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WHITE HOUSE
CORRESPONDENCE TRACKING WORKSHEET

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Name of Correspondent: William D. Fay

☐ **MI Mail Report** **User Codes:** (A) _____ (B) _____ (C) _____

Subject: Attached material concerning S. 1630 ① letter to Sen. Johnston ② Qual CBO, CRS and OTA letter and questions ③ letter from Sen. Dole to Maj. Leader Mitchell ④ Pres. Bush's letter to the Senate warning that he will veto any Clean Air bill that jeopardizes jobs and the economy.

ROUTE TO: Office/Agency (Staff Name)	Action Code	Tracking Date YY/MM/DD	Type of Response	Code	Completion Date YY/MM/DD
Cmte	ORIGINATOR	90 10 2 02		_	1 1
	Referral Note:				
Cmte 17	I	90 10 2 02		S	90 10 2 12
	Referral Note:				
Cmte 02	I	1 1		_	1 1
	Referral Note:				
Cmte	I	1 1		_	1 1
	Referral Note:				
	_	1 1		_	1 1
	Referral Note:				

ACTION CODES:
A - Appropriate Action
C - Comment/Recommendation
D - Draft Response
F - Furnish Fact Sheet to be used as Enclosure
I - Info Copy Only/No Action Necessary
R - Direct Reply w/Copy
S - For Signature
X - Interim Reply

DISPOSITION CODES:
A - Answered
B - Non-Special Referral
C - Completed
S - Suspended

FOR OUTGOING CORRESPONDENCE:
Type of Response = Initials of Signer
Code = "A"
Completion Date = Date of Outgoing

Comments: No action required. JRH 2/27/90

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Subject

CATA - Gen.

CAWG
CLEAN AIR WORKING GROUP

EARL W. MALLICK, CHAIRMAN
WILLIAM D. FAY, ADMINISTRATOR

January 30, 1990

Mr. John Schmitz
Deputy Counsel to the President
The White House
1600 Pennsylvania Avenue NW
Washington, DC 20500

Dear Mr. Schmitz:

In my most recent set of materials, I included a letter to Senate Energy and Natural Resource Committee Chairman Bennett Johnston requesting hearings on S.1630. The hearings took place on January 24th and 25th under Senator Johnston's able leadership.

Unfortunately, in my mailing, I omitted page 2 of the letter, which included the signatures of ten senators joining Senators McClure and Ford.

So that your files are accurate and so you can see the extent of the bipartisan questions surrounding S. 1630, I have attached 1) the letter to Senator Johnston in its entirety 2) the final CBO, CRS and OTA letter and questions 3) a letter from Senator Dole to Majority Leader Mitchell and 4) President Bush's letter to the Senate warning that he will veto any Clean Air bill that jeopardizes jobs and the economy.

I have also enclosed the Business Roundtable Clean Air Act Legislation Cost study for your review.

Sincerely,

Bill

William D. Fay
Administrator

WDF/lw
enclosure

818 CONNECTICUT AVE NW
SUITE 900
WASHINGTON, DC 20006
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CLEAN AIR ACT LEGISLATION
COST EVALUATION

Prepared for
The Business Roundtable

Prepared by
Denny Technical Services

PROPOSED CLEAN AIR ACT LEGISLATION COST EVALUATION

Executive Summary

This report, supported by The Business Roundtable, contains a compilation and analysis of cost estimates for the three major provisions contained in various proposed amendments to the Clean Air Act. The major provisions include changes to attempt to achieve compliance with ambient air quality standards for ozone, acid deposition provisions, and toxic air pollutant provisions. A unique feature of this report is that it provides a comprehensive cost perspective for the many proposed modifications to the Clean Air Act. The estimated cost for all three provisions could be as much as $104 billion per year. A "Best Estimate," representing a middle ground of possible requirements, would be about $54 billion per year for the provisions evaluated. Cost estimates are not included for Administration bill elements such as the PM10 requirements and provisions related to enforcement and permit amendments. These items could substantially increase the "Best Estimate."

The Administration bill, H.R. 3030 in the House of Representatives and S. 1490 in the Senate, could be less costly than the "Best Estimate" of $54 billion per year. Various combinations of bills before Congress could lower or raise the estimated cost. The Senate Environment and Public Works legislation, S. 1630, reported on November 19th, would be significantly more expensive than the Administration bill.

The basis for the evaluation is a series of cost estimates generated by several organizations. To the extent possible, this evaluation has been reviewed by the cost study authors or sponsors and their comments have been considered in the conclusions reached.

Acid Deposition Provisions

The range of costs and a best estimate for the acid rain, air toxics and ozone provisions are contained in Figure ES-1. The electric utility acid deposition rain cost range

estimate of $3 billion to $8 billion per year covers estimates generated by Temple, Barker, and Sloane (TBS) for the Edison Electric Institute and by ICF Resources and Pechan Associates for EPA. The "Best Estimate" was generated in this report following discussions with TBS, electric utility personnel, EPA staff, and electric utility management consultants. The electric utility "Best Estimate" of $5 billion per year is at the high end of the ICF range and at the low end of the TBS range. Uncertainties in the availability and cost of low sulfur coal, extent of allowance trading that would occur, and differences in scrubber costs among the studies led to the conclusion that the most likely cost would be at the high end of the ICF range.

The "Best Estimate" and range of costs for acid rain provisions include $0.8 billion per year for increased natural gas prices. The natural gas price increase estimate was included in the ICF report.

Clean Air Act Modification Cost Summary

Provision	Cost Range ($ Billions/year)	Best Estimate ($ Billions/year)
Acid Rain	3 - 8	5
Ozone	6 - 34	24
Air Toxics	5 - 62	25
Totals	14 - 104	54

Figure ES-1

Ozone Non-Attainment Provisions

The ozone control cost range would be from $6 to $34 billion per year. The lower value is based on an analysis conducted for EPA by Pechan and Associates. The $6 billion

per year was the lowest estimate to implement the original Administration bill. The high end of the cost range, $34 billion per year, represents the high Pechan estimate for the original Administration bill plus costs for the Waxman-Dingell compromise for motor vehicle emissions controls and additional costs for ozone non-attainment cities that are far from compliance.

A "Best Estimate" for ozone compliance costs was calculated to be $24 billion per year. The Pechan average estimate to comply with Administration proposal, as introduced, was adjusted to account for additional motor vehicle emissions controls, alternate fuel amendments, and for estimated control costs to comply with ozone air quality standards in southern California. No cost estimates were included for the Waxman-Dingell compromise requirement for a 0.2 grams per mile motor vehicle tailpipe nitrogen oxides emission limit.

Air Toxics Provisions

Toxics air pollutant control costs were projected to range from $5 to $62 billion per year. The lower cost of $5 billion was the lowest cost to implement the air toxics Maximum Available Control Technology provisions as contained in the Administration bill. The low estimate was taken from a report prepared by Energy and Environmental Analysis, Incorporated for EPA. The $62 billion per year upper end of the range is based upon compliance with a one in a million residual risk requirement as would be required by S. 1630. A "Best Estimate" of $25 billion per year includes EPA's average estimate for the Administration bill plus an incremental cost to comply with a one in one hundred thousand residual risk requirement. The incremental residual risk estimates are based on analyses performed by the American Petroleum Institute and by Denny Technical Services for the Chemical Manufacturers Association (CMA). The incremental residual risk compliance cost estimates are for VOC carcinogens only. No cost estimates were made for carcinogenic particulates, radionuclides, or threshold pollutant controls.

Comparison to the Administration Bill as Introduced

The "Best Estimate" cost increments to the Administration bill, as introduced, are shown graphically in Figure ES-2. There is little difference between the Administration proposal acid deposition costs and those included in the "Best Estimate." The ozone attainment provisions in the "Best Estimate" are more than twice those for the Administration bill. There seems to be little disagreement regarding the magnitude of the incremental $9 billion per year for motor vehicle tail pipe emissions controls. The $5 billion per year increment for high ozone cities is less certain. EPA staff indicated they agree there may be some cost increment above the average estimate for the Administration bill. They had not estimated the value for that incremental cost.

The largest difference between the "Best Estimate" and estimates for the Administration bill is the $18 billion per year for air toxics residual risk controls. Residual risk controls cost estimates are very sensitive to the risk level selected. S. 1630 would mandate the establishment of two simultaneous residual risk standards. The first residual risk standard would be one in ten thousand and all facilities would be required to comply. The second residual risk standard would be one in one million and all facilities would be required to attempt to achieve that standard. The "Best Estimate" assumes an intermediate compliance level at a one in one hundred thousand residual risk level. If the residual risk requirement were to be one in ten thousand as stipulated in S. 1630, the control cost increment would be $7 billion per year. If the residual risk requirement were one in a million as also stipulated in S. 1630, the incremental cost would be $55 billion per year. CMA member company representatives estimated the residual risk cost estimate uncertainty to be plus or minus 50 percent.

In many instances, compliance with residual risk requirements may not be technically feasible. Figure ES-3 contains a list of some industries that EPA has indicated may not be able to comply with the S. 1630 residual risk requirements without new control technologies or new manufacturing processes.

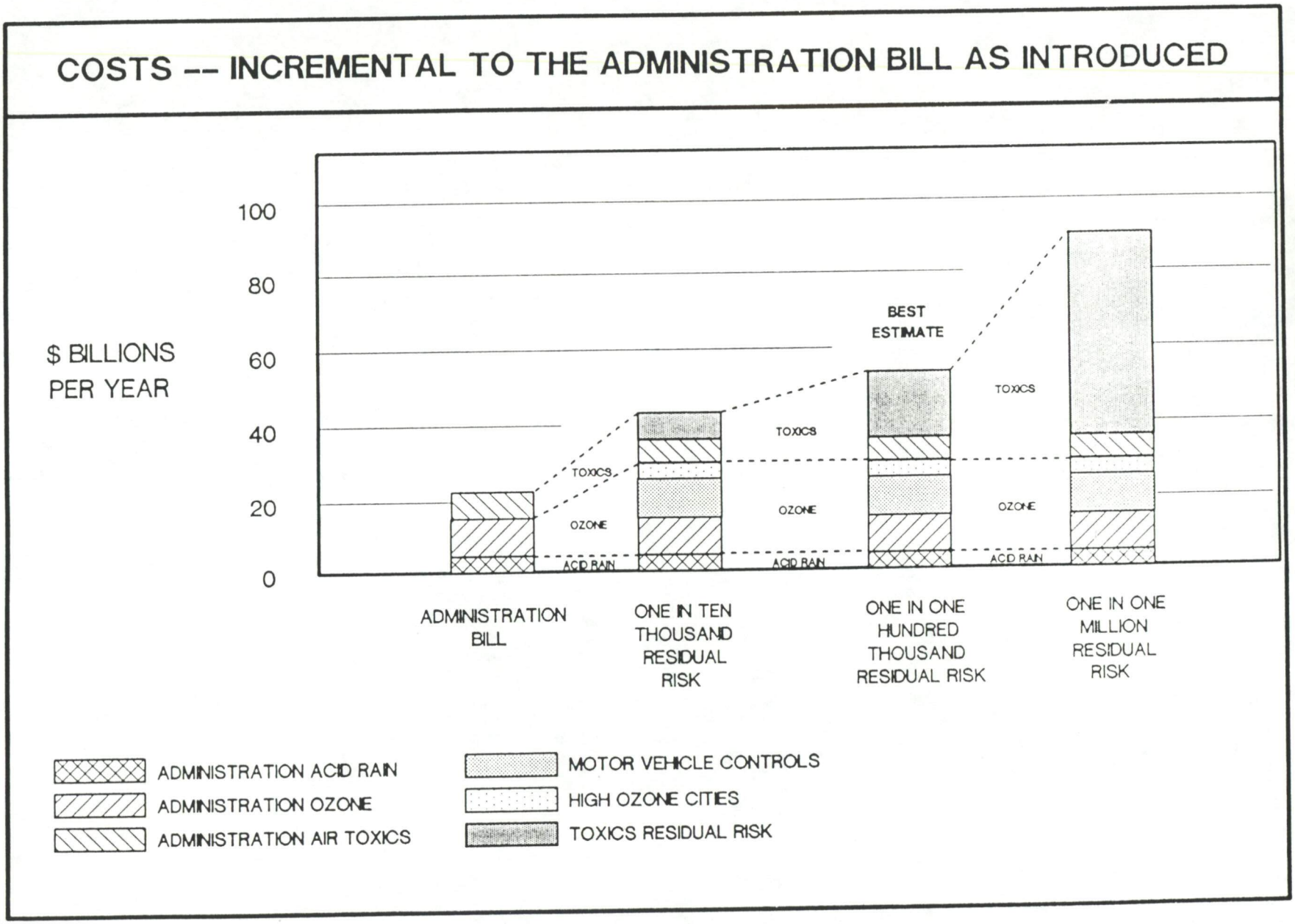

COSTS -- INCREMENTAL TO THE ADMINISTRATION BILL AS INTRODUCED
$ BILLIONS PER YEAR
100
80
60
40
20
0
BEST ESTIMATE
TOXICS
OZONE
ACID RAIN
ADMINISTRATION BILL
ONE IN TEN THOUSAND RESIDUAL RISK
ONE IN ONE HUNDRED THOUSAND RESIDUAL RISK
ONE IN ONE MILLION RESIDUAL RISK
ADMINISTRATION ACID RAIN
ADMINISTRATION OZONE
ADMINISTRATION AIR TOXICS
MOTOR VEHICLE CONTROLS
HIGH OZONE CITIES
TOXICS RESIDUAL RISK

FIGURE ES-2

INDUSTRIES WITH RESIDUAL RISK COMPLIANCE TECHNOLOGY LIMITATIONS

ONE IN TEN THOUSAND RESIDUAL RISK

BUTADIENE PRODUCTION
NEOPRENE PRODUCTION
POLYBUTADIENE PRODUCTION
STYRENE-BUTADIENE RESINS
METHYLENE CHLORIDE USE AND PRODUCTION
PHARMACEUTICAL
ETHYLENE DICHLORIDE PRODUCTION
CHLORINATED HYDROCARBON PRODUCTION
CHLORINATED HYDROCARBON USE
ETHYLENE OXIDE PRODUCTION
PRIMARY COPPER SMELTERS
PRIMARY LEAD SMELTERS
ZINC OXIDE PRODUCTION
CHROMIUM PRODUCTION
VINYLIDIENE CHLORIDE POLYMER
COKE OVENS
FERROCHROME PRODUCTION
PESTICIDE PRODUCTION

ONE IN ONE MILLION RESIDUAL RISK

CHROMIUM PRODUCTION
CHLORINE PRODUCTION
REFRACTORIES
COKE BYPRODUCTS PROCESSING
ELEMENTAL PHOSPHORUS PLANTS
ARSENIC CHEMICAL PRODUCTION
GLASS MANUFACTURING
SECONDARY LEAD SMELTERS
SPECIALTY STEEL PRODUCTION
MILL TAILINGS PILES
UNDERGROUND URANIUM MINES
ETHYLENE DICHLORIDE PRODUCTION

Figure ES-3

Conclusions

The Administration bill, as introduced, implementation cost estimate would be about $22 billion per year. Motor vehicle control amendments to the Administration bill would increase the implementation cost to $31 billion per year. Adjustments to the ozone provisions cost estimate for high ozone cities would likely add another $5 billion per year. The "Best Estimate" of $54 billion per year could dramatically increase or decrease depending on the final form of the residual risk requirements that are currently not specified in the amended Administration bill. If the one in a million residual specified in S. 1630 were to be required, the total costs could approach $104 billion per year. This requirement could result in shutdown or significantly reduced production in United States industries whose total revenues exceed $100 billion annually. Several cost items, some potentially major, have not been evaluated and would increase the costs further.

TABLE OF CONTENTS

TOPIC	Page
Introduction	1
Acid Deposition	2
Edison Electric Institute	3
Environmental Protection Agency-ICF	4
Environmental Protection Agency-Pechan	6
Bush Administration	7
Duke Power Company	7
Public Service Indiana	8
Discussion	9
Best Estimate	13
Ozone Non-Attainment	15
Environmental Protection Agency-Pechan	15
Office of Technology Assessment	21
National Association of Manufacturers	26
Discussion	27
Best Estimate	29
Air Toxics	31
American Petroleum Institute-DMG	32
Chemical Manufacturers Association-DTS	36
Environmental Protection Agency-EEA	43
Discussion	49
Best Estimate	52

INDIVIDUAL PROVISION COST ESTIMATES

Introduction

This report contains individual provision cost estimates for various Clean Air Act amendment proposals. The pollutants covered include acid deposition, ozone, and air toxics. The analyses are organized by pollutant. H. R. 3030/S. 1490 is used as a base for cost comparisons. The Administration acid rain bill costs have been modified to include costs for increased natural gas prices. Ozone non-attainment costs have been modified to incorporate the recent Waxman-Dingell compromise, which includes motor vehicle tail pipe and on-board emissions controls. Ozone non-attainment costs have also been modified to reflect cost estimates reported by the National Association of Manufacturers, Siemon, Larsen, & Marsh, and Portney for southern California. Air toxics costs are based on the Administration bill with the range of the estimate reflecting residual risk requirements that are included in S. 1630. Cost estimates are identified by the organization performing them. The major assumptions made and conclusions reached by the evaluator have been summarized. A best cost estimate and supporting rationale is provided for each pollutant.

To the extent possible this evaluation has been reviewed by the cost study authors or sponsors and their comments have been considered in the conclusions reached. The bills considered are under going frequent revisions. The provisions included here are believed to be accurate as of mid December 1989. In most cases, cost estimates are expressed to the nearest $0.1 billion. The uncertainties associated with some of the estimates are of the order of plus or minus 50 percent. The uncertainties should be kept in mind when interpreting the report contents.

Acid Deposition

Title V of the Administration bill is entitled Acid Deposition Control. The Administration Bill would require the reduction of SO_2 emissions by 10 million tons per year from 1980 levels and the reduction of NO_x emissions by about 2 millions tons per year relative to their levels in the year 2000. Sulfur oxides emission allowances would be established for each existing affected electric utility unit. Emissions reductions would take place in two phases. The first phase would be completed by 1995 and the second by the year 2000. Emission allowances specified in the bill could be transferred among owners or operators of affected sources. During the first phase of emissions reductions, the allowances could be transferred among affected sources within a single state or among affected facilities with common ownership irrespective of state boundaries. During the second phase of emission reductions, allowances may be transferred among affected sources within each of the geographic regions of the country as prescribed by regulation.

There is a long list of affected facilities in the legislation for which allowances are specified. Unlisted affected units would be issued allowances based on a baseline of average fuel consumption during the years 1985, 1986, and 1987. Owners of new units would be required to hold allowances equal to the annual tonnage of sulfur dioxide emitted by the unit after December 31, 2000. New units may obtain allowances from any unit without regard to geographic restrictions.

Three different organizations, Temple, Barker, and Sloane, for the Edison Electric Institute, and ICF, and Pechan for EPA have conducted studies to estimate the costs to implement the Administration proposal. Sulfur dioxide control approaches include coal switching from high to low sulfur, scrubbers and partial scrubbers, fuel blending, fuel substitution, and clean coal technologies. Nitrogen oxides control approaches used were primarily combustion controls.

All three organizations have made estimates of the costs to implement the provisions contained in the Administration acid deposition bill. Each study generated a range of costs

dependent on assumptions included by the investigator. All the studies appear to have incorporated the EPA high and low case for emissions growth as a basis for calculation. The major differences in the assumptions used are the costs for scrubbers, cost of coal, and the extent of allowance trading that will take place. The three studies are summarized below.

Edison Electric Institute--Temple, Barker, and Sloane

Temple Barker and Sloane, Inc. (TBS) prepared a report for the Edison Electric Institute (EEI) analyzing the requirements and associated costs for H. R. 3030. TBS used optimized methodology with a unit-by unit, plant-by plant, utility-by-utility cost buildup. Electric Power Research Institute cost data for scrubbers, clean coal technologies, and other controls were used. The methodology was extensively reviewed by the U. S. Environmental Protection Agency (EPA), The Department of Energy (DOE), the Congressional Research Service (CRS), and others. TBS used higher scrubber costs, apparently higher coal costs, and very limited allowance trading relative to ICF the assumptions.

A low and high cost scenario were examined. The range of costs was estimated from $5.0 to $7.1 billion/year with a mean value of $6 billion/year. Capital requirements would range from $13.6 to $22.8 billion. Costs included were for SO_2 and NO_x emissions reductions, permit fees, and emissions offsets to allow for growth during the period 2001 to 2010. The study found that the bill, as structured, would result in 12.4 million tons per year SO_2 reductions from 1980 levels, 2.4 million tons per year more than the President's goal of 10 million tons per year. Virtually all the additional emissions reductions would come from the utility industry. TBS estimated that both the low and high cost estimates could be reduced by more than 30 percent if the total emissions reduction were reduced to the original goal.

TBS estimated that compliance would be attained at 26 to 31 percent of affected capacity by coal switching. Scrubbers, including upgrades and partial scrubbers, would be employed at 42 to 52 percent of affected capacity and all forms of innovative technology are

estimated for 11 to 18 percent of affected capacity. In the analysis, TBS assumed that coal switching would account for only 20 to 25 percent of current usage because of provisions that would permit state governors to require the use of in-state coal. Total coal switching was projected to reach between 91 and 109 million tons per year. Removing the restriction requiring the use of in-state coal would increase the amount of coal switching to 149 million tons per year.

Indiana, Missouri, Ohio, Pennsylvania, and Tennessee would incur 44 percent of the total national costs for acid deposition control. Fifteen eastern states would incur 84 percent of the total costs. Thirty six of 100 major utilities would have rate increases greater than 10 percent. Twelve utilities would have rate increases over 25 percent.

TBS estimated costs would be reduced by as much as 25 to 30 percent with modifications to the existing legislative language. It is the TBS opinion that short time schedules, potential limits on coal switching, offset provisions, and the proposed permit program all would inhibit allowance trading and would add to the bill's cost.

Environmental Protection Agency -- ICF

The second organization, ICF Resources, under contract to the Environmental Protection Agency (EPA), estimated the cost to implement the Administration bill for four cases. Two alternative future utility emissions levels were selected by EPA to present a reasonable base range for future utility emissions. These were designated "High" and "Low" emissions scenarios. The "Low" base case included an assumption that moderate repowering with clean coal technologies would occur in the year 2004. Each base case was evaluated for two sets of conditions. The first set of conditions was called "Flexible" and assumed full exploitation of all economic emissions trading opportunities. The second set of conditions was called "Constrained" and assumed only intra-utility trading. The "Constrained" case also assumed some plants in Ohio, Indiana, and Illinois would be restricted from using out of state coals. ICF used lower scrubber costs and apparently lower coal costs than TBS.

By the year 2004, utility SO_2 emissions were predicted to be 8.2 to 8.7 million tons per year below 1980 levels. Total SO_2 emissions were forecasted to reach 9.7 to 10.2 million tons per year below 1980 levels. The total reduction takes into account an estimated 1 million ton per year reduction from other sectors since 1980 (e. g., smelters). The total reduction also includes 0.5 million tons per year reduction from diesel fuel desulfurization. Utility NO_x emissions were forecasted to be reduced by 2.0 to 2.1 million tons per year as required by the bill.

Peak year utility revenue requirements were estimated to range from $3.1 to $5.2 billion per year depending on the base case used and the regulatory/institutional restrictions in place during implementation. The $3.1 billion represents the EPA "Low" base case and a "Flexible" environment. The $5.2 billion represents the EPA "High" base case and a "Constrained" environment. The estimated present value of costs through 2010 in 1988 dollars ranged from $13 to $22 billion.

National electricity rate increases were projected to increase by 1 to 2 percent on a levelized basis. Several states are projected to have rate increases higher than the national average. All states except West Virginia and Missouri under the "High" EPA base case are projected to have levelized rate increases less than 5 percent. ICF recognized that individual utilities could have rate increases much higher than 5 percent but no specifics were given.

Coal market switching was projected by ICF to range from 109 to 119 million tons per year under "Flexible" implementation conditions. The switch would be from high sulfur coal production to low sulfur coal production with the total coal market remaining nearly constant. Between 15,000 and 17,000 jobs would be shifted from Northern Appalachia and the Midwest to other regions. Western Kentucky, Pennsylvania, and Illinois were forecasted to lose the greatest number of coal mining jobs. ICF has also indicated that an additional $0.8 billion per year cost to residential and commercial natural gas consumers under the "High" scenarios. This cost is due to the increase in natural gas prices caused by increased demand in the utility sector.

Environmental Protection Agency -- Pechan

The Environmental Protection Agency also had a second contractor, Pechan and Associates, estimate the relative cost to implement several acid deposition legislative proposals. The Administration proposal was one of the six proposals evaluated and is the only one included in this report.

To estimate costs, Pechan evaluated several options for each affected facility. Technologies or fuel switching in order of least cost were applied at facilities until the sulfur dioxide emissions reduction goal was reached. Facilities with more costly alternatives above the goal limit in reductions were assumed to purchase allowances from facilities that had excess emissions reductions above their allowance. The allowance purchase price was taken as the approximate marginal cost per ton of the last ton of SO_2 removed under the regional emission reduction targets. Allowance trading was modeled to comply with the Administration bill requirements. Three multi-state utilities were assumed to trade only among themselves and not with other state utilities in Phase I. Projected new units by the year 2010 would be subjected to a "revised" new source performance standard that would require a 95 percent SO_2 removal rather than the currently mandated 90 percent. Combustion modification was the assumed method for nitrogen oxides control. The maximum control efficiency used was 50 percent.

Total costs for the Administration bill were calculated to be $2.6 to $4.0 billion per year in the year 2000 and from $2.2 to $4.8 billion per year in 2010. Sulfur dioxide emission reductions from 1980 levels were calculated to be from 8.7 to 9.2 million tons per year depending on the growth calculation basis used. The estimated scrubber capacity that would be installed was from 41 to 73 gigawatts of electrical generating capacity.

Bush Administration

The Administration estimated the acid rain provisions in H. R. 3030/S. 1490 would be $3.8 billion/year. The cost estimate was contained in a press release that accompanied

the announcement of the legislation. According to EPA staff, an earlier version of the ICF analysis is the basis for the Administration cost estimate.

Individual Utility Estimates

Two studies performed by individual companies are included in this report. The Duke Power study is included to illustrate a needed change in the baseline basis for allowance allocation calculation. The Public Service Indiana study is included because it contains cost information that is used for comparison purposes in the acid deposition discussion section below.

Duke Power Company

Duke Power has reduced sulfur dioxide emissions by over 120,000 tons per year since 1980 through the use of low sulfur coal and the development of nuclear power. The proposed legislation would penalize Duke Power for this positive environmental contribution.

The proposed legislation would, with its current language, force Duke Power to reduce SO_2 emissions by an additional 100,000 tons per year. The additional reductions would be required because the use of actual coal fired generation capacity at Duke in the period 1985-1987 was low. Units were taken out of service for refurbishment and were planned to be brought back into service to accommodate growth in demand during the early part of the next decade. The investment in the refurbishment has already been made. Emission allowances based on the reduced coal fired capacity along with the SO_2 emissions cap would require Duke to reduce emissions to an equivalent of 0.6 pound SO_2 per million BTU when all the currently inactive coal fired generating capacity is brought back on line. That is one half the targeted emissions limit of 1.2 pounds per million BTU that would be required by the Administration bill.

To achieve the required reductions Duke would have to invest an incremental $1.3 billion for emissions control equipment at 4,400 megawatts of capacity and switch to lower sulfur coal at the remaining units. Operating and maintenance costs would amount to $175 million per year. These requirements translate to an increased revenue requirement of $400 million per year.

According to EPA staff the Duke Power situation is not an isolated incident. There are other utilities faced with a similar predicament. The language in the Administration bill would permit the EPA Administrator to exclude periods during which a unit is shut down for a continuous period of four months or longer. That language may permit a resolution to problems similar to the one at Duke Power. The intent of the language is not clear.

Public Service Indiana

Public Service Indiana (PSI) calculated emission limits requirements for its Gibson, Cayuga, Wabash River and Gallagher stations. No allowance was included for the Gibson #5 unit because it was not in service in 1980. Growth requirements from 1985 to 2000 were also included in the calculations. Consequently, control strategies would require compensating for the Gibson #5 unit, growth, and complying with the 2.5 and 1.2 pound SO_2 per million BTU emission limits contained in the Administration bill.

To comply PSI would have to install one additional scrubber and upgrade the Gibson #5 scrubber by 1996. Four additional scrubbers would be required by 2001 to meet Phase II requirements. It was assumed that compliance coal prices would increase to become competitive with scrubber technology. Scrubber costs estimates were made for each unit based on the cost of construction experience at the Gibson #5 unit. Costs ranged from $223-293 per kilowatt in 1989 dollars. Low NO_x burners would be installed to comply with the nitrogen oxides emission reduction requirement. A total capital investment of $0.8 billion was calculated with associated total revenue requirements of $408 million per year in 2001. The rate increase required to cover the revenue requirement was estimated to be 24.9 percent.

Discussion

Figure 1 contains a comparison of some of the significant features from the TBS, ICF and Pechan cost estimates. Costs are expressed in 1989 dollars. Only these three studies were included in the comparison because they are the most detailed and complete from a national perspective. The largest cost differences are for SO_2 emissions reductions by the year 2001 or the costs for Phase I and Phase II of the Administration bill. While the TBS report indicates a utility SO_2 emissions reduction of 9.7 million tons per year compared to 8.2 to 8.6 million tons per year for ICF, 1.3 million tons per year of the TBS total are pre 1985 reductions. The net tonnage associated with TBS costs would then be the difference of 9.7 and 1.3, or 8.4 million tons per year. That reduction is within the range calculated by ICF so it appears that both estimates were based on about the same utility SO_2 reduction from 1980 levels. The Pechan estimate of from 8.7 to 9.2 million tons per year is slightly higher than either of the other two estimates.

The major differences among the three estimates appear to be in the control strategies assumed to achieve the required reductions. TBS calculated their costs for about 65 gigawatts capacity using scrubbers and about 21 gigawatts capacity using coal switching. The Pechan scrubber capacity is of the same order of magnitude as estimated by TBS. ICF by comparison has calculated the costs for about 25 gigawatts capacity using scrubbers and about 15 percent more coal switching capacity than used by TBS. Clean coal technology implementation was nearly the same for both the TBS and ICF estimates but no cost comparisons could be made since only TBS included cost information. Coal switching under ICF assumptions may be less expensive than scrubbing to reduce SO_2 emissions. The less expensive coal switching may account for part of the difference between the two estimates. No details were included in the Pechan report regarding the extent of coal switching or clean coal technology application. Since scrubber capacity is nearly the same for the Pechan and TBS estimates the cost differences must lie in the assumptions for scrubber costs, coal costs or the amount of allowance trading that takes place. TBS apparently provided little for allowance trading in their estimate, while Pechan assumed the maximum allowance

Administration Bill Acid Rain Comparisons

Item	Organization		
	TBS	ICF	Pechan
Annual Cost Year 2001 ($ Billion/yr)			
SO_2	4.2-5.1	2.0-3.7	2.3-3.2
NO_x	0.2-0.3	0.3-0.3	0.3-0.3
Permit Fees	0.1-0.1	NE	NE
Totals	4.5-5.5	2.3-4.0	2.6-4.0
Annual Cost Year 2010 ($ Billion/yr)	5.0-7.1	3.1-5.1	2.2-4.8
Capital Cost ($ Billion)	13.6-22.8	NE	NE
Utility SO_2 (MM tons/yr)	9.7 (1.3 pre 1985)	8.2-8.6	8.7-9.2
Utility NO_x (MM tons/yr)	2.0	2.0-2.1	1.8-2.0
Control Mix			
Coal Switching			
Gigawatts	16-27	NE	NE
MM Ton/year	90-110	109-119	NE
Cost ($/MM BTU)	0.18-0.56	NE	NE
Scrubbers			
Gigawatts	61-74	22-28	41-73
Cost ($/Kilowatt)	165-195 (+ retrofit)	125-156 (+ retrofit)	NE
Clean Coal Technologies			
Gigawatts	25	30	NE
Cost ($/Kilowatt)	75-100	NE	NE
States with Greater Than a 5% Rate Increase	15	2	1

NE = No Estimate

Figure 1

trading that could be achieved. The difference in allowance trading assumptions is probably the major component of difference between the TBS and Pechan estimates.

ICF used an average capital cost for scrubbers that is about 30 percent less than that used by TBS. Since retrofit factors were not specified in either estimate, it is impossible to tell if they compensate for the difference in capital cost estimates. The difference in capital costs may account for an additional fraction of the difference between the two estimates. The Public Service Indiana data indicate the retrofit factor would have to be about 1.9 for the ICF range and 1.4 for the TBS range. The TBS retrofit factor would be close to the value of 1.3 estimated by EPA according to TBS personnel. No scrubber capital cost data were contained in the Pechan report, so no comparisons can be made with the other estimates.

The difference in NO_x emissions tons below future estimates and the cost to achieve those reductions are very similar among all three estimates. The inclusion of permit fees in the TBS estimate is small compared to the overall difference among the estimates. Neither the NO_x estimates or the permit fees are judged to contribute significantly to the difference among the estimates.

The TBS and ICF reports contained SO_2 emission reduction credits for sources other than electric utilities. The TBS report contains emissions reductions totaling 3.2 million tons per year. That total is comprised of 2.7 million tons per year from industrial sources and an estimated 0.5 million tons per year from diesel fuel desulfurization that would be required by the Administration bill. The TBS report also includes a 1.3 million tons per year reduction from electric utilities during the period from 1980 to 1985. The total estimate for SO_2 emissions reductions below 1980 level is calculated to be 12.4 million tons per year which is 2.4 million tons more than the Administration goal. TBS estimates their costs would be reduced by about 30 percent if the total reduction were scaled back to the 10 million ton per year goal. EPA staff have indicated they and NAPAP have shown that the TBS estimate for SO_2 reductions since 1980 are in error but no documentation detailing the differences was made available.

The total emissions reduction in the ICF report is about 10 million tons per year below 1980 levels. The 10 million ton total is composed of about an 8.5 million tons from electric utilities, 1 million tons from industrial sources, and 0.5 million tons from diesel fuel desulfurization. The source of the industrial emissions reduction discrepancy between the TBS and ICF reports is not clear from the references cited in the reports. The emissions reductions contained in the ICF report would be consistent with the Administration goal of a 10 million ton per year reduction from 1980 SO_2 levels. The Pechan report only contained estimates for utility SO_2 emissions reductions from 1980 levels.

Discussions with utility decision makers and utility industry management consultants have indicated that significant uncertainties exist with regard to the selection of low-sulfur coal relative to scrubbers for compliance with the proposed legislation. Some experts are of the opinion that low sulfur coal prices will rise to a point where they are just below the cost of scrubbers. On the other hand, supplies of low sulfur coal may be large enough that competition will keep the price down. In the first case, it would be a prudent decision to commit to long term contracts at today's lower coal prices. In the second case it would be prudent to purchase low sulfur coal on the spot market at competitive prices. Either option places utilities at risk with public utilities commissions with regard to recovering their costs. If a utility were to make the wrong judgement, it might not be able to pass along all the fuel costs to its customers.

A second constraint is that some utilities may not be permitted to purchase and use low sulfur coal because of language in the proposed legislation permitting governors of states to require a certain percentage of in-state coal. Utility decision makers feel the time constraints in the bill will not permit them adequate time to make informed decisions. EPA staff expressed the opinion that the time required to implement coal use restrictions in individual states would be too long to have any significant effect on control strategies.

A final constraint is the availability of low sulfur coal supplies and the necessary infrastructure to deliver the coal in time to comply with the schedules contained in the proposed legislation. Utilities may opt for scrubbers if, in their judgement, they would not

be able to obtain the required quantity and quality of coal in a timely manner. Complicating the issue of coal availability is the fact that the ICF analysis predicted approximately a halving of high sulfur coal production between now and the year 2000. High sulfur coal production in the year 2010 is predicted to be twice that in the year 2000. The flexibility of the coal industry to accommodate the ICF estimate of a 15,000 to 17,000 job shift from high sulfur production regions and back again over a 20 year period is not known but would be subject to question.

