in March 1985 and the resumption of negotiations on control measures in December 1986, the international community participated in a unique cooperative effort to improve common understanding of the nature and impacts of the ozone depletion issue. The United States Government played a leading role in that process.

- A two-part UNEP workshop, in Rome in May 1986 and in Leesburg, Virginia in September 1986, focused on key economic issues related to the control of ozone-depleting chemicals.
- In June 1986, the U.S. co-sponsored with UNEP an international conference with over 300 participants on the effects of both ozone depletion and climate change.
- The Coordinating Committee on the Ozone Layer (CCOL), a UNEP body comprising scientists from many interested nations, assessed current knowledge of the atmospheric science and effects of ozone depletion, and presented their findings to UNEP for consideration in the development of measures to protect the ozone layer. Scientists and policymakers from EPA and NASA played a leading role.

- 150 scientists, coordinated by Dr. Robert Watson of NASA, prepared a landmark publication on the state of knowledge about atmospheric ozone, under the auspices of NASA, the World Meteorological Organization (WMO), UNEP, the European Communities, NOAA, FAA and the German Federal Ministry for Research and Technology.

At the same time, U.S. government representatives were working bilaterally with various governments to improve understanding of the nature of the problem and the options for reducing risks.

- EPA, NASA and NOAA have worked with scientists in key nations, such as India, Egypt and Australia, to increase understanding of the risks if depletion should occur and to advance scientific assessment and monitoring capabilities.
- We have discussed the issue with policymakers in key countries. For example, my Deputy Richard Benedick, who is the lead U.S. negotiator, and a team from EPA went to Brussels and Bonn last November for consultations in preparation for the December negotiations.

As this extensive bilateral and multilateral effort moved forward, we saw that consensus was emerging, both in the United States and in the international community, in a number of important areas:

- The ozone layer is an exceedingly valuable resource for the present and future population of the world.
- The ozone layer has been, is being, and will continue to be adversely affected by the long-lived chlorine molecules which stem from chlorofluorocarbons.
- This ozone depletion, by permitting greater quantities of harmful ultra-violet radiation to reach the earth, will pose significant, even if currently difficult to quantify, risks.
- These risks are sufficiently serious as to warrant control actions.
- The very nature of the ozone layer requires global cooperation if protective measures are to be effective.

## The U.S. Position

The United States Government believes that the potential risks to the stratospheric ozone layer require early and concerted action by the international community. We seek agreement on the following broad objectives:

- o A meaningful near-term first step to reduce significantly the risk of stratospheric ozone depletion and associated environmental and human health impacts;
- o A long-term strategy and goals for coping with the problem successfully; and
- o A carefully-scheduled plan for achieving the long-term goals, including periodic reassessment and appropriate modification of the strategy and goals in response to new scientific, technical and economic information.

We believe a protocol to achieve these objectives should:

- provide a simple approach to facilitate agreement within the current UNEP timetable;
- provide as much certainty as possible for industrial planning in order to minimize the costs of adjustment;
- provide adequate time for shifting away from ozone-depleting chemicals to avoid social and economic disruption, while at the same time give a strong incentive for the rapid development and employment of safer substitutes and recycling techniques;
- address CFC's 11, 12, and 113, and Halon 1211 and 1301, so that all the principal man-made sources of long-lived atmospheric chlorine and bromine are included;
- allow flexibility for national implementation by allowing trade-offs among controlled chemicals based on their relative ozone-depleting effects;
- take into full consideration scientific uncertainties and promote future improvements in understanding by instituting a requirement for periodic reassessment of the goal and timing of limits;
- create incentives to participate in the protocol by regulating relevant trade between parties and non-parties.

In response to UNEP's invitation, the United States prepared a draft text for the operative articles of the protocol which we believe offers a straightforward, cost-effective approach that will provide incentives and clear targets to governments and industry for developing and introducing new technologies for chemical conservation, recycling and substitution. The U.S. draft protocol text is attached.

