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Folder Title:
Air Toxics

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Outline of Agreement on Air Toxics

Residual Risk

EPA is to conduct a 2 year residual risk review after MACT compliance date for each source category.

At the end of the 2 year period EPA is to promulgate emissions standards that would achieve risk levels for the MEI (theoretical) of 10^{-4} and 10^{-6} . The compliance date for the standards is 3 years after enactment.

Risks Greater Than 10^{-4} :

Sources which cannot meet 10^{-4} emissions standard with available technology may do a site-specific health assessment to measure risk to the actual population. The public must have the opportunity to review and comment on the health assessment before a permit is issued.

Sources that exceed 10^{-4} to the maximum exposed actual person must correct the problem before the compliance date (3 years after promulgation) or shut down. In addition to controls, mitigation measures, except tall stacks, may be used to reduce risks.

Sources that can reduce emissions below 10^{-4} risk levels to the maximum exposed actual person must use available technology to achieve a 10^{-6} risk to the maximum exposed actual person.

Sources that cannot reach 10^{-6} risk levels to the maximum exposed actual person must employ available technology and be reviewed for further control every five years.

The legislation is to contain a definition of "available" based on committee report language.

Risks Less Than 10^{-4}

Sources which do not exceed 10^{-4} emissions standard have three options:

(Option 1) Sources may comply with the 10^{-6} emissions standard.

D.K. 8/9 - this
would shut plants
down

(Option 2) Sources that cannot reach 10⁻⁶ risk level to the MEI (theoretical) may employ available technology and be reviewed for further control every five years.

(Option 3) Sources that cannot reach 10⁻⁶ with available technology may conduct a site-specific health assessment (subject to public comment) and demonstrate that risks to the maximum exposed actual person are below 10⁻⁶ for each pollutant and below 10⁻⁵ on an additive basis for all pollutants. In addition to controls, demonstrations may include mitigation measures, except tall stacks. Actual exposures must be reconsidered when permits are renewed.

Leak Detection

Senator Reid has prepared specific legislative language. The Administration would like changes in the Reid language.

Electric Utility Regulation

EPA will conduct a study of particulate emissions from electric utility boilers to be completed three years after enactment.

EPA will conduct a study of mercury emissions from electric utility boilers considering emissions, the health and environmental effects of the emissions, control technologies and the costs of control to be completed four years after enactment.

Problem for TVA → require
EPA will promulgate MACT standards for particulates and mercury not later than five years after enactment. Utilities shall comply with the standards not later than eight years after enactment.

MACT standards for the acid gases chlorine, fluorine and _____ shall not be required. However, emissions of the acid gases are counted to determine whether a source is a major source.

Mandatory MACT for All Source Categories

The Senate bill except:

Emissions from oil and gas wells and compressor stations which are in contiguous areas and under common control shall not

be aggregated for the purpose of determining whether the well or station is a major source.

EPA is not required to list a category of sources for control, if it determines that no source in the category emits carcinogenic pollutants presenting a risk greater than 10^{-6} to the MEI.

Area Sources and Monitoring

The Senate bill except:

EPA's national urban air toxics strategy to be submitted to the Congress in 5 years is to demonstrate that cancer risks attributable to all sources of air toxics including major sources will be reduced by 75%.

The requirement that all cities above 250,000 conduct monitoring for air toxics will be deleted. In the alternative, EPA is to prescribe monitoring and modeling requirements as part of the national strategy which are sufficient to demonstrate that the strategy is achieving the cancer reduction goal.

Accidental Releases

The Senate bill except:

EPA is to conduct an annual audit of X% of the hazard assessments which are prepared.

EPA is to enforce hazard assessment as if it were a section 114 requirement and is authorized to issue administrative orders to assure compliance.

Definition of MACT

For existing sources the "top-down" procedure is to be replaced with a floor based on the average control achieved by the top 10% of sources in the category.

The benchmark language is to be clarified to indicate that the benchmark is an average reduction over the source category and not applicable to individual sources.

United States Senate

WASHINGTON, D.C. 20510

February 6. 1990

Dear Colleague:

As the Senate continues to consider amendments to the Clean Air Act, we believe it would help further the debate if Members received a briefing from an individual in the scientific community, specifically on the issue of air toxics and the concept of residual risk.

Consequently, we have arranged for Dr. Bernard Goldstein, Director of the Environmental and Occupational Health Sciences Institute and Director of the Graduate Program in Public Health, (joint programs of Rutgers University and the University of Medicine and Dentistry of New Jersey-Robert Wood Johnson Medical School), to come and brief **Members Only** tomorrow, February 7th, at 3:00 in Room S-146.

Many of you will remember Dr. Goldstein from his days when he served as EPA's Assistant Administrator for Research and Development. Prior to that, he chaired the Agency's Clean Air Scientific Advisory Committee.

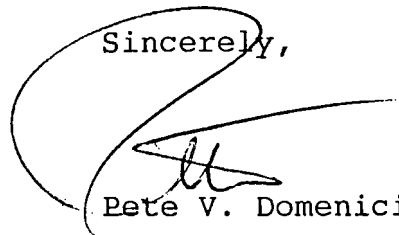
We view this as an opportunity to begin to more thoroughly understand the different toxic proposals that have been put forth, and we encourage you to take advantage of this session.