Both the ICF and TBS estimates included credits for national SO_2 reductions due to diesel fuel desulfurization requirements included in the proposed legislation. Neither included a cost estimate to accomplish that reduction. Oil industry representatives have estimated that diesel fuel desulfurization will require a $2.8 billion capital investment resulting in about $1 billion per year in annual costs. EPA estimated the diesel desulfurization cost to ultimately range from $0.6 to $1.5 billion per year in 2015. The total best estimate for the acid rain provisions, described below, does not include diesel desulfurization costs because EPA staff have indicated there will shortly be a regulation in place that would require diesel fuel desulfurization. Therefore, while a diesel desulfurization provision is included in H.R. 3030, the costs have not been included in the best estimate for the acid deposition requirements.

Best Estimate

Because of the uncertainties with supply and cost of low sulfur coal and the difference in capital cost estimates for scrubbers, the best electric utility estimate is likely to be near the upper end of the range estimated by ICF, about $4.5 billion per year. That is also near the lower end of the TBS estimate range and at the high end of the Pechan range for the year 2010. This best estimate value recognizes that some allowance trading will take place with resulting total cost reductions. Further, the $4.5 billion per year estimate also recognizes there are constraints that would prevent the optimum amount of allowance trading to take place.

ICF has indicated in their report that natural gas prices would be expected to rise due to increased demand caused by fuel switching strategies to comply with sulfur dioxide emissions limitations. They estimated additional costs to residential and commercial natural gas consumers could be as much as $0.8 billion per year in the 2005-2010 time frame. These costs would be in addition to the $4.5 billion per year SO_2 control costs and would bring the best estimate for the acid deposition provisions to $5.3 billion per year.

Ozone Non-Attainment

Ozone, as an ambient air pollutant, is not directly emitted from specific sources. Ozone is formed in the atmosphere through a series of chemical reactions involving, primarily, volatile organic compounds (VOC), nitrogen oxides (NO_x), and sunlight. Strategies to comply with ozone air quality standards are typically based on reduction of VOC emissions and in some cases NO_x emissions. Cost estimates to control both pollutants are included in the studies described below.

The cost analyses presented in this section are primarily those prepared for the Environmental Protection Agency by E. H. Pechan and Associates. Additional studies performed by the Office of Technology Assessment (OTA), the National Association of Manufacturers (NAM), Siemon, Larsen, and Marsh (SLM), and Portney are also included. The Pechan studies include the costs to comply with specific requirements included in each of several ozone non-attainment legislation proposals. The OTA analysis does not evaluate any proposal specifically but deals with the problem of ozone non-attainment in general. The OTA report provides a basis for comparison of costs and the degree of attainment that is likely to be achieved under any circumstances. The NAM study and others listed above deal specifically with the ozone attainment approach proposed for the South Coast Air Quality Management District in southern California. The Pechan analyses is described first for the Administration bill (H. R. 3030/S. 1490), the Waxman bill (H. R. 2323), and the Group of Nine proposal (H. R. 99).

EPA Cost Analyses-Pechan

The EPA pre-1988 policy costs are important for all agency analyses because they provide a basis for incremental costs of proposed new legislation. Pre-1988 costs are those that will be implemented independent of any changes in Clean Air Act legislation or EPA policies. The pre-1988 policy costs that would be incurred by the years 1995 and 2000 are summarized in Figure 2. These new costs are estimated to be $6.995 billion per year by the year 2000. Costs for meeting motor vehicle emission standards in 1985 or costs for

PRE-1988 EPA OZONE POLICY COSTS

SOURCE TYPE	1995 COST ($Million)	2000 COST ($Million)
STATIONARY		
NSPS	878	1,213
NON-CTG RACT	449	449
LAER NEW GREATER THAN 100 TON SOURCES	3,137	4,047
MOTOR VEHICLES	712	926
TOTALS	5,176	6,995

Figure 2

stationary source controls in place in 1985 are not included. Each legislative proposal cost estimate in this report would be in addition to the pre-1988 costs.

Control costs to implement various legislation requirements were estimated from a set of equations developed by Alliance Technologies. Equations for 34 point sources and 7 area sources are included in the Alliance inventory. In addition, Pechan developed cost equations from model plant data for other source types. The annual costs for some control options are negative. The reason is a credit is generated for recovered materials such as solvents. Cost effectiveness factors for a total of 97 control approaches applied to 65 source categories are contained in the Pechan report. The cost effectiveness factors range from a $3,260/ton VOC emissions reduction credit for automotive refinishing controls to a cost of $80,853/ton VOC emissions reduction for alternate fuels in heavy duty vehicles. Control efficiencies range from 5 percent for Waxman alternate fuel proposals to 100 percent for emulsified asphalts and petroleum refining vacuum distillation controls. No controls or costs were proposed for VOC emissions from stationary combustion sources.

The key provisions for the Administration, Group of Nine, and Waxman proposals are summarized in Figures 3, 4, and 5. The VOC control cost summary for all three proposals is shown in Figure 6. The Administration bill and the Group of Nine proposals are nearly identical when taken in aggregate. Each would require VOC emission reductions of about 8 million tons per year at an annual cost projected to be between $9 and $10 billion per year. In both cases attainment would be reached in all areas of the country by the year 2005. The Waxman proposal would require an additional reduction of 700-800 thousand tons of VOC per year. Costs for the Waxman proposal would be nearly $18 billion per year or about $8 billion per year more than either of the other two proposals.

The summary of the provision categories and differences between the bills provided includes a statement of the scope of the regulation, significant differences in the features among the proposals, and comments regarding the technical feasibility of the requirements. Some provisions have no costs estimates included. Those items are identified in the summary description.

ADMINISTRATION BILL PROVISIONS SUMMARY

Ozone Non-attainment Area Classification and Deadlines

	Ozone Design Value (ppm)	Attainment Date
Marginal	0.13	1995
Moderate	0.14 - 0.15	1995
Serious	0.16 - 0.18	2000
Severe	0.19 and greater	2010

Motor Vehicles/Fuels

- Enhanced I/M in serious and severe areas
- Stage II vehicle refueling controls in moderate, serious, and severe areas
- Improved evaporative test procedures
- Gasoline volatility controls
- New emission standards for light duty vehicles and light duty trucks
- Alternative fuels in severe areas
  - 500,000 vehicles in model year 1995
  - 750,000 vehicles in model year 1996
  - 1,000,000 vehicles in model years 1997-2004

Stationary Sources

- National control measures for TSDF, architectural coatings, commercial solvents, vessel loading, and landfill emissions
- Seven CTGs in all but marginal non-attainment areas
- Moderate, serious and severe areas must achieve 15% VOC reduction net of growth by 1995 and 3% per year thereafter till attainment

Figure 3

GROUP OF NINE BILL PROVISIONS SUMMARY

Ozone Non-attainment Area Classification and Deadlines

	Ozone Design Value (ppm)	Attainment Date
Moderate I	0.13	3 Years after enactment
Moderate II	0.14 - 0.15	1995
Serious	0.16 - 0.18	1997
Severe	0.19 and greater	2005

Motor Vehicles/Fuels

- Enhanced I/M in serious and severe areas
- Stage II vehicle refueling controls in all non-attainment areas
- On-board vapor recovery
- Improved evaporative test procedures
- Gasoline volatility controls
- New emission standards for light duty vehicles and light duty trucks
- Alternative fuels program
  - Fleets in serious and severe areas
  - 30% of new vehicles in 1994
  - 50% of new vehicles in 1995 and 1996
  - 90% of new vehicles after 1996

Stationary Sources

- National control measures for architectural coatings, commercial solvents, and traffic coatings--25% in five years, 50% in 10 years
- Eleven CTGs in all but moderate I non-attainment areas

Figure 4

WAXMAN BILL PROVISIONS SUMMARY

Ozone Non-attainment Area Classification and Deadlines

	Ozone Design Value (ppm)	Attainment Date
Moderate	0.121 - 0.144	4 Years after enactment
Serious	0.145 - 0.180	8 Years after enactment
Severe	0.181 - 0.240	12 Years after enactment
Extreme	0.241 and greater	16 Years after enactment

Motor Vehicles/Fuels

- Enhanced I/M in all but moderate areas
- Stage II vehicle refueling controls in all but moderate areas
- Improved evaporative test procedures
- Gasoline volatility controls
- On-board vapor recovery for all light duty vehicles
- New emission standards for light duty vehicles and light duty trucks
- Alternative fuels in severe and extreme areas
  - Fleets of 15 or more vehicles--alternate fuels in 1993 and thereafter
  - 30% of new registrations in severe areas to be low emissions vehicles by 1998
  - Extreme area low emission vehicle schedule--10% 1994, 30% 1996, 70% 1998, 100% 2000

Stationary Sources

- National control measures for architectural coatings, commercial solvents, pesticides, traffic coatings, and military coatings
- Twelve CTGs in all non-attainment areas
- Minimum VOC reduction targets; serious = 30%, severe = 50%, extreme = 70%
- Ozone transport region controls the same as serious areas
- Emission reduction milestones

Figure 5

COMPARATIVE OZONE LEGISLATION COSTS--2005

PROVISION	ADMINISTRATION			GROUP OF NINE			WAXMAN		
	TONS	COST	$/TON	TONS	COST	$/TON	TONS	COST	$/TON
NATIONAL STATIONARY									
TSDF	2,100	1,800	900	2,100	1,800	900	2,100	1,800	900
Municipal Landfills	130	69	550	130	69	550	130	69	550
Solvents	220	430	2,000	580	1,200	2,000	220	430	2,000
Architectural Coatings	340	0	0	290	0	0	340	0	0
Marine Vessels	25	51	2,000	25	51	2,000	25	51	2,000
MOTOR VEHICLES/FUELS									
RVP II	2,000	280	140	2,000	280	140	2,000	280	140
Evaporative/Running Losses	880	68	80	880	68	80	900	68	80
Tailpipe/Useful Life	200	500	2,600	120	510	4,300	490	8,400	17,000
Refueling									
Stage II	170	150	870	190	170	890	37	110	2,800
Onboard	-	-	-	-	-	-	470	180	380
Alternative Fuels	43	0	0	9	360	-	53	40	-
AREA SPECIFIC MEASURES									
RACT to 50 tons/yr	-	-	-	54	84	1,600	54	84	1,600
New GTG	380	420	1,100	510	630	1,200	590	730	1,200
Enhanced Inspec. & Maint.	85	87	1,000	85	87	1,000	110	380	3,500
Basic Inspect. & Maint.	32	82	2,600	32	82	2,600	-	-	-
Transport Regions							180	240	1,400
PROGRESS REQUIREMENTS									
Identifiable Controls	300	270	900	140	85	600	79	16	200
Assummed Controls	1,000	5,000	5,000	900	4,500	5,000	960	4,800	5,000
NATIONAL TOTALS	7,905	9,207		8,045	9,976		8,738	17,678	
NON-ATTAINMENT AREAS		0			0			0	

VOC CONTROLS ONLY
TONS ARE IN THOUSANDS
COSTS ARE IN $MILLIONS/YEAR

Figure 6

National Stationary Measures

Sources controlled in National Stationary Sources category include Treatment, Storage and Disposal Facilities (TSDF), Municipal Landfills, Commercial and Consumer Solvents, Architectural Coatings, and Marine Vessels. Controls applied to these facilities would result in emissions reductions in attainment and non-attainment areas. The major cost difference in the three legislative proposals is the requirement for solvent emission reductions in the Group of Nine bill. That bill would require an emissions reduction of 50 percent by the year 2000. This is a technology forcing provision because controls beyond 20 percent are not currently reasonable or feasible, according to the Pechan report.

The emissions reduction for architectural coatings in the Group of Nine proposal is less than for the other two legislative proposals. EPA information apparently indicates that the Administration and Waxman estimates are more reasonable. Many architectural coatings could be reformulated to incorporate water based solvents at little or no cost, according to a draft EPA Control Techniques Guideline. Therefore, no cost was assigned for the architectural coatings category.

Motor Vehicles/Fuels Measures

The provisions evaluated include reduction of gasoline Reid Vapor Pressure (RVP) to 9.0 pounds per square inch, reductions in motor vehicle Evaporative/Running Losses, motor vehicle Tailpipe/Useful Life emissions reductions, Refueling emissions controls, and Alternative Fuels. Differences among the proposals for RVP and Evaporative/Running losses are essentially non-existent.

The most significant difference among the bills is the Waxman tailpipe emissions reduction requirements. H. R. 2323 would require a reduction to 0.25 grams per mile (gpm) VOC and 0.4 gpm NO_x for the model years 1993 through 1999. For model years 2000 and later emissions would be further reduced to 0.125 gpm VOC and 0.2 gpm NO_x. The VOC emissions reductions would be less than six percent of the total included in the Waxman

proposal and are clearly the least cost effective at $17,000 per ton. H. R. 2323 would also require that tailpipe control devices remain effective for 10 years or 100,000 miles.

All proposals contain provisions for nitrogen oxides emissions reductions from motor vehicles. The costs to comply with those provisions in the year 2005 have been estimated to be $0.415, $0.508, and 1.785 billion per year, for the Administration, Group of Nine, and Waxman bills respectively. These costs must be added to the VOC cost estimates to obtain the total incremental cost estimate for each bill. No costs have been included for the proposed 0.2 gpm NO_x emission standard. The technical feasibility of such a standard is questionable.

The differences in refueling control cost estimates between the Administration and Group of Nine bills are negligible. The Waxman bill would require on board controls for all light duty vehicles. The total controlled emissions are higher than for Stage II controls alone because on board controls would reduce emission nation wide. Stage II would only be required in certain non-attainment areas.

The differences in alternative fuels programs among the bills is due to the difference in extent of application, quality of the fuel (100 percent versus 85 percent methanol), and motor vehicle costs. Neither the auto nor the oil industry agree with the Administration zero cost estimate for alternate fuel provisions. No cost effectiveness values are included in Figure 6, but a sensitivity analysis is included in the Pechan report. If the cost per 100 percent methanol fueled vehicle ranged from $50 to $250 and the premium for methanol fuel relative to gasoline ranged from 20 to 30 cents per gallon, as estimated by petroleum industry sources, the alternate fuel cost effectiveness would range from $21,000 to $34,000 per ton of VOC emissions reduction. These estimates are for the year 2005.

Area Specific Measures

The categories included under Area Specific Measures are the application of Reasonably Available Control Technology (RACT) to 50 ton per year sources, new Control

Techniques Guidelines (CTG), Basic and Enhanced Inspection and Maintenance procedures for motor vehicles, and extension of controls to VOC Transport Regions.

The Administration proposal contains no provisions for controlling VOC emissions from smaller stationary sources. The Group of Nine and Waxman provisions are identical. The three bills differ primarily in the number of CTGs required. The Administration would require seven, the Group of Nine would require eleven, and Waxman would require twelve. Recent modifications to the Administration bill have changed the number of required CTGs to 11. The costs in Figure 6 are for seven CTGs. The difference in number of CTGs account for the difference in emissions controlled and the costs. The larger Waxman cost for enhanced inspection and maintenance procedures are due to the requirement for annual inspections. The other bills would require biennial inspections. Neither the Group of Nine nor the Administration bills contain provisions for VOC controls in regions that might result in atmospheric transport to non-attainment areas. Costs are included to account for this requirement in the Waxman bill.

Progress Requirements

The two Progress requirement categories listed are Identifiable Controls and Assumed Controls. These categories are potential sources of additional controls needed to achieve the emissions reduction required to achieve AAQS in non-attainment areas. The Identifiable Control costs and emissions reductions are complimentary to the new CTG costs and emission reductions. The Administration bill has the lowest CTG requirement and consequently has the highest identifiable controls requirement. The converse is true for the Waxman bill.

Assumed controls cover the additional emissions reductions needed to achieve ozone standards. A cost effectiveness range from $2,000 to $10,000 per ton of VOC controlled was derived in an earlier Pechan report for EPA. It was based on a weighted average of $6,200 per ton to obtain residual VOC reduction requirements from industrial solvent use, commercial solvent use, and additional mobile source reductions. All other source

categories were judged to be either essentially completely controlled or that the VOC reductions available were insufficient to contribute to the reduction requirement. A cost effectiveness of $5,000 per ton was used by Pechan in the calculations.

The control techniques considered were incineration for industrial solvent users and product reformulation for commercial solvent emissions. Additional motor vehicle emissions reductions would come from transportation control measures and increased use of alternate fuels over that which would already be required in any given legislative proposal.

Cost Summary

The total cost estimate would be $9.6 billion per year for the Administration bill, $10.5 billion per year for the Group of Nine bill and $19.5 billion per year for the Waxman bill. These totals are summarized in Figure 7 and include both VOC and NO_x costs. The costs for the pre-1988 EPA policy have been included in Figure 7 and added to the costs for each proposal to show the full cost that would be required to achieve ozone Ambient Air Quality Standards in all regions of the country under each proposal.

Office of Technology Assessment Analysis

The Office of Technology Assessment (OTA) has conducted a comprehensive study of the ozone non-attainment problem in the United States. They have analyzed the VOC reduction requirements for all non-attainment cities based on design values for each city. The analysis included an assessment of attainment levels based on legislation and environmental regulations currently in place. OTA then evaluated the additional VOC reductions needed to bring each city into compliance. Costs and cost effectiveness were evaluated for 11 different control categories that covered both stationary and mobile sources. The study has been active for over two years and is very comprehensive in terms of emission reduction requirements, costs, and definition of uncertainties in the calculations.

EPA OZONE LEGISLATION COST COMPARISON 2005

ITEM	LEGISLATION COST ($ Billion/year) ADMINISTRATION	GROUP OF NINE	WAXMAN
VOC CONTROLS	9.2	10.0	17.7
NO_x CONTROLS	0.4	0.5	1.8
LEGISLATION SUBTOTAL	9.6	10.5	19.5
PRE-1988 POLICY	7.0	7.0	7.0
OZONE ATTAINMENT TOTAL	16.6	17.5	26.5

Figure 7

OTA – MODIFIED ADMINISTRATION COMPARISON 2005

PROVISION	OFFICE OF TECHNOLOGY ASSESSMENT			MODIFIED ADMINISTRATION		
	TONS	COST	$/TON	TONS	COST	$/TON
NATIONAL STATIONARY						
TSDF	840	760	900	2,100	1,800	900
Municipal Landfills	–	–	–	130	69	550
Solvents	–	–	–	220	430	2,000
Architectural Coatings	120	58	1,200	340	0	0
Marine Vessels	–	–	–	25	51	2,000
MOTOR VEHICLES/FUELS						
RVP II	1,500	270	260	2,000	280	140
Evaporative/Running Losses	–	–	–	880	68	80
Tailpipe/Useful Life	330	2,900	2,700	490	8,400	17,000
Refueling						
Stage II	220	220	1,000	170	150	870
Onboard	260	270	1,100	470	180	380
Alternative Fuels	16	490	31,000	43	0	0
AREA SPECIFIC MEASURES						
RACT to 50 tons/yr	470	1,300	2,800	–	–	–
New GTG	110	620	5,600	380	420	1,100
Enhanced Inspec. & Maint.	170	1,040	6,100	85	87	1,000
Basic Inspect. & Maint.	–	–	–	32	82	2,600
Transport Regions	–	–	–	–	–	–
PROGRESS REQUIREMENTS						
Identifiable Controls	–	–		300	270	900
Assummed Controls	–	–		1,000	5,000	5,000
NATIONAL TOTALS	4,040	7,900		8,500	17,300	
NON-ATTAINMENT AREAS		61			0	

VOC CONTROLS ONLY
TONS ARE IN THOUSANDS
COSTS ARE IN $MILLIONS/YEAR

Figure 8

The major conclusions from the OTA study paint a bleak picture regarding the possibility of achieving ozone ambient air quality standards in all cities in the United States. OTA has projected that by the year 2004 all the control measures they have evaluated will cost between $8.8 and $13 billion per year. They also project that the VOC emissions reductions under-control for those cities with a design value of 0.16 ppm or greater will range from 1.81 to 2.14 million tons per year. Even with all controls evaluated by OTA at the costs cited above, as many as 61 cities would still not be in compliance with the ambient air quality standard in 2004. Figure 8 contains a summary of the VOC source categories evaluated by OTA and their associated costs. The Administration bill projections modified to incorporate the recent Dingell-Waxman compromise on motor vehicle emissions controls are also shown in Figure 8 for comparative purposes. Total costs for the modified Administration bill would be the $ 17.3 billion per year shown in Figure 8 plus the $1.8 billion for motor vehicle NO_x control shown in Figure 7. The total estimate for the modified Administration bill would be $19.1 billion per year in the year 2005.

Discussion

The total emissions reductions achievable by the methods evaluated in the OTA report is 3,700,000 tons per year in non-attainment areas. The value shown in Figure 8 is 4,040,000 tons per year. The difference between the values in Figure 8 and the OTA estimate is contained in four source categories. First, the architectural coatings reduction of 120,000 tons per year in Figure 8 includes 70,000 tons per year from attainment areas. Second, adding both Stage II and on-board emissions reduction numbers for non-attainment areas results in double counting. Third, there is a 140,000 ton per year reduction in the OTA report that is due to existing regulations. Correcting for these differences yields a total non-attainment area reduction of 3,700,000 tons per year, the same as in the OTA report.

The OTA analysis indicates that an additional 1.8 to 2.0 million tons per year of emissions reductions would be required for all areas to achieve attainment by the year 2005. It would be useful to determine if the modified Administration bill contains sufficient

reductions to comply with that requirement. The following paragraphs contain a comparison of the OTA emission reduction with those in the modified Administration bill.

Emissions Reduction Comparison

Total national VOC emissions reductions that would be required under the modified Administration bill are 8,500,000 tons per year. That is 4,800,000 tons per year greater than those identified in the OTA report. The reductions indicated in the Pechan report were not itemized by attainment area classification. Only a rough estimate could be made of the portion of the difference that would be in non-attainment areas.

OTA has indicated in their report that 44 percent of VOC emissions are in non-attainment areas. For the National Stationary Measures identified in the modified Administration bill, the total emissions reduction would be 2,820,000 tons per year. On the assumption that 44 percent of the emissions are from non-attainment areas, the total non-attainment reductions would be 1,240,000 tons per year. That is about 280,000 ton per year more than the amount included in the OTA report for National Stationary sources.

Pechan estimated gas station and motor vehicle Evaporative/Running Loss reductions to be 2,800,000 tons per year for the modified Administration bill. That is 1,380,000 tons per year more than the OTA emissions reduction estimate. Both estimates are apparently based on the implementation of a 9.0 pound per square inch vapor pressure limit on gasoline. OTA included Evaporative/Running Losses in their emissions reduction estimate. The Pechan report does not specify the control approach for Evaporative/Running Losses, but it is assumed to be due to RVP reduction. EPA personnel indicated their estimate of running losses differs from OTA's which might account for a portion of the discrepancy between the emission reduction estimates.

Additional motor vehicle tailpipe controls agreed to in the Waxman-Dingell compromise would result in 160,000 tons per year additional emission reduction over the OTA national estimate. Assuming that 44 percent of the increment would come from non-

attainment areas, the modified Administration bill would result in 70,000 tons per year more that the OTA estimate in non-attainment areas. EPA staff have indicated that the percentage of tailpipe emissions may be higher than 44 percent because motor vehicle travel is largely in non-attaining urban areas. If that is the case, the incremental modified Administration bill motor vehicle emissions reductions would be larger than shown in Figure 9 as would the total VOC emissions reduction increment.

The modified Administration bill would achieve 50,000 tons per year less VOC emissions reduction than the OTA estimate for refueling controls. The difference between the modified Administration bill and the OTA estimate would be the same if either on-board controls or Stage II is used as the basis for calculation. Since on-board controls would reduce VOC emissions in attainment areas, the modified Administration bill estimate was corrected to estimate non-attainment area emissions reductions. Differences in the impact of alternative fuel measures would not significantly affect the total emissions reduction between the Pechan and OTA analyses.

The categories of RACT, CTGs and Identifiable Controls were grouped to compare the two estimates for stationary source Area Specific Measures and Progress requirements. The modified Administration bill would result in an incremental 110,000 ton per year VOC emissions reduction over that contained in the OTA analysis for the three source categories. These controls are directed only to non-attainment areas.

Inspection and Maintenance techniques contained in the OTA analysis would result in 53,000 tons per year more emission reductions than would those in the modified Administration bill. There is also a category of Assumed Controls in the Administration bill that would require an additional 1,000,000 tons per year reduction. The OTA analysis contained no such provision and no specific sources or control techniques were included in the Administration bill analysis.

As shown in Figure 9, the modified Administration bill has provisions that would require emissions reductions that are nearly 2.8 million tons per year more than those

EMISSIONS REDUCTION COMPARISON

PROVISION	OTA TONS	ADMINISTRATION TONS	ADMINISTRATION INCREMENTAL EMISSIONS REDUCTION	
NATIONAL STATIONARY				
TSDF	840	2,100	ADMINISTRATION SUBTOTAL 2,815	
Municipal Landfills	–	130	x 0.44 = 1,240	
Solvents	–	220	OTA SUBTOTAL 960	
Architectural Coatings	120	340		
Marine Vessels	–	25	DIFFERENCE 280	280
MOTOR VEHICLES/FUELS				
RVP II	1,500	2,000		500
Evaporative/Running Losses	–	880		880
Tailpipe/Useful Life	330	490	DIFFERENCE = 160	71
Refueling			x 0.44 = 71	
Stage II	220	170		-50
Onboard	260	470	470 x 0.44 = 210	-50
Alternative Fuels	16	43		27
AREA SPECIFIC MEASURES				
RACT to 50 tons/yr	470	–		-470
New GTG	110	380		270
Enhanced Inspec. & Maint.	170	85		-85
Basic Inspect. & Maint.	–	32		32
Transport Regions	–	–		
PROGRESS REQUIREMENTS				
Identifiable Controls	–	300		300
Assummed Controls	–	1,000		1,000
NATIONAL TOTALS	4,040	8,500		2,750
NON-ATTAINMENT AREAS	61	0		

VOC CONTROLS ONLY
TONS ARE IN THOUSANDS

Figure 9

included in the OTA analysis. That should be more than adequate to provide for the 1.8 to 2.1 million tons per year additional requirement OTA has indicated for all ozone non-attainment areas to achieve compliance. The major difference between the OTA and Pechan estimates for emissions reductions are associated with RVP control and the Pechan category of Assumed Controls. These two items make up nearly 90 percent of the incremental emission reductions in the Administration bill above the OTA analysis.

Cost Comparison

The difference in annual cost between the OTA and Pechan analyses is about $9 billion per year. Since there is limited provision by provision comparability in costs evaluated, only the major differences will be discussed. The largest absolute cost difference is for Tailpipe/Useful Life provision. OTA estimated a total cost of $2.9 billion per year while Pechan estimated $8.4 billion per year. The difference is the OTA estimate appears to be based on VOC control costs to reach a 0.25 gpm emission level from light duty vehicles with certification testing for 50,000 miles. The Pechan estimate is apparently based on the Waxman requirement for a second level of emissions reduction to 0.125 gpm. The difference between these two estimates accounts for $5.5 billion per year, or about 60 percent of the total difference.

The second largest difference among common emission sources is for Enhanced Inspection and Maintenance. OTA has estimated $1.0 billion per year will be required while Pechan has calculated $0.09 billion per year. The OTA estimate is based on an inspection program that includes all requirements of the existing California program plus annual testing for all pollutants (VOC, NO_x, CO, and particulate), improved visual inspection, and a repair cost ceiling of $500 per year. Enhanced I/M would be required in all non-attainment areas. The OTA VOC cost was calculated from a total I/M cost of $3.1 billion/year assuming that one-half the cost was for ozone and two-thirds of that was for VOC. No details were contained in the Pechan report for the I/M cost calculation basis.

The final major cost difference is the $5.0 billion in the Pechan report for Assumed Controls. The basis for the range of $2,000-10,000 per ton cost effectiveness range or for the average value of $5,000 per ton was developed in an earlier Pechan report for EPA. The estimates are based on a mix of discretionary controls for industrial solvents, consumer solvents, and mobile sources. These sources were estimated to be 77 percent of the emissions inventory in the year 2000 and were judged to have relatively low levels of control. The control strategies included incineration for industrial solvent sources, product reformulation for consumer solvents, and transportation control measures (TCM) or alternate fuels for mobile sources. The range and most likely value for these discretionary controls mentioned above was a weighted average of the cost effectiveness for each of the categories. TCMs with a cost effectiveness greater than $100,000 per ton VOC reduced were eliminated from consideration in the estimate.

The sum of the major Administration excess costs for motor vehicle Tailpipe/Useful Life and Assumed Controls is $10.5 billion/year. Subtracting the major excess OTA cost of $1.0 billion per year for Enhanced I/M yields $9.5 billion per year which is about the difference between the two estimates.

National Association of Manufacturers

The National Association of Manufacturers (NAM) has reported an estimate of costs to implement the proposed South Coast Air Quality Management District (SCAQMD) plan for southern California. SCAQMD has proposed several techniques to further reduce VOC, particulate, NO_x, CO, and SO_x emissions in an area that has the most stringent regulations in the country but still has the worst air quality. Some of the additional restrictions proposed are listed below.

- Four day work week
- Equipment and process changes in manufacturing and building construction
- Mandated use of alternative fuels in vehicles starting in the 1990s and electric vehicles by the year 2007
- Strict regulatory controls on solvents and coatings in industrial, commercial, and residential applications
- Retrofit of Best Available control technology for all pollutants

- Trucking and goods distribution limitations to from 12 midnight till 5 am
- Technology forcing emissions controls

NAM reported cost estimates for Tier I of the three Tier program could be as high as $15 billion per year. No estimates have been made for the second and third Tiers. A study conducted for the California Council for Environmental and Economic Balance estimated a job loss of 52,000 for the entire plan. Economic impacts were projected to be disproportionately felt by lower income households with costs being as high as 17.7 percent of income. There was no indication in the report that Tier 1 would likely permit attainment of the ozone standard. Consequently, costs could be higher than the NAM estimate. No details of the basis for the cost and impact estimates were available at the time this report was prepared.

Additional information regarding the details of the basis for the NAM report was obtained from the Congressional Research Service. Two reports were evaluated. The Siemon, Larsen, and Marsh (SLM) report contained information describing the emissions reductions targets for the SCAQMD. In Tier I the reductions in tons per year that would be required are 200,000 for NO_x, 210,000 for VOC, 100,000 for particulate, 44,000 for SO_x, and 750,000 for CO. Cost estimates for these reductions were taken from an article by Portney. There is a great deal of uncertainty in the total estimate of $13 billion per year. The average cost per ton was calculated for the 58 provisions for which there were cost estimates. The total tons of emissions reduction in Tier I were then multiplied by the calculated average cost per ton to obtain the cost estimate for all 120 provisions in Tier I. Details of the cost breakout by pollutant were not included in the report.

Discussion

From the OTA analysis and the Pechan analysis it is clear that most of the less costly controls are already in place or are specifically included in the proposed legislation. There are few, if any, available emissions reductions remaining in the $1,000 to $2,000 per ton cost effectiveness range. The major cost uncertainty in the Pechan analysis is the estimate for

the category of Assumed Controls. While Pechan estimated the Assumed Controls costs will range from $2,000 to $10,000 per ton with an average of $5,000 per ton, other indications are that the costs could be much higher. The three categories of VOC sources that are projected to comprise about 80 percent of the inventory in 2005 are consumer solvents, industrial solvents and motor vehicles. These categories would be the likely targets for the final increment of emissions control needed to attain ozone air quality standards in high design value areas, such as Southern California.

Incinerators for industrial solvent controls are estimated to cost $6,000 per ton of VOC removed. The Chemical Specialty Manufacturers Association presented information showing that costs to achieve a 50 percent reduction in VOC emissions from one small category of consumer products, underarm products, could range from $49,000 to $98,000 per ton of VOC emissions reduction. OTA estimated methanol fuels would cost from between $8,700 and $51,000 per ton of reduction which is consistent with calculations based on oil industry estimates. Twenty Transportation Control Measure options were evaluated in Kansas City State Implementation Plan. Of the twenty, twelve were evaluated for cost effectiveness. Three had costs less than $5,000 per ton of VOC and two had costs between $5,000 and $10,000 per ton of VOC . Four had costs between $10,000 and $100,000 per ton of VOC and the remaining three fell in the $100,000 to $500,000 per ton of VOC range. It would appear that the final increment of reductions needed to achieve compliance with AAQS could easily fall in the $2,000 to $50,000 per ton range.

An estimate for southern California Tier I VOC control costs was developed from the SLM and Portney data as follows. Costs for CO control were taken as $2 billion of the $13 billion per year that Portney estimates for Tier I controls in SCAQMD. The $2 billion per year is more than ten times the national total estimated by EPA for S. 1894, introduced in the 100th Congress. An average cost for the remainder of the pollutants was calculated to be $20,000 per ton by dividing the remaining $11 billion per year cost from the Portney estimate by the remainder of the annual emissions reductions that would be required. The $20,000 per ton value was taken as the cost for VOC and NO_x controls for Tier I.

To estimate the ozone air quality standards compliance cost for southern California, the VOC reduction requirements for all three Tiers of the SCAQMD plan were multiplied by the calculated cost effectiveness for Tier I. The total VOC emission reduction requirement for all three Tiers in the SLM report was about 375,000 tons per year. Applying the Tier I VOC cost per ton estimate to all three Tiers leads to estimate of about $7.5 billion per year for the SCAQMD plan VOC controls. If the Tier II and Tier III VOC control costs would be higher than those in Tier I, the SCAQMD VOC cost estimate would be understated. It was assumed that about $2 billion of the estimated $7 billion total for NO_x controls would also be required for ozone attainment purposes. The total cost estimate for ozone attainment in the SCAQMD would then be about $9.5 billion per year.

Best Estimate

The range for Assumed Controls could apparently extend from about $2,000 to at least $20,000 per ton. The total cost estimate for the provisions evaluated by Pechan other than for Assumed Controls is $14.1 billion per year. Adding $2 billion for the low end and $20 billion for the high end of the Assumed Controls would result in an ozone non-attainment cost range from $16.1 to $34.1 billion per year.

A best estimate for the cost to comply with ambient ozone standards was calculated by adding the $9.5 billion per year estimate for southern California to the $19.1 billion average estimate generated by Pechan, then subtracting the Pechan estimate for California from the total to avoid double counting. The best estimate result would be $24.4 billion per year. The uncertain nature of this estimate is clear from the basis of the calculation. The best estimate represents an attempt to quantify the cost to solve what has been generally recognized as the very difficult problem of ozone air standards compliance in a high design value area.

There is reason to believe that other cities with high ozone levels would also have to implement measures similar to those in southern California. If the thirteen cities with design values between 0.18 and 0.26 ppm cited in the OTA report implemented similar measures the estimates for the modified Administration bill cost could be significantly higher.

Air Toxics

The air toxics provisions in each of the legislative proposals contain similar features. Facilities would be categorized as major or area sources depending on their amount of emissions from a list of chemicals, metals, and metal compounds. Each proposal would require an initial reduction in emissions of the listed chemicals. The amount of reduction required would be determined by applying an unspecified "Maximum Available Control Technology" (MACT). Following the application of MACT, the EPA administrator would evaluate the residual risk and specify additional controls if, in his judgement, such controls were justified. In H.R. 3030/S. 1490 a level of acceptable residual risk is not defined. In S. 1630 specifies two simultaneously applicable residual risk standards. All facilities would be required to comply with a one in ten thousand lifetime risk to the maximum exposed individual. All facilities would also be required to strive to achieve compliance with a one in one million residual risk standard. Under S. 1630, compliance costs may not be considered in residual risk exposure level decisions. One major difference between the Administration bill and S. 1630 is that the Administration bill would only require MACT for 50 percent of the source categories. Also, compliance costs and technical feasibility could be considered in residual risk decisions under the Administration bill.

Cost estimates included in this section are those provided by the American Petroleum Institute (API), the Chemical Manufacturers Association (CMA), and the Environmental Protection Agency (EPA). The CMA report contains cost estimates for several levels of MACT and two levels of residual risk. In their reports, both API and CMA stress the uncertainty of their cost estimates. Both have considered point and fugitive sources of emissions. CMA included particulate emissions control costs while API did not. EPA estimated costs for the technology based standards for specific source categories and five generic classes of pollutants. EPA also estimated costs for implementation of the Administration at the MACT level. EPA did not include any estimates for the residual risk provisions. A summary of the analysis and results from each of the three studies are given below.