#### Geneva, December 1986

We have come a long way since March 1985 in Vienna. In the first round of resumed negotiations in Geneva last month, representatives from all regions agreed that new measures must be taken in the near term to control emissions of ozone depleting chemicals. However, differences over the scope, stringency and time-phasing of control measures remain.

The week-long session included some 120 participants from 25 governments plus international organizations, industry and environmental groups.

The U.S. delegation focused in the first round on seeking support for the basic elements of a protocol which would have both meaningful near and longer term control measures; would cover a broad spectrum of ozone depleting chemicals; and would contain good scientific assessment and technology incentives.

#### Country Positions

Canada firmly supports a strong agreement. Canada has presented a draft providing for a global emissions limit (a) allocated nationally on the basis of gross national product and population and (b) measured in terms of adjusted production (production plus imports minus exports to parties). However, in the first negotiating session, the Canadians, like the U.S., sought to achieve consensus on the broad outlines of a protocol rather than on specific formulas.

The European Communities (EC) have moved from insistence on a production capacity cap (their current capacity is approximately 30% above current production) to consideration of a cap on production itself. Representatives of the EC Commission distributed at Geneva a "provisional paper" proposing that production of CFC 11 and 12 (and possibly 113 and 114) be frozen at 1986 levels and that the controls be reviewed periodically (i.e., further steps might be decided in the future, but would not be included in the protocol at this time).



Finland, Norway and Sweden endorsed the U.S. approach in general, and tabled an amendment to the U.S. text calling for a first step phase-down of 25 percent rather than a freeze.

While the USSR delegation acknowledged the risk of ozone depletion and the need for control measures, they introduced a text calling for a global production limit for CFC 11 and 12 only, allocated to nations on the basis of population, with less developed countries exempt from controls.

Japan, too, acknowledged the need for controls, but favored a production capacity cap, only on CFC 11 and 12.

Developing country representation at Geneva was sparse. Argentina, Brazil and Egypt participated actively in support of an early agreement.

### Looking Ahead

The United States will continue in the next round of negotiations, February 23-27, to pursue the objectives outlined above. We are consulting actively with a number of nations in the interim, through discussions with environmental, foreign ministry, and trade officials in Washington and abroad, through our Embassies, official visits, and scientific exchanges.

Ambassador Benedick will leave in the next few days for consultations in Europe. Deputy U.S. Trade Representative Michael Smith discussed the issue with Japanese trade officials in Tokyo this week, and I will discuss it with Foreign Ministry and environmental policy officials in Tokyo next week. A team from NASA, NOAA and EPA will visit the Soviet Union February 3-9 to exchange information on the chemistry and dynamics of the atmosphere as it relates to ozone depletion and on the effects of increased ultraviolet radiation. We are meeting this week with Canadian representatives. Yesterday, through the USIA "Worldnet" interactive satellite hookup, Ambassador Benedick and Dr. Watson of NASA discussed the issue with experts, policymakers and journalists in London, Rome, Copenhagen, Paris and Geneva; another such program is planned for next month with several other capitals.

This is a difficult and complex negotiating process. We have made substantial progress, but we have a long way to go to reach an effective agreement with broad participation. Meanwhile, we must be sure that our actions domestically support and do not undercut that international process, since this is clearly a matter which the U.S. cannot resolve alone. We have entered a new era of truly global environmental management, in which we are all made more conscious of the unity and vulnerability of our planet.

TESTIMONY OF  
J. CRAIG POTTER  
ASSISTANT ADMINISTRATOR FOR AIR AND RADIATION  
U.S. ENVIRONMENTAL PROTECTION AGENCY  
BEFORE THE  
SUBCOMMITTEE ON HAZARDOUS WASTE AND TOXIC SUBSTANCES  
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS  
U.S. SENATE

January 28, 1987

Good morning, Mr. Chairman and members of the Subcommittee. I am pleased to have the opportunity to discuss the current state of our knowledge of the changes in earth's atmosphere, the possible public health and environmental implications of these changes and what we at EPA are doing to address these issues both within the United States and in our international negotiations. With me today are Fitzhugh Green, Associate Administrator for International Activities, and Dr. Vaun Newill, Assistant Administrator for Research and Development. Our direction from the Administrator has been to place these issues among the Agency's highest priorities, and together, our offices spearhead EPA's efforts to understand and respond to these concerns.