If you plan to attend, please have your office call one of our offices. We look forward to seeing you.



John B. Breaux

Sincerely,



Pete V. Domenici

Preliminary Analysis of the Impact on the AEP System of S.1630, Title III
Control of Hazardous Air Pollutants

Impact of S.1630 Title III

Title III of S.1630 is geared to amend Section 112 of the Clean Air Act (the control of hazardous air pollutants (HAPs)). This bill would have a direct impact on American Electric Power and its customers as each power plant in the AEP System would be classified as a "major source" and could be subject to technology-based emission control standards. For the AEP System, capital costs required to meet these standards could exceed \$8 billion.

Introduction

Title III of S.1630 defines a "major source" of HAPs as "any stationary source (including all emission points and units of such source located within a contiguous area and under common control) that emits, considering installed and operating controls, in the aggregate ten tons per year or more of any HAP or twenty-five tons per year or more of any combination of HAPs". The bill lists 191 substances defined to be HAPs. Table 1 lists estimated emissions of those substances which are potentially emitted from coal-burning power plants. The estimates in Table 1 show that some AEP plants emit at least 10 tons/year of chromium manganese, nickel, selenium or formaldehyde, all plants emit at least 10 tons/year of chlorine and phosphorus, and all plants emit at least 25 tons/year of a combination of all listed HAPs.

Basis For Emission Estimates

The emission estimates shown in Table 1 were derived using emission factors obtained from two references (as documented in Table 2) and the five year actual coal burn at each respective plant. The Radian report appears to be the most comprehensive reference available on the topic of HAP emissions from coal-fired power plants. The report summarizes Radian's analysis of actual HAP emission tests conducted on various combinations of utility boilers, coals and control technologies. Chlorine, mercury, and formaldehyde are emitted in a gaseous form while the remaining substances adhere to the fly ash and are emitted as particulate matter. It is important to note that the Table 1 estimates may not be representative of actual emissions as there is no plant-specific HAP emission rate data available for AEP plants.

Options for HAP Emission Control

The degree of HAP emission reduction which may be required if S.1630 is enacted into law is unclear. The bill requires emission standards that achieve the "maximum degree of reduction". This conceivably could require the installation of baghouses for further control of particulate HAPs and/or scrubbers to control gaseous HAPs. However, the bill states that a 90% reduction (95% for particulates) from uncontrolled emissions is an appropriate benchmark for existing plant emission standards. It is assumed that this provision would exempt from regulation those substances which are removed to these levels by existing control equipment. If it could be shown that existing particulate matter controls reduce most HAP emissions to this level or better (see Table 3), utility plants may be exempted from further

particulate control standards. Again, this data may not be representative of actual removal efficiencies at AEP plants as it is based on a relatively small number of sample points. Actual removal efficiencies will be largely dependent upon existing ESP design and operating parameters.

Scrubber controls improve upon baghouse removal efficiencies only slightly, except for the case of mercury and nickel where additional control levels of 55% and 42.5%, respectively, are achieved. Scrubbers will also remove gaseous HAP emissions (chlorine, formaldehyde, mercury) which are largely unaffected by particulate control equipment.

In any case, additional controls will result in additional waste streams that must be properly treated and/or disposed. Assuming that the waste will be concentrated in the HAPs removed therein, sophisticated treatment may be required so that waste water discharges from treatment facilities or disposal areas will meet appropriate state and federal regulatory limits.

Estimated Costs to Comply

In developing a rough estimate of a worst case cost impact on AEP, capital costs of \$100/kw for a baghouse retrofit and previously developed plant by plant cost estimates for scrubber retrofits are assumed. If baghouse retrofits alone are required, the capital cost for the AEP System is estimated to be \$2.1 billion. An emission standard that also required scrubber retrofits would increase the capital cost (based on our current mix of control equipment and considering future controls which may be required by other proposed CAA revisions) by an additional \$6 billion. The annual carrying charges alone for this level of capital expenditure would be approximately \$1.6 billion. With present annual revenues of approximately \$5 billion the rate increase needed just to pay for amortization costs (not O&M) would exceed 30% on average. The practical effect of this Title may be to force the premature retirement of a large number of older, smaller units on the AEP System because of limited room for additional retrofit equipment and the excessive cost of control.

American Iron and Steel Institute

1133 15TH STREET, N.W., WASHINGTON, D.C. 20005-2701

Phone (202) 452-7100

Fax (202) 463-6573

February 8, 1990

Dear Senator:

You are no doubt aware of the new proposals on air toxics that were developed as a result of discussions between the Senate leadership and the Administration. The steel industry has reviewed these proposals. We find that, while they do constitute a marginal improvement over the current Senate bill, they remain seriously defective because they constitute a shutdown threat to coke production and the steel industry.

The enclosed paper explains why this new proposal will not work. The solutions we are proposing on page 2 protect public health and avoid the automatic shutdown of domestic industry.

Sincerely,


Milton Deaner
President

Enclosure



American Iron and Steel Institute

1133 15TH STREET, N.W., WASHINGTON, D.C. 20005-2701

WHY The