American Petroleum Institute--Delta Management Group

The API report was prepared by the Delta Management Group (DMG). API supplied the approach, cost estimates, and types of equipment that would be used to comply with more or less restrictive MACT definitions. API dealt with the uncertainty in the MACT definition by estimating costs for two separate cases. The first was based on MACT requirements being approximately equivalent to those required now in certain non-attainment areas. This level of control would be consistent with a less restrictive interpretation of MACT and would not include any additional controls for residual risk. The second case is based on additional control requirements that are currently experimental or are not otherwise in significant commercial use. The second case would correspond to a very strict interpretation of MACT or to additional controls to reduce the estimated residual risk. Cost estimates for the second case would be incremental to those for the first case.

Capital Cost Estimates

For each of the two cases API estimated capital and annual costs for each of four petroleum sectors including production, transportation, refining, and marketing. Because the proposed legislation will likely include many smaller sources than have been included in previous analyses of the petroleum industry, API chose a bottom up analysis for a cost basis. First potential sources of listed pollutants were identified. Then the number of those sources in the appropriate sector were estimated. A unit capital cost for Case I and Case II control technologies was calculated and multiplied by the number of sources in the sector to estimate total sector costs. A sample calculation for the refining sector is shown below.

Sample API Capital Cost Calculations

Case I

Emissions Source	Number	Unit Cost	Total Cost
Safety Valves	70,140	$200	$14,000,000

Control Device: Rupture disk

Case II

Emissions Source	Number	Unit Cost	Total Cost
Pumps	39,907	$27,000	$1,100,000,000

Control Device: Dual mechanical seals with barrier fluid

The costs for each case for each petroleum sector were summed to calculate the total capital cost estimates. The results are summarized in Figure 10.

API CAPITAL COST SUMMARY
($ Millions)

Sector	Case I	Case II	Combined
Production	8,500	27,000	35,000
Transportation	900	3,000	4,000
Refining	1,300	14,000	15,000
Marketing	4,300	9,200	14,000
Totals	15,000	53,000	68,000

Figure 10

As was indicated earlier, Case II costs would be incremental to those incurred under Case I. The total for both cases is included in Figure 10. Total capital costs would range from $15 billion to $68 billion depending on the restrictiveness of the controls selected. API did not include any analysis that would indicate if the more restrictive controls would result in a residual risk of less than one in ten thousand or one in a million as would be required by S. 1630.

The capital cost estimates do not include controls for catastrophic releases of acutely toxic materials such as ammonia, chlorine, and hydrogen sulfide. The costs to modify the constituents in motor gasoline are also not included. In some instances, the application of Case II controls would require the removal of Case I controls. No costs are included in the API estimate for Case I control system removal nor have the impacts of forcing marginally viable industry operations out of service. No effort has been made to estimate the costs associated with diminished industry capacity or oil and product import impacts. No costs have been included for down time to install items such as fugitive controls. Some of the controls could be required under ozone non-attainment legislation requirements. No attempt has been made to estimate the amount of double counting that may have occurred.

Annual Cost Estimates

API included operating and maintenance costs as well as capital recovery in their annual cost estimates. Incremental operating and maintenance cost estimates were divided into five groups. The first group had no incremental costs because the equipment would be similar to that currently in place but with lower emissions. The second group included relatively passive equipment such as drains, piping and vents. Costs were estimated to be one half the industry average or 2.13 percent of capital investment. For equipment that is judged to be an "average" mix of equipment and machinery, group 3, overall industry operating and maintenance costs equal to 4.26 percent of capital investment were used in the calculation. Group 4 was composed of rotating, reciprocating, or highly mechanical equipment. For group 4 operating costs were judged to be higher than the industry average. A value of 6.39 percent of capital costs was used for this group. The fifth group category was Stage II controls. An earlier study indicated operating and maintenance costs would be 8.25 percent of capital investment. Sample calculations for operating and maintenance estimates are shown below.

Sample API Operating and Maintenance Cost Calculations

Case I

Equipment	Capital Cost	O/M %	Annual O/M Cost
Rupture disks	$14,000,000	4.26	$600,000

Case II

Equipment	Capital Cost	O/M %	Annual O/M Cost
Double mechanical pump seals	$1,100,000,000	6.39	$68,900,000

Operating and maintenance cost estimates were calculated for all items in both cases and the results totalled. A summary of the calculations is shown in Figure 11. Total annual operating and maintenance cost estimates are $1.1 billion and $1.7 billion for Cases I and II respectively. As with the capital investment estimates, the operating and maintenance estimates are additive. The total of $2.8 billion per year represents the annual cost for a most stringent interpretation of MACT or added controls to reduce residual risk.

Capital recovery costs were determined as a function of the interest rate used and the equipment's useful life. API used a five year useful life for equipment associated with internal combustion engines and ten to twenty years for most other equipment. A ten percent interest rate was assumed for the results summarized in Figure 11. The annual cost for capital recovery would be $2.1 billion under Case I and $7.9 billion under Case II. The total capital recovery representing a restrictive MACT or added controls for residual risk would be $ 10.0 billion per year.

The annual operating and maintenance costs have also been included in Figure 11. The column identified as Total Annual Costs is the sum of operating and maintenance and capital recovery costs. API concluded the total annual costs for air toxics legislation could range from a low of $3.2 billion to a high of $12.8 billion for the petroleum industry.

API also evaluated the possible consequences of provisions in the legislation that would require permits "for a fixed period, not to exceed five years...." API has suggested that a five year permit may have the same effect as a five year useful life for all equipment.

API Total Annualized Costs
($ Millions)

Case I

Sector	O&M	Capital Recovery	Total
Production	550	1,220	1,770
Marketing	300	600	900
Transportation	65	140	200
Refining	175	180	350
Sub Totals	1,100	2,100	3,200

Case II

Sector	O&M	Capital Recovery	Total
Production	810	4,450	5,260
Marketing	400	1,100	1,500
Transportation	120	350	470
Refining	340	2,000	2,340
Sub Totals	1,700	7,900	9,600
Totals	2,800	10,000	12,800

Figure 11

Revision of permit requirements every five years could result in the replacement of control equipment at the end of the permit period. API calculated the effect of a five year useful life in the capital recovery portion of the annual costs for each technology incorporated in the Case I and Case II control strategies. The results show that Case I annual costs would increase from $3.2 billion to $4.7 billion per year and Case II annual costs would increase from $9.6 billion to $14 billion per year. The total increase for the combined cases would be from $12.8 to $18.7 billion per year. The five year permit requirement could result in as much as a 50 percent increase in compliance costs.

Chemical Manufacturers Association--Denny Technical Services

The CMA report was prepared by Denny Technical Services (DTS). The DTS cost analysis follows the requirements proposed in S. 816 which are identical to those in S. 1630. S. 816 is the most specific bill with regard to residual risk criteria. Several different assumptions for the definition of MACT have been evaluated as well as two levels of residual risk for each MACT assumption. Cost estimates for H.R. 3030/S. 1490 have been backed out of the CMA estimates. The results are described in the air toxics discussion. Costs for risk based standards were calculated only for carcinogens. No costs were estimated for toxic threshold pollutant controls that would be required by the proposed legislation.

The EPA 1985 National Emissions Data System (NEDS) was used in conjunction with EPA's VOC/PM Speciation Data System (SDS) to determine the major sources subject to S. 816's provisions. A commercially available, simplified, version of EPA's Industrial Source Complex Long-Term (ISCLT) air dispersion model was used to estimate exposure concentrations. Publicly available unit risk estimates were used to determine cancer risk due to exposure at concentrations predicted from the ISCLT model. Cost equations for the required control technologies were generated from material in the open literature. The details for each topic listed above are described in the following sections.

Toxic Air Pollutants List

The list of toxic air pollutants was taken as that presented in S. 1894. Of the 223 pollutants in the list, 89 are in the EPA VOC/PM Speciation Data System (SDS). The 89 species are listed in Figure 12. Of the 89 species, 21 have been identified as known, probable, or possible human carcinogens. All the carcinogens shown in Figure 12 are included in the Administration bill Hazardous Air Pollutant list. They are identified in Figure 12 by the unit risk number.

Major Source Identification

Each facility record in NEDS was assumed to be a source within a contiguous area and to be under common control. For each facility record in NEDS, each source classification code (emissions point) was matched to the SDS. Where species profile for the emissions point was available, the emissions from the source were multiplied by the weight fraction of toxic pollutant in the SDS to determine the tons/year toxic pollutants emitted from that emissions point. The total facility emissions for each individual toxic pollutant and for all toxic pollutants were summed. If the total emissions for any one pollutant exceeded 10 tons per year, or, if the total of all toxic air emissions exceeded 25 tons per year, the facility was designated a major source.

Facility Risk

The risk due to exposure to carcinogens from each facility was calculated using 1985 emissions of carcinogens as a basis. The simplified ISCLT model was applied to each emissions point in each facility. Stack height data for the calculation were taken from NEDS. A default value of six feet was used when no height was specified in NEDS. One important factor in determining public exposure is the distance from the emissions point to the facility fence line. There is no data in NEDS that could be used to determine that distance for each facility. A size survey for a large number of chemical company facilities indicated the largest was over 1700 acres and the smallest was less than 5 acres. The

AIR TOXICS SPECIES AND UNIT RISKS

SPECIES	UNIT RISK
Butadiene	1.8 E-3
Methyl Alcohol	
Methyl Cellosolve	
Ethylene Glycol	
Acrylic Acid	
Ethyl Acrylate	
Methyl Methacrylate	
Dimethyl Formamide	
Vinyl Acetate	
Formaldehyde	1.3 E-5
Acetaldehyde	2.2 E-6
Acrolein	
Methyl Ethyl Ketone	
Methyl Isobutyl Ketone	
Ethylene Oxide	1.0 E-4
Maleic Anhydride	
Acrylonitrile	6.8 E-5
Dichloromethane	4.7 E-7
Chloroform	2.3 E-5
Carbon Tetrachloride	1.5 E-5
Ethylene Dichloride	
Perchloroethylene	5.8 E-7
1,1,2-Trichloroethane	1.6 E-6
Cyclohexane	
Ethylene	
Isopropyl Alcohol	
N-Butyl Alcohol	
sec-Butyl Alcohol	
Methyl Methacrylate	
Butyl Acrylate	
Bytyraldehyde	

SPECIES	UNIT RISK
Isomers of Xylene	
Benzene	8.3 E-6
Toluene	
Ethylbenzene	
o-Xylene	
m-Xylene	
p-Xylene	
Styrene	
Phenol	
Dimethyl Phthalate	
Cresol	
Dibutyl-Phthalate	
Phthalic Anhydride	
Aniline	7.4 E-6
Nitrobenzene	
Toluene Diisocyanate	
Chlorobenzene	
o-Dichlorobenzene	
m-Dichlorobenzene	
Dichlorobenzenes	
Benzyl Chloride	
Trichlorobenzenes	
Napthalene	
Acetone	
Propylene Oxide	
1,1,1-Trichloroethylene	
Chloroprene	
Cumene	
Biphenyl	
Terephthalic Acid	
Butyl Benzyl Phthalate	

SPECIES	UNIT RISK
Trichloroethylene	1.3 E-6
Ethylene Dibromide	2.2 E-4
Propylene Dichloride	
Vinyl Chloride	4.1 E-6
Epichlorohydrin	1.2 E-6
Carbon Disulfide	
m-Xylene and p-Xylene	
Antimony	
Beryllium	2.3 E-3
Arsenic	4.3 E-3
Cobalt	
Lead	
Mercury	
Nickel	3.6 E-4
Phosphorous	
Selenium	
Thallium	
Barium	
Cadmium	1.8 E-3
Chromium	1.2 E-2
Copper	
Manganese	
Osmium Tetroxide	
Aluminum	
Silver	
Vanadium	
Zinc	

Figure 12

median size was 170 acres. The distance from the center of a 170 acre, square site would be about 1360 feet. That distance was used in the exposure estimate calculation.

The annual average exposure concentration was multiplied by the unit risk factor for each carcinogen species. The risks from all emissions points in the facility were summed to determine the total carcinogen risk for the facility. The language in S. 816 is not clear regarding the cumulative effect of exposure to multiple carcinogens. The words "stream of pollutants" could mean those from a single source or could mean the stream of pollutants from the entire facility. The assumption that the language means the entire facility was used in the DTS analysis.

Control Equipment Costs

Cost equations were developed for three VOC control technologies and three particulate control technologies. The VOC control systems include flares, carbon adsorption, and incinerators (thermal oxidizers). The particulate control systems include venturi scrubbers, electrostatic precipitators, and baghouses. The cost equations generally follow procedures contained in the literature. Virtually all the references used were authored by EPA staff or EPA contractors. The cost equations were structured so total capital investment and annual costs were a function of emissions parameters contained in NEDS. The cost factors used were those contained in the references. Total costs were indexed to spring, 1989.

The procedure followed in selecting control technologies for specific emissions streams was to replace existing technology with a new control system of the same type. The replacement system was sized to comply with the legislative requirements. Discussions with industry representatives indicated that would be the predominant approach taken to comply with the proposed regulations. The default control system for sources where no system is specified in NEDS or the NEDS specification is something other than those for which cost equations were developed, was an electrostatic precipitator for particulate sources and an

incinerator for VOC sources. The costs in this report are incremental to existing control costs.

Compliance Cost Calculations

The basis for emissions reductions in the MACT cost estimates is emissions absent controls as calculated from the 1985 NEDS database. It is CMA's understanding that this basis was the intent of Congress when the legislation was drafted. Two options for MACT were evaluated. The first option would require a 90 percent reduction in toxic species emissions from those that would be emitted absent controls. The second option was a 98 percent reduction for VOC sources and a 99 percent reduction for particulate sources from emissions absent controls. The second option set of control efficiencies are typical of Reasonably Available Control Technology (RACT) determinations cited in the BACT/-LAER Clearinghouse Report for VOC and particulate sources in the chemical industry.

Two scenarios for each MACT definition were evaluated based on a 1985 facility risk calculation. The first scenario is a de minimis case scenario. For the de minimis it was assumed that facilities which, based on 1985 NEDS emission data, would not exceed one in a million risk due to exposure from all carcinogen emissions would be exempted from further emissions reduction requirements. Also, under the de minimis case, it was assumed that facilities that could achieve a one in a million risk with less than MACT emissions reductions would do so. The de minimis cost estimates reflect the lower than full MACT emissions reduction. It was assumed the de minimis facilities would be able to convince the EPA Administrator that such actions would be compliant. Such a procedure would be permitted in the proposed legislation. Under the second scenario, all major sources would be required to comply fully with MACT emissions reduction requirements.

Maximum Available Control Technology Standards Costs

SIC 28 MACT requirements compliance costs are summarized in Figure 13. The estimates range from $3.0 to $6.5 billion per year for SIC 28 point sources. The costs were

calculated assuming that each point source at a facility would be fitted with a control system that would comply with the MACT requirement. At a 90 percent MACT level, most manufacturers would install controls that would exceed the emissions reduction requirement on some point sources to comply with the facility emissions reduction requirement. Other control systems would remain unchanged. The installed controls would be more expensive individually, but in aggregate the cost would likely be less than the values cited in Figure 13. That uncertainty has led CMA member company representatives to the conclusion that the DTS cost estimates for the 90 percent MACT are probably high by a factor of two. A similar argument for possibly fewer and subsequently lower cost control systems does not hold true for the 98/99 percent MACT level.

Fugitive emissions controls were also considered by CMA in estimating MACT control costs. No costs were added for the 90 percent MACT case. An estimate of $1 billion per year was made for an enhanced inspection and maintenance program for the 98/99 percent MACT case. That would raise the total MACT cost estimates to $7.0 billion per year under the de minimis scenario an $7.5 billion without the de minimis provision.

SIC 28 MACT POINT SOURCE ANNUAL COST ESTIMATES
($ Billion per year)

MACT De Minimis	90% Yes	90% No	98/99% Yes	98/99% No
Pollutant				
VOC	2.4	2.8	4.5	4.9
Particulate	0.6	0.6	1.5	1.6
Totals	3.0	3.4	6.0	6.5

Figure 13

Residual Risk Technology Cost Estimates

The residual risk was calculated for those facilities that would be required to fully comply with either of the MACT definitions stated above. The emissions used to estimate residual risk were those that would occur with the MACT technology in place. The costs for replacement technologies to achieve emissions reductions that would comply with either a one in ten thousand or a one in a million residual facility risk were then calculated. The risk levels are those specified in S. 816. The result of the cost calculations are shown in Figure 14. The annualized residual risk cost estimates are incremental to those for MACT in each case.

The residual risk incremental costs would range from a low of $1.6 billion per year for a one in ten thousand risk to a high of $9.6 billion per year for the case where MACT would be defined as a 90 percent emissions reduction with no de minimis provision. CMA assumed no additional fugitives controls would be required for either the one in ten thousand residual risk case or for the 98/99 percent MACT case. CMA did estimate a $1 billion per year cost for an enhanced inspection and maintenance program for the one in a million residual risk at a 90 percent MACT. The total residual risk costs for the 90 percent MACT case would then be $10 billion per year with the de minimis assumption and $10.6 billion per year without the de minimis assumption. As would be expected the residual risk cost estimates are higher for the 90 percent MACT control case. Fewer facilities would achieve residual risk compliance levels under this less stringent MACT option.

Total SIC 28 Air Toxics Compliance Costs

The calculated residual risk costs estimates were incremental to those for MACT. Total replacement technology costs for the air toxics provisions of the proposed legislation are summarized in Figure 15. The cost estimates range from a low of $4.6 billion per year to a high of $14.5 billion per year.

SIC 28 POINT SOURCE RESIDUAL RISK TECHNOLOGY COST ESTIMATES
($ Billion per year)

One in Ten Thousand Residual Risk

MACT De Minimis	90% Yes	90% No	98/99% Yes	98/99% No
Pollutant				
VOC	1.3	1.3	1.3	1.3
Particulate	0.3	0.3	0.3	0.3
Totals	1.6	1.6	1.6	1.6

One in One Million Residual Risk

MACT De Minimis	90% Yes	90% No	98/99% Yes	98/99% No
Pollutant				
VOC	6.5	7.0	4.0	5.2
Particulate	2.5	2.6	1.5	1.8
Totals	9.0	9.6	5.5	7.0

Figure 14

SIC 28 ANNUAL COST ESTIMATES
($ Billion per year)

MACT De Minimis	90% Yes	90% No	98/99% Yes	98/99% No
One in Ten Thousand Residual Risk				
MACT Costs				
Point Sources	3.0	3.4	6.0	6.5
Fugitive	0.0	0.0	1.0	1.0
Sub Totals	3.0	3.4	7.0	7.5
Residual Risk Costs				
Point Sources	1.6	1.6	1.6	1.6
Fugitive	0.0	0.0	0.0	0.0
Sub Totals	1.6	1.6	1.6	1.6
Totals	4.6	5.0	8.6	9.1
One in One Million Residual Risk				
MACT Costs				
Point Sources	3.0	3.4	7.0	7.5
Fugitive	0.0	0.0	1.0	1.0
Sub Totals	3.0	3.4	7.0	7.5
Residual Risk Costs				
Point Sources	9.0	9.6	5.5	7.0
Fugitive	1.0	1.0	0.0	0.0
Sub Totals	10.0	10.6	5.5	7.0
Totals	13.0	14.0	12.5	14.5

Figure 15

The low case is for a 90 percent MACT. The assumptions for this case are that no additional controls would be required for facilities that are less than one in a million risk. Also those facilities that could reach one in a million risk with less than 90 percent emissions reduction would be permitted to do so. The residual risk requirement for facilities that install MACT would be to comply with a one in ten thousand life time risk to the maximally exposed individual.

The high case is for a 98/99 percent MACT and compliance with a one in a million residual risk requirement. All major sources would be required to install MACT and those that do so would also be required to later comply with a one in a million residual risk requirement. DTS did not include estimates for fugitives controls such as welding flanges, canned pumps, and valves with bellows seals in the CMA study as was done by API. Should such stringent measures be required to comply with a one in a million residual risk requirement, the cost estimates could increase by several billion dollars per year.

Environmental Protection Agency

Energy and Environmental Analysis (EEA), in a report prepared for EPA, evaluated the costs to comply with five different air toxics provisions in H.R. 3030, H.R. 2858, and S. 816. The provisions include technology based standards, health based standards, area source standards, mobile source standards, and accidental release requirements.

Within the technology based standards analysis (MACT), costs were determined for eight specific source categories and for five generic categories. The specific categories include utility boilers, electric arc furnaces, publicly owned treatment works, coke ovens, primary lead smelters, secondary lead smelters, and copper smelters. Specific category costs were estimated from information in existing EPA documents. Costs for the generic categories were based on aggregated emissions reported to EPA under SARA Title III Section 313 from facilities meeting the toxics major source criteria. The five generic source categories included, acids and bases, chlorinated hydrocarbons, non-chlorinated hydrocarbons, sulfides, and particulates. Residual risk costs were not evaluated.

Area source control costs were estimated by assuming the magnitude of area source emissions, estimating the probable composition of those emissions, applying costs for EPA's likely control requirements. Mobile source costs for controlling three of the four chemicals specifically mentioned in H.R. 2585 and the two chemicals mentioned in Title II of the Administration bill were estimated using data from recent publications and preliminary estimates prepared by EPA and the California Air Resources Board. Costs for the accidental release provisions of H.R. 2585 and S. 816 were based on a separate EPA sponsored analysis. Compliance costs for accidental release provisions included in the Administration bill were not estimated.

The EEA cost estimates are summarized in Figure 16. The cost estimates have been corrected to take into account the costs of other EPA regulatory programs. Consequently, the estimates in Figure 16 represent incremental costs that would be required by the proposed legislation. The annualized costs are for the year 2003 and are expressed in 1989 dollars. The cost basis assumes the specific source categories evaluated, with the exception of utility boilers, will be regulated equally under each bill. For the generic sources, the analysis differentiates the number of sources that would be controlled under each bill. The top 50 percent of facilities in each four digit SIC code accounting for about 90 percent of the SARA 313 emission would be regulated under the Administration bill. Technology transfer was generally not considered by EEA in the selection of control devices to comply with MACT. Details for each of the cost categories in Figure 16 are presented below.

Technology Based Standards

Specific Source Categories

Coal and Oil Fired Utility Boilers

Emissions and control costs were estimated using an EPA Office of Air Quality Planning and Standards (OAQPS) model that evaluates hazardous pollutant emissions and control costs. Controls are for particulate emission only. Control options included

AIR TOXICS BILLS COST COMPARISON--EPA
($ Billions per year)

Legislation	Administration	H.R. 2585	S. 816
Category			
Technology Based Standards			
Utility Boilers	0.7-2.6	0.8-2.6	0.8-2.6
Specific Source Categories	0.4-1.2	0.4-1.2	0.4-1.2
Generic Source Categories	0.4-2.7	0.4-2.8	0.4-2.8
Subtotals	1.5-6.5	1.6-6.6	1.6-6.6
Health Based Standards	NE	NE	NE
Area Sources	0.1-0.5	0.4-0.7	0.1-0.5
Mobile Sources	3.0-3.0	3.1-3.1	3.0-3.0
Totals	4.6-10.0	5.1-10.4	4.7-10.1

Accidental Releases--Cost estimates are for one time costs for the preparation of risk management plans. For H.R. 2585 the estimates range from $1.1 billion to $2.8 billion. For S. 816 the estimates range from $0.9 billion to $1.8 billion. The Administration bill requirements are similar to those of S. 816 and the costs would also be expected to be similar.

Figure 16

baghouses, upgrading electrostatic precipitators, and fuel switching. Four scenarios were evaluated and the cost estimates are representative of the range for the different scenarios.

Cost Range: **Oil Fired $0.150-$0.660 billion per year**
Coal Fired $0.600-$1.925 billion per year

Electric Arc Furnaces

Ninety percent of the toxic emissions were estimated to be from electric arc furnaces in the steel industry. Fugitive emissions controls and baghouse collectors were projected to achieve about an 85 percent reduction in particulate emissions from the 600 affected facilities.

Cost Range: **$0.059-$0.117 Billion per year**

Publicly Owned Treatment Works

About 800 POTWs in ozone attainment areas would be required to install controls to comply with the air toxics legislation. The control approach evaluated was to apply controls to the facilities discharging to the POTW, eliminating the POTW as a source. The discharge categories evaluated were miscellaneous solvents used by equipment manufacturers, manufacturers of organic chemicals, pharmaceuticals, and pesticides and miscellaneous industries such as paper, plastics and laundries.

Cost Range: **$0.019 billion per year**

Coke Ovens

Best Available Control Technology systems include optimized stage charging, a door leak control program, temperature resistant door seals, topside leak seals, and offtake modification or replacement. Technologies would vary from site to site. Lowest Achievable Emission Rate technology would require rebuilding almost all coke ovens. New doors with an appropriate maintenance system could also be required. Costs have been corrected to avoid double counting the cost for the EPA NESHAP for coke ovens. EPA has recognized that most coke ovens would be forced to close if a one in ten thousand residual risk were

to be required. All would be forced to close if a one in one million residual risk level were to be required.

Cost Range: $0.029-0.782 billion per year

Secondary Lead Smelters

Controls would include installation of venturi scrubbers downstream of the baghouse on process stack sources, enclosure of the smelter building with ventilation to a new baghouse, water systems for dust suppression, and replacement of blast furnaces with electrolytic processes.

Cost Range: $0.186 billion per year

Primary Lead Smelters

Technologies for primary lead smelter control would include increased baghouse maintenance, improved scrubber efficiency, enclosure of buildings containing process fugitive emissions, ventilation of enclosed buildings to baghouses, and control of area source fugitive emissions.

Cost Range: $0.081 billion per year

Copper Smelters

Copper smelters would be required to install fugitive emission controls such as building ventilation to a baghouse to control particulate arsenic and other metals.

Cost Range: $0.060 billion per year

Generic Source Categories

Chlorinated Hydrocarbons

Fifty percent of the chlorinated hydrocarbons were assumed not to be VOCs that would be regulated under ozone non-attainment requirements. Facilities emitting

chlorinated hydrocarbons were assumed to add freeboards and covers to open tanks, switch to other non-listed compounds when able to do so, use good operating practices to reduce emissions, or to add control devices such as carbon adsorption, incinerators, or condensers to reduce emissions. Costs were assumed to be range from $500 to $7,500 per ton and to provide an overall emissions reduction efficiency of 75 percent.

Cost Range: $0.091-$1.361 billion per year

Non-Chlorinated Hydrocarbons

Controls applied to facilities were assumed to be identical to those at sources of chlorinated hydrocarbons. The controls cost were assumed to range from $500 to $4,000 per ton and to provide an overall control efficiency of 75 percent. Calculated costs were reduced by a factor of two to avoid double counting costs for those facilities in ozone non-attainment areas.

Cost Range: $0.137-$1.096 billion per year

Acids and Bases

Approximately 850 facilities would be required to install low pressure drop scrubbers and neutralizing capability to reduce acidic and basic emissions under the specifications contained in H.R. 2585. For the Administration bill requirements the number of facilities and cost would be slightly less.

Cost Range: $0.035-$0.175 billion per year

Sulfides

EEA cost estimates were based on flaring emissions of carbon disulfide and carbonyl sulfide at 40 facilities. No emissions data for hydrogen sulfide was available from the SARA 313 data base or elsewhere. No costs are included for hydrogen sulfide. The number of facilities and cost differences between H.R. 2585 and the Administration bill are insignificant.

Cost Range: $0.115 billion per year

Particulates

EEA assumed that half the facilities emitting over 10 tons per year toxics would be able to add or upgrade a control device at a cost of $25,000 per ton of particulate removed. The high incremental rate is because most sources of toxic particulates are already well controlled. Emissions were assumed to be reduced by 75 percent.

Cost Range: $0.028-0.031 billion per year

Health Based Standards

No estimate was calculated in the EEA analysis.

Area Sources

Area source control costs were calculated by assuming the magnitude of area source emissions and estimating a control cost range from $500 to $2000 per ton. The extremes in the range reflect differences between the Administration bill and H.R. 2585 in the degree of control required with H.R. 2585 being more restrictive.

Cost Range: $0.1-0.7 billion per year

Mobile Sources

EEA provided mobile source emissions reduction cost estimates for benzene, butadiene, formaldehyde, and diesel particulate. The estimates are nearly the same for all three bills analyzed. Nearly all the costs for each bill are to remove benzene from gasoline and would be the same for all three bills.

Cost Range: $3.0-3.1 billion per year

Accidental Releases

One time costs for facilities to prepare risk management plans were estimated for H.R. 2585 and S. 816. The estimate for H.R. 2585 is based on an average cost of from $100,000 to $250,000 per facility. The S. 816 estimate is based on an average cost of from $20,000 to $40,000 per chemical for an average of four chemicals per facility. The Administration bill provisions are similar in scope to those in S. 816 and the costs are also expected to be similar.

Cost Range: $0.9-2.8 billion

Discussion

The petroleum and chemical industries would face significant incremental operating costs if the proposed air toxics Clean Air Act modifications were implemented. The material presented below describes the methods used to extrapolate the API and CMA estimates to national cost basis. EEA estimates for the Administration bill were taken as the lowest air toxics cost estimate. The estimated residual risk costs would be incremental to the EPA estimate.

The API study included only VOC toxics while the CMA study included both VOC and particulates. From a previous analysis of the 1984 NEDS data base, it was determined that petroleum production and petroleum refining account for about 24.4 percent of the VOC emissions in SIC codes 10-39. Chemical manufacturing, SIC 28, accounts for about 18.3 percent of VOC emissions in SIC codes 10-39. Under the assumption that toxics VOC control costs will be proportional to VOC emissions, costs for all the SIC codes 10-39 can be extrapolated. The factors used to estimate national costs for the VOC toxics provisions are summarized in Figure 17.

Both the CMA and API estimates were extrapolated to SIC codes 10-39. To do so, both industry segment cost estimates had to be corrected. API costs were for VOC controls only. Approximately 65 percent of the API annual low cost estimate and 75 percent of the

NATIONAL VOC AIR TOXICS COST ESTIMATE DATA

	API	CMA
% SIC 10-39 VOC Emissions	24.4	18.3
Low VOC Estimate ($ Billions/year)	3.2	3.0
% Costs in SIC 10-39	65.0	100.0
Efficiency Correction	-	50.0
% Costs for VOC Control	100.0	100.0
Corrected Low VOC Cost ($ Billion/year)	2.1	1.5
High Estimate ($ Billions/year)	12.8	15.8
% Costs for VOC Control	100.0	80.0
% Costs in SIC 10-39	75.0	100.0
Corrected High VOC Cost ($ Billion/year)	9.6	12.6

Figure 17

annual high cost estimate were for the production and refining sectors. The total low and high cost estimates were multiplied by 0.65 and 0.75 respectively to account for only the API costs included in SICs 10-39. The low and high API estimates of $3.2 and $12.8 estimates were corrected to $2.1 and $9.6 billion per year respectively. The API costs were extrapolated from 24.4 percent of VOC emissions in the refining and production sectors to 100 percent of the VOC emissions in SIC codes 10-39. The national estimate range generated was from $8.6 to $39.3 billion per year.

The CMA low estimate of $5.2 billion per year included $3.0 billion per year for MACT VOC control. The $3.0 billion per year value was corrected to $1.5 billion per year to allow for efficient application of control systems to meet the 90 percent MACT requirement. The upper value of $14.8 billion per year was corrected to $12.4 billion per year because only 80 percent of the CMA high estimate was for VOC control. Again the CMA cost range was extrapolated 18.3 percent of VOC emissions in SIC 28 to 100 percent VOC emissions in SIC codes 10-39. The national estimate range was from $8.2 to $67.8 billion per year. A third estimate for national incremental air toxics costs was generated by DTS. DTS calculated the costs for all VOC major sources in EPA's NEDS point source data base using the CMA methodology. The incremental VOC air toxics cost estimates ranged from $6.4 billion to $60.6 billion per year.

The low and high for the three national VOC toxics cost estimates, described above, were averaged. The low end national average calculated cost was $7.7 billion per year and the high national estimate was $55.9 billion per year. These incremental costs are for VOC toxics only. The $7.7-$55.9 billion per year range represents national costs for full implementation of S. 816. The low end of the range would be for a 90 percent MACT with a de minimis assumption and a residual risk requirement of one in ten thousand. The upper end of the range would be for a 98 percent MACT with no de minimis assumption and a residual risk requirement of one in a million. No means was readily available to estimate national particulate toxics control costs from the API and CMA study results. The national estimate was compared to the EPA estimate for air toxics costs. The comparison is described below.

The Administration bill would require that only 50 percent of the toxics source categories be regulated by standards with decisions on the remaining categories to be made by the EPA Administrator. Controls for 50 percent of the major source categories is the basis for the EPA cost estimates. The EPA cost estimates for chlorinated and non-chlorinated hydrocarbons toxics ranged from $0.2 to $2.5 billion per year. The national VOC toxics cost estimate of $7.7 billion per year generated from the API and CMA estimates is for 100 percent of the source categories. Also, no correction has been made in the API/CMA national extrapolation to account for the fact that some facilities in ozone non-attainment areas may be required to reach MACT control levels to comply with ozone attainment provisions in the Administration bill. Correcting for these two differences would yield a low API/CMA national estimate of $1.9 billion per year on the same basis as the EPA calculation for VOC toxics. The API/CMA extrapolation is consistent with the EPA VOC estimate at the low end of the cost range. EPA did not estimate residual risk provision costs so no comparison for the high end of the national estimate range can be made.

A best estimate for VOC air toxics would be near $1.9 billion per year if the EPA assumptions are those implemented by the EPA Administrator, i. e., only 50 percent of toxics categories are regulated and residual risk compliance cost estimates are taken to be zero. The VOC toxics best estimate would be near the API/CMA residual risk cost of $55.9 billion per year if all major source categories were required to comply with MACT regulations and a one in a million residual risk requirement. Control costs rise rapidly with risk increased reduction or increased emissions reduction at control efficiencies above 90 percent. For residual risk level standard of one in one hundred thousand, SIC 28 incremental costs would be about 10 times the incremental costs at the minimum requirement. Those costs extrapolated to SIC codes 10-39 would be $19.0 billion per year for a residual risk requirement of one in one hundred thousand.

The average EPA air toxics compliance cost estimates for the Administration bill are shown in Figure 18. The API/CMA extrapolated residual risk VOC toxics costs are also included in Figure 18 for three different residual risk levels. Source categories for which

AIR TOXICS RESIDUAL RISK INCREMENTAL COST
($ Billions per year)

Legislation	Administration	Incremental Residual Risk Costs		
Residual Risk Level		10^{-4}	10^{-5}	10^{-6}
Category				
Technology Based Standards				
Utility Boilers	1.67	NE	NE	NE
Specific Source Categories				
Electric Arc Furnaces	0.09	NE	NE	NE
POTWs	0.02	NE	NE	NE
Coke Ovens	0.41	NE	NE	NE
Secondary Lead Smelters	0.19	NE	NE	NE
Primary Lead Smelters	0.08	NE	NE	NE
Copper Smelters	0.06	NE	NE	NE
Generic Source Categories				
Chlorinated and non-Chlorinated VOC Sources	1.07	6.6	17.9	54.8
Acids and Bases	0.11	NE	NE	NE
Sulfides	0.11	NE	NE	NE
Particulates	0.03	NE	NE	NE
Health Based Standards	NE	NE	NE	NE
Area Sources	0.40	NE	NE	NE
Mobile Sources	3.0	NE	NE	NE
Totals	7.1	6.6	17.9	54.8
Administration Bill plus Residual Risk Increment	7.1	13.7	25.0	61.9

NE = No Estimate

Figure 18

no residual risks costs have been evaluated are indicated by a NE. As can be seen from Figure 18, the average Administration bill estimate would be $7.1 billion per year. At one in ten thousand, one in one hundred thousand, and one in a million residual risk compliance levels, the incremental cost above the EPA average estimate would be $6.6, $17.9, and $54.8 billion per year respectively for VOC air toxics. Total costs would be the sum of the incremental residual risk costs and the EPA average for VOC toxics. These totals are $7.1 billion per year for the Administration bill, $13.7 billion per year for a one in ten thousand residual risk, $25.0 billion per year for a one in one hundred thousand residual risk, and $61.9 billion per year for a one in a million residual risk. The totals are shown at the bottom of Figure 18.

Incremental residual risk costs would approximately triple for each factor of 10 decrease in residual risk. The total costs would approximately double with each factor of 10 decrease in incremental residual risk. Total incremental costs for each residual risk level could clearly be higher because costs for most of source categories were not evaluated.

Best Estimate

Assuming a compromise residual risk requirement of one in one hundred thousand would be required, the best estimate for the air toxics provision would be $25 billion per year.

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APPENDIX A

BRT BEST ESTIMATE
STATE-BY-STATE
COST DISTRIBUTION

BRT BEST ESTIMATE
STATE-BY-STATE
COST DISTRIBUTION

The state-by-state cost distributions for ozone, acid deposition, and air toxics costs are shown in the attached spread sheet printout. Each distribution was generated by multiplying the BRT best estimate by the state fraction of cost for the particular provision given in other distribution estimates.

The Acid Deposition distribution follows that generated by Temple, Barker, and Sloane (TBS) for the Edison Electric Institute. For example, the state of Alabama was projected to absorb $0.221 billion per year of the total TBS national low estimate of $4.97 billion per year. The Acid Deposition portion of the BRT $5.3 billion per year best estimate for the state of Alabama would then be:

$$\text{Alabama Acid Deposition Costs} = (0.221/4.97) \times 5.3$$
$$= \$0.24 \text{ billion per year}$$

Similar procedures were followed for the ozone and air toxics cost distributions. The basis for the ozone cost distribution is an estimate developed by Pechan and Associates for EPA. The basis for the air toxics cost distribution is an estimate of VOC emissions by state and by industry category prepared for BRT by Alliance Technologies in an earlier analysis of S. 1894 introduced in the 100th Congress. The lone exception to the procedures described above is the adjustment to California ozone non-attainment costs as described in the text of this report.

BRT BEST ESTIMATE
CLEAN AIR ACT COSTS
STATE BY STATE
($ Billions per year)

STATE	TOXIC	ACID RAIN	OZONE	TOTAL	STATE	TOXIC	ACID RAIN	OZONE	TOTAL
Alabama	0.92	0.24	0.20	1.35	Missouri	1.22	0.42	0.24	1.88
Alaska	0.00	0.00	0.01	0.01	Montana	0.11	0.01	0.01	0.13
Arizona	0.01	0.01	0.21	0.23	Nebraska	0.00	0.00	0.02	0.02
Arkansas	0.30	0.01	0.05	0.36	Nevada	0.00	0.00	0.02	0.02
California	1.50	0.00	9.50	11.00	New Hampshire	0.03	0.03	0.04	0.10
Colorado	0.02	0.00	0.06	0.08	New Jersey	0.28	0.06	1.11	1.45
Connecticut	0.04	0.01	0.36	0.42	New Mexico	0.02	0.01	0.02	0.05
Delaware	0.03	0.02	0.10	0.15	New York	0.04	0.10	2.00	2.14
District of Columbia	0.00	0.00	0.02	0.02	North Carolina	0.77	0.15	0.20	1.12
Florida	0.14	0.17	0.17	0.49	North Dakota	0.01	0.04	0.01	0.06
Georgia	0.45	0.29	0.22	0.96	Ohio	0.60	0.73	0.29	1.62
Hawaii	0.04	0.00	0.01	0.05	Oklahoma	0.35	0.00	0.08	0.43
Idaho	0.01	0.00	0.01	0.02	Oregon	0.14	0.00	0.11	0.26
Illinois	0.99	0.33	1.35	2.67	Pennsylvania	0.77	0.50	0.64	1.91
Indiana	0.28	0.54	0.49	1.32	Rhode Island	0.01	0.00	0.06	0.07
Iowa	0.10	0.04	0.02	0.17	South Carolina	0.09	0.10	0.06	0.25
Kansas	0.93	0.01	0.06	1.00	South Dakota	0.01	0.02	0.01	0.04
Kentucky	0.24	0.21	0.12	0.57	Tennessee	1.47	0.29	0.28	2.04
Louisiana	2.51	0.00	0.23	2.74	Texas	6.88	0.06	3.51	10.46
Maine	0.03	0.00	0.04	0.07	Utah	0.12	0.00	0.06	0.18
Maryland	0.21	0.10	0.18	0.48	Vermont	0.00	0.00	0.02	0.02
Massachusets	0.15	0.02	0.82	0.99	Virginia	0.66	0.06	0.33	1.06
Michigan	0.31	0.11	0.30	0.72	Washington	0.47	0.06	0.12	0.66
Minnesota	0.23	0.03	0.16	0.42	West Virginia	0.47	0.37	0.13	0.98
Mississippi	0.19	0.04	0.05	0.28	Wisconsin	0.60	0.07	0.29	0.96
					Wyoming	0.25	0.02	0.01	0.28
					TOTALS	25.00	5.31	24.46	54.77

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COMMITTEES:
AGRICULTURE, NUTRITION, AND FORESTRY
FINANCE
RULES

United States Senate

WASHINGTON, DC 20510

November 15, 1989

Honorable George J. Mitchell
Majority Leader
S-221 - Capitol
Washington, D.C. 20510

Dear George:

As you know, the Environment and Public Works committee will be marking-up critical Clean Air legislation tomorrow. I know this has been a priority for you, Senator Baucus and Senator Chafee.

As you complete action on this very complex and controversial piece of legislation, I would respectfully request that the Committee require two things before floor debate occurs next year: that detailed industry cost estimates of all titles of the bill be made to all Senators on a state-by-state basis; and that all Senators, particularly those who are not members of the Environment Committee, have an adequate opportunity to review the bill and the Committee report.

I am concerned, upon hearing comments from a number of my colleagues, that completion of a truly comprehensive Clean Air bill will require a thorough effort by all Senators. I am certain you understand the need for this information and look forward to working with you in the months ahead.

Sincerely,

BOB DOLE
United States Senate

BD/jgs

THE WHITE HOUSE

WASHINGTON

January 19, 1990

Dear Senator Dole:

Last July I submitted to the Congress a comprehensive proposal for reauthorizing and strengthening the Clean Air Act. That proposal was the result of a long and careful debate within the Administration, and reflected extensive consultation with Members of the House and Senate, representatives of affected industries, state and local governments, and environmental and public health groups.

Consistent with my belief that environmental protection and economic growth can be compatible, the Administration's Clean Air bill seeks to achieve public health and environmental protection in an economically efficient way by making extensive use of market principles. My comprehensive proposal carefully balanced our mutual desire for enhanced public health, a cleaner environment, and sustained economic growth. Even so, the cost estimate of the Administration's bill to the American economy is approximately $19 billion annually when fully phased-in.

As the Senate moves toward floor consideration of the Clean Air Act, I am convinced that we must maintain the balance reflected in the Administration's bill. Initial cost estimates of the Clean Air bill reported by the Senate Environment and Public Works Committee exceed $40 billion annually -- more than double the cost of the Administration's bill. Yet the Committee bill provides little incremental environmental benefit above that proposed by the Administration. And the additional costs of some of the Committee bill's far-reaching provisions have yet to be incorporated in these estimates.

I want to sign a Clean Air bill this year -- so that the 1990s can indeed be known as the "Clean Air decade." But I will only sign legislation that balances environmental and economic progress.

Specifically, I will only approve legislation which meets the following minimum tests of balance and reasonableness:

1.) The important environmental protections afforded by the Administration's bill must be maintained in the final legislation and preserved over time. The Administration proposes to: reduce sulfur dioxide emissions permanently by 10 million tons; achieve attainment of ozone, carbon monoxide and particulate matters standards; and sharply curtail the hazards posed by air toxics emissions. These represent critically important steps in achieving clean and healthy air for all Americans. In view of the environmental and health risks posed by acid rain; the fact that 100 million Americans now live in cities which are out of attainment with public health standards for ozone; and the estimate that current excessive levels of air toxics emissions may result in premature cancer deaths and other serious adverse health effects; it is vital that we move quickly and decisively to reduce these pollutants. The Administration's proposed bill would do just that.

2.) The bill should not impose aggregate costs on the economy that exceed the already considerable costs embodied in the Administration's bill -- with an adjustment of no more than ten percent to reflect certain mobile source provisions added in the House Energy and Commerce Subcommittee on Health and the Environment. The House subcommittee added certain provisions affecting mobile sources to the titles of the bill which relate to non-attainment that will modestly increase the cost of these titles. Unfortunately, several provisions currently contained in the Senate Environment and Public Works Committee's bill -- such as mandatory nationwide second phase tailpipe standards for automobiles, an inflexible second phase of air toxics control, and carbon dioxide emissions standards for mobile sources -- cause the Senate bill to exceed substantially the cost of the Administration bill. The result of an excessively costly bill will be a less competitive American economy with fewer jobs for American workers.

The Administration has received letters from around the country, for example, indicating that a considerable number of plant closings could result from adoption of the Senate's air toxics provisions. The Administration has set up a task force under the chairmanship of the Council of Economic Advisers, and including the Environmental Protection Agency, the Office of Management and Budget, the Department of Energy, and the White House Office of Policy Development, to monitor and estimate the economic cost of various clean air proposals as the debate proceeds.

3.) Controls in the bill should be designed to achieve reductions in the most cost-efficient way -- that is, for the least cost per ton of reduced pollutant. By incorporating flexibility and innovation in its recommended control strategies, the Administration's bill would allow environmental and health standards to be met in a way that creates maximum choice for both states and regulated industries and places fewer burdens on consumers. For example, the Administration's alternative fuels proposal will challenge the automobile and oil industries to produce cleaner vehicles and cleaner fuels at the lowest cost to the consumer.

The "command and control" approach embodied in several provisions of the Environment and Public Works Committee's bill -- such as that which disallows "netting" for factories and commercial facilities seeking to meet ozone non-attainment standards in the most cost-effective way -- results in the same environmental benefit, but at greatly increased cost and with sharply increased impediments to economic growth. Similarly, the provisions in the Environment and Public Works Committee's bill which move up emissions reduction deadlines while failing to provide incentives for clean coal technology needlessly inflate the cost of acid rain control.

4.) The system of emissions trading, which allows acid rain reductions to be achieved in the least costly and most equitable fashion, must be allowed to work. The Administration's proposed acid rain emissions trading program inherently reduces the cost of any given level of sulfur dioxide or nitrogen oxide reduction, and provides an efficient mechanism for balancing the burdens imposed on any given region of the country. The Administration has provided information to several Senators which indicates that this trading system can dramatically reduce the impact of acid rain controls on electric utility rates in any given state, while at the same time reducing the cost of the overall bill by up to billions of dollars per year. In the first phase, the initial allocation of required reductions to 107 plants is essential to ensuring that effective trading opportunities exist. The trading system must survive in a form that achieves environmental benefits comparable to those in the Administration's bill and involves a sufficient number of plants in the first phase to ensure its workability.

5.) The legislation must not include a national electricity tax to pay for controls, which would penalize consumers in those states which have already undertaken reductions by making them in effect "pay twice" for clean air. Supporters of such "cost sharing" argue that it is needed to address regional inequities. Any imbalance in control costs can be addressed far more effectively, efficiently, and equitably through the operation of a robust emissions trading system -- which would not require new taxes.

The Administration took substantial time and effort to craft a balanced proposal. My staff and I stand ready to assist you and the other Members of both the House and Senate as you work to develop legislation which maintains this vitally important balance, and which does not violate one or more of the above mentioned "tests."

I look forward to signing legislation that will accelerate progress toward cleaner air for a growing America at the earliest possible opportunity.

Sincerely,

The Honorable Robert Dole
Republican Leader
United States Senate
Washington, D.C. 20510

DALE A. DENNY, Ph.D.

Dr. Denny has over twenty years experience in environmental work, including support of hazardous waste site cleanups, evaluating existing and emerging control technologies, managing pollution control technology development and demonstration programs, trouble shooting commercial pollution control processes, providing support for Environmental Protection Agency regulations development, and analysis of proposed environmental legislation for commercial clients.

During the past five years, he has operated his own consulting business, providing a variety of technical and management services to business and government clients. Specific projects have included:

- Technical analysis for the clean-up of a capacitor/PCB contaminated land fill for a major electronics manufacturer
- Analysis of proposed Clean Air Act modifications for two major Washington trade associations
- Environmental technical support for policy development in the secondary mortgage market
- Analysis of the validity and impact of EPA hazardous waste air and land restriction regulations for a major Washington trade association
- Technical analysis of a non-compliant waste water treatment system for a specialty steel manufacturer
- Solved a process related particulate control compliance problem for an electric utility
- Provided consulting services to support the development of computer-based management information systems and on-line time share systems residing on large mainframes.

From 1982 to 1984, Dr. Denny managed Lockheed Missile and Space Company's Oak Ridge Engineering Center where he directed the efforts of over 25 computer science and engineering professionals. The work was comprised of 1) the development of a large computer based project control information system that incorporated such features as electronic mail, video teleconferencing, and artificial intelligence applications and 2) engineering analysis of advanced uranium enrichment processes.

As Director of Technical Services for Environmental Research and Technology, Inc., from 1980 to 1982, Dr. Denny managed a major engineering certification study for a direct coal liquefaction project; the preparation of a comprehensive environmental, health and safety background information report for an indirect coal liquefaction project; a cost/benefit study of water pollution regulations applied to the steel industry; and a hazardous waste cost reduction project for a major electronics firm.

From 1969 to 1980, Dr. Denny served as a top line manager in EPA's Office of Research and Development. He chaired the agency's Hazardous Air Pollutant Research Committed responsible for providing the technical basis for hazardous air pollutant standards. Interdisciplinary issues represented in this effort included health effects testing, risk analysis, pollutant transport and transformation, ambient monitoring, emissions characterization and control technology evaluation and development. He was responsible for the development of the agency's technical record in support of BAT guidelines for the pesticides industry. He conceived and implemented a program to identify multi-media pollutant discharge problems from over 60 industries. He was responsible for more than 20 pollution control process development projects ranging from bench to commercial scale. Earlier in his career with EPA he managed a research grants program covering mobile and stationary source control technology development and meteorological research.

Dr. Denny served as Director of Product Development for the Ross Division of Abbott Laboratories from 1965 to 1970. He was responsible for major improvements in product shelf life, significant product cost reductions, the introduction of a new packaging development to the market. He holds patents on both the package and components of the processing equipment.

Dr. Denny holds doctoral, master's and bachelor's degrees in chemical engineering from the Ohio State University. He is currently a Visiting Professor in the Department of Chemical Engineering at North Carolina State University. He also teaches waste minimization courses for the University's Industrial Extension Service.

OPENING REMARKS

Business Roundtable Briefing

Philip X. Masciantonio
Vice President - Environmental Affairs
USS, a division of USX Corporation

Good morning! We are here to talk about congressional proposals to strengthen the Clean Air Act and what they might mean for the American people - and for their pocketbooks.

As you know, tremendous progress already has been made in the improvement of the air which we all breathe. The Environmental Protection Agency reports that during the ten-year period 1978-1987 the following reductions were made in air pollutants:

-- airborne lead, down 88 percent
-- sulfur dioxide, down 35 percent
-- carbon monoxide, down 32 percent
-- dust, soot and particulate matter, down 21 percent
-- ground-level ozone, down 16 percent.

We must not overlook the fact that these gains were achieved while the U.S. population and economy both increased substantially and the demand for goods and services grew dramatically.

Progress was made because of provisions of the Clean Air Act and because government and industry -- despite differences of opinion on certain occasions -- were able to work together in a beneficial manner. We expect this progress and cooperation will continue.

--more--

I would like to take this opportunity to stress that American industry remains firmly committed to the task of helping bring about efficient and cost-effective improvements in the clean air program.

I think it is appropriate to emphasize that there is a financial aspect to our clean air progress. According to the Department of Commerce, the clean air laws now on the books require expenditures of about $32 billion per year. This is no small sum and eventually it works its way into the bills we all have to pay and the cost of all goods and services we buy.

The Business Roundtable today is releasing a study which estimates the cost of various Clean Air Act amendments now being considered by Congress. These figures are hard to pin down. And I note with interest that 40 members of the Senate have asked the Congressional Budget Office, the Congressional Research Service and the Office of Technology Assessment to do studies of what one bill in particular, S. 1630, will cost the American economy. That bill was approved in November by the Senate Environment and Public Works Committee.

The study we are releasing today estimates that the cost of various proposed amendments -- including S. 1630 -- could be as high as $104 billion per year. That's in addition to the $32 billion we are already paying each year. The study suggests that as much as $55 billion of the $104 billion total could be created by the most stringent air toxics provisions of S. 1630 alone.

--more--

The study, you will note, says such a law could have serious side effects, namely, reduced industrial production, job losses, employment dislocations and possibly even "shutdowns" of industries. This could be brought about not only by high costs but also because compliance with residual risk requirements of the air toxics provisions may not be technically feasible.

The study, prepared for The Business Roundtable by Denny Technical Services of Raleigh, N.C., covers various amendments dealing with ozone pollution, acid rain and, of course, toxic air pollutants.

Although the estimated total costs of various amendments could reach the already mentioned $104 billion per year, the study also gives a "Best Estimate" of costs, based on a compromise, middle ground of what might become law. This figure comes to $54 billion per year. Bills incorporating the Bush Administration's proposals -- H.R. 3030 and S. 1490 -- could be less costly than this best estimate.

Specifically, the study says that for the Administration bills, as introduced, the implementation cost estimate would be about $22 billion per year. Motor vehicle control amendments to the Administration proposals would increase the implementation cost to a total of $31 billion per year. Adjustments to the ozone regulations for high ozone cities would likely add $5 billion per year.

Basically, our study is an evaluation of a series of cost estimates from several organizations. To the extent possible, this evaluation has been reviewed by the cost study authors or sponsors and

--more--

their comments have been considered in the conclusions reached.

The "Best Estimate" of $54 billion per year in "middle ground" compliance costs is broken down by the study as follows: acid rain - $5 billion; ozone smog - $24 billion; and air toxics - $25 billion.

The high and low costs range in each of the above categories is as follows:

-- Acid rain - $3 billion to $8 billion per year

-- Ozone - $6 billion to $34 billion

-- Air Toxics - $5 billion to $62 billion.

The totals on these add up to a low estimate of $14 billion and a high of $104 billion.

A state-by-state breakdown of the "Best Estimate" costs is found on the back page of our study.

The study points out that the proposed amendments are undergoing frequent revisions and that the provisions included in the study are believed accurate as of mid-December.

--end--

22

Embargoed for Release at 10 a.m. EST
Thursday, January 18, 1990

Business Roundtable Analysis

Cost of Senate Clean Air Amendments
Could Approach $104 Billion A Year

WASHINGTON, D.C., January 18 -- The Business Roundtable today released a study which said the cost of various Clean Air Act amendments now being considered by Congress could range from a "Best Estimate" of $54 billion to as much as $104 billion per year in the case of legislation being prepared for debate in the Senate.

The study warned the result might be a "shutdown" of industries, or "significantly reduced production in United States industries..."

The bill which could generate much of the new costs is S. 1630, approved by the Senate Environment and Public Works Committee and scheduled for action when the Senate resumes business on January 23.

The Roundtable study says that if the bill's most stringent air toxic residual risk requirements become law, the incremental cost for this item alone could be $55 billion per year.

Prepared by Denny Technical Services of Raleigh, N.C., the study is a compilation and analysis of cost estimates for the three major provisions in various proposed amendments to the Clean Air Act. Those provisions deal with ozone pollution, acid rain and air toxic pollutants.

"The estimated cost for all three provisions," the study says, "could be as much as $104 billion per year. A 'Best Estimate,' representing a

--more--

'middle ground' of possible requirements, would be about $54 billion per year for the provisions evaluated.

"Cost estimates are not included for Administration bill elements such as the PM10 requirements and provisions related to enforcement and permit amendments," the study notes, and says "these items could substantially increase the 'Best Estimate.'"

"The basis for the evaluation is a series of cost estimates previously generated by several major trade organizations, the congressional Office of Technology Assessment, and the Environmental Protection Agency. To the extent possible, this evaluation has been reviewed by the cost study authors or sponsors and their comments have been considered in the conclusions reached."

The study says provisions in the Bush Administration Clean Air Act amendments, H.R. 3030 in the House of Representatives and S. 1490 in the Senate, "could be less costly than the 'Best Estimate' of $54 billion per year."

Elaborating, the study says the implementation cost estimate for the Administration bills, as introduced, would be about $22 billion per year. Motor vehicle control amendments to the Administration proposals would increase the cost to a total of $31 billion per year. Adjustments to the ozone regulations for high ozone cities would likely add $5 billion per year. The study adds:

"Various combinations of bills before Congress could lower or raise the estimated costs. The Senate Environment and Public Works legislation, S. 1630, reported on November 19th, would be significantly more expensive than the Administration bill."

--more--

The study notes that the proposed amendments are undergoing frequent revisions and that the provisions included in the study are believed accurate as of mid-December 1989.

The "Best Estimate" of $54 billion per year in compliance costs is broken down by the study as follows: acid rain - $5 billion ; ozone smog - $24 billion; and air toxics - $25 billion.

The high and low cost range in each of the above categories is given as follows:

Acid rain - $3 billion to $8 billion per year;

Ozone - $6 billion to $34 billion;

Air Toxics - $5 billion to $62 billion.

The totals on these add up to a low estimate of $14 billion and a high of $104 billion.

The Business Roundtable is an association of 200 major corporations represented by their chief executive officers who focus and act on public issues.

--end--

For additional information, please contact Dick Anthony,
The Business Roundtable: Washington, 202-872-1260; New York, 212-682-6370.

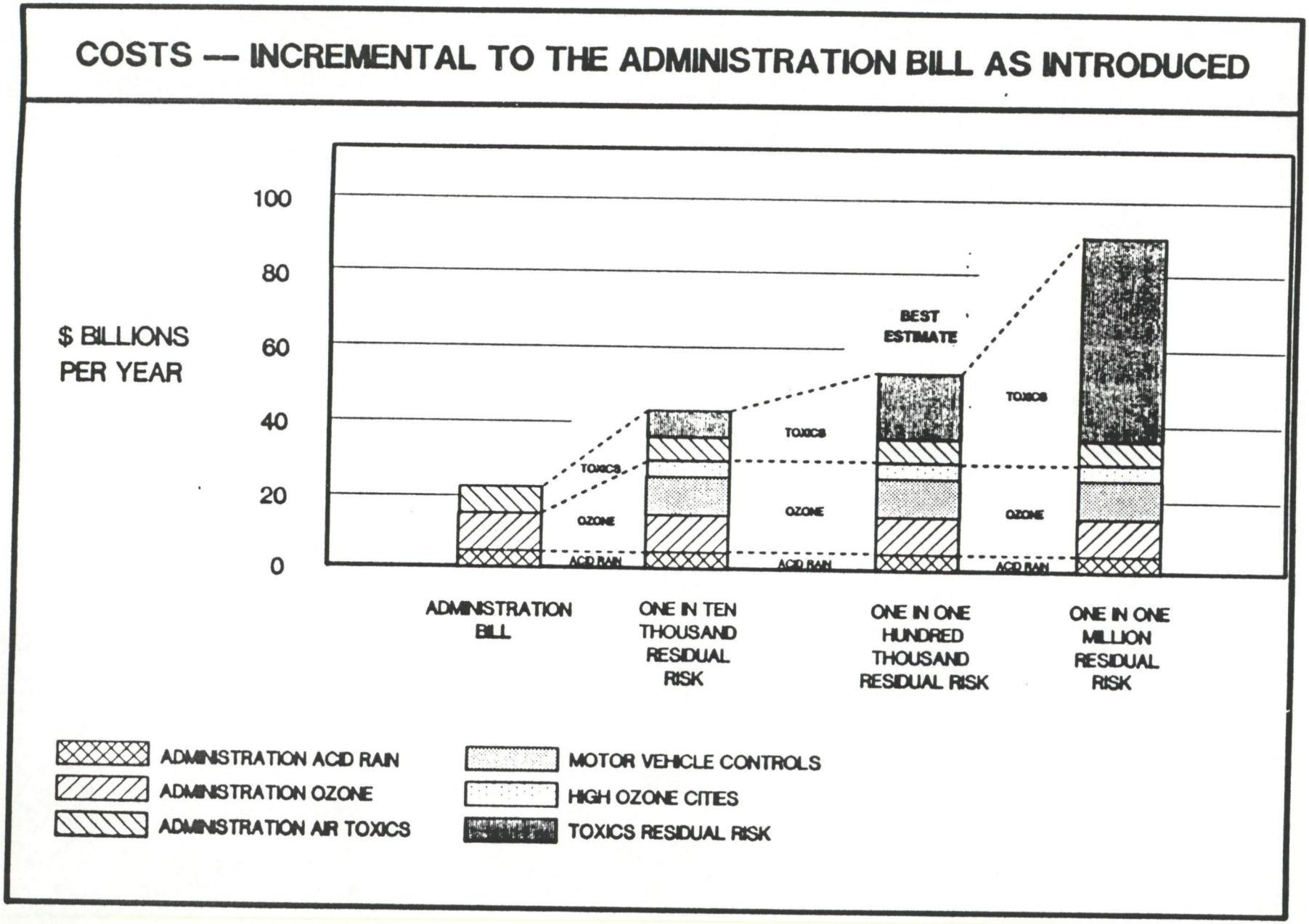

COSTS — INCREMENTAL TO THE ADMINISTRATION BILL AS INTRODUCED
$ BILLIONS PER YEAR
100
80
60
40
20
0
BEST ESTIMATE
TOXICS
OZONE
ACID RAIN
ADMINISTRATION BILL
ONE IN TEN THOUSAND RESIDUAL RISK
ONE IN ONE HUNDRED THOUSAND RESIDUAL RISK
ONE IN ONE MILLION RESIDUAL RISK
ADMINISTRATION ACID RAIN
ADMINISTRATION OZONE
ADMINISTRATION AIR TOXICS
MOTOR VEHICLE CONTROLS
HIGH OZONE CITIES
TOXICS RESIDUAL RISK

FIGURE ES-2

INDUSTRIES WITH RESIDUAL RISK COMPLIANCE TECHNOLOGY LIMITATIONS

ONE IN TEN THOUSAND RESIDUAL RISK

BUTADIENE PRODUCTION
NEOPRENE PRODUCTION
POLYBUTADIENE PRODUCTION
STYRENE-BUTADIENE RESINS
METHYLENE CHLORIDE USE AND PRODUCTION
PHARMACEUTICAL
ETHYLENE DICHLORIDE PRODUCTION
CHLORINATED HYDROCARBON PRODUCTION
CHLORINATED HYDROCARBON USE
ETHYLENE OXIDE PRODUCTION
PRIMARY COPPER SMELTERS
PRIMARY LEAD SMELTERS
ZINC OXIDE PRODUCTION
CHROMIUM PRODUCTION
VINYLIDIENE CHLORIDE POLYMER
COKE OVENS
FERROCHROME PRODUCTION
PESTICIDE PRODUCTION

ONE IN ONE MILLION RESIDUAL RISK

CHROMIUM PRODUCTION
CHLORINE PRODUCTION
REFRACTORIES
COKE BYPRODUCTS PROCESSING
ELEMENTAL PHOSPHORUS PLANTS
ARSENIC CHEMICAL PRODUCTION
GLASS MANUFACTURING
SECONDARY LEAD SMELTERS
SPECIALTY STEEL PRODUCTION
MILL TAILINGS PILES
UNDERGROUND URANIUM MINES
ETHYLENE DICHLORIDE PRODUCTION

Figure ES-3

J. BENNETT JOHNSTON, LOUISIANA, CHAIRMAN
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FRANK M. CUSHING, STAFF DIRECTOR FOR THE MINORITY
GARY G. ELLSWORTH, CHIEF COUNSEL FOR THE MINORITY

United States Senate

COMMITTEE ON
ENERGY AND NATURAL RESOURCES
WASHINGTON, DC 20510-6150

November 16, 1989

The Honorable J. Bennett Johnston
Chairman
Committee on Energy and Natural Resources
U. S. Senate
Washington, D. C. 20510

Dear Bennett:

A major issue before the Senate upon its return in January will be the Clean Air Act amendments. All members have a vital interest in the final outcome of this long overdue legislation. At stake are the public health and economic well-being of the American people. We therefore share the belief that it is time that the Congress take additional steps to improve the quality of the Nation's air.

However, significant energy policy issues are associated with such legislation. Time and again, efforts to amend the Clean Air Act have been frustrated because of a failure to reach a consensus on the divisive issue of acid rain. In addition to this issue, current legislative proposals contain major initiatives in such areas as alternative fuels and clean coal technology. The energy policy implications of these and other provisions under consideration have major economic and social implications for all Americans.

In order to become more fully informed on the implications of this legislation for national energy and natural resource policies, we request that the full Committee convene hearings to receive testimony from Administration representatives and other witnesses. We urge you to schedule these hearings prior to Senate consideration of such legislation so that members may make informed decisions. Thank you for your consideration of this request.

Sincerely,

Wendell H. Ford

James A. McClure
Ranking Minority Member

John D. Rockefeller IV

Mitch McConnell

Dale Bumpers

Don Nickles

Mark O. Hatfield

Kent Conrad

Malcolm Wallop

Howard M. Metzenbaum

Jake Garn

Howell T. Heflin

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GORDON J. HUMPHREY, NEW HAMPSHIRE
DAVID M. STRAUSS, STAFF DIRECTOR
ROBERT F. HURLEY, MINORITY STAFF DIRECTOR

United States Senate
COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS
WASHINGTON, DC 20510-6175

December 15, 1989

Dr. Robert D. Reischauer, Director
Congressional Budget Office
House Annex II
Second and D Street, S.W.
Washington, D.C. 20515

Mr. Joseph E. Ross, Director
Congressional Research Service
Library of Congress
101 Independence Ave., S.W. Room LM 203
Washington, D.C. 20540

Dr. John H. Gibbon, Director
Office of Technology Assessment
U.S. Congress
Washington, D.C. 20510-8025

Dear Sirs:

On November 17, the Senate Environment and Public Works Committee reported S. 1630, a seven title bill to amend the Clean Air Act. At the opening of the mark-up session, the committee's leadership committed to seeking cost analysis of the bill's provisions. We share their interest and request your assistance obtaining such cost estimates.

We are most interested in estimates that can be broken down industry by industry, and assigned to specific geographic regions (state by state where possible), with a focus on the issues most likely to be topics of debate. The Department of Commerce estimates that EPA's current clean air program costs the nation 32 billion dollars a year. Please base your estimates on the direct and indirect incremental costs of the committee bill's provisions over and above this current expenditure.

Understanding that this is an enormously complex and encompassing bill, we appreciate the difficulty of the task we are requesting. Rather than impose a deadline for your response, we merely request your best efforts to make available the most comprehensive analysis possible prior to January 23, 1990, and would appreciate a timetable for when further information might be available.

The preparation of cost estimates may also bring to light valuable information about the scientific soundness and feasibility of various provisions. These points, too, would be of interest to us, as well as any observations about the ease of transition from the current regulatory framework to the new frameworks envisioned by the committee bill.

In undertaking this analysis, please feel free to consult our offices for additional details as to the areas of our specific concern. Also, while we hope your analysis will maintain its usual independence, you may need to seek the data and resources available to executive agencies. We would certainly be willing to encourage the cooperation necessary to facilitate this admittedly large request.

Sincerely,

Steve Symms
STEVE SYMMS

Jim McClure
JAMES A. McCLURE

Chuck Grassley
CHARLES E. GRASSLEY

Richard Shelby
RICHARD C. SHELBY

Larry Pressler
LARRY PRESSLER

Howell Heflin
HOWELL HEFLIN

Jesse Helms
JESSE HELMS

Conrad Burns
CONRAD BURNS

John Warner
JOHN W. WARNER

Wendell Ford
WENDELL H. FORD

Don Riegle
DONALD W. RIEGLE, JR.

Carl Levin
CARL LEVIN

CONNIE MACK

SLADE GORTON

ORRIN G. HATCH

MALCOLM WALLOP

NANCY LANDON KASSEBAUM

DON NICKLES

TED STEVENS

JAKE GARN

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TRENT LOTT

ROBERT DOLE

DAN COATS

JOHN HEINZ

DAVID L. BOREN

STROM THURMOND

ERNEST F. HOLLINGS

ARLEN SPECTER

THE WHITE HOUSE
WASHINGTON

November 1, 1989

MEMORANDUM FOR THE FILE

FROM: JEFFREY R. HOLMSTEAD JRH
Assistant Counsel to the President

SUBJECT: EPA's Answers to Questions from the Senate Environment; Environmental Subcommtitee on S. 1490, the Administration's Clean Air Act Amendments Bill

I contacted Holly Fitter at 12:00 noon on October 31, 1989, and suggested several minor revisions to the above-referenced draft. I also pointed out that there are several issues yet to be resolved about the regulation of radionuclides, and that the draft might need to be revised to reflect decisions that are expected to be made today. She said that she was aware of the situation with respect to radionuclides and would make sure that the final draft reflects a consensus between EPA and Energy.

EPA2. ANS

(Pls make copy

for subject

file)

ID # _____ CU

WHITE HOUSE
CORRESPONDENCE TRACKING WORKSHEET



☐ O - OUTGOING
☐ H - INTERNAL
☐ I - INCOMING
Date Correspondence Received (YY/MM/DD) 1 1

Name of Correspondent: Ronald K. Peterson

☐ **MI Mail Report** **User Codes: (A)** _____ **(B)** _____ **(C)** _____

Subject: EPA's answers to questions from the Senate Environment; Environmental Subcommittee on S. 1490 the Administration's Clean Air Act Amendment bill

ROUTE TO:		ACTION		DISPOSITION		
Office/Agency (Staff Name)	Action Code	Tracking Date YY/MM/DD	Type of Response	Code	Completion Date YY/MM/DD
Cu Ofc	ORIGINATOR	84/10/30			/ /
	Referral Note:				
Cu Cat 17	R	84/10/30		S	84/10/31 10:00
	Referral Note:				
	_	/ /		_	/ /
	Referral Note:				
	_	/ /		_	/ /
	Referral Note:				
	_	/ /		_	/ /
	Referral Note:				

ACTION CODES:
A - Appropriate Action
C - Comment/Recommendation
D - Draft Response
F - Furnish Fact Sheet to be used as Enclosure
I - Info Copy Only/No Action Necessary
R - Direct Reply w/Copy
S - For Signature
X - Interim Reply

DISPOSITION CODES:
A - Answered
B - Non-Special Referral
C - Completed
S - Suspended

FOR OUTGOING CORRESPONDENCE:
Type of Response = Initials of Signer
Code = "A"
Completion Date = Date of Outgoing

Comments: _____

Keep this worksheet attached to the original incoming letter.
Send all routing updates to Central Reference (Room 75, OEOB).
Always return completed correspondence record to Central Files.
Refer questions about the correspondence tracking system to Central Reference, ext. 2590.

5/81

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

URGENT

October 27, 1989

LEGISLATIVE REFERRAL MEMORANDUM

TO: Legislative Liaison Officer -

Department of Commerce (Levitt 377-3151)	324
Department of the Interior (Spagnole 343-4547)	329
Department of Health & Human Svcs. (White 245-7750)	328
Department of Labor (Zinman 523-8201)	330
Department of Justice (Perkins 633-2113)	217
Nuclear Regulatory Commission (Rothschild 492-1607)	227
Department of Energy (Rabben 586-6718)	209
Council of Economic Advisers (Obermiller 395-5046)	242
NAPAP (Mahoney x5771)	256
Office of Science and Technology Policy	

SUBJECT: EPA's answers to questions from the Senate Environment; Environmental Subcommittee on S. 1490, the Administration's Clean Air Act Amendments bill.

The Office of Management and Budget requests the views of your agency on the above subject before advising on its relationship to the program of the President, in accordance with OMB Circular A-19.

A response to this request for your views is needed no later than **10:00 A.M., TUESDAY, OCTOBER 31, 1989**.

Questions should be referred to **HOLLY FITTER (395-6194)**, the legislative analyst in this office or to ED WATTS **(395-6827)**.

Ronald K. Peterson

RONALD K. PETERSON FOR
Assistant Director for
Legislative Reference

Enclosures

cc: C.B. Gray
A. Fraas
G. Bennethum
K. Glozer
N. Maloley

ANSWERS TO QUESTIONS FOR ADMINISTRATOR REILLY
FOLLOWING THE HEARING OF SEPTEMBER 26, 1989
REGARDING THE ADMINISTRATION'S PROPOSED CLEAN AIR AMENDMENTS

ANSWERS TO QUESTIONS FROM SENATOR SYMMS

QUESTION 1

What specific (in quantitative terms) public health and environmental benefits will be achieved by the acid rain provisions of S. 1490? What scientific studies support the nexus of such benefits with SO_2 controls?

ANSWER 1

The specific benefits that will be achieved as a result of the President's acid rain proposal relate to: (1) improvements in surface water chemistry leading to improvements in surface water biology, and in other cases the prevention of acidification associated with a low probability of the presence of fish in streams and lakes; (2) increased visibility as a function of decreased levels of sulfates in the atmosphere; (3) reduced stress on high elevation spruce forests as a function of increasing the pH of mountain clouds -- the increase in pH will be caused by a decrease of the level of sulfates in the atmosphere; and, (4) decreased amount of materials damage that are caused by current levels of acidic and acid forming compounds in the atmosphere; and, (5) improved public health through a reduction in the formation and concentration of sulfate-based acid aerosols that can lead to breathing difficulties such as bronchoconstriction.

~~Your question is a good one~~. Although the current state-of-the-science confirms reductions of acid deposition and its precursors would be beneficial, it does not allow us to neatly quantify all the benefits we expect to receive. We believe, however, that it is possible to include some quantitative information on benefits in the areas of aquatic resources, visibility improvements, and public health. In the case of high elevation spruce forests, and materials such as paints and statues, the inability to quantify the expected benefits should not be taken as a sign that there are no benefits in these areas to be derived

from reduced emissions of acid rain precursors, particularly sulfur dioxide (SO_2).

We know, for example, that reduced emissions of SO_2 will result in lower concentrations of sulfates in mountain clouds, thereby leading to an increase in the pH of the clouds; we would then expect a decrease in mortality of part of the spruce forest that now results from very acidic clouds that linger at high elevations. In the case of materials, we know from controlled experiments that acid rain, resulting from the emissions of sulfur dioxide and nitrogen oxides, corrode certain commercially important coating and building materials. We also know that by reducing sulfur dioxide emissions we will decrease the acidity of rainfall and dry deposition, and the damage to these materials.

Aquatic resources

In order to put the potential benefits of an acid rain control program in its proper context, it is important to know the chemical status of our lakes and streams. EPA, under the auspices of the National Acid Precipitation Assessment Program (NAPAP) has conducted extensive scientific research in this area. The National Surface Water Survey encompasses distinct surveys, including The Eastern Lake Survey, The Western Lake Survey, and The National Stream Survey. These studies produced a number of documents which detail the characteristics of surface waters in various regions of the United States. These studies demonstrated the extent not only of acidified surface waters in the U.S., but also the number of lakes and stream reaches that are very sensitive to episodic acidification; that is, those lakes and streams which might become acidic as a result of episodic "shock" such as spring snow melt. The extent of sensitive systems is critical to understanding the importance of reducing acid rain emissions, because we not only want to start on the road to recovering currently acidic surface waters, but we also want to prevent the sensitive systems from becoming acidic.

Data for the period 1965 to 1981 suggest that surface water sulfate (a transformation product of SO_2) concentrations roughly track trends in sulfur emissions. In the Northeast, sulfur dioxide emissions have decreased in recent years; over the same period, surface water concentrations have decreased. In the Southeast sulfur emissions have continued to increase as a function of the burning of more sulfur-containing fuels for the production of electricity for a growing population and increased economic activity. Sulfate concentrations in streams in the Southeast have also continued to increase. There is a connection between sulfur emissions and the sulfate found in surface waters.

Lakes and streams that have an Acid Neutralizing Capacity (ANC) of less than 0 microequivalents/liter (ueq/L) are considered acidic; that is, they have no buffering capacity. If ANC is less than 50 ueq/L, surface waters are considered "very sensitive" and may become acidic as a result of episodic events such as spring snow melts. This is important because episodic events could have a significant impact on fish during the spawning season.

In the Northeast section of the United States there are about 7,000 lakes greater than 10 acres in size. Of these lakes, approximately 5 percent are acidic and 20 percent are very sensitive to acidification. In the Adirondacks, about 15% of the lakes are acidic. If we look at data on lakes in New York collected by the Adirondack Lake Survey Corporation (ALSC), which includes lakes smaller than 10 acres, the number of acidic surface waters increases; for example, about 25% of the lakes less than 10 acres in size were found to be acid in the ALSC work.

In the Middle Atlantic region there are 110,000 km of streams. About 4.4% are estimated to be acidic and 15.5% are very sensitive, for a total of 20%.

In the Southern Blue Ridge about 1% of streams or lakes are acidic and 8% are very sensitive.

Florida is an anomaly. While 12% of the lakes and 22% of the streams are acidic, there are relatively low levels of sulfur

deposition in the state. The relatively high degree of acidity there appears to be a function of the unique geology of the area, which includes the decomposition of materials in the soils leading to organic acidity. The soil characteristics in Florida are not characteristic of other areas that we have studied.

In the Western Lake Survey, there were essentially no acidic surface waters found; however, 16.8% of the target population was very sensitive to acidification (i.e., ANC < 50 μeq/L). You may be interested to know that out of five subregions in the West, the Northern Rockies had the third highest estimated number of lakes with low ANC. Most of the lakes with low ANC were located in the Bitterroot Range along the Idaho-Montana border and in the Sawtooth Mountains of Idaho.

Projections of changing surface water conditions as a function of different levels of sulfur deposition scenarios were estimated as part of the Direct/Delayed Response Project (DDRP). The DDRP establishes a link between decreasing sulfate deposition and environmentally beneficial changes in surface water chemistry and projects that continued decreases in deposition will lead to further improvements in the chemistry of currently acidic lakes and will prevent in most cases the acidification of lakes and streams currently not acidic.

Based on example deposition scenarios, it was estimated that a 30% decrease in deposition of sulfur dioxide would lead to chemical recovery of about half the acidic lakes in the Northeast and would slow down the acidification process in the sensitive systems in the Northeast and Southern Blue Ridge. Preliminary results from the DDRP project also indicate that emission reductions would be beneficial to streams in the mid-Atlantic region. The results to date from the DDRP suggest that even larger reductions than 10 million tons annually of sulfur dioxide emissions would be necessary to eliminate the danger of surface water acidification resulting from man-made emissions.

We have not estimated benefits to Canadian surface waters from emission reductions because the Canadian lake sampling data does not lend itself easily to application of our regional aquatics models, but we can expect results in Canada similar to those in the Northeast section of the United States because the watershed chemistry is similar.

Visibility

Summertime skies in the eastern U.S. are noticeably hazy much of the time. This haze is not, as commonly thought, a natural phenomenon, but is caused largely by manmade pollution. The link between visibility reduction and increased levels of sulfate in the atmosphere is firmly established in the scientific literature. The increase in sulfate levels has been found to be directly related to sulfur dioxide emission patterns. Based on preliminary work by EPA, we estimate that a 10 million ton reduction in SO_2 emissions would increase visibility along the east coast 30 to 40%. Increased visibility translates into aesthetic value, particular in national parks and other scenic vistas, as well as public safety value, in terms of activities such as flying.

Health

A growing body of evidence from epidemiological studies together with laboratory studies of humans and animals suggests that current levels of acid sulfate aerosols may be responsible for a variety of health effects. For example, researchers at Harvard, Brookhaven, Carnegie Mellon, and elsewhere have found a persistent statistical relationship between sulfates and excess mortality, and it has been suggested that perhaps 2 to 5% of mortality (40,000 to 80,000 premature deaths per year) may be caused by these pollutants. A Canadian study has consistently found correlations between hospital admissions for respiratory ailments and exposure to sulfates, even after taking ozone into account. Finally, some of the most compelling data is coming from the Harvard "Six City" Study where the incidence of bronchitis in children varies directly with subsequently measured acid aerosol

levels. In addition other studies implicate acid aerosols in possible breathing difficulties in asthmatics and children, and raise concern that long-term exposure may contribute to the development of chronic lung disease.

EPA's science advisors recently noted that the cumulative evidence available about sulfates and lung impairment raises clear concerns about the potential health effects of current levels of acid aerosols. These levels will be reduced under the President's proposal, which will benefit public health.

QUESTION 2

The data used as the basis for provisions in Title V of S. 1490 apparently came from the National Acid Precipitation Assessment Program (NAPAP) data base showing 1985 emission levels. Any effort to acquire the data base, I am told, is met with the response that it is not yet available. How do you justify the use of a data base that is not yet available and that has not been peer reviewed, especially when considering how critical the data is to this element of the legislation?

ANSWER 2

The 1985 NAPAP Emissions Inventory (Version 1) was published in November, 1988 and is available. Inclusion of Canadian data and additional quality assurance activities have been underway since November, 1988 and will lead to the 1985 NAPAP Emissions Inventory (Version 2) scheduled for publication in November, 1989. There will be significant differences for some unit specific data between version 1 and version 2; however, national and state totals are expected to be similar. The 1985 NAPAP Emissions Inventory (Version 2) is preferable for the Title V allowance allocations, since it contains the most accurate unit level data available at this time. We realize that the timing of the release of these data in November is not ideal when the ongoing legislative process is considered. However, we believe that 1985 NAPAP Emissions Inventory (Version 2) is the most defensible data set available and that the advantages of having a thorough review outweigh the advantages of using the earlier data base. When the data is

released, it will have been peer and administratively reviewed by EPA and NAPAP.

QUESTION 3

How do you justify the inequities imposed by the cap and offset requirements? Won't clean states be penalized? Won't growing states be penalized? Isn't the baseline date rather arbitrary, and thus creates inequities of it's own?

ANSWER 3

First, we believe the cap and offset requirements are absolutely necessary. Without these requirements, we could spend billions of dollars to protect the environment from the effects of acid deposition and then permit the damage to return. Second, we believe these requirements are fair. For example, sources receive credit for past clean-up efforts. Clean and small sources are held to their 1985 rates but their capacity is not restricted. For some clean and small units, this means doubling or tripling their utilization and emissions. Dirty sources must clean up to levels similar to the 1971 New Source Performance Standard of 1.2 lbs./mm Btu.

In general, we believe that clean states can operate under the proposed system without significant penalty since clean sources have the option of their 1985 rate with no utilization restrictions or they can opt into the allowance system. We recognize that some problems may arise that were not anticipated. An example would be a source that burned natural gas in 1985 but in other years used a higher sulfur fuel. We are open to considering modifications to S. 1490 that will allow the necessary relief in these special cases.

We believe that most growing states can operate under the system by reducing emissions from existing sources or purchasing necessary allowances. In cases where unanticipated problems have been identified, we are also interested in fine-tuning type modifications. Examples are as follows: (1) Clean and small utilities that opt for their 1985 emission rates and not the

allowance system should be able to receive and sell allowances on retirement. This has always been intended but was omitted due to a drafting error. (2) New sources may need a "seller of last resort" for allowances in cases where they can not find them on the open market.

We agree that any baseline will be somewhat arbitrary and will lead to some inequities. However, changing the baseline does not resolve this problem since it creates relief for some and new problems for others. In view of this, we selected the baseline where we have the most recent and accurate data.

QUESTION 4

Won't the cap and offset provisions severely restrict trading? What incentive would there be for those who hold allowances to sell or trade them if they themselves must plan for future growth? How would utilities with currently low emission rates accommodate growth?

ANSWER 4

We believe that the net effect of the cap and offset provisions will not restrict trading. The cap results in a finite number of allowances that will be available. The need for least cost utility operations will encourage the sale of excess allowances.

Our belief in the efficiency of the allowance system is based on the following: (1) The system encourages cost-effective additional control to create allowances. (2) This additional control will encourage development of higher pollutant removal efficiency in control technology resulting in still more allowances. (3) As growth continues, allowances will become more valuable which will stimulate additional control technology development. (4) Least cost utility operation incentives will encourage the sale and not hoarding of allowances.

Utilities with currently low emission rates do not need allowances to accommodate growth between now and 2000. After 2000, allowances will be needed. This can be accomplished by controlling

beyond NSPS requirements and purchasing the minimal number of necessary allowances. After 2000 technology for achieving 95-99% SO_2 removal is anticipated to be available. This higher efficiency control technology means that allowances from one retiring plant would be sufficient for 3 - 5 times its capacity in new plants.

QUESTION 5

The legislation provides a three-year extension of Phase II deadlines for plants that use one of five repowering clean coal technologies for compliance. Why three years? Why confine this option to only five technologies? Isn't it true that other technologies currently being demonstrated show great promise in reducing SO_2 and NOX emissions?

ANSWER 5

Section 502(j) defines "repowering" as the: "replacement of an existing pulverized coal boiler with one of the following clean coal technologies: Atmospheric or Pressurized Fluidized Bed Combustion, Integrated Gasification Combined Cycle, Magnetohydrodynamics, Direct and Indirect Coal-Fired Turbines, Integrated Gasification Fuel Cells, or a derivative of one of these technologies, as determined by the Administrator, in consultation with the Secretary of Energy."

This definition provides some flexibility to expand the applicability of section 508. There is a concern that if "repowering" is defined too broadly, almost anything might qualify for the three year extension, even if it does not produce as much emission reductions or is not particularly innovative. This could result in achieving less than the ten million ton reduction called for by President Bush. The six technologies listed in the repowering definition are the only repowering technologies currently considered by both DOE and EPA to be capable of deployment by December 31, 2003.

The other non-repowering clean coal technologies (CCT) currently in the DOE CCT Program, are more developed than the repowering technologies and do not need the three year extension.

These retrofit technologies show promise to cost effectively reduce SO_2 and/or NOX emissions in time to meet Title V deadlines.

QUESTION 6

The electric utility industry has calculated that Title V provisions would actually reduce SO2 emissions by 12.8 million tons by the year 2000. This includes 3.1 million tons from non-utility sources and 9.7 million tons from utilities. What is the basis of the emission numbers EPA used to calculate total tonnage reduced? Why does the bill fail to include non-utility sources in the total calculations?

ANSWER 6

EPA has assumed that emission reductions between 1980 and 1985 were 1.1 million tons for non-utility sources and 1.1 million tons for utility sources. This assumption was derived from the 1985 NAPAP Emission Inventory, EPA emissions trends data, and other analysis. Additional reductions achieved after 1985 under the administration bill are estimated as follows: 7.4 million tons from the utility industry and 0.4 million tons from the desulfurization of diesel fuel. (1.1 + 1.1 + 7.4 + 0.4 = 10.0).

QUESTION 7

One of the nominal goals of Title V of S. 1490 is to encourage energy conservation as a long range strategy for reducing air pollution. Please tell me specifically how energy efficiency and conservation measures are included in the bill?

ANSWER 7

S.1490 enhances energy efficiency and conservation by specifying a finite number of emission allowances and requiring that new sources obtain allowances sufficient to cover their emissions, i.e. the so-called cap. The allowances ensure that utilities will receive full credit for emission reductions from energy conservation measures and renewable energy sources, while the cap ensures that SO_2 reductions will be maintained into the future. Other control approaches, specifically emission rate-based approaches, do not offer utilities any incentive to use energy conservation or efficiency to meet reduction goals.

The firm emission allowances, with offsets for new facilities, as proposed in S.1490, provide flexibility and strongly encourage utilities to rely on energy conservation and clean renewable energy technologies as new generating resources: 1) without detailed Federal specification, 2) without extensive calculations to equate conservation measures to emission credits, and 3) without increasing the size and cost of Federal and State governments to administer a new program.

The emission allowance approach in S.1490 allows utilities wide discretion and flexibility in achieving emission reductions and allows conservation to compete with other technologies on the basis of cost per ton of SO_2 removed. We believe conservation will be successful in the market as a cost-effective means of achieving compliance. Conservation measures that reduce system load will reduce emissions directly and further, through load-shifting to cleaner plants, may reduce the number of hours that an "affected" source is operated.

QUESTION 8

During testimony in the House before the Energy and Power Subcommittee, the witness for the National Association of Regulatory Utility Commissioners (NARUC) stated that state PUCs would be unlikely to approve the selling of allowances by utilities, especially interstate, in light of concerns for future generation needs. Considering this statement, how can you be sure that the trading system in S. 1490 is workable?

ANSWER 8

We agree that state PUCs could and should encourage banking of allowances if such banking appears to offer the lowest cost means of achieving the energy service goals in the future. However it should be noted that PUCs and other state regulators have multiple objectives such as: providing a safe and adequate supply of electricity, just and reasonable rates, adequate environmental protection, and prevention of employment disruptions. When these objectives are considered, we believe that PUCs will encourage the selling of allowances in many cases in order to minimize

electricity rate impacts. It should be noted that an existing unit receives allowances each year. Therefore, a unit operator that anticipates future growth can sell allowances for a particular year, without giving up the right for perpetual allowances in future years when growth is actually expected.

QUESTION 9

Doesn't the "greenfield" offset provision simply exacerbate the problem with trading by creating a demand for allowances that will not be available - especially in areas of the country that have the "cleanest" plants?

ANSWER 9

First of all, new sources are allowed to obtain allowances from anywhere in the country. Therefore, areas with the "cleanest" plants are not restricted. We believe that demand will create the necessary offsets and allowances since: (1) the technology for higher control efficiency is available, and (2) the marginal cost for additional control can create allowances that can be sold for a profit. A modification to the currently proposed system establishing EPA as the allowance "seller of last resort" should solve any remaining problems.

QUESTION 10

As plants are forced to depend on natural gas for fuel, the nation becomes more and more dependent on that one fuel supply. Considering that the mobile source provisions of the bill are already presuming to tap currently unused gas supplies for conversion to methanol, is there any assurance that gas supplies will be available to future needs? Sudden supply disruptions are always possible due to gas-line breaks, production shutdowns, natural disasters, etc. What provision does S. 1490 make for emergencies?

ANSWER 10

We do not believe that S. 1490 will force utilities to total dependence on natural gas. Utilities will want to use natural gas when it is available cheaply during some periods of time, such as the summer. Utilities will use other fuels such as oil, hydro, and nuclear when natural gas is too expensive or is not available due

to sudden supply disruptions. Low sulfur coal below 1.2 lbs. SO_2/mm Btu and continually improving coal combustion and control technology will allow growth and ensure the use of coal for decades to come.

S. 1490 makes no specific provisions for natural gas disruptions which utilities have always had to plan for. We believe that under S. 1490 adequate supplies of the following will be available for these alternate plans: (1) other fuels, (2) control technology, (3) capacity, and (4) allowances.

QUESTION 11

Title V contains triple penalties for sources which exceed their annual emissions allowance. Isn't subjecting a source to (1) an excess emissions fee, (2) civil or criminal sanctions, and (3) allowance offsets as a result of excess emissions something of an "overkill"?

ANSWER 11

We believe that the three penalty provisions mentioned above are necessary to ensure adequate enforcement of Title V. The penalty provisions currently in the Clean Air Act have not been as effective as we believe Congress intended. In recent years, sources have become more willing to litigate rather than clean up. This is costly both to the federal government and to the environment. Often, no environmental clean up occurs until a case is decided, a process that can take years. EPA believes that the cost and possible jail penalties in (1) and (2) are needed to encourage compliance. The excess emissions offsets are needed to help ensure that the environment does not suffer because of a non-compliant source.

QUESTION 12

Is it true that new industrial fossil fuel boilers that commence operation on or before the date of enactment of this bill would be required to obtain allowances by December 31, 2000, to offset 100% of their SO_2 emissions?

ANSWER 12

As Title V was initially drafted, new industrial fossil fuel boilers would be required to obtain allowances by December 31, 2000. However, this was not our intent. The Lent substitute in the House bill corrects this technical drafting error and we support this change. With this change, only new utility units will have to obtain offsets.

QUESTION 13

Is it true that, if this bill is enacted early next year as the President hopes, then many new sources that were planned before the inception of this bill and that are now in advanced stages of construction would be swept up under the definition of "new unit" and subject to the bill's emission offset requirement?

ANSWER 13

It is true that the intent of the current bill is to count a source as a "new unit" if it begins operation after enactment. This is necessary to meet the President's 10 million ton reduction goal.

QUESTION 14

How can you be sure that such new sources (question 13) will be able to obtain allowances at a price that does not overwhelm the economic viability of the project? How can you be certain that allowances will be available at all?

ANSWER 14

First of all, the new sources do not have to obtain those offsets until the year 2000. This gives them time to explore options and attain allowances. We believe that the market will work and that sufficient allowances will be available at reasonable prices which should not overwhelm the economic viability of the project. The cost of allowances should be less than 5% of the annual cost of a new plant. However, allowances should be looked at like any other needs such as coal supplies, and their future availability should be just as certain.

QUESTION 15

Would not uncertainty with regard to the availability of allowances have a chilling effect on business expansion? How would a business go about evaluating its potential risk?

ANSWER 15

Utility units are the only new sources that are required to obtain allowance offsets. Therefore, the offset requirements do not directly effect industry or business expansion. Their dependence on electricity could be a factor. However, as stated before, we believe the market approach will work and sufficient allowances for utilities will be available at reasonable prices. This will be particularly true if modifications allow EPA to be the "seller of last resort." There are many risks that a business must evaluate and we see this one as no different.

QUESTION 16

Has EPA calculated from whom new industrial sources would get their emissions offsets, how many allowances would actually be available for trading and how much allowances would cost if some are available on the market? Please provide a detailed description of these calculations for the hearing record.

ANSWER 16

As the bill is currently written, new industrial sources would have to obtain allowances. However, this is a technical error since the intent was that only new utility sources would have to obtain allowance offsets. This technical error was corrected in the House bill and has EPA's support. Therefore, we have not conducted the analysis indicated in this question.

QUESTION 17

Is there any indication from Midwestern Utilities that they anticipate a surplus of allowances?

ANSWER 17

We have received no indication from Midwestern Utilities concerning any anticipated surplus or shortage of allowances. Our assumption is that allowances will be generated when a buyer is willing to pay more than the marginal cost of control necessary to generate that allowance (i.e. the market will be balanced based on

the cost of supply versus demand). We anticipate that the marginal costs of over control to produce allowances will be in the range of $100-400 per allowances in Phase I and $500-650 per allowance by Phase II. The ICF Corporation has performed an analysis for us on potential allowance transfers based on least cost controls, (i.e. allowances were assumed to be generated by those with inexpensive control options and sold to those that would have more expensive control costs).

In this least-cost flexible trading case, nine midwestern states (Georgia, Illinois, Indiana, Kentucky, Missouri, Ohio, Pennsylvania, Tennessee, and West Virginia) would be expected to sell approximately 200,000 allowances per year during the 2000-2010 time period due to the fact that they have additional cost-effective control options that go beyond their required control levels.

QUESTION 18

How would non-profit institutions such as schools and hospitals obtain emission offsets for new boilers and facilities? Would such institutions have to compete on the open market against private businesses and utilities? Would new hospitals and schools be forced to close in 2000 if they are unable to obtain or afford allowances? Has EPA studied the effects of the offset provision on non-profit institutions? If so, please provide the details of that study for the hearing record. If not, please evaluate these effects to the extent possible and provide the results before the close of the hearing record.

ANSWER 18

The intent of Title V was that only utility sources will have to obtain emission offsets. Technical corrections were made to the House bill to reflect the original intent and EPA supports this change. Therefore, EPA has not performed these studies.

QUESTION 19

How does the offset requirement affect new defense facilities? Would defense facilities have to compete on the open market for allowances? Has EPA studied the effect of the offset provisions on the nation's defense? If so, please provide the details of that study for the hearing record. If not, please evaluate these

effects to the extent possible and provide the results before the close of the hearing record.

ANSWER 19

The intent of the bill was that these sources do not have to obtain offsets. Therefore, EPA has not performed these studies.

ANSWER TO QUESTIONS FROM SENATOR BURDICK REGARDING AIR TOXICS

QUESTION 1

Would mobile sources be included within the definition of "area sources" in S. 1490?

ANSWER 1

Section 301 of S. 1490 defines an area source as "any source that is not a major source listed under this section based on aggregate emissions, or potential aggregate emissions, of a listed pollutant or pollutants in an area." This definition was not intended to include mobile sources whose toxic air emissions are addressed under section 206 of S.1490. Moreover, the term "major source" is used in the definition of "area source" and is explicitly defined earlier in section 301 to apply only to stationary sources.

QUESTION 2

Please explain the basis for listing as "hazardous air pollutants" the substances listed in proposed Clean Air Act (CAA) section 112(b)(1) under S. 1490.

(a) How was this list compiled?

ANSWER 2(A)

The current list of hazardous air pollutants was derived from several sources. This list originated with the list of 224 chemicals proposed by Senator Mitchell in 1988. These 224 chemicals were compiled from the three data bases described below. The first data base includes over 300 substances that are manufactured, processed, or used in excess of thresholds established under the Community Right-to-Know provisions of Section 313 of the Superfund Amendments and Reauthorization Act (SARA 313). The second data base includes data collected under Section 104 of the Comprehensive Emergency Response and Compensation Liability Act (CERCLA 104) and included over 100 substances that are reported to EPA because they exceed the "reportable quantities" levels

identified in CERCLA. The list of substances compiled from these two data bases was then compared to the National Air Toxics Information Clearinghouse (NATICH) data base of chemicals which one or more States regulate, using acceptable ambient concentration levels. Those chemicals which were in either SARA 313 or CERCLA 104 and which were also found in NATICH became the list of chemicals proposed in the Mitchell bill.

Using the list of 224 chemicals in the Mitchell bill as a starting point, the EPA's Office of Air Quality Planning and Standards added 8 chemicals and deleted 51 chemicals based on several criteria. These criteria included toxicity, air pollution potential (e.g., some dyes that are not produced in the U.S. were deleted), delistings from SARA 313, consolidation with other listed chemicals as a single chemical group, whether the chemical was listed under Section 112 (e.g., coke oven emissions and radionuclides were added), and whether the chemicals would be regulated under other provisions of the Act (e.g., stratospheric ozone depleters were removed from the list). The result of this evaluation was the list of 181 chemicals which appeared in H.R. 4 introduced by Congressman Dingell.

Further refinement to the H.R. 4 list resulted in the Administration's proposed list of 191 chemicals referred to as H.R. 3030. This refinement added or deleted chemicals based on: further information on toxicity from EPA's Office of Research and Development, emissions and health data collected during the development of EPA's National Emission Standards for Hazardous Air Pollutants (NESHAPs) and National Ambient Air Quality Standards (NAAQS), data on current U.S. production of pesticides from the Office of Pesticide Programs, additional data on emissions and delisting efforts for SARA Section 313 and SARA Section 302 (the provision pertaining to acutely hazardous substances) from the Office of Toxic Substances, data on recently verified carcinogens from the National Toxicology Program, and data on the number of States regulating a pollutant using acceptable ambient

concentrations (i.e., chemicals were added if 4 or more States had established acceptable ambient levels).

In summary, the final list represents two sets of revisions to the original list contained in the Mitchell bill. The original list was compiled from three data bases (SARA 313, CERCLA 104, and NATICH). The first set of revisions added and deleted chemicals based on criteria such as toxicity and air pollution potential. The second set of revisions was based on a review of the most current data from several EPA program offices.

QUESTION 2(b)

What were the criteria used for inclusion on the list?

ANSWER 2(b)

Chemicals were included on the original Mitchell list if they were found in either the SARA 313 or CERCLA 104 data base and were also found in the NATICH data base, as described in paragraph (a) above. The primary criteria used for adding chemicals to the Mitchell list were toxicity, air pollution potential, and whether a chemical or compound was listed under Section 112 (i.e., coke oven emissions and radionuclides). The determination of toxicity was based on whether the chemical is believed to cause cancer or other serious noncancer health effects. Noncancer health effects include serious or irreversible developmental or reproductive effects, neurological disorders, mutagenicity, other chronic health effects, and adverse acute health effects. The determination of air pollution potential took into account factors affecting the emission potential such as volatility and half-life of the compound(s) and domestic production volume.

QUESTION 2(c)

Under which category does each substance fall according to EPA's classification scheme for describing the weight of evidence for potential carcinogens (i.e., Group A, B, C, D, or E)?

ANSWER 2(c)

Approximately 45 percent of the 191 chemicals included on the list of hazardous air pollutants in H.R. 3030 have been evaluated

for potential carcinogenicity. An estimate of these chemicals according to the Agency's classification scheme for weight-of-evidence is: Group A - 13 percent (known human carcinogens), Group B - 55 percent (probable human carcinogens), Group C - 13 percent (possible human carcinogens) and Group D - 19 percent (not classifiable).

QUESTION 2(d)

Why are mineral fibers on the list?

ANSWER 2(d)

Mineral fibers are included in the list of hazardous air pollutants because of potentially significant exposures and concern for adverse health effects (e.g., carcinogenicity) to result following ambient exposures. The Office of Toxic Substances has concurred with the definition of mineral fibers currently included in Title III ("characterized as "respirable" (fiber diameter less than 3.5 micrometers) and possessing an aspect ratio (fiber length divided by fiber diameter) greater than 3").

QUESTION 3

Proposed CAA sections 112(b)(2)(A) and 112(b)(2) 1(B) in S. 1490 provide criteria for the addition and deletion, respectively, of substances to the list in proposed CAA section 112(b) (1).

(a) For which of the listed hazardous air pollutants has the EPA made a determination that would satisfy either of these criteria?

ANSWER 3(a)

While we believe that the listed substances generally satisfy one or more of the criteria for addition, we have not made determinations for the substances currently listed. It is our intention that these determinations would be made in response to petitions to add or delete substances from the list.

QUESTION 3(b)

If substances are on the list without having met the criteria for addition to the list, why? Why shouldn't the criteria for

addition to the list be the same as for inclusion on the original list?

ANSWER 3(b)

As shown in the response to question 2 (above), broader criteria than those identified in Section 112(a)(2)(A) were used to develop the list of hazardous air pollutants. We believe the petition process will address any errors occurring in development of the original list requiring addition or deletion.

QUESTION 4(a)

How do the criteria in proposed CAA section 112(b) (2) (A) in S. 1490 for addition to the list in proposed section 112(b)(1) compare with EPA's criteria for categorization of overall weight of evidence for human carcinogenicity?

ANSWER 4(a)

Carcinogenicity is one of several criteria proposed in section 112(b)(2)(A) for adding substances to the list of hazardous air pollutants. Air pollutants that have been classified as known or probable human carcinogens (Classes A, B1, B2, C) would be considered to meet the carcinogenicity criteria.

QUESTION 4(b)

Does "sufficient evidence to establish that the pollutant is known to cause or can reasonably be anticipated to cause in humans" in proposed CAA section 112(b)(2)(A) in S. 1490 mean that only Group A carcinogens may be added to the list?

ANSWER 4(b)

The language in this section is not meant to restrict the hazardous air pollutant list to Class A carcinogens.

QUESTION 4(c)

Could agents for which there is inadequate evidence or no data from human epidemiological studies, but "sufficient evidence" of carcinogenicity in animals --i.e., a Group B2 carcinogen -- qualify for inclusion on the list?

ANSWER 4(c)

Air pollutants classified as Group B would meet the listing criteria.

QUESTION 4(d)

Could a Group C carcinogen qualify?

ANSWER 4(d)

It is qute possible that Group C carcinogens (limited evidence) could qualify for listing and several are present on the list in S. 1490.

QUESTION 4(e)

In its Intent to Review Guidelines for Carcinogen Risk Assessment, 53 FR 32656 (August 25, 1988), EPA states that "The Agency is considering clarifying its definitions of sufficient and limited evidence because of uncertainty inside and outside the Agency about the intended use of 'sufficient' and 'limited' in the Guidelines." Does "sufficient evidence" in proposed section 112(b)(2)(A) mean the same thing as "sufficient evidence" in the Guidelines? If so, what does it mean in both contexts? Will this meaning change? If they do not mean the same thing, then what does it mean in S. 1490? Can this meaning be changed by EPA?

ANSWER 4(e)

The meanings of "sufficient" in both contexts are similar but not linked. In both cases, there is an expressed intent that the available information is persuasive enough to render a positive judgment. In classifying carcinogens, the judgment is that "sufficient" human or animal data support the finding that the substance is a known or probable human carcinogen. In determining to add a pollutant under 112(b)(1), the decision is more broadly based than whether the data are "sufficient" to support a known or reasonable anticipation of human health consequence. A change or clarification in the meaning of "sufficient" in the Guidelines would not automatically affect the meaning as applied in 112(b)(2)(A).

QUESTION 5

S. 816 includes adverse environmental effects as a criterion for inclusion on the list of hazardous air pollutants, whereas S. 1490 does not. Why is "that the pollutant is known to cause or can reasonably be anticipated to cause adverse environmental effects" or some similar test not a criterion for qualification on the list of hazardous air pollutants under proposed CAA section 112(b)(2)(A) in S. 1490?

ANSWER 5

Section 112 of the Clean Air Act has historically been the primary section providing for the protection of public health from exposure to hazardous air pollutants. The criteria for regulation under section 111 includes both health end environmental effects. This distinction between section's 111 and 112 has not been changed in S. 1490. The focus on public health in section 112 does not mean that environmental effects are not mitigated. It is anticipated that by controlling the emissions of the substances on the S. 1490 list, a number of environmental effects associated with these compounds will also be mitigated. The focus on health effects in section 112, however, provides EPA with the tools necessary protect the public health from exposure to hazardous air pollutants in the most expedient manner while also achieving benefits for the environment.

QUESTION 6

Proposed CAA section 112(c)(3) in S. 1490 allows the Administrator not to list a category or subcategory because its emissions are, in his judgement, "already adequately controlled" under other Federal laws.

(a) What does "adequately controlled" mean?

ANSWER 6(a)

"Adequately controlled" means that the source category is at a minimum already controlled to levels comparable to maximum achievable control technology (MACT).

QUESTION 6(b)

How would the level of control under "adequately controlled" compare with the level of control under (i) MACT, (ii) the unreasonable risk standard for residual risk in S. 1490, and (iii) the negligible risk standard in proposed section 112(f)?

ANSWER 6(b)

As stated above "adequately controlled" would always be at least as stringent as MACT and the unreasonable risk standard in

S. 1490. The negligible risk standard in section 112(f) may be more stringent than the "adequately controlled" level.

QUESTION 7

Under S. 1490 and S. 816 a category or subcategory of area sources is to be subject to emissions standards if the Administrator finds that regulation is "warranted."

(a) What is the standard under S. 1490 for "warranting regulation?"

ANSWER 7(a)

Under S. 1490 the Administrator must promulgate regulations for 50% of the source categories identified on the list of source categories within 7 years after enactment. For the remaining 50% of the source categories the Administrator must promulgate regulations within 10 years for those source categories which warrant regulation. Emissions standards for source categories on the list will be promulgated according to the priority criteria outlined in S. 1490 which include the quantity and location of emissions, the adverse effects on public health and the efficiency of grouping source categories. These criteria ensure that the source categories associated with the greatest potential public health risk will be addressed early in the process (i.e., in the non-discretionary 50%). The vast majority of the emissions and public health risk will be reduced by the emissions standards applied to the first 50% of the source categories. The determination of which of the remaining 50% of the source categories warrant regulation will be based on the potential risk posed to public health and the cost and feasibility of applying emission controls. For many of the listed pollutants, it is not currently possible to establish a threshold below which there are no adverse health effects in the exposed population. As better information is developed on these thresholds, it may become apparent that there is negligible public health risk from certain industries and therefore regulation is not warranted.

QUESTION 7(b)

According to EPA, area sources may contribute, in the aggregate, approximately 75% of the cancers from air toxics, compared to a 25% contribution from stationary sources. If these stationary sources warrant regulation under S. 1490 doesn't it follow that the other 75% "warrant regulation" as well? Why is the Administrator required to regulate the lesser 25% contribution to public health risks but given the discretion of whether to regulate the greater 75% contribution to those risks?

ANSWER 7(b)

Section 112 was intended to function in concert with other elements of the Administration's Clean Air Act proposal. For example, Title II of the Administration's Clean Air Act proposal contains numerous provisions to limit the emissions from mobile sources which contribute about half of the overall nationwide estimated cancer incidence associated with air toxics. It is anticipated that the majority of emissions and risk associated with air toxics emissions from mobile sources will be mitigated by the provisions of Title II. Title II also requires that EPA study the emissions of air toxics remaining after the mobile source provisions take effect and recommend further controls for air toxics if warranted.

With mobile sources removed, the total cancers associated with air toxics are almost evenly divided between point and area stationary sources. The Administrator would list stationary area source categories along with the point source categories under section 112(c) of S. 1490. The discretion of whether to add area sources to this list is similar to the 10 ton and 25 ton emissions threshold for point source categories. This discretion allows the Administrator the needed flexibility to avoid listing source categories which are not significant in terms of emissions or risk.

QUESTION 8(a)

Under proposed Clean Air Act section 112(c)(6) in S. 1490, what does "negligible risk" mean?

ANSWER 8(a)

Negligible risk means that the likelihood of the effect is so low that exposure to the listed chemical is virtually safe, i.e., a risk that is de minimis.

QUESTION 8(b)

Can cost be considered in determining negligible risk?

ANSWER 8(b)

Cost is not a factor in determining negligible risk.

QUESTION 8(c)

How does the "negligible risk" standard compare with the following standards elsewhere in S. 1490 --

(i) "adequately controlled" - proposed CAA section 112(c)(3)

(ii) "warrant regulation" - proposed CAA section 112(c)(4)

(iii) "unreasonable risk" - proposed CAA section 112(f)

ANSWER 8(c)

(i) A negligible risk determination will be made when deciding to withdraw source categories (or subcategories) from the list. When deciding whether to add source categories to the list, the judgment will be made that the source category (or subcategory) is adequately controlled, if the decision is against adding the source category. The Administrator has discretion about making a formal negligible risk determination if he decides against adding a source category to the list. Practically speaking, it will be unlikely that such a decision would be made in the absence of a finding about the magnitude of the risk.

(ii) A category or subcategory of area sources will be added to the list if "regulation is warranted" based on aggregate emissions of a listed pollutant. Implicit in this determination is the finding that the risk is more than negligible for residents in the area. It is possible that exposure to a single facility (in a category of area sources) may be such that the risk to that one source would be considered negligible. However, due to the risk from the combined emissions of numerous similar facilities, the

aggregate risk would be considered greater than negligible and regulations would be developed.

(iii) The determination of whether there is an "unreasonable risk" remaining after the application of emission standards would be made within 7 years of promulgation of such standards.

In contrast to a finding of "negligible risk" the finding of "unreasonable risk" considers cost and technical feasibility as well as the health risks of such standard. If a finding of unreasonable risk is made, continued exposure to the emissions of the listed substances is of great enough concern to require further control.

QUESTION 8(d)

How does it compare with the 10E-6 standard that EPA uses to determine "negligible risk" for pesticides in processed foods or feeds?

ANSWER 8(d)

See response to question 14.

QUESTION 8(e)

Why isn't one standard used for all of these determinations under section 112? Shouldn't the standard for the protection of public health and the standard for regulation of air pollutants be the same regardless of what particular section of the law is used?

ANSWER 8(e)

One standard is used, i.e., maximum achievable control technology, to the extent practicable. The philosophy behind the Administration's proposal is to require controls on sources of 191 pollutants as quickly as possible, and then make determinations about whether any remaining risk is unreasonable or whether some sources emit such minuscule amounts of the pollutants that emission controls are not needed. There is great scientific uncertainty associated with the development of risk estimates, and therefore our goal is to minimize, where possible, the use of risk estimates as "bright lines." Our ultimate goal is to move as quickly as

possible to protect the public health and the environment by reducing emissions of toxic air pollutants.

QUESTION 9

The proposed MACT standards in S. 1490 require the Administrator to "take into account energy, environmental, economic impacts and other costs, as well as any other factors the Administrator deems appropriate."

(a) Does this require the Administrator to conduct a cost-benefit analysis of (i) whether to impose technological controls? (ii) which controls should be imposed?

ANSWER 9(a)

A cost-benefit analysis is not required for determination of MACT unless the standards are a "major rule" as defined in Executive Order 12291. As stated in section 112(d)(3), MACT for new sources is to be at least as stringent as the best emission reduction achieved in practice by the best similar source. For existing sources, MACT is to be at least as stringent as the level of emission reduction achieved in practice by the best similar sources.

QUESTION 9(b)

Is it accurate to term this requirement of this section Maximum Available Control Technology if the technology chosen is not the most stringent technology feasible for the source category, but a balance between costs and benefits of all available technologies?

ANSWER 9(b)

Considering the emphasis in section 112(d)(3) on the stringency of MACT for new and existing sources, it is clear that the term "maximum achievable control technology" is appropriate.

QUESTION 10(a)

Under the proposed CAA section 112(e) in S. 1490, 50% of the source categories are to be regulated only if the Administrator determines that they "warrant regulation."

(a) Under which circumstances would a category "warrant regulation?"

ANSWER 10(a)

A source category warrants regulation if the emissions from that source category pose a significant risk to public health and the controls applied to the emissions are feasible and can be achieved at reasonable cost.

QUESTION 10(b)

How does this compare with the unreasonable risk standard proposed in section 112(f)?

ANSWER 10(b)

This compares better with the negligible risk language in section 112(c)(6). It is anticipated that as new information regarding the health effects and exposure associated with the pollutants emitted from the listed source categories, many of these source categories will fall into the negligible risk category and thus will not warrant regulation.

QUESTION 10(c)

Will cost be take into account?

ANSWER 10(c)

Yes.

QUESTION 10(d)(i)

Could a pollutant be found to satisfy the criteria for inclusion on the list under 112(b)(2)(A) and yet not warrant regulation?

ANSWER 10(d)(i)

The determination of which source categories warrant regulation is wholly different from the criteria for inclusion on the list of hazardous air pollutants. While the criteria for inclusion on the list of hazardous air pollutants involve primarily health related parameters, the decision of which source categories warrant regulation includes consideration of exposure and potential risk as well as cost. In deriving the initial list of hazardous

air pollutants, efforts were made to ensure that all of the compounds had the potential to be emitted in large quantities.

QUESTION 10(d)(ii)

Could a pollutant on the list be regulated even though the Administrator has not yet made a determination that the pollutant warrants regulation?

ANSWER 10(d)(ii)

It is important to remember that the emissions standards that would be promulgated under S. 1490 would apply to entire source categories often emitting multiple pollutants, both listed and not listed. The controls required by these regulations will likely mitigate the emissions of non listed pollutants in some cases, but the determination of whether the source category warrants regulation will be based only on the exposure, risk and control costs associated with listed pollutants.

QUESTION 10(e)

Why should 50% of the source categories be subject to a different absolute threshold for regulation solely on the basis of their relative risk to more toxic pollutants? Why shouldn't all the substances on the list be subject to regulation?

ANSWER 10(e)

This question mixes the regulation of source categories with the listing of substances as hazardous air pollutants. The criteria for inclusion on the list of hazardous air pollutants is based on the toxicity of the pollutant and its potential to be an air pollutant. Whether a source category warrants regulation is based on the potential risk to public health and the cost to control the emissions. Again, multiple pollutants (both listed and non listed) are often emitted from the same source category and will be reduced by the required controls. It is likely that the vast majority of the substances on the hazardous air pollutant list (both in quantity of emissions and number of compounds covered) will be controlled by emission standards applied to the first 50% of the source categories. The determination of whether

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emissions standards are warranted for the remaining 50% of the source categories is dependant on the exposure and risk resulting from the entire mix of listed pollutants emitted. Although under this approach the same pollutant may be subject to varying levels of control at different facilities, the purpose of this discretion is to avoid requiring EPA to spend scarce resources in developing regulations for source categories which pose little or no risk to public health.

QUESTION 11

Under the unreasonable risk evaluation provisions of S. 1490, why are costs permitted to be taken into account?

ANSWER 11

After substantial emission and risk reduction has already been achieved by applying MACT to a source category, it is appropriate that a decision on the need for further emission reductions include a consideration of the cost and technical feasibility of such emission reductions. For the majority of source categories, the residual risk after application of MACT will be small. However, for those few categories that may pose an unreasonable risk the need for additional reductions should be balanced against the cost of achieving such reductions.

QUESTION 12

Under Vinyl Chloride, the current section 112 does not permit costs to be taken into account when determining what is "safe," although costs may be considered in determining what is an "ample margin of safety." Does proposed CAA section 112(f) of S. 1490 represent a change in philosophy regarding the consideration of cost in protecting the public against hazardous air pollutants? Why?

ANSWER 12

The proposed changes to section 112 of the CAA do represent a change in philosophy from the current section 112. The recommended changes put the emphasis on regulating major source categories that emit any of 191 compounds or compound categories

rather than the current pollutant by pollutant approach. The suggested amendments also focus on getting maximum controls in place on these major source categories. Finally there is a residual risk test that must be applied after MACT has been installed. These changes were meant to speed up the regulatory process and achieve substantial reductions in public exposures to toxic air pollutants. In most cases, MACT will provide "an ample margin of safety." In those few cases where the risks after application of MACT are determined to be unreasonable, additional reductions may be required. The purpose of the new section 112 is not to allow consideration of cost in protecting public health but to speed up the process of achieving the goal of protecting the public health from toxic air pollutants.

QUESTIONS 13 AND 14

13. (a) To what extent has EPA established numerical thresholds or guidance in areas other than air toxics?

(b) Are there other areas in which EPA performs risk assessment and uses only a single measure of risk, such as the maximum individual risk, and does not consider other measures, such as the risk distribution or incidence?

(c) In which instances does the EPA use 10E-6 as a safety threshold or measure of safety?

14. The EPA's policy regarding pesticide residues in foods is that EPA generally will approve an application for registration of a pesticide if it either does not induce cancer in test animals or poses "only a negligible human Cancer risk (generally a quantitative risk of 10E-6 or less)." EPA, Regulation of Pesticides in Food: Addressing the Delaney Paradox Policy Statement, 53 FR 41104, 41112 (October 19, 1988).

The FDA's regulations provide that the FDA will approve the use of carcinogenic compounds in food-producing animals, provided that the concentration of any residue remaining in edible tissues if the maximum lifetime risk to the test animal is less than 1 in 1 million. 21 CFR Part 500, Subpart E.

In light of the EPA's and FDA's use of a 1 in 1 million quantitative standard as a basis for determining acceptable risk from carcinogens in these contexts, please comment on:

(a) The appropriateness of setting a quantitative standard for health-based standards for emissions of hazardous air pollutants. If it is acceptable to establish numerical thresholds for pesticides and carcinogens in animals, then why shouldn't it be acceptable to establish numerical thresholds for hazardous air pollutants?

(b) The appropriateness of setting a 1 in 1 million standard for the risks from hazardous air pollutants. If it is acceptable to establish a 1 in 1 million standard for the addition of carcinogens to food, then why shouldn't there be the same standard for the addition of carcinogens to the air?

ANSWERS 13 and 14

Questions 13 and 14 address the use of 10^{-6} individual risk as a guideline for EPA regulatory decision and the use of incidence and risk distribution as additional parameters of risk. The following addresses these questions together:

Background -- Individual Risk

An individual risk number is calculated for a carcinogen by multiplying an estimated potency factor by an estimated dose. The potency factor is a ratio of probability of effect to dose. The estimated dose is derived from an exposure analysis which takes into account concentration of the carcinogen in the exposure medium (air, food, water), frequency of exposure to the medium, and the duration of exposure (lifetime or partial lifetime). Because exposure analyses are performed differently for different media and circumstances, a risk number such as 10^{-6} is not a comparable parameter for all programs.

In the case of pesticide residues, the concentration of the residue in a food as it reaches the consumer is a single number that does not change according to the set. A person's exposure varies instead by the amount consumed. A 10^{-6} individual risk for average consumption would cover the entire population consuming the food; certain individuals may be exposed to somewhat higher risks depending on their consumption of the food.

In the case of an air toxic, the concentration of the toxic diminishes with distance from the source. The amount of air

"consumed" by all persons exposed is assumed to be the same. A 10^{-6} individual risk calculated here covers only people exposed to the same concentration. This can be one person, several, or many. The term "maximum exposed individual" (MEI) in S816 would mean that person or persons in the U.S. at the location at which estimated concentration is greatest. This number does not have the same meaning as the pesticide residue risk number. It is more comparable to a residue exposure for the individual who, for instance, eats more potatoes than anyone else in the country.

From this discussion, it is obvious that the "MEI" risk for an air toxic is a worst case parameter when used to characterize numerous sources around the country. Therefore, EPA also uses the risk distribution and incidence nationwide as part of its public health decisions.

Background -- Risk Distribution

A risk distribution for air toxics is a nationwide composite of risk from all sources in a source category. It shows the number of persons exposed by risk interval. An hypothetical example follow:

Individual risk	Cumulative number of persons at or above individual risk.
$\geq 10^{-1}$	0
$\geq 10^{-2}$	0
$\geq 10^{-3}$	1
$\geq 10^{-4}$	150
$\geq 10^{-5}$	2500
$\geq 10^{-6}$	300,000
$\geq 10^{-7}$	7,000,000

In this case, the MEI is $\geq 10^{-3}$ and one person is at the risk.

Background--Incidence

Incidence is a population risk number calculated by multiplying individual risk by the number of persons at the risk.

If for example 7,000,000 persons nationwide were exposed to an average lifetime risk of 10^{-4}, the lifetime incidence in this population would be 70 (7,000,000 / 10,000) and the annual incidence (70 / 70 years) would be 1 per year. Incidence is generally used in estimating composite nationwide risk, not risk associated with one source. For single sources, individual risk and risk distribution are used.

Specific Response to Questions

Numerical individual risk guidelines have been used for EPA programs for many years. However, they have never been used as rigid decision lines. The explanation of individual risk parameters above shows that the meaning of the numbers is dependent on how the analysis is done and for what exposure medium. Another reason that rigid lines are not used is that the numbers are estimates. The amount of uncertainty or conservatism associated with estimates in different cases varies greatly. Also, the weight of evidence for existence of a hazard to humans varies from case to case. In general, the guidelines recently stated by EPA for section 112 decisions are consistent with other goals of other EPA programs. These guidelines are that individual risks exceeding 10^{-4} are presumptively not acceptable and regulation should reduce risk to the greatest number of persons possible to 10^{-6} or below.

As previously indicated, risk from single sites or sources is usually considered by using individual risk. Incidence is used when estimating nationwide risk. Thus for a single air toxics source or waste site, incidence is not a useful parameter. nA individual risk of 10^{-6} or below is generally considered a benchmark of negligible risk. This is because cancer risk estimates done by Federal agencies err on the side of being conservative of public health and because this amount of added risk is a vanishingly small contribution to the lifetime cancer risk for an individual (about one in four on average.) Again, this is a benchmark only.

The facts of a particular risk assessment may support a higher or lower number as being negligible in that case. Thus a

particular risk assessment may be based for good reason on more conservative assumptions than others, justifying a higher level for "negligible", or may deal with an environmentally persistent pollutant which tends to accumulate in the environment, justifying a lower level for "negligible".

A number like 10^{-6} would be a negligible risk benchmark for hazardous air pollutants or food residues or other environmental contamination. However, to write it as a rigid number in a statute would disallow any judgment to be made about the different meanings the number may carry according to the body of data from which it is calculated.

The question of what risk to set as a national goal is a social and economic one. The question whether or not to allow greater than negligible risk from use of a product for which there may be substitute presents one set of issues. Another set is presented by the question of how much money the nation is willing to spend over what period of time to reduce risk from and use production of chemical products, petroleum and metals to negligible risk levels.

In both S. 816 and S. 1490 a showing of negligible risk would allow a source to operate without additional emission controls. S. 816 also contains requirements that continuously drive sources to add controls as feasible to reduce residual risk to 10^{-6}. S. 1490 requires a single regulation of unreasonable risk based on a range of considerations, including cost.

QUESTION 15

Proposed CAA section 112(g) in S. 1490 would allow the imposition of alternative emissions limitations if a source owner can demonstrate the resulting emissions would present a "negligible risk" to public health. In this context, what is a negligible risk?

ANSWER 15

Negligible risk in this context is the same as stated in the response to question 8. If the risk to the public is so small that exposure to the emitted substances is virtually safe, i.e., a de

minimis risk, then a State, with an approved permit program, may grant an operating permit exempting the source from the maximum achievable control technology requirements as specified in the emission standards. To assist the State in determining whether the source presents a negligible risk, the EPA will publish guidance establishing methods for assessing the significance of the public health risks, and methods for evaluating evidence presented by the permit applicant. It is anticipated that negligible risk health benchmarks for each of the relevant pollutants will be identified in the Federal Register notices promulgating each of the emission standards under Section 112.

QUESTION 16

Please explain the reason for the exclusion of electric utility fossil fuel fired boilers from the emissions standards requirements. Why is this source category excluded?

ANSWER 16

Exposure to toxic air pollutants would be very low in the vicinity of electric utilities but the MACT controls to reduce emissions of these pollutants, if required, could cost as much as $9 billion per year. These costs would be in addition to the costs associated with the controls required under the proposed acid rain program. Electric utilities emit a variety of toxic organic and inorganic compounds, acid gasses, and metals. The acid rain program established under Title V of the Administrations Clean Air Act proposal would result in some reduction of these pollutants. The Administration's proposal calls for a study to be done on the health risks associated with the emissions from electric utilities and for the Administrator to develop controls for the sources which would require MACT (if any). This approach allows the needed flexibility to address the air toxic problem associated with utilities without mandating expensive controls that may be unnecessary.

QUESTION 17(a)

In the EPA's recent final rule on benzene emissions standards, how do the controls imposed under the rule compare with the

controls that would be imposed under the standards of (i) S. 816 and (ii) S. 1490?

ANSWER 17(a)

It is hard to say specifically how MACT standards would compare to the proposed and promulgated benzene NESHAP because of the significant difference in decision criteria that is contained in the S.816 and S.1490 versus the criteria established by the vinyl chloride decision for the current Section 112.

Under the vinyl chloride decision, the Administrator is first to determine "acceptable risk" based only on health data. After selecting that level, the Administrator is to determine what is an ample margin of safety considering cost and technical feasibility. In addition, these NESHAP focus only on benzene emissions.

Under S. 816 and S.1490, the Administrator is first to set standards which reflect MACT considering costs, energy impacts, environmental impacts, and technical feasibility. Under S. 816, the Administrator would evaluate these categories to see if they posed maximum individual risks greater than 1 in a million after MACT. Under S.1490, the Administrator is to determine if the risks remaining after MACT pose an unreasonable risk considering health-based data and cost and technical feasibility. All of these decisions would consider the emissions of all listed hazardous air pollutants from these sources not just benzene emissions.

QUESTION 17(b)

In the EPA's recent proposed rule on benzene emission standards, how do the proposed controls compare with the controls that would be imposed under the standards of S. 816 and S. 1490?

ANSWER 17(b)

Because under S. 816 and S. 1490, the initial focus is on technology-based standards for the emissions of all the listed pollutants from these sources while under the current Section 112 the first decision is based only on health-based data associated with benzene emissions without considering cost and technical feasibility, the two approaches are not comparable.

Considering only the benzene emissions, it is likely that MACT standards for these sources would not be dramatically different from the recently proposed and promulgated standards. In addition, these sources after complying with the recently promulgated controls would not pose an "unreasonable risk to public health" as defined in S. 1490. However, a number of these source categories would be required to further reduce their emissions under the residual risk test in S. 816 based on current data. It is possible that new controls will be developed and in place prior to this test and therefore, additional control will not be necessary.

QUESTION 18

In 1984, EPA stated that it did not believe that a section 112 NESHAP for radionuclide emissions from uranium fuel cycle facilities was necessary because it already had promulgated emission standards for these sources under 40 CFR 190, and that to issue a CAA standard in addition "would be duplicative and. . . would not offer any additional public health protection."

(a) Does EPA believe that the standards under 40 CFR 190 provide adequate protection to the public and the environment?

(b) As a policy matter, does EPA believe that it should be required to regulate radionuclide emissions from uranium fuel cycle facilities under the Clean Air Act in addition to its regulation of these sources under the Atomic Energy Act?

(c) Would uranium fuel cycle facilities quality for exclusion from listing as a source category under proposed CAA section 112(c)(3) in S. 1490?

ANSWER 18

(a) EPA believes that the Uranium Fuel Cycle Standards, 40 CFR 190, provide adequate protection to the public based on the legal criteria of the Atomic Energy Act.

(b) As a policy matter, EPA believes that it should not be required either to or not to regulate any source category under the Clean Air Act. The Agency believes that neither the existing Section 112 or the new Act will require or preclude the Agency from regulating uranium fuel cycle facilities. The Agency decides whether to regulate a source category based on the hazards of the

pollutant(s) emitted, the expected risks from the source and the current regulations affecting that source. These are then compared to the legal requirements of the act, the Court's interpretation of the act, and EPA's policy for implementing that act. EPA weighs all these factors before deciding whether regulation of a given source category is appropriate or desirable.

(c) EPA has not determined whether uranium fuel cycle facilities qualify for an exclusion under Section 112 (c)(3) of S.1490. Although the existing standards are adequate under the Atomic Energy Act, EPA has not made a judgement on whether they are adequate under the new Clean Air Act. The language of the new Section 112 has not yet been decided and EPA has not yet established its policy for implementing the Act. Determinations of the adequacy of existing regulations cannot be made in a legal and policy vacuum.

ANSWER TO QUESTIONS FROM SENATOR JOSEPH I. LIEBERMAN

QUESTION

Your bill does not require each car to meet the emission limit; it does not require cars to meet the standards for 100,000 miles; and it never requires that cars meet the California NOx standard.

Yet, eight states, seven in the Northeast and California, now require each of these items. These states have done what they can under current law. But nothing will prevent people from Pennsylvania, for example, from driving to Connecticut with the dirtier cars your bill would allow.

Has the Administration reexamined its position on each of these issues after the decision by the Northeast states? Why are you allowing the automakers to create a dirtier car that eight individual states have said no to?

ANSWER

Administration proposal, as packaged, is designed to cut auto emissions by 10% did not propose tighter NOx since generally not needed and cheaper-stationary.

QUESTION

In testimony before Congressman Waxman, you stated that the Administration's proposal would only allow averaging within engine families. I'm going to ask you to explain why you believe this solves the problems associated with averaging. However, I am told that the experts have concluded that even this type of averaging would produce increases in emissions because engine family averaging creates an incentive to take "paper" credit for those emissions which would have occurred in any event, and use the credits to allow other cars within the family to emit above the average.

How precisely would your averaging proposal work and how do you respond to the critics?

ANSWER

EPA's averaging program would be adopted along the lines of the current averaging program that exists for heavy trucks, ie, a certification-based program with no in-use averaging. Under this type of averaging, the auto manufacturer must select an emission limit at the time of certification for each engine family (The

limit may be greater than or less than the emission standard, although a ceiling is set by EPA to prevent any gross emitting models.) The average of all emission limits within a manufacturer's entire auto fleet must comply, on a sales weighted basis, with the emission standard. Once an engine family is assigned its emission limit, it must comply with that limit throughout its useful life. This assures that the current recall enforcement program will continue to be effective; every car within an engine family must comply with the family's emission limit throughout useful life of the vehicle. Thus, the averaging system is computationally equivalent to the existing "every engine family must pass" system in terms of emission control achieved.

To ensure an adequate in use emissions margin of safety, which is still needed under this type of averaging program, an auto company may lower the 0-mile emissions level of its cleanest models from where they are today before it will allow another model's 0-mile emission level to increase. Because of the significant jeopardy of slicing the safety margin too much (recall), we expect manufacturers will offset any emissions increase by a corresponding decrease in another model.

QUESTION

I am told that the possibility of a recall is one of the strongest incentives for the manufacturer to design and build vehicles which will meet emission standards throughout their lives in order to avoid the expense and negative publicity associated with a recall.

Isn't this powerful tool almost eliminated under your proposal because a manufacturer simply will be able to say that he will produce cars with emission levels more stringent than the standard next year?

ANSWER

The proposed averaging program does not allow averaging of in-use emissions in order to avoid recall; manufacturers must select an emission level for each family at the time of certification and are responsible for conforming with that family emission level throughout the useful life of the vehicle. The

program would not provide a means of "offsetting" high in-use emissions through an agreement to build cleaner cars in future years.

QUESTION

It seems to me that averaging will be a very complex program to administer and enforce. For example, in the recall program, you will have to test a very large number of cars to make certain that the average is being met.

I am told that the financial and human resources in the mobile source enforcement program are already far below the levels needed to effectively enforce the program. Why has the Administration proposed a program which, to operate at all, requires a vast increase in resources?

ANSWER

The present recall program maintains a strong incentive for manufacturers to design and build vehicles with durable emission control systems by EPA testing of a relatively small, but targeted fraction of the fleet. This targeting is accomplished using all available emission data (I/M programs, Emission Factor data, certification data etc.) and evaluating the emission control technology used by specific engine families. The effectiveness of this targeting allows us to maintain a strong presence in the industry without testing each and every engine family.

Under our averaging program proposal, it is not necessary to determine the average in-use emissions of the fleet; it is necessary only to ensure that engine families meet their certified family emission limits when in actual use. We believe that the targeting methods we now use will be equally effective in an averaging program in convincing manufacturers that, in spite of a limited recall testing program, EPA will identify non-conforming families and require their repair.

QUESTION

One of the basic lessons of the 1970 Clean Air Act is that, once Congress establishes specific emission standards, industry will develop the technology to meet these standards.

With averaging, the certainty that emission controls will be needed to meet the standards is eliminated. The Manufacturers of

Emissions Controls Association has concluded that the incentive for research and development of new and refined technologies will be discouraged with averaging.

Why has the Administration proposed a program which will discourage the development of new technologies for emission controls?

ANSWER

The development of emission control technology is primarily driven by the stringency of the standards and the length of the statutory useful life. Under an averaging program, any high emitting families must be balanced by low emitting families. Therefore, we believe that averaging will affect only the extent of utilization of new technology, not its development.

QUESTION

The Administration proposed to allow automakers and the oil industry leeway in meeting the requirements of the Act through a complex system of trading and banking credits. Yet, a 1985 experiment by EPA with gasoline lead-reduction credits led to significant falsification of data and other violations, according to both GAO and the EPA Inspector General.

Why would the Administration propose to even consider a program which is so difficult to administer and enforce?

ANSWER

The Administration bill has several distinct provisions related to averaging, banking, and trading:

1. The EPA Administrator is required, to the maximum extent feasible considering costs, environmental benefit and technology, to permit averaging and banking with respect to compliance with new vehicle emission standards. Trading among manufacturers is not included. Within each family of vehicles, there would still be an "every vehicle" standard. (New Section 206(a)(4)(A))
2. The EPA Administrator is required to allow vehicle manufacturers and fuel refiners to substitute other measures for their clean vehicle production quota,

their clean fuel availability obligation, or their Stage II refueling control obligation. (New Section 214(a))

3. The EPA Administrator is <u>permitted</u> to allow substitutes more generally, e.g., for compliance with RVP limits. (New Section 214(b))

The statutory language in these sections emphasizes equality of emission reduction and enforceability. Even though EPA is mandated to create averaging systems in two of the three cases, the rulemakings to do so would be fully open and fully reviewable in court. We expect these rules would not be difficult to enforce and would not sacrifice environmental benefit.

The lead-reduction credit trading program served the very useful purpose of allowing a more rapid phase-out of lead than would have been politically palatable if every refinery and every gallon of gasoline had been required to meet a fixed limit. The Administration believes that there is potential for averaging, trading, and banking to be of similar utility in hastening environmental benefits in the future and that this possibility should not be statutorily prohibited.

Flexibility in the compliance system may also allow less costly compliance, thereby allowing more effective environmental control for a given societal expenditure.

There were violations of the lead credit regulations. These were due in part to the somewhat unexpected participation of numerous small fuel blenders. Also, refiners and blenders were not required to receive any approval of their plans in advance. We believe that the situations would be quite different in the two areas in which the Administration bill mandates averaging, and that significant violations can be avoided as well as they can be under a no-averaging compliance system.

<u>QUESTION</u>

The proposal for allowing the manufacturers leeway to substitute alternative controls for time-tested controls such as tailpipe standards is particularly puzzling because we need all the controls possible. If new methods of controls are developed, the studies tell us that we will need these new methods in addition to the old ones.

Why does your proposal allow for this type of substitution of controls when studies such as the one by OTA show that, even with all available controls, many areas will fall far short of meeting the ozone standards?

ANSWER

The proposal does not allow manufacturers to substitute alternatives for tailpipe standards. The averaging system required under new Section 206(a)(4)(A) would substitute more stringent tailpipe standards on some vehicles for less stringent ones on others.

One important advantage of permitting substitution of equally effective controls is that it encourages the very innovation we need to reach our clean air goal. In a strictly command-and-control system there is no incentive for discovering ways to get more effective control. Once new control methods are developed, they can be extended to all similar sources and to other types of sources. The Administration bill does not remove any of EPA's general authority to require reasonably available controls on existing sources, and it does not grandfather sources who substitute a new control method for a traditional one.

QUESTION

EPA's overall strategy for ozone control relies heavily on the conversion to alternate fuel strategy. I assume, because of your optimism about this program, you have declined to include stricter mobile source controls in the bill. Yet, OTA has reached virtually opposite conclusions from EPA about the cost-effectiveness of methanol. And others have raised very serious questions about the safety and environmental benefits of methanol.

Have you considered the effects on the environment if your projections about issues such as cost and supply associated with methanol are slightly off? For example, if methanol costs are higher than gasoline costs, suppliers in Nebraska may not want to

stock methanol. Why should someone in Los Angeles buy a vehicle which is only fueled on methanol if he can't take it on a vacation to Nebraska?

ANSWER

The Administration bill does contain stricter mobile source controls. The list of what it does not contain is quite short. It does not contain the California NOx standard because we are not certain that large NOx reductions will be favorable to ozone attainment in most cities outside California. We believe that for those cities that can benefit from NOx controls it would be more economical to control large industrial sources of NOx. The bill also does not contain the 0.125 HC, 1.7 CO, and 0.2 NOx standard for 2000 or 2003 and beyond. We are unsure of the feasibility of these standards, but quite confident that the small increment of control they represent can be obtained more cheaply elsewhere. The recent agreement in the House to make these standards the subject of an EPA study and rulemaking confirms our position. They are simply too uncertain to be rigidly codified into an Act that has proven so difficult to amend when necessary. OTA's negative assessment of the cost-effectiveness of methanol lies on the fuel cost side, not on the benefit side. The Administration believes that OTA's fuel costs are not realistic and we understand that OTA is now in the process of looking at this issue again.

The Administration bill allows the EPA Administrator to require the sale of vehicles dedicated to clean fuels. EPA envisions that this will not happen before 2000. Before then, clean fuel vehicles can operate on gasoline when traveling outside the clean fuel cities. Once dedicated vehicles begin production, EPA can require enough stations in states like Nebraska to offer the necessary clean fuels for sale.

QUESTION

What if EPA is wrong in its basic assumption that methanol will become a second nationwide fuel?

ANSWER

EPA does not make this assumption. The Administration bill is fuel and technology neutral, and the private sector can fulfill its obligations by any combination of engine technology and fuel. Methanol is one leading candidate, as are compressed natural gas, ethanol, propane, and reformulated gasoline.

QUESTION

Even though your bill is fuel-neutral on the face, the critics say it favors methanol because EPA has only issued fuel specifications for methanol.

By requiring that more than nine million vehicles be introduced into commerce within the next 14 years, aren't you really favoring methanol because the standards are already in place? Is it appropriate for the government to inject its voice into the marketplace in this manner?

ANSWER

EPA has issued emission standards for methanol-fueled vehicles, but has not specified any formula for methanol fuel itself. We decided it would be premature to do so and that auto companies and fuel companies should take as much time as necessary to come to a technical agreement on fuel specifications.

The emission standards that do exist for methanol vehicles do not give methanol a head start. An entirely new rulemaking will be needed to set emission limits for clean-fueled vehicles. All fuel types will be treated simultaneously and equitably. The experience in establishing the current methanol vehicle standard has been useful in that it resolved most technical issues of measurement and instrumentation. The new rulemaking will be able to be faster as a result and will include standards for all candidate clean fuels.

QUESTION

Your bill provides EPA with vast discretion both in the mobile source and toxics provisions. The problem with such discretion in my view is not simply that we can't be sure EPA will always be run by men like Bill Reilly, who want to act. It goes deeper. History has shown us hat, when EPA is provided with discretion, it becomes paralyzed --- overwhelmed by interest groups from all sides. We

need to ensure against such paralysis on issues affecting public health.

Would you agree that discretion can lead to this type of paralysis?

ANSWER

EPA does not agree. Discretion tends to provide EPA with the flexibility to deal with technical issues and new concerns as they develop. Agency rulemaking through a public process assures a detailed consideration of issues. The Congress should not presume bad faith on the Agency's part. Congressional oversight can assure that an agency is effectively carrying out its responsibilities.

QUESTION

Last week we heard testimony emphasizing the importance of an independent investigatory board, modeled after the National Transportation Safety Board, as provided in the Committee's Bill. This allows for the separation of accident investigators from accident prevention regulators when evaluating chemical releases. The Transportation Board has been extremely successful in its work.

What precisely is the Administration's objection to this independent board?

ANSWER

The Agency fully supports the need to investigate major accidental releases to gain information on which to determine appropriate approaches to accident prevention and regulations as evidenced in its proposal for the establishment of an accident board. This, combined with an effort to build consensus among the "stakeholders" i.e. appropriate federal agencies, states and local communities, industry, environmental and professional organizations, trade associations and labor, can tailor and enhance the federal effort.

The Agency does not see the need for the creation of a new, potentially costly and self perpetuating, independent organization which will assist us in the development of regulations and enhancement of program efforts. We propose and promulgate

regulations yearly after gathering information and we do not think that this situation is different. We have the authority and the will to investigate releases and to use that information in our program development. Unlike the NTSB, which can and does in some cases investigate federal wrongdoing requiring an independent perspective, the Board should have as its primary mission investigation to gather information regarding the causes of accidents in order to identify actions to correct deficiencies found in terms of guidance, regulation, and legislative initiative. In the past, the Agency has investigated several releases, some jointly with other Agencies such as the Nuclear Regulatory Commission and has reported to Congress, receiving the benefit of its oversight. This, of course, will continue and be enhanced by the activities of the Board we propose. In addition, the current proposal supported by the Administration requires the development and issuance of a report that is not reviewed by the Administrator prior to publication, thus ensuring that the information which the Board generates will be impartial.

QUESTION

It seems fundamental to me that communities have a right to know what is being produced in their own backyard and what risks those chemicals pose. Yet, the Administration's bill does not require that companies prepare hazard assessments, as required in the Senate bill.

What is your rationale for excluding this provision from your bill?

ANSWER

The Agency agrees that communities have a right to know what is being produced in their own backyard and what risks those chemicals pose. In this we fully support the approach taken by Congress in the Emergency Planning and Community Right to Know Act of 1986 (Title III of the Superfund Amendments and Reauthorization Act). Under this legislation, State Emergency Response Commissions (SERC) and Local Emergency Planning Committees (LEPC) have been

established to receive and use information on the presence of chemicals and the hazards they pose, quantity and location of chemicals, their manner of storage, and actions taken after accidental releases. Further, under Section 303(d)(3), a facility must provide the LEPC with information needed for developing and implementing emergency plans. This would include information on hazards, risk, and consequences to the community in case of a release.

The Senate bill requires facilities to conduct "hazard assessments". We interpret this as the use of appropriate methodologies to determine the hazards that exist, consequences that may occur as a result of those hazards, the likelihood that events might occur and the likelihood that safety systems, mitigation systems, alarms and evacuation plans function properly and eliminate or reduce the consequences. of a release. We believe that facilities should be using appropriate methodologies to do this. However, accident prevention requires a complete, non-generic, comprehensive program in which hazard assessment or evaluation is an integral, non-separable part, along with preventive maintenance, operator training, incident investigations, and management of process change, among other things. Prevention programs applied at a facility must reflect local, site specific conditions. Meeting a "minimum" national standard of performing a hazard assessment will not be sufficient and may not be useful at specific sites. We believe that the legislation which we support will allow us, after discussion with the stakeholders, to develop guidance, regulations, and legislative initiatives leading to a national prevention program supported by States who will implement part of the program, federal agencies, industry, labor, and environmental and professional groups.

Clean Air - misc











JACK ANDERSON and DALE VAN ATTA

Reilly: A Made-for-TV Administrator?

We owe our readers an apology. In a recent column we took Environmental Protection Agency Administrator William K. Reilly to task for being too accommodating to industrial polluters. We led you to believe that was Reilly's biggest problem.

We were wrong. Reilly's biggest problem is that he is a made-for-TV administrator. He has been dubbed by some EPA insiders, "The Vanna White of the Bush administration" and a "clean air head."

To be sure, Reilly spends far more time than his predecessors cultivating an image as a champion of the environment. Staffers say they know Reilly is truly pleased with a new idea when it makes the 6 o'clock news.

For Reilly, the camera angle and sound bite are paramount, some staffers told our associate Stewart Harris. But is Reilly for real?

The administrator is on a two-week swing through Europe on EPA business, and, for once, is not available for interviews. But his spokesman said that the grumbling from some EPA staffers about Reilly's public image will end when they get used to the idea of an agency head who uses the soapbox.

Administrators during the Reagan years were expected to work quietly or lose their jobs. That gave staffers plenty of time to work closely with Reilly's predecessors, including Lee M. Thomas and William D. Ruckelshaus—something they can't do with Reilly because he spends so much time on the road and in television studios.

The day-to-day administration has fallen on Reilly's deputy, Henry Habicht.

Staffers may eventually get used to Reilly's high profile, but they may never get him to pay attention to details. Insiders tell us that Reilly often glazes over when staff meetings turn to nitty-gritty policy issues. He would rather recount his lunches with Washington celebrities.

Some environmental leaders are concerned that Reilly's tough talk about the environment is, like his cover-boy looks, only skin deep. One prominent environmentalist gave Reilly "high marks on rhetoric, low marks on essence."

Reilly's aborted attempt to get a limousine for home-to-work transportation didn't impress his staffers who remember his predecessor, Thomas, unfolding his strapping frame from a Toyota Tercel every morning.

Likewise, some staffers were amazed when Reilly fell for an unworkable alternative-fuels plan that would have forced Detroit to sell 1 million cars a year that run on something other than pure gasoline. It is doubtful that Americans would have been willing to buy the cars. And it is even a more remote possibility that the federal government would have forced gas stations to stock alternative fuels.

The unrealistic proposal would have run out of gas on its own if it had not collided head-on with powerful oil and auto interests in Congress. Despite the drubbing, Reilly is clinging to hope for the plan.

To a certain degree, Reilly's public relations campaign has been successful, even if the man behind it stumbles occasionally. In a poll released last month, Americans in rural areas said they trusted the EPA more than Congress or the White House to protect the environment.

BROOM HILDA RUSSELL MYERS



MOTHER GOOSE & GRIMM MIKE PETERS



Clean Air Act - Gen

DRAFT

EARTH DAY PROCLAMATION SIGNING CEREMONY
JANUARY 3, 1990/2:00 PM ROOSEVELT ROOM

- GOOD AFTERNOON, AND WELCOME TO THE WHITE HOUSE. ON APRIL 22, 1990 AMERICA WILL CELEBRATE EARTH DAY. ACROSS THE COUNTRY CITIZENS WILL BE ASKED TO MAKE A PERSONAL AND COLLECTIVE COMMITMENT TO THE PROTECTION OF THE ENVIRONMENT -- TO "THINK GLOBALLY AND ACT LOCALLY."

- APRIL 22ND ALSO MARKS THE TWENTIETH ANNIVERSARY OF THE FIRST EARTH DAY, GIVING EACH AND EVERY ONE OF US A CHANCE TO REFLECT ON THE PROGRESS MADE OVER THE PAST TWENTY YEARS AND SET THE ENVIRONMENTAL AGENDA FOR THE NEW DECADE.

- WE'VE JUST STARTED A NEW YEAR. TWENTY YEARS AGO THIS WEEK, ON ANOTHER NEW YEAR, PRESIDENT NIXON SIGNED LANDMARK ENVIRONMENTAL LEGISLATION -- THE NATIONAL ENVIRONMENTAL POLICY ACT -- INTO LAW. THE HISTORIC ENVIRONMENTAL LAWS OF THE SEVENTIES FOLLOWED THIS STEP -- THE CLEAN AIR ACT, THE CLEAN WATER ACT, AND THE LAWS REGULATING PESTICIDES, TOXIC SUBSTANCES AND HAZARDOUS WASTES.

- THAT ACT CREATED THE CEQ -- A VOICE FOR THE ENVIRONMENT THAT'S BECOMING STRONGER THAN EVER, THANKS TO MIKE DELAND. AND THE EPA -- ESTABLISHED SOME 20 YEARS AGO UNDER THE LEADERSHIP OF BILL RUCKELSHAUS -- IS THRIVING UNDER BILL REILLY.

- WE'VE MADE MUCH PROGRESS IN THE LAST TWENTY YEARS, AND I AM PARTICULARLY PROUD THAT IN 1989 WE WERE ABLE TO TAKE A NUMBER OF NEW INITIATIVES. WE'VE SIGNED LEGISLATION TO PROTECT WETLANDS AND VALUABLE WATERFOWL HABITAT. WE'VE ADDED FUNDS TO EXPAND OUR PARKS, FORESTS, AND WILDLIFE REFUGES. WE'VE BANNED THE IMPORT OF IVORY. WE PLAN TO HOST AN INTERNATIONAL CONFERENCE ON CLIMATE CHANGE THIS SPRING.

- WE'VE PROPOSED TO PHASE OUT CFC'S WORLDWIDE. AND WE'VE INTRODUCED THE FIRST MAJOR OVERHAUL OF THE CLEAN AIR ACT IN OVER A DECADE.

- WE NEED ACTION ON THE REVISIONS TO THE CLEAN AIR ACT WE SENT TO CONGRESS. THAT PACKAGE WAS CAREFULLY BALANCED, TO RESTORE CLEAN AIR FOR ALL AMERICANS, WHILE SUSTAINING JOB CREATION, COMPETITIVENESS, AND ECONOMIC GROWTH.

- I CALL ON THE CONGRESS TO PASS A CLEAN AIR ACT QUICKLY, CAREFULLY, AND RESPONSIBLY. A CLEAN AIR ACT THAT HONORS THE PRINCIPLES I'VE OUTLINED -- HARNESSING THE POWER OF THE MARKETPLACE, IN THE SERVICE OF THE ENVIRONMENT. IF NOT, I WILL BE FORCED TO VETO THAT LEGISLATION. THE VERY AIR WE BREATHE IS AT STAKE -- THIS CAUSE IS TO IMPORTANT TO BE DELAYED ANY LONGER.

- BUT THE FEDERAL GOVERNMENT IS ONLY PART OF THE STORY. IT IS IN CITY HALLS AND STATE CAPITOLS, IN SCHOOLS AND IN THE WORKPLACE, IN THIS COUNTRY AND AROUND THE WORLD THAT REAL PROGRESS ON THE ENVIRONMENT WILL BE MADE. ENVIRONMENTAL AWARENESS MUST BECOME SECOND NATURE.

- EARTH DAY CAN BE PART OF THE AMERICAN TRADITION OF PRIVATE AND PUBLIC LEADERSHIP THAT WILL HELP US REACH THIS GOAL.

- IN DECIDING TO MAKE THIS EARTH DAY PROCLAMATION THE FIRST PROCLAMATION OF THE NEW YEAR -- AND THE NEW DECADE -- I WANTED TO MAKE A POINT: EARTH DAY, AND EVERY DAY, SHOULD INSPIRE US TO SAVE THE LAND WE LOVE.

TO REALIZE THAT GLOBAL PROBLEMS HAVE LOCAL SOLUTIONS. TO MAKE THE PRESERVATION OF THE PLANET A PERSONAL COMMITMENT.

o I NOW TAKE GREAT PLEASURE IN SIGNING THIS PROCLAMATION RECOGNIZING APRIL 22, 1990 AS EARTH DAY.

# # #

Senate and White House Start Clean Air Talks

2/3/90 NYT

By PHILIP SHABECOFF
Special to The New York Times

WASHINGTON, Feb. 2 — Senior Administration officials have begun discussions with Senate leaders to resolve serious differences between changes proposed for the Clean Air Act by President Bush and legislation that is now before the Senate.

All the major elements of the Senate bill are on the table for negotiation, Administration and Senate aides said today.

The Senate majority leader, George J. Mitchell of Maine, said in a telephone interview tonight, "Progress is being made, and we are proceeding in hopes we can work out a fair compromise."

White House complaints about the measure, particularly its costs, may delay strengthening the pollution control law. Mr. Bush has indicated that he will veto the bill and Administration aides have suggested there may be a filibuster by some Republican Senators.

In large part because of opposition by President Ronald Reagan, all efforts by Congress to improve the Clean Air Act failed in the 1980's.

Open Discussions Urged

Environmentalists said today that the Bush Administration was trying to weaken pending legislation through private negotiations with senators.

Spokesmen for the National Clean Air Coalition — environmental, public health, labor and consumer groups — demanded that decisions be made in open votes on the Senate floor, not closed negotiations.

"We are saying, 'Let's make senators vote on the floor to show where they are,' " said Blake Early, legislative representative of the Sierra Club. Richard E. Ayres, the coalition's chairman, said it would be "politically suicidal" for senators to vote against a stronger law that the people want.

Casey Scott Padgett, legislative counsel for the national group Environmental Action, said the Administration's efforts to make a "back room deal" meant Mr. Bush had reneged on his pledge to clean up the skies.

Senate Leaders' Initiative

But Administration officials insisted that the current discussions had been requested not by the White House but by Senators Mitchell and Bob Dole of Kansas, the minority leader.

"The negotiations were initiated by the Senate leaders as a constructive measure to help expedite the legislative process," said David Cohen, a spokesman for the Environmental Protection Agency.

William K. Reilly, Administrator of the E.P.A., members of his staff and White House and Office of Management and Budget aides are conducting the negotiations.

The senators and Administration officials resolved most of their differences over toxic air pollution Wednesday and Thursday, officials said. They added that agreements on specific issues would not be regarded as final until agreement on the entire bill.

Negotiations are expected to continue through Monday. Senator Mitchell said he was aiming to return the legislation to the Senate floor on Tuesday.

CAA - Gen.

WASH. POST: 02-04-90

1 of 3

Constituencies Are Clashing On Clean Air

Lawmaker Pressured By Industry, Activists

First in a series of occasional articles

By Michael Weisskopf
Washington Post Staff Writer

CHAMPAIGN-URBANA, Ill.—For Rep. Terry L. Bruce (D-Ill.), the warning shot was early and unmistakable.

"We are shocked and dismayed," said a letter to Bruce from the local chapter of the Sierra Club. "Your record on clean air is, for virtually all of our members, flatly unacceptable and your reputation as a friend

AIR WARS
THE POLITICS OF POLLUTION

of the environment is slipping rapidly."

It was stinging criticism for Bruce, an ambitious, three-term congressman who owes his House seat largely to environmentalists from this college town. But as Congress struggles to rewrite the Clean Air Act for the first time in 20 years, Bruce is buffeted by powerful competing pressures: Nearly every polluting industry targeted by the legislation is represented in his southeastern Illinois district, and they are predicting financial disaster if the most far-reaching proposals advocated by environmentalists are enacted.

Because clean air legislation entangles industry more than any federal statute except the tax code, few in Congress are immune from this pressure from companies at home. Some lawmakers see it as their duty to protect oil or petrochemical plants in their districts; others, to watch out for coal jobs, an automobile factory or local utility rates; a few, to advance environmental causes. Bruce's district includes all those interests, and they have put him under siege.

As a member of the House Energy and Commerce Committee, a key battleground for clean air legislation, Bruce is in a particularly sensitive position—and he has the volume of mail and stream of visits from union bosses and corporate chiefs to prove it. The chairman of General Motors and presidents of Marathon Oil and U.S. Can have all made time to lobby this junior lawmaker from Main Street USA.

"The environmentalists want me to be their champion," Bruce said. "But no one wants to come back to his district and hear industry say, 'Hey, we're shutting down or laying off because of some new clean air law.'"

That dilemma will test the political skills of Bruce, 45, a plain-talking, clubby lawmaker who cultivates the art of horse-trading. Using the Bush administration's bill as a starting point, he and his committee colleagues must sort out issues that were too thorny for a subcommittee to resolve last fall. The committee's deliberations could continue all winter and are crucial, because the diverse House is likely to respect and adopt key provisions of the bill voted by the diverse membership of Energy and Commerce.

Not even a political Houdini could manage to stop acid rain without boosting electric bills in Champaign-Urbana and sacrificing coal-mining jobs in Keensburg, or foster markets for nonpolluting motor fuels without cutting into gasoline production at the oil refinery in Robinson, or eliminate the health risks of airborne toxic emissions without bankrupting chemical plants in Tuscola.

Bruce's ability to reconcile the clashing industrial and environmental interests of the 19th District will test whether a broader compromise is possible. His efforts will be chronicled in future articles in The Washington Post. For it is the same constellation of forces, arrayed on a national scale, that has split Congress regionally and ideologically for a decade, blocking revision of the Clean Air Act despite steadily worsening air quality.

Now the battle is joined by President Bush and congressional leaders, who appear willing to support drastic steps to combat smog, curb the emissions of toxic substances blamed for high cancer rates in industrial corridors and stop acid rain damage to lakes and forests of the Northeast.

Even if all these objectives were reached, there would be scant direct benefit for Bruce's district, a narrow swath of farmland and small, old-fashioned towns straddling the Indiana border. Its factories and cars pollute, but they are too scattered to foul the skies. Instead, the district's industrial products—coal, oil, cars, chemicals, electricity and aerosol cans—contribute to the pollution of other places.

The pleas of these industries for protection may be more persuasive to a pragmatic politician like Bruce than the vaguer exhortations of environmentalists. Bruce has collected $135,000 in campaign contributions since 1984 from unions, companies and industry groups directly affected by clean air legislation.

But Bruce cannot afford to ignore the sizable and well-organized community of environmentalists at the University of Illinois in Champaign-Urbana whose canvassing, voter-registration and fund-raising efforts first helped elect him to Congress in 1984 after 14 years in the state Senate.

That year the incumbent, Rep. Daniel B. Crane (R), a staunch conservative who rarely supported environmental causes and who had been damaged by a sex scandal involving a congressional page, carried the rest of the traditionally Republican district, but Bruce won big enough here to beat him.

Once in Washington, Bruce lobbied for a seat on the energy committee, the first stop for environmental bills and a traditional bottleneck for past attempts to revise the Clean Air Act, last amended in 1977. He was named to the panel at the beginning of his second term, and burrowed in to master the complexities of environmental issues. He positioned himself as a swing vote, thereby gaining political leverage to protect the intricate web of interests at home.

"I'm not a poet; I'm a legislator," Bruce said. "I can listen to the call of the loon, but it's not going to help you pass legislation to solve the problem."

Loons are found on many of the Northeast lakes polluted by acid rain, which is the most divisive issue for Bruce's district and for the country. Emissions from the use of high-sulfur coal in midwestern and Appalachian power plants, expelled high in the atmosphere by towering smokestacks, waft as far as New England, turn acidic, and finally fall to the ground in snow, rain and dust.

Hoping to set a national example, students and faculty at the University of Illinois in the early 1980s protested university plans to burn high-sulfur coal at the campus's small power plant. They eventually forced a compromise, getting Gov. James R. Thompson (R) to allocate $13 million to buy the most advanced Japanese "scrubber" technology to remove sulfur from the gases before their emission.

Now they see a chance to enact national legislation. A clean air bill, whose acid rain provisions are modeled after the Bush administration's proposal, has been passed by the Senate Environment and Public Works Committee and calls for drastic emission reductions by the 107 dirtiest U.S. power plants. These plants would have to pick up full costs of cleanup but could choose the more cost-effective method—low-sulfur coal or scrubbers.

For years such measures have divided Congress into warring camps, with northeasterners and environmentalists on one side, utility and high-sulfur coal interests on

the other. On a smaller scale, the struggle is the same in Bruce's district.

Environmentalists expect their congressman to assume a leadership role as the price for future support. "We hope to get out the message that it's good politics to take strong environmental positions," said John Thompson, who directs a regional environmental group here.

But six of the plants targeted in Bush's bill for stringent pollution cutbacks produce electricity for the homes and factories of Bruce's district. With hundreds of millions of dollars in cleanup costs projected by the two local utilities—Illinois Power and Central Illinois Power Service (CIPS)—consumers could face rate increases of as much as 24 percent, officials say.

The impact would be immeasurably greater on the gritty town of Keensburg, where the Amax Coal Co. provides jobs and a way of life practiced for generations in the southern reaches of Bruce's district.

Without federal subsidies to help pay for curbs on sulfur emissions, utilities are likely to turn to the cheaper option—low-sulfur coal. Mined primarily in the West, it is more expensive than the coal mined locally, but it discharges so little sulfur dioxide that utilities could avoid using costly scrubbers.

"It's a dollars and cents thing," said Richard Grant, manager of environmental affairs for CIPS.

Amax supplies 3 million tons of coal every year to the Gibson power plant less than a mile away in Indiana. Gibson, with its 500-foot stacks, was the nation's third-largest emitter of sulfur dioxide in 1987, and it is slated for major emission cutbacks.

A decision by Gibson to burn lower-sulfur fuel would doom Amax and its 800 miners, including Don Baldwin, who considers sacrificing his livelihood to save New England from acid rain a powerful injustice.

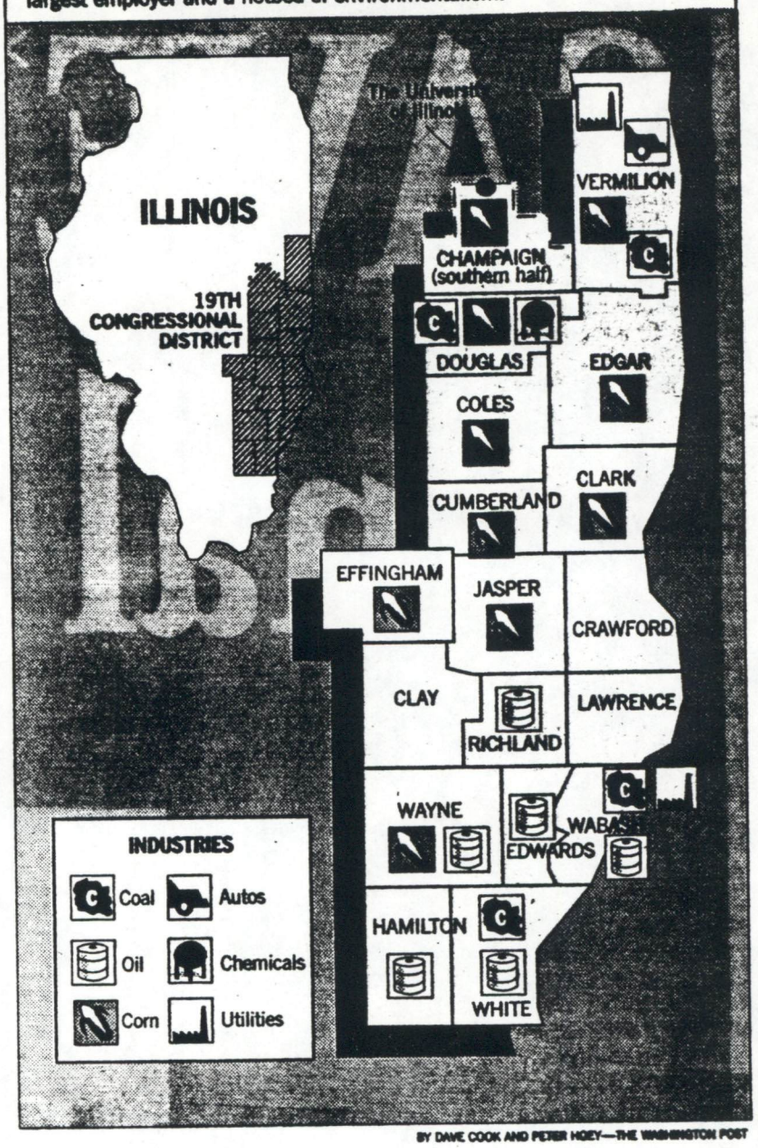
"Environmentalists want a perfect world, and they don't care if my family goes hungry," said Baldwin, 42.

Bruce's attempts to work out a compromise on acid rain provisions have only made environmentalists more impatient. In its letter last November, the Sierra Club said he was "showing far, far too much concern over mining jobs in this district and utility bills. These issues are not unimportant, but we believe that you are seriously overstating" them.

As complex and politically treacherous for Bruce as acid rain is the issue of alternative motor fuels. This dispute involves not only environmentalists and industry, but corn farmers.

THE 19TH CONGRESSIONAL DISTRICT OF ILLINOIS

The 19th Congressional District is the largest east of the Mississippi River, a narrow wedge of territory that borders Indiana for 180 miles and extends 70 miles to the west. In 1980 the population was 518,000. By 1986 it had fallen to 513,000. The district's economy includes most major industries affected by clean air legislation: coal, oil, utility, farming, auto and chemical. The University of Illinois in Champaign-Urbana is the largest employer and a hotbed of environmentalism.



BY DAVE COOK AND PETER HOEY—THE WASHINGTON POST

With half the U.S. population exposed to dangerous levels of urban smog and carbon monoxide, environmentalists have pressed a number of alternatives for controlling the source, which is gasoline combustion by motor vehicles. Tightening limits on tailpipe emissions is one solution, but automakers have already cut back so far there is not much room to improve.

The administration plan seeks salvation in alternative fuels, especially methanol made from natural gas, proposing that in seven years a million new cars annually be able to run on alternatives as clean as pure methanol. Many environmentalists embrace the plan.

But farmers in Bruce's district advocate the use of ethanol. Produced by fermenting corn, it is rich in oxygen and, when blended with gasoline, burns off carbon monoxide in auto engines.

The farm lobby sees ethanol as a way of stabilizing demand for corn and is pushing hard to have gasohol required in cities polluted by carbon monoxide. With the ethanol producer Archer Daniels Midland located just west of the district, Bruce's 10,500 corn farmers, who produce 2.5 percent of the nation's harvest, would be the main suppliers.

"If Terry Bruce wants farmers to sit up and take notice, he'll get an ethanol mandate," said farmer Fred D. Werts, 67, who decorated his fuel tank with the drawing of a large yellow ear of corn and the pitch—"Gasohol from Illinois Corn."

But as Bruce has learned, the oil industry also takes notice of alternative fuels. With ethanol proposed for carbon monoxide centers and pure methanol for smoggy cities, big oil stands to lose its monopoly on motor fuel. As Werts noted, "Every time you sell a gallon of ethanol, you beat an oil company out of a gallon of gas."

Marathon Petroleum Co. runs a large refinery in Robinson, producing 125,000 gallons of gasoline dai-

ly, one-third of it going to Chicago—one of the nine cities designated by Bush for methanol-grade fuel.

Marathon sees methanol as the greatest threat, predicting that the nine-city plan spells doom for the refinery, which employs more than 10 percent of Robinson's work force. It is the only major industry for miles around.

"You become less profitable the minute the law hits," said James Wilkins, a Marathon lobbyist. "You'd throttle back, lay off people. If you go all the way to methanol, you mothball the plant."

Similar threats come from General Motors, whose Central Foundry is the largest employer in Danville. Automakers fear they will not be able to sell the 1 million clean-fuel cars supposed to be manufactured and distributed annually by 1997.

The foundry produces cast-iron components for GM's large engine families, which, GM says, may have to be phased out if environmentalists get their way with proposals for higher fuel economy—a benefit of small cars.

If that is not enough of a threat to the depressed Rust Belt city, Danville's aerosol can industry is lobbying against proposals to reformulate the smog-generating ingredients of consumer products from oven cleaners to deodorants. And its chlorofluorocarbons (CFCs) plant is fighting efforts to cut back production of the chemical, which depletes stratospheric ozone, years earlier than an international treaty calls for.

Air toxin measures, intended to limit the risk of cancer and birth defects from industrial emissions, strike hard at the chemical industry, including the large plants owned by Cabot Corp. and Quantum Chemical Corp. that rise incongruously from the farmland of Tuscola, a town of 4,000 southwest of Champaign-Urbana.

Far-reaching proposals call for use of the most advanced control devices regardless of cost, a requirement that would force Cabot to invest $8 million to curb its plant emissions of 500 pounds per hour of chlorine, a severe lung irritant.

Quantum, a booming petrochemical plant, faces even more rigorous controls if Congress approves tough limits on cancer risks. Among its emissions is the carcinogen benzene.

Air toxin controls may be the final blow to the oil industry along the southern rim of Bruce's district. Its 18,000 wells create a Texas-like landscape. But most are depleted after decades of drilling.

Their output is less than 10 barrels a day each, too little to justify the heavy costs of plugging up leaks from old pipes, flanges and valves, said Marathon's Wilkins.

"You'd get out of the production business" rather than patching the leaks as could be required in a new law, he said.

The long winter recess brought home the pressures on Bruce, who said he found that "environmentalists are stoking up their membership. But as various trade associations get their people fired up, more businessmen are asking, 'What does it mean to me?' "

The antagonists in his district appear dug in for a bitter fight.

"There are some who want to go back to bicycles," Wilkins said of environmentalists. "There's got to be a better way than to close [industry] down."

Bruce's longtime supporters here are just as adamant. "Terry has to decide whether he is going to be someone who is leading us into a world with cleaner air or someone who caves in to constituencies who want to continue using the air as a sewer," said Clark Bullard, a University of Illinois mechanical engineering professor.

Bruce, who styles himself as a conciliator, does not see the choices as that stark. "I try to work to the point where I don't have tough political calls," he said.

The coming weeks will test whether he can reach that point on the Clean Air Act.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

FEB 1 1990

OFFICE OF
AIR AND RADIATION

Honorable John D. Dingell
Chairman, Committee on Energy and Commerce
House of Representatives
Washington, D. C. 20515

Dear Mr. Chairman:

This is in response to your letter of November 30, 1989 to the Administrator and to Governor John Sununu about the Administration's position in regard to the need for further legislation of environmentally persistent air pollutants beyond the Great Lakes provisions of H.R. 3030. Your letter stated that some people cite Mr. Reilly's speech of October 11, 1989 in Chicago as indicating a change in position from that described in Mr. Reilly's letter to you dated October 4, 1989, and you requested a clarification of the Administration's position.

As stated in Mr. Reilly's October 4 letter to you, we share your concerns and those of the Great Lakes States' Governors regarding the potential atmospheric deposition of pollutants to aquatic ecosystems. We believe that the Administration's bill (H.R. 3030) is fully responsive to these concerns. As reported by the Subcommittee on Health and the Environment, the air toxics provision in Title III of H.R. 3030 would regulate emissions of the air pollutants of concern to the Great Lakes States' Governors and would require a detailed study of the sources of atmospheric deposition and the adverse health and environmental effects associated with such deposition.

The H.R. 3030 would regulate major sources of the 191 pollutants included in a list of hazardous air pollutants. This list includes those pollutants of particular concern to the Great Lakes States' Governors due to the pollutants' environmental persistence. The regulations would consist of emission standards that reflect the maximum degree of emission reduction achievable through the application of various measures, processes, methods, systems or techniques. In addition to the application of control technology, these measures may include process changes, substitution of materials, and reuse and recycling. The emission standards would be at least as restrictive as the best available control technology standard which the Michigan Department of Natural Resources suggested in its proposed amendment to the Clean Air Act.

As you know, the Administration also accepted the modification made to H.R. 3030, as introduced, to include a provision for the investigation of sources of atmospheric deposition of hazardous air pollutants and their atmospheric transformation products in the Great Lakes and tributary waters. This study would evaluate the adverse health and environmental effects caused by such deposition. The results of the investigation and evaluation are to be presented in a report to Congress within 5 years following enactment of the amendments.

With the combination of requirements to promulgate emission standards for major sources of the listed air pollutants and to conduct a detailed study of atmospheric deposition in the Great Lakes, H.R. 3030, as reported by the Subcommittee on Health and the Environment, contains ample authority to address potential air pollution impacts on the Great Lakes. Further legislation beyond the provisions of H.R. 3030 is not needed. As the impacts of atmospheric deposition in the Great Lakes become clearer, we will apply the authorities of the Clean Air Act, as warranted, to address them.

In the Administrator's speech of October 11, 1989, he committed the Environmental Protection Agency to an agencywide effort to focus on Great Lakes issues. He also specifically referred to the Administration's Clean Air Act amendments as a means of aggressively addressing the problem of toxic air pollutants. I am not aware of any part of the Administrator's speech that is inconsistent with the position described in Mr. Reilly's previous letter to you and repeated above. Please be assured our position on addressing Great Lakes issues has not changed. I appreciate your concerns in this area and look forward to continuing to work with you and your colleagues to complete the amendments to the Clean Air Act.

Sincerely,

William G. Rosenberg
Assistant Administrator
for Air and Radiation

cc: The Honorable Evan Bayh
The Honorable James J. Blanchard
The Honorable Robert P. Casey
The Honorable Richard F. Celeste
The Honorable Mario M. Cuomo
The Honorable Rudy Perpich
The Honorable James R. Thompson
The Honorable Tommy G. Thompson

Clean Air Act - Gen.

FILED

SEP 19 2

IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF CALIFORNIA

CITIZENS FOR A BETTER ENVIRONMENT, et al.,

Plaintiffs,

v.

GEORGE DEUKMEJIAN,

Defendants.

NO. C89-2044 TEH

SIERRA CLUB,

Plaintiff,

v.

METROPOLITAN TRANSPORTATION COMMISSION, et al.,

Defendants.

NO. C89-2064 TEH

(Consolidated Cases)

ORDER

Pursuant to this Court's September 19, 1989 oral ruling, it is HEREBY ORDERED THAT:

1. The Bay Area Air Quality Management District or the Air Resources Board, as specified, shall adopt, implement, and enforce control measures, for the following classes of stationary sources, that are designed to achieve at least the

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target emission reductions described in the 1982 Plan, according to the following schedule:

a. Large commercial bakeries: adoption by the District by September 30, 1989.

b. Pesticides: staff report and recommendation by April 1, 1990; adoption by the Air Resources Board by June 1, 1990.

c. Reciprocating engines: staff report and recommendation by April 1, 1990; adoption by the District or the Air Resources Board by June 1, 1990.

d. Consumer Solvents: staff report and recommendation by April 1, 1990; adoption by the District or the Air Resources Board by June 1, 1990.

Counsel for plaintiffs, the District, and the Air Resources Board, are to meet and confer within 20 days of September 19, 1989, to attempt to agree upon final implementation dates for the above four rules. Intervenor's counsel may join in the meet and confer with respect to the bakery rule. Within 35 days of September 19, 1989, the above counsel shall either submit a stipulation with respect to implementation dates or a statement that no agreement was reached with an explanation of the parties' respective positions and supporting affidavits, if appropriate. The Court will then impose an implementation date. If necessary, the Court will order the appointment of a neutral expert at the expense of the parties to aid in this determination.

2. The Metropolitan Transportation Commission is ordered to implement the Transportation Contingency Plan, to wit:

a. MTC shall adopt sufficient Transportation Control Measures within six months of today's date to bring the region back within the "Reasonable Further Progress" line.

b. MTC shall conclude any hearings with respect to the criteria for delaying projects within 45 days of today's date. Within 150 days of today's date, MTC shall, after public hearing, apply that criteria to projects in the Transportation Improvement Program and make a determination as to whether any projects should be delayed due to their significant adverse impact on air quality.

3. Defendants affected by this order shall file and serve reports every 90 days addressing the status of their compliance with this order.

4. The following issues are taken under submission:

a. the permit moratorium

b. the conformity assessments

c. the liability of the District with respect to stationary source contingency measures.

d. the liability of Deukmejian

e. the liability of Association of Bay Area Governments.

A written opinion will follow which addresses these issues and elaborates on the Court's reasoning with respect to

the issues ruled upon orally on September 19, 1989.

The Court retains jurisdiction over this case for all further matters.

IT IS SO ORDERED.

DATED 9/19/89

Judge Thelton E. Henderson,
United States District Court.

FILED

JAN 10 1990

RICHARD W. WIEKING
CLERK, U.S. DISTRICT COURT
NORTHERN DISTRICT OF CALIFORNIA

IN THE UNITED STATES DISTRICT COURT

FOR THE NORTHERN DISTRICT OF CALIFORNIA

CITIZENS FOR A BETTER ENVIRONMENT, et al.,

Plaintiffs,

v.

GEORGE DEUKMEJIAN,

Defendants.

NO. C89-2044 TEH

SIERRA CLUB,

Plaintiff,

v.

METROPOLITAN TRANSPORTATION COMMISSION, et al.,

Defendants.

NO. C89-2064 TEH

(Consolidated Cases)

ORDER RE CONSUMER SOLVENTS

On September 19, 1989, this Court ordered the Bay Area Air Quality Management District ("District") and/or the Air Resources Board ("ARB") to adopt, by June 1, 1990, control measures designed to achieve at least the target emission reductions described in the 1982 Bay Area Air Quality Plan ("1982 Plan") for (a) pesticides, (b) reciprocating engines,

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and (c) consumer solvents. The Court reserved determination of implementation dates for the above measures to give the parties an opportunity to informally resolve this issue. September 19, 1989 Order at 1-2. When no agreement was reached, the parties submitted detailed statements and declarations supporting their respective positions.

The Court appreciates that the important issues raised by this action deserve expeditious treatment. However, because of delays occasioned by the earthquake, and a heavy docket, this Order will address only the consumer solvent category. The Court expects that orders concerning pesticides and reciprocating engines will issue shortly. An opinion addressing those matters ruled on, or taken under submission, on September 19, 1989, will also follow.

DISCUSSION

We begin with the premise that once the Environmental Protection Agency (EPA) approved the 1982 Bay Area Plan, the pertinent state and local agencies were under a mandatory duty to carry out its provisions. Friends of the Earth v. Carey, 535 F.2d 165, 169 (2nd Cir. 1976), cert. denied, 434 U.S. 902 (1977). Equally clear is the proposition that the Court's function, at this juncture, is not to rebalance costs and benefits considered in devising the 1982 Plan, American Lung Ass'n v. Kean, 26 E.R.C. 1865, 1870 (D. N.J. 1987), or to assess the wisdom of its requirements. Rather, once a

violation of the 1982 Plan has been demonstrated, the Court has the singular role of enforcing the Plan to the extent possible. Friends of the Earth, 535 F.2d at 173 ("Once a citizen suit to enforce an EPA-approved state implementation plan has been properly commenced, the district court is obligated, upon a showing that the state has violated the plan, to issue appropriate orders for its enforcement.")

The 1982 Plan called for a 4.0 ton per day reduction in emissions from consumer solvents. 1982 Plan, Table F-3.[1] The Plan's "schedule for action" specifies 1985 as the year for both adoption and initial implementation of appropriate regulation to achieve this reduction. Id.[2] Five years after this mandatory date has passed, the Bay Area has still not adopted, much less begun to implement, control measures designed to reduce consumer solvent emissions by 4.0 ton per day.

Plainly, it is impossible for this Court to order exact compliance with the 1982 Plan, given that the 1985 date for adoption and initial implementation has long past. Thus, it is the Court's task to devise a new schedule that will result in the promised 4.0 ton per day emission reduction at the

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[1] Consumer solvents include such products as air fresheners, deodorants, disinfectants, aerosol paints, household cleaners, and hairspray. When used, they release reactive organic compounds or ozone precursors into the air.

[2] Initial implementation was to achieve a 1 ton per day reduction Full implementation (of the 4 ton per day reduction) was to occur by 1987. 1982 Plan at A-8.

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earliest feasible time or as "expeditiously as practicable." American Lung Ass'n, 26 E.R.C. at 1867, 1870, 1872. As Judge Ackerman observed, "[t]he will of Congress, as embodied in the [Clean Air Act], demands nothing more. But it certainly insists on nothing less." Id. at 1872.

The ARB, which has assumed responsibility for adopting rules for consumer solvents, except for aerosol paints,[3] proposes an adoption date of July 1991 and an outside implementation date of July 1999. While the ARB represents that under this schedule it will ultimately reduce emissions by at least 8.0, rather than 4.0, tons per day, it offers no interim strategies for reducing emissions prior to 1999. Terris Decl. at ¶3; Donohue Decl. The District offers a similar schedule for adoption and implementation of an aerosol paint rule.[4]

The ARB explains that the prolonged schedule is necessary because, based on past experience, at least 24 months is required to do the necessary background development and research to draft an effective rule. And given that the

[3] The District has assumed responsibility for enacting an aerosol paint rule.

[4] The District proposes an adoption date of June 30, 1991, an initial implementation date of July 1, 1993, and a final implementation date of July 1, 1996. This schedule assumes that the ARB will decide to enact a generic state-wide rule, which would enable the District to benefit from the background data developed by the ARB. If the ARB decides to proceed instead on a product by product basis, the District proposes an adoption date of December 1991, an initial implementation date of January 1994, and a final implementation date of January 1997.

ARB was only statutorily directed to investigate consumer solvents in January 1988, research in this area is still in the initial stages. The District contends it needs a similar amount of time to draft an aerosol paint rule, although its responsibility for consumer solvent rules dates back to the 1982 Plan. 1982 Plan at A-8, and Table F-1. Once adopted, the ARB states that more testing and study will be necessary, including perhaps some extensive testing on animals, before such rules could actually be implemented.

Both the ARB and the District contend that embarking on the above long range strategy of developing technology-forcing regulations is the only feasible means of complying with the 1982 Plan with respect to consumer solvents. However, this view is clearly contradicted by the record before the Court.

According to Daniel Donohue, Manager of the Solvents Control Section of the Criteria Pollutants Branch of the Stationary Source Division of the ARB, a ban of certain consumer products would achieve reductions as high as four tons per day by 1993. Donohue Decl. at ¶ 22. It is also apparent that banning of selected products has been accepted as a viable and technically feasible means of attaining emission reductions from consumer solvents. A 1987 study prepared for EPA, for example, found that:

> [B]anning is probably the most effective control strategy to implement for [air fresheners and household pesticide consumer solvent products]. [They] are not considered to be essential for life and non-[smog precursor chemicals] containing substitute products exist for the majority of the

product types.[5] Also, banning might serve as an impetus for industry to essentially invoke other control strategies such as reformul ion, change in application method, and development or market "push" of substitute products.

May Decl., Exh. A, p.i. The study concluded that banning just these two products in the New York City metropolitan area alone would reduce emissions at least 11 tons per day. Id; see also, "Analysis of Regulatory Alternatives for Controlling Volatile Organic Compound (VOC) Emissions From Consumer and Commercial Products in the New York City Metropolitan Area," Draft Report, August 1989 (discussing banning as feasible strategy), May Decl., Exh. B.

Neither the ARB nor the District provide the Court with any convincing evidence or reason as to why selective banning is not a feasible strategy, particularly given the existence

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[5] Alternative products for categories of consumer solvents which account for significant emissions include:

a. Pesticides: Combat Ant Control System, Combat Roach Control Bait Systems, Raid Ant Traps, Johnson's No Roach, d-Con Roach Traps, Black Flag Roach Motel, d-Con Extract, Enforcer Flea Kill for Carpets, Eaton's 4 the Roach, Bug Zapper, Taxize no-Pest Strip, Copper-Brite Roach Proof, Citronella candle/incense, Flypaper, and Flyswatter;

b. Air Fresheners: Airwick stick-ups, Renuzit Adjustable, Twice as Fresh Two Way Air Freshener, Airwick Breeze Room and Vacuum Freshener, Airwick Magic Mushroom, Love-My-Carpet Rug and Room Deodorizer, Pine Sol Spray Cleaner, Renuzit Roommate, Forest Fresh Air Freshener, Earth Scents Fragrance Sticks and Cones, and Candle-Lite Scented Candles.

c. Hairsprays: Pump spray bottles are widely available; mousses (non-aerosol, and non-pump) have significantly less chemical precursors; substituting water for alcohol could also result in significant reductions.

May Decl., ¶ 9, and Exh. A (footnote not in original).

of a number of non-polluting product alternatives. Milton Feldstein, Air Pollution Control Officer for the District, opines that a "large percentage" of Bay Area residents will travel to Stockton, Modesto, Hollister, Salinas, Sacramento, Healdsburg or elsewhere twice a year to stock up on aerosol air fresheners or other polluting consumer solvents. Feldstein Decl. at ¶ 28. This seems unlikely, particularly given the non-essential nature of the products and the existence of non-polluting alternatives for at least some products, see n.5, supra. Defendants have provided no evidence which even suggests, much less demonstrates, that Bay Area consumers would so sabotage a selective banning rule as to render it an unfeasible method of control.[6] Nor do any of the other assorted objections raised by the ARB and the District come close to demonstrating a lack of feasibility.[7]

Plaintiffs also point to other potential strategies for

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[6] Any noncompliance can also be reduced by consumer education of the environmental harm cause by banned products. See May Decl., Exh A., p. 1.

[7] For example, the ARB contends that development of a Bay Area product ban would detract from their other statewide efforts. However, the Clean Air Act requires states to provide adequate personnel and funding to carry out its duties under an EPA approved plan. 42 U.S.C. §§ 7410(a)(2)(E), 7502(7). Cf., Friends of the Earth v. Carey, 552 F.2d 25, 35 (2nd Cir. 1977), cert. denied, 434 U.S. 902 (1977)(City can not escape obligations voluntarily undertaken on grounds that the plan failed to ensure that the state would have necessary personnel and resources to implement plan).

The ARB also points out that air pollution is worse in other parts of California than the San Francisco Bay region. This fact is irrelevant to defendants' obligation to fully implement the 1982 Plan.

reducing consumer solvent emissions on a shorter schedule, such as requiring certain reformulations (i.e. reformulating insect repellent to liquid forms or replacing aerosol propellants with CO_2). See May Decl. at ¶¶ 6-7, and Exh. A. Neither the ARB nor the District demonstrate why certain reformulations could not be implemented on a significantly shorter time period than that proposed.

In short, it is apparent that no technical or other obstacles make reduction of consumer solvent emissions infeasible in the short term. What is clear is that the ARB and the District strongly prefer their proposed long term approach over any measures that would bring more immediate results. Preferences, however, simply can not be accommodated at this late hour. Plaintiffs are entitled to compliance with the 1982 Plan on the most expeditious schedule feasible. American Lung Ass'n, 26 E.R.C. at 1872.

We emphasize that defendants' approach, would, in effect, allow continued violation of the 1982 Plan for several additional years. Such a result can not be sanctioned when alternative methods of compliance are available. This is particularly so given the District's appalling failure to take any significant action on consumer solvents since 1982, despite its mandate to do so under the 1982 Plan. The District still has not completed the basic task of

inventorying consumer solvent products[8] and little to nothing has been done to develop specific rules.[9] Had the District embarked on its "preferred path" in 1982, the Court would have no need to be involved in this matter today. However, the District can not ignore its obligations under the 1982 Plan, with respect to consumer solvents, for the better part of seven years and then expect approval of a schedule that further delays full compliance for perhaps some 12 years beyond the 1987 deadline for final implementation. Defendants are not entitled, at this juncture, to impose the continued risks of unclean air upon the public because of policy preferences, when feasible alternatives for earlier compliance are available. This, of course, is not to suggest that

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[8] Sections 110(a)(2)(F)(iii) and 172 (b)(4) of the Clean Air Act, 42 U.S.C. §§ 7410(a)(2)(F)(iii) and 7502(b)(4) require a "comprehensive, accurate, current inventory of actual emissions from all sources . . . which is revised and resubmitted as frequently as may be necessary. . . "

[9] See Feldstein Decl. at ¶ 7 ("The District currently has very little information on the emissions of precursor organic compounds from consumer aerosol spray paints"); Guthrie Decl. at ¶ 4 ("there has been no significant technical work performed by the [statewide Technical Research Group] during the last five years. Before that, there was no technical work performed.")

The 1982 Plan, however, specifically contemplated investigation of an aerosol paint rule, which it was estimated, could alone achieve a 4.5 ton per day reduction:

> A communication from ARB states the technology regarding aerosol paint cans is evolving towards 75% control, and should be available by 1987. This technology could provide a 4.5 ton/day reduction in organic emissions from this product line alone.

1982 Plan at A-8.

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defendants should not vigorously pursue their proffered long term strategy for reducing emissions from consumer solvents. However, in light of this Court's obligation to enforce the 1982 Plan, and defendants' failure to demonstrate the infeasibility of shorter term strategies, interim measures must also be adopted on a schedule consistent with the spirit of the 1982 Plan.

Accordingly, and good cause appearing, it is HEREBY ORDERED that the Bay Area Air Quality Management District or the Air Resources Board shall adopt, implement, and enforce control measures for consumer solvents that are designed to achieve a 4.0 ton per day reduction in emissions according to the following schedule[10]:

1. Adoption by July 1, 1990;[11]

2. Initial implementation of emission reductions of at least 1 ton per day by February 1, 1991;

3. Full implementation by February 1, 1993.

IT IS SO ORDERED.

DATED: 1/10/90

Judge Thelton E. Henderson,
United States District Court.

[10] On November 8, 1989, the ARB adopted a regulation concerning antiperspirant and deodorant products. Terris Decl. ¶ 4, and Exh. 6. Anticipated emission reductions for the San Francisco Bay Area resulting from this rule may be considered in determining compliance with this schedule.

[11] Although this Court's September 19, 1989 Order specified a June 1, 1990 adoption date, the Court has extended this date to account for its brief delay in issuing this decision.

THE WALL STREET JOURNAL
Friday, January 12, 1990

Clean air Act — gen

REVIEW & OUTLOOK

Justices vs. Judges

The Supreme Court this week sent lower federal judges a message. Easily translated, it says: "C'mon guys, cool off!" This shot across the bow of America's most activist judges came in a case out of Yonkers, New York. But the larger target is all those judges who've elbowed aside elected officials from running schools, housing, jails and other programs far beyond the constitutional and practical responsibilities of judges.

The justices ruled that Judge Leonard Sand went too far when he turned the financial thumbscrews on some elected officials to get them to carry out his own scheme to create new public housing projects. One federal appeals court had already declared unconstitutional his stupefying $100 fine (doubling daily) against the city, which would have reached $3 billion in a month. Judge Sand also held four city councilmen in contempt, fined them personally $500 a day and threatened to jail them until they cried uncle.

By a 5-4 margin, the Supreme Court this week invalidated the fines against the city councilmen. A reasonable fine against the city may be appropriate where a judge is trying to enforce a consent decree, but "this sort of individual sanction effects a much greater perversion of the normal legislative process." Chief Justice Rehnquist's opinion noted that the fines were "designed to cause them to vote not with a view to the interest of their constituents or of the city, but with a view solely to their own personal interests. . . . to avoid bankrupting themselves." Yonkers voters understood the unfairness. *Spallone v. U.S.* was brought by recently elected Mayor Henry Spallone.

Although this was a victory for judicial restraint, it's worth noting that the court did not take its logic as far as we think it goes. One reason Yonkers consented to Judge Sand's plan to build new public housing units in the first place was that he had threatened what we now know were the unlawful fines. A contract coerced at the end of a gun should not become enforceable because the finger on the trigger belonged to a federal judge.

The Supreme Court may have more to say about activist judges when it rules in a related case. Federal Judge Russell Clark has an ambitious, $500 million-plus desegregation plan for Kansas City, Missouri. His idea is to spend enough to entice whites back to the schools so that he has the fodder to craft acceptable racial balance. Judge Clark's plan includes building several Olympic-sized swimming pools, a 50-acre educational farm, a planetarium and a model United Nations lab. The only hitch is that the voters kept refusing to approve higher taxes or a bond to pay for his plan.

So Judge Clark simply issued an order that nearly doubled property taxes and added a 1.5% surcharge on state income taxes from residents and businesses in the area. The Supreme Court will decide whether judges really have the taxing power. The Federalist Papers confidently assured voters debating whether to approve the Constitution 200 years ago that the judiciary would have "no influence over either the sword or the purse."

Judges Sand and Clark have plenty of company. Just this week, federal Judge Thelton Henderson ordered a reduction in air pollution for San Francisco by four tons a day by 1993. He is thinking about banning the sale of some or all of the following: air fresheners, deodorants, disinfectants, aerosol paints, household cleaners and hair sprays. Judge Henderson added that he would soon order a timetable to limit or ban farm pesticides, lawn mowers, leaf-blowers and power tools. A lawyer for the Bay Area Air Quality Management District said the judge's plan "sounds impractical on the face of it."

Practicality is an irrelevant consideration in the narrow confines of some judicial chambers. So what if criminals are freed from prisons that federal judges deem "overcrowded" or mental patients forced from institutions judges deem "substandard"? Many judges now view the law as a set of absolutes giving them license to mandate, regulate and tax—without any thought to the trade-offs, balancing and common sense we insist on from our elected representatives.

There is a silver lining. Judges Sand, Clark and Henderson all were appointed to the bench in an era disappearing into the historical mists. Messrs. Reagan and Bush have selected their judges chiefly because these men and women promised sensible restraint and respect for the democratic procedures we have developed for deciding hard social issues. They promised to avoid what Robert Bork has called judicial ukases. Like the Supreme Court majority, these judges understand that the legitimacy of the law is at risk when judges pretend to powers that no one ever gave them.

CAA - Ger

ANALYSIS

Running on Empty: Auto Emissions Plans Short on Specifics

As part of its Clean Air Act proposals, the Bush administration is promoting greater use of cars that burn non-polluting fuels. Unfortunately, such details as who will produce and who will buy these vehicles have been all but ignored.

BY WILLIAM PEDERSEN JR.

The Bush administration's proposals to amend the Clear Air Act promise major air-quality benefits from a program to introduce millions of "clean-fuel vehicles" into heavily polluted urban areas. Yet the legislative language that accompanies that promise, which is still being actively considered in Congress, does not answer the most basic questions about how such a program might work.

Given the magnitude of the social choice at issue, a responsible clean-fuel vehicle program should tell us in advance how vehicles and fuels will be selected, how those vehicles and fuels will be placed in use, and how the program will make the environment better instead of worse. The administration's proposals fail on all three counts.

The administration's bill starts by requiring the Environmental Protection Agency to set "performance standards" that quantify the potential benefits of using clean-fuel vehicles. The program must then be designed to achieve these standards.

The EPA must base these standards *solely* on "the long-term reduction in ozone-producing and toxic air emissions that . . . may reasonably be expected to result from the use of clean alternative fuels formulated to provide maximum reductions of such emissions." Methanol, ethanol, natural gas, electricity, and reformulated gasoline are cited as examples of such fuels.

If this language is taken literally, only one possible clean fuel—electricity—can qualify. Only electric vehicles have no emissions of any kind.

Assuming the bill allows the EPA to select other fuels, it completely fails to set standards for that selection. For example, how will the EPA make its choice if one fuel is better than another in reducing ozone precursors, but worse in reducing toxics? What if two competing fuels emit different amounts of different toxic chemicals? What if one fuel has less long-term toxicity than another, but is explosive or acutely poisonous?

Beyond that, low emissions are not a function of the fuel alone, but of the vehicle and the fuel in combination. To avoid confusion, a control scheme should assign the leading role to designers of either vehicles or fuel. In fact, for 20 years, the Clean Air Act has controlled emissions by setting standards for motor vehicles and authorizing such fuel regulation as was needed to make these standards effective. In an unexplained break with that pattern, the administration bill fails to address this crucial chicken-and-egg question.

For the administration's bill to realize its goals, 500,000 to one million clean-fuel vehicles must be produced and sold every model year, in predictable quantities, to customers in each of the clean-fuel regions in 10 states—California, New York, New Jersey, Connecticut, Illinois, Indiana, Maryland, Delaware, Wisconsin, and Pennsylvania. These vehicles and their fuels must be sold and operated in competition with more conventional vehicles and fuels.

An enforceable program for producing a set total of vehicles will require the EPA to order individual companies to produce set numbers of vehicles. Indeed, the bill expects this, for it authorizes the agency to grant credits to any company that produces clean-fuel vehicles in excess of its baseline requirements. Experience with rationing in wartime, and with the petroleum allocation program in the 1970s, shows that such allocation schemes for consumer products are difficult and complex.

Yet the bill does not explain how the quotas to produce clean-fuel vehicles will be allocated among manufacturers. Will these allocations be based on past production, economic health, technical capability, or other factors? Will waivers be authorized in hardship cases? If the EPA has discretion to design the allocation, what standards must it follow, or is its discretion boundless?

One answer sometimes informally suggested by administration officials is to require manufacturers that sell cars in clean-fuel areas to sell a given number of clean-fuel vehicles for every 100 conventional vehicles. But what will prevent a manufacturer from simply stopping sales in these areas, leaving residents to travel outside the region to buy their cars? Can the EPA require the manufacturer to keep selling in the area? Can it forbid residents to register cars they had bought outside the area? If a manufacturer simply lacks the capability to produce the type of clean-fuel vehicle required, will any relief be authorized?

All these issues would arise if the EPA were trying to allocate the obligation to produce a single federally selected clean-fuel vehicle. But the bill does not assign the ultimate choice of types and quantities of vehicles to the federal government. Following the general pattern of the Clean Air Act, it calls on states to make this choice in their implementation plans. That raises additional questions.

What will happen if state plans are inconsistent with what the market can provide? For example, what if the state plans all call for natural-gas vehicles while vehicle manufacturers (and the EPA) prepare for a mixture of methanol and electric vehicles? Will the EPA be authorized to adjust the state plans? If so, what principles will the agency follow in reallocating the available vehicles? How will the EPA assure that the program is implemented by states that have been denied their first choice of vehicles? If the agency is not authorized to adjust the state plans, what will become of the clean-fuel program?

Even if satisfactory programs can be devised, they risk having only a paper existence. It may be hard to sell clean-fuel vehicles. Their operations will be restricted by fuel availability, they will be entirely new products with "shakedown" problems, they will have no resale history, and they and their fuels may well be more expensive than conventional vehicles and fuels.

The administration's bill, accordingly, requires implementation plans for clean-fuel areas to contain "all measures necessary to make the use of clean alternative fuels in clean-fuel vehicles . . . economic from the standpoint of vehicle owners."

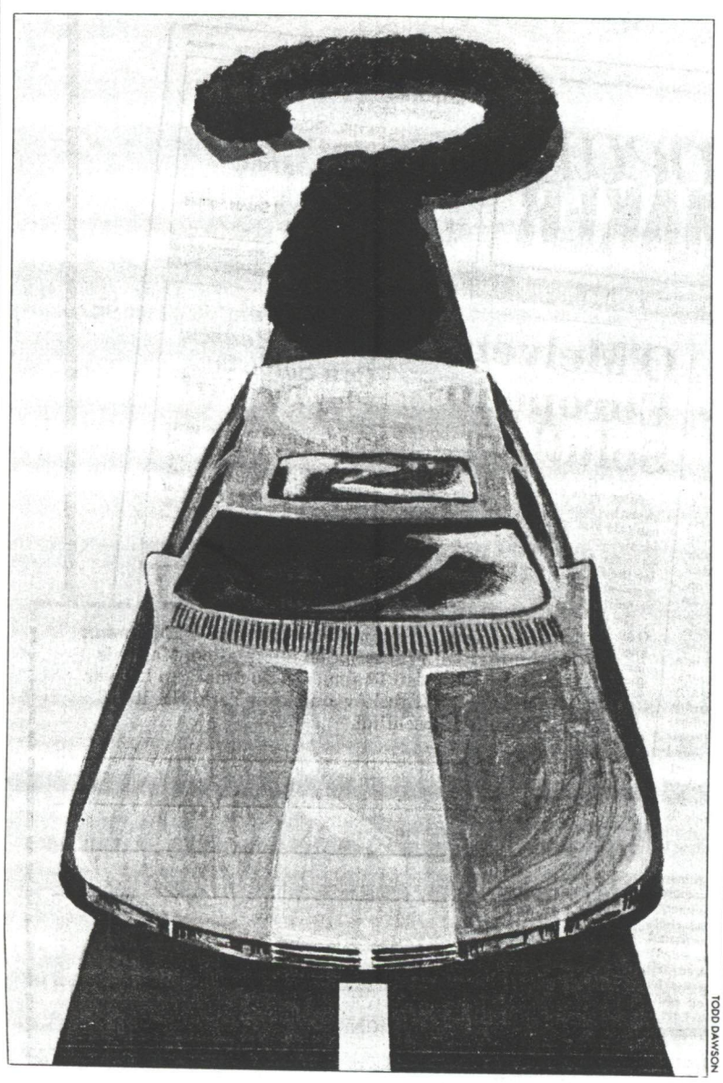
This language appears to require states to subsidize clean-fuel vehicles and clean fuels or to control their prices or to tax competing products to the extent necessary to attain the regional sales quotas for clean-fuel vehicles. It is surprising that such a radical suggestion did not receive more discussion when the bill was announced. Yet if radical steps are not authorized, what alternative mechanisms will clear the market so that the sales quotas will be met?

Market Manipulation

Many sub-questions arise in designing a price-control or subsidy program. Since the cost of operating a clean-fuel vehicle consists of both its purchase price and the price of its fuel, the overall program could be made more attractive to consumers either by subsidizing fuels or by subsidizing vehicles (or by imposing price controls on one or the other). How will the EPA chose between these various competing approaches? How will the EPA evaluate the effectiveness of state plans that choose among them?

Quite probably states will be reluctant to promulgate subsidy or price-control programs tough enough to erase the market disadvantages of clean-fuel vehicles. Will the EPA then be authorized to promulgate federal subsidies and price controls? If so, what standards will apply? Where will the money come from? If not, isn't there a real chance that the entire clean-fuel program could unravel due to a failure to sell the contemplated number of

SEE CLEAN AIR ACT, PAGE 32



TODD DAWSON

William Pedersen Jr. is a partner in the D.C. office of Seattle's Perkins Coie. He served as deputy general counsel and associate general counsel at the Environmental Protection Agency from 1977 to 1985. Pedersen has advised the American Petroleum Institute on Clean Air Act questions.

CLEAN AIR ACT FROM PAGE 31

vehicles? What measures will be taken under such circumstances?

Exactly the same problems of allocating production among manufacturers and states—and of imposing subsidies or price controls—arise regarding clean fuels. And the fact that both vehicles and fuels will need to be allocated and subsidized raises additional challenges of making the two allocation schemes consistent. None of these issues is discussed in the bill.

The environmental and social impact of a clean-fuel program runs far beyond the fuel itself. Electricity might be the cleanest possible fuel in the Los Angeles basin, but environmental damage would result from constructing power plants outside the basin to supply it. Similarly, the overall equation for methanol must consider the environmental and social costs of the plants that produce it.

The bill's language does not give these secondary impacts *any* role in setting performance standards. Yet if only the short-term impact on air quality governs the setting of performance standards, the result may well be standards that cannot be implemented or that do more harm than good.

> Should the administration's 'clean fuel' suggestions be enacted exactly as written, the system they contemplate would certainly collapse under the weight of its unanswered questions.

An opposite problem arises in actually establishing the program after the performance standards have been set. The administration bill directs the EPA to "consider," among many other things, the "ozone, toxic, and global-warming benefits of the program" and "other environmental, economic, energy, national security, and safety implications of the program." It does not specify the weight that the agency should give these factors, separately or together, in designing the vehicle-allocation, fuel-allocation, subsidy, and price-control systems required by the total program.

Nor does the bill set any limits to the EPA's authority to make decisions based on such considerations. Will the agency be free to decide that, in view of the drawbacks of some or all the vehicles and fuels being considered, the overall program shall not go forward? Similarly, may the EPA conclude that an alternative fuel with low ozone and air-toxics benefits should be chosen because it is superior in other ways—for example, in its impact on global warming? If such decisions are proper, is not the EPA's discretion boundless? If not, how will such clearly important factors be considered?

Nothing has more damaged efforts to protect the environment than laws making unreachable promises or laws that tried to make difficult and politically unattractive regulatory questions look easy. For example, Congress in 1972 promised an end to discharges into the water, while simultaneously declining to address the "nonpoint sources" (such as farms and construction sites) that cause half of those discharges, a failure that has persisted to this day.

Clean fuels may or may not have their place in future efforts to attain higher air-quality standards. But should the present suggestions be enacted exactly as written, the system they contemplate would certainly collapse under the weight of its unanswered questions. A program with such potential for adding to the list of unfulfilled environmental promises needs major surgery—if, indeed, it deserves to survive at all. □

An Intelligence Briefing For Your European Business Ventures

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European DEALMAKER

- **BRITISH MERCHANT BANKS** Finesse Fee Disclosure- page 2.
- **CHICAGO'S MAYER, BROWN'S** £200,000 Teaser Raises Spectre of 'Poaching' - page 4.
- **TAKEOVER PANEL** Teaches KKR a Lesson - page 2.
- **N.Y.'S WINTHROP, STIMSON** Snares Former EC Chief Sutherland - page 3.

Vol. 1, No. 1 — The Bankers and Lawyers Shaping the New Europe — September 1989

Continental LBO Firms Bash Outsiders and Prevail

Jean-Daniel Camus, an equity member of LBO France, the largest leveraged buyout investment firm in that country, is blunt when measuring the value of an American or British dealmaker on a continental European transaction.

"They bring nothing we need," Camus says flatly. "We don't have junk bonds. We don't have asset stripping. And we don't have mezzanine financing," Camus continues, summarily dismissing nearly all the financial wizardry American and British advisers have concocted to transform high-risk leveraged buyouts into alluring investments. Pushed, Camus allows that there could be one possible reason for welcoming the non-Continentals: "They bring the money that is willing to take a little more risk."

Although Camus himself acknowledges his statements are hyperbolic, the comments reflect an emerging marketing strategy for continental (non-British) European dealmakers eager to preserve their burgeoning LBO market for themselves. Fledgling conti-

O'Melveny's European Solution

After eight months of Concording between his Washington office and Europe's capitals and industrial centers, Michael Masin—the O'Melveny & Myers partner charged with developing a coherent plan for the California firm's European practice—had good news for his management committee.

The Three Lazard Houses: Can Soloists Play Together?

Robert Agostinelli, a partner of New York's Lazard Frères & Co., has been expounding from behind the desk of his London office on one of his favorite subjects—himself—for about an hour, when his secretary interrupts.

Agostinelli's boss is calling, she reports. On the line is Lazard Partners chairman

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CAA - Gen

WARREN BROOKES 1/29/90 WT

Killer trees vs. cars?

This is the third of three columns addressing the Environmental Protection Agency's smog problem.

The Senate is now considering Clean Air Act Amendments (S 1630) which could destroy what's left of the U.S. car industry, without solving the nation's complex urban ozone (smog) problem.

That is because the Senate bill is rooted in the same bad science and anti-auto mindset that dominated a "greenies-only" conference at the Smithsonian Institution last September when NBC's Andrea Mitchell regaled the audience with the following statement:

"For eight years I covered the Reagan White House which concluded that acid rain was really caused by 'killer trees.' "

Not only did President Reagan *never* suggest that trees caused acid rain, but his 1980 assertion that smog was caused in some measure by "gases from trees and vegetation" was no joke.

As Newsweek magazine reported last June, "He [Reagan] had the right idea. Last September, atmospheric chemist William Chameides of Georgia Tech reported in Science magazine that trees are major sources of hydrocarbons, a main ingredient in ozone (smog) . . . This month the Environmental Protection Agency confirmed Chameides' findings — and is now re-examining its pollution-control strategy."

see **BROOKES,** *page F4*

Warren T. Brookes is a nationally syndicated economics columnist.

BROOKES

From page F1

Mr. Chameides' research was stimulated by the city of Atlanta, which from 1979 to 1985 spent more than $740 million to cut volatile organic compounds by 50 percent. Yet, by the 1985-1987 period, Atlanta's ozone levels were *higher* than in 1979, causing Georgia's EPA to conclude "the present national ozone abatement strategy is flawed." (Table)

"That is because," Mr. Chameides told us, "the EPA assumes that man-made hydrocarbons [volatile organic compounds] are the only ones that count. That ignores the fact that in many regions, particularly the South [where wood volume soared 66 percent since 1952], natural hydrocarbons from trees and vegetation can be as large or even larger in volume. In those cases, nitrogen oxide, which we don't control very well, becomes the main culprit."

Mr. Chameides' 1988 research warned that "Natural hydrocarbons react faster to nitrogen oxide than volatile organic compounds and thus can have a significant effect in spite of their low concentrations." Also, natural hydrocarbon emissions increase with heat, suggesting they were the main culprit in the sudden 1988 ozone spike, especially in the Northeast and Southeast.

In September 1988, Science magazine editorialized: "Lack of success of the [ozone] program and evidence of the role of biogenic hydrocarbons in producing ozone are causing some geophysicists to question whether a continuation of current policies of the EPA will achieve control of ozone levels." Since 1974, total automobile volatile organic compounds have been cut 50 percent, yet urban ozone remains very high.

Even the Senate report admits, "The complex mechanisms for ozone formation and the sources of ozone precursors and their interactions remain somewhat unclear." Indeed they do.

Research from 1988 to 1989 by Greg MacRae of Carnegie-Mellon University shows Congress and the EPA are on the wrong track: "What we find is that by concentrating entirely on volatile organic compounds we have minimized the impact of our controls both on ozone formation as well as on particulates. Our present strategy simply isn't working.

"We found that the really critical need was for much more reduction in nitrogen oxide, and that reducing organics [volatile organic compounds] merely slows down the chemistry, but it doesn't reduce the ozone peak. It merely shifts it downwind. Even if you doubled the reductions on volatile organic compounds in those areas where natural hydrocarbons are higher, it does no good."

Unfortunately, that is precisely what the Senate bill now mandates in a blunt-edged strategy which, while cutting nitrogen oxide, also forces all cities in the country to make the same deep volatile organic compound cuts as Los Angeles, which alone accounts for 25 percent of all ozone exceedances. As Science magazine argued, "If the EPA is to regulate intelligently, it must be better informed about the differing circumstances and mechanisms that exist in various rural and urban areas." No two markets have identical ozone formation.

"That is precisely why the president's approach is so much better," said William Rosenberg, the EPA's top administrator on clean air, who told us: "We agree there's a high level of variability and uncertainty on ozone formation. The president's bill allows us to deal with that on a case-by-case basis by mandating overall ozone reduction standards and then letting each area choose the best strategy, including the use of alternative fuels.

"The Senate bill is simply the old 1970s strategy of squeezing down hard on tailpipe emissions without recognizing that can in some places be counterproductive," Mr. Rosenberg said.

Indeed, the entire Senate ozone bill is counterproductive. Not only does it raise car costs 7.5 times as much as the president's bill (slowing fleet turnover, raising emissions), it introduces a "global warming" requirement having nothing to do with clean air.

Under it, carbon-dioxide emissions are cut to 266 grains per mile by model year 1996 and 220 grains by the year 2000. This mandates a 40 mile per gallon fleet average by 2000. That means the end of even the compact family car and of the U.S. auto industry. Apparently, the only thing safe from this stupid bill is the smog.

IS SMOG CONTROL WORKING?

The Atlanta Case History

	VOCs (emissions)	Ozone (ppm)	Days above 0.125 ppm (two-year average)
1979	187,000	0.18	12
1987	90,000	0.20	14
% change	(52)	11	17

Source: Georgia Environmental Protection Agency

The Washington Times

WARREN BROOKES

WT 1/25/90

Ozone cover-up inside the EPA

CAA - Gen

This is the second of three columns addressing the Environmental Protection Agency's smog problem.

After nearly 15 years and $32 billion a year in emissions-control costs, Americans are convinced urban air has gotten dirtier and more dangerous. Based on this perception, the Senate is trying to pass a bill that will require them to spend another $24 billion a year to do more of the same thing.

Between 1975 and 1986, every indicator of air quality improved dramatically: Sulphur dioxide was down 40 percent, carbon monoxide down 40 percent, suspended particulates down 22 percent, lead down 85 percent and ozone down 20 percent.

So why are we so sure things are getting worse? Because in September 1988, after the hottest U.S. summer since 1940, the Environmental Protection Agency rushed out with preliminary data showing surface ozone — smog — soaring out of control.

The number of days during which the 186 EPA metropolitan sites collectively exceeded the EPA's ozone standard shot up 60 percent — from 854 days in 1987 to 1,369 days in 1988. The nation's average ozone level, after falling modestly but steadily from 0.153 parts per million in 1975 to 0.123 in 1986, reportedly jumped back above 0.15 in 1988. (Table)

The number of metropolitan sites not in compliance more than doubled from 1986, even as total automobile emissions were falling by another 15 percent. This was potent stuff in the heat of an election. Yet the only reason ozone readings suddenly soared was not auto emissions, which fell, but temperatures, which rose.

That was immediately proven in 1989, when temperatures fell, and so did ozone exceedances, by about 65 percent to what could be the lowest recorded level: an estimated 480 days to 520 days total for 186 areas, while the number of areas out of compliance fell from 111 to under 50. The average ozone level fell 20 percent to 30 percent.

As a result, through last Oct. 16, 22 of the 31 areas listed by the Senate Environment Committee Staff in the Clean Air Amendments Report as "serious areas" of ozone exceedance were in full compliance in 1989, as were two of the eight areas classified as "severe." *None* of those were still "severe" (above 18 violation days) in 1989.

But the EPA, which couldn't wait to publish the bad news in 1988, told us they won't release 1989 data until April. EPA officials said this is "in full accord with normal procedures," but Kay Jones, former senior environmental scientist at both the EPA and the president's Council on Environmental Quality, charges:

"The EPA is determined to hang on to that 1989 ozone exceedance data until next summer, by which time they expect the Clean Air Program will have been passed. Yet Title II of that act is based primarily on a two-year (1987-1988) temperature spike that makes the ozone situation look a lot worse than it is."

Mr. Jones says the 1989 data collected by the Clean Air Working Group (an industry lobby) confirm his thesis "that simply by allowing fleet turnover to take place and the post-1981 cars to become dominant, almost all significant ozone problems will disappear, with the exception of Los Angeles and Houston."

But EPA's head of air and radiation programs, William Rosenberg, warns that "1989 was just as much an aberration in temperature and moisture as 1988." He says that despite 80 percent reductions in hydrocarbon emissions and 60 percent less nitrogen-oxide emissions "much of this impressive vehicle-emission reduction has been and will continue to be offset by the continual growth in the number of motor vehicle miles traveled."

"We have to run harder just to break even," he said in an interview. He told Congress on Jan. 11 that "based on data from 1986 to 1988, 101 urban areas exceed our health standards for ozone, and unfortunately many of these areas will not reach compliance without stringent additional control programs."

Even so, Mr. Rosenberg does not really disagree with Mr. Jones' stated concern that Congress has decided "what's good for California would also be good for the nation." In other words, even if the rest of the nation doesn't need it, the technology to deal with California's problems is available, so we should use it.

Mr. Jones charges that "this is because both the Senate and the EPA are deliberately selecting the worst-case data and using it to make bad law instead of looking carefully at actual trends.

"But you look at the long trend in Chicago, adjusting for unusual temperature spikes, and it shows steady improvement. In 1989, through Oct. 16, Chicago had only three exceedance days, the lowest since we started measuring, and a continuation of a downward trend from an average range of 10 days to 15 days a year."

The EPA's Mr. Rosenberg says Mr. Jones is putting the best face on a situation that in fact threatens to get much worse, even with continuing reductions in emissions. But, if that is the case, are we using the right ozone strategy? Will spending another $24 billion a year bring us to compliance? Probably not. (See next column.)

Warren T. Brookes is a nationally syndicated economics columnist.

OZONE EXEEDANCES IN METRO SITES, 1983-89

	Exceedance days	Number of non-compliant areas	Transp. vocs* (million tons)	Ozone Levels (ppm)
1974	NA	NA	10.9	0.151
1983	1,195	88	7.3	0.145
1984	817	52	7.3	0.130
1985	688	49	6.7	0.127
1986	542	58	6.4	0.123
1987	854	69	6.0	0.137
1988	1,369	111	5.7	0.151
1989 Est.*	480-520	40-50	5.4	0.121
Percent Change 1983-88	14.6	26	(22.0)	4.1

*Volatile organic compounds 1989 estimates projected by author from measurements through Oct. 16 in 71 urban areas provided by Clean Air Working Group.

Source: Environmental Protection Agency, President's Council on Environmental Quality.