Pollution that directly affects land, water, and the air we breathe has been the Environmental Protection Agency's traditional focus. However, the environmental significance of changes now occurring in the composition of the earth's atmosphere as a result of human activities presents a new and demanding challenge, and requires that all nations consider the effect of their actions on the atmosphere.

Obviously, our atmosphere plays a fundamental role in shaping and protecting our planet's environment. Sustaining its viability is of paramount importance to all nations, and true global cooperation is necessary if we are to ensure its protection. For it is possible that a shift in the atmosphere's chemical and physical balance could lead to two separate but related environmental and health concerns.

The first concern involves possible future depletion of the stratospheric ozone layer. Here our concern rests upon a growing body of scientific evidence which indicates that continued use of chlorofluorocarbons (CFCs) and other ozone-reactive substances could result in reducing the effectiveness of the atmosphere's outer protective ozone shield. We are certain that if enough chlorine and other halogens are put in the atmosphere, the ozone layer will begin to be depleted. The current state of science also tells us that the effect of a diminution in the stratospheric ozone layer would be to allow more damaging ultraviolet-B (UV-B) radiation to penetrate to the earth's surface causing increases in the number of skin cancers, suppressing the immune system, and possibly damaging crops and aquatic organisms.

The second related concern which I will just briefly describe relates to the greenhouse effect or global warming. We know that the concentrations of several gases including CFCs are increasing in the atmosphere. Some, like chlorofluorocarbons and sometimes nitrous oxide, contribute to stratospheric ozone depletion; while others, such as methane and carbon dioxide, can actually add to the ozone column or reduce losses. Yet all are greenhouse gases.



As such they block the escape of heat energy from the earth's surface, thus forming a thermal blanket and contributing to warmer temperatures.

In assessing the problems of stratospheric ozone depletion and the greenhouse effect, we must keep several things in mind. First, as mentioned earlier, both of these issues are examples of environmental problems which demonstrate how clearly we are part of a "global commons." Because CFCs and related ozone-reactors quickly disperse throughout the atmosphere, all nations should be concerned about recent changes in the atmosphere. Although the producing nations must shoulder primary responsibility, all nations will need to cooperate in any effective solution to these problems. The U.S. has already begun to meet its responsibility by taking a leadership role through the banning of non-essential aerosol uses. Seven other nations, including Canada and the Scandinavian nations, have also taken this important first step. However, we can and must do more. CFC use has returned to levels approximating those reached in 1974 before concern first surfaced about ozone depletion. Our studies have shown that if anticipated CFC production and use continue as projected, global use of CFCs can be expected to increase, with potentially significant effects on the ozone column.

A second thing to keep in mind in assessing these problems is the need to distinguish between the scientific process of risk assessment and the public policy process of risk management. Risk assessment looks specifically and exclusively at the scientific and technical evidence in order to determine the health and environ-

mental risks associated with depletion of the ozone layer. Risk assessment will have a particularly important role in evaluating the uncertainties associated with this issue.

Risk management, on the other hand, takes this risk assessment information as its starting point and determines which options are available to address the problem. Any course of action which the United States ultimately chooses must take into consideration the full spectrum of associated economic and social impacts, and must also recognize both the national and international aspects of the issue. Through the risk management process, and pursuant to our mandate under the Clean Air Act, we will make a determination of whether our nation will need to take additional specific actions to control risks related to stratospheric ozone depletion. EPA will make this decision publicly, with ample opportunity for comment by all interested parties.

We feel our risk assessment efforts in this area have led to a greater understanding of the problem of stratospheric ozone depletion and its implications. Decreases in total column ozone would increase the penetration of biologically damaging ultraviolet-B radiation reaching the earth's surface. Exposure to UV-B radiation has been linked by laboratory studies and epidemiology to squamous and basal skin cancers. While uncertainty exists concerning the appropriate action spectrum and measure of exposure, a range of estimates was developed linking possible future ozone depletion with increased incidence of nonmelanoma skin cancers.

The relationship between cutaneous malignant melanoma and UV-B radiation is a complex one. However, recent studies, some of which are financially supported by the Agency, suggest that UV-B radiation plays an important role in causing melanoma. Studies have also demonstrated that UV-B radiation can suppress the immune response system in animals and possibly humans. While UV-B induced immune suppression has been linked to herpes virus infections and leishmaniasis, its possible impact on other diseases has not been studied.

To support our risk assessment efforts, we have a continuing research program to assess the environmental effects of UV-B. Several hundred varieties of crop plants have been examined and some 140, about two-thirds, exhibit some level of sensitivity to increased UV-B radiation. Some of the crops are important human food sources and our work is not completed in this area.

Our aquatic research, mainly with marine environments, has shown marine organisms, especially plankton and larval forms, to be sensitive to increased UV-B; so sensitive that the species composition may be altered by this radiation. The ramifications of these responses on larger fish which are at the top of the food web are still being examined.

Modest research and modeling efforts are examining the role of increased UV-B radiation on other air pollutants in the troposphere to determine if they may enhance pollutant formation.

While work still needs to be done to quantify some of our research results, the research evidence clearly shows that increasing levels of UV-B are damaging to humans and many important plant and animal life forms both on land and in the sea.

Given these concerns, we have greatly expanded our efforts to better understand the risks and uncertainties associated with ozone depletion, and have factored our current understanding into our risk management activities.

In January of 1986, we announced our stratospheric ozone protection plan which sets forth a comprehensive agenda for dealing with both domestic and international aspects of this issue. This plan also formed the basis for settlement of a lawsuit filed by the Natural Resources Defense Council (NRDC) seeking to compel us to make a decision on the need for further domestic regulation.

I would first like to briefly describe what we have been doing recently in the international arena. As I mentioned earlier, the global aspects of this problem make it paramount that any true solution involve the other CFC producing and consuming nations. As a result, we have initiated a series of activities aimed at educating and encouraging other governments to support measures to reduce CFC use. Key activities include:

-- U.S. leadership in negotiating and ratifying the Vienna Convention for the Protection of the Ozone Layer, which provides a framework for international cooperation on research, monitoring, and information exchange, and procedures for developing control protocols as needed;

-- U.S. leadership in a two-part workshop organized by the United Nations Environment Programme (UNEP) which focused on key economic issues related to control of CFCs;

-- U.S. co-sponsorship with UNEP of an international conference on the effects of both ozone depletion and climate change.

This series of meetings--all during the past 12 months--provided the analytical basis for assessing the nature of the problem and the options for reducing global risks. But our efforts have gone well beyond sponsorship of these meetings. For example--

-- Lee Thomas sent letters to his counterparts in over 100 nations advising them that this issue was a very high priority and requesting their active participation in the UNEP negotiations.

-- We have also sent teams of scientists to other key nations as part of our effort to increase understanding of other risks if depletion should occur. Over the next two weeks, a team from NASA, NOAA, EPA, and State will be in Europe, and next week a scientific team will be in Moscow expressly to continue this dialogue.

-- We have participated actively in UNEP negotiations on a protocol to the Ozone Layer Convention.

Ambassador Negroponte will discuss the status of the international negotiations in greater detail in a few minutes. Let me just say here that the U.S. position -- a near-term freeze followed by a scheduled longer-term reduction of CFC emissions and use, subject to a periodic reassessment of the science -- has had the effect of altering the tone and content of the negotiations. We are now working hard to maintain the momentum and to broaden the level of international awareness and cooperation -- and looking to create and seize new opportunities to engage other nations in discussions of the science of ozone depletion as well as of measures needed to deal effectively with the problem.

On the domestic side of this issue, we are also moving forward rapidly. While we hope that we are able to reach a satisfactory international resolution of this issue in the near-term, we recognize that we face an obligation under the Clean Air Act to assess the need for further domestic regulation. The deadlines set forth in our plan, as mentioned earlier, are consistent with the court order negotiated with NRDC and others, calling for EPA to propose a decision on the need for further domestic regulation and, if warranted, specific regulations, by May 1, and to make a final decision by November 1 of this year.

To meet this deadline we have completed several steps:

-- In March and July of last year we held workshops in Washington attended by a wide range of interest groups. These workshops discussed alternative regulatory options and their economic impact;

-- In late November we submitted to a subcommittee of the Agency's Science Advisory Board -- convened specifically for the purpose of reviewing this issue -- our draft risk assessment document;

-- within the Agency we are now in the process of preparing a regulatory impact analysis and evaluating options for action, all key steps in our regulatory process.

While I cannot yet say what will be the outcome of this process, I can state that we are committed to making a decision and to meeting the timeframes that we have laid out in our January 1986 plan.

I would also like to note the significant contributions made by industry. Their attempts to find mutual areas of agreement and their general support for some form of international protocol are certainly encouraging developments and are illustrative of the growing consensus on the science and the need for action. I should also add that the interest and involvement of the environmental community and staff from both the Senate and House have substantially aided our efforts. The presence of these groups at this hearing and the fact that representatives of three EPA offices are here today should underscore the growing importance of this issue. Given the complex nature of this issue, widespread cooperation in both the national and international scene is essential to the future progress we all desire.



In summary, I believe that the activities I've just described are important first steps toward expeditiously and aggressively moving forward in our efforts to obtain an international agreement and to assess our domestic regulatory options.

I, Mr. Green and Dr. Newill would be pleased to attempt to answer any questions you may have.



United States Department of State

*Bureau of Oceans and International  
Environmental and Scientific Affairs*

Washington, D.C. 20520  
January 29, 1987

To: See attached list

From: OES/ENH - Suzanne Butcher *SB*

Subject: Meeting on trade aspects of ozone protection  
protocol, Thursday, February 5, 1987,  
10:30 a.m.-1:00 p.m., Room 6226, State Department

Any protocol to control ozone-depleting chemicals will have trade implications. U.S. interests in encouraging open trade, protecting U.S. industry and achieving an effective and broadly acceptable protocol will come into play and perhaps into competition. We believe it would be useful to have an exchange of views and information among interested parties and would appreciate your participation. Here is a proposed agenda. If you have other items you would like to discuss, please let me know before the meeting. Please call (647-9312) to let us know who will attend.

We hope to distribute before the meeting discussion papers on several of the topics. Any materials you can provide to all the participants for review before the meeting would be helpful.

### Discussion Topics

1. Are options under consideration consistent with GATT and other international legal obligations?
2. Evaluation of options for calculating national limits (production vs. adjusted production).
3. Is restriction of exports of technology and/or investment necessary? advisable? enforceable?
4. Should the protocol restrict trade in bulk CFC's, products containing CFC's, and/or products made with CFC's? Can such restrictions be used to:
  - (a) Make the agreement more effective by providing incentives to join?
  - (b) Make the agreement as fair as possible to U.S. manufacturers competing in the U.S. and third country markets?
  - (c) Discourage movement of capital offshore by restricting markets for the products of non-party production?

Would the benefits of trade restrictions outweigh the administrative costs to government and industry? To address this, we need to analyze what the costs to the effectiveness of the agreement and to U.S. industry would be of not imposing trade controls -- what the value of trade is, what the effect on relative costs of U.S. manufactured vs. imported goods would be, how much this is likely to affect the various U.S. manufacturers.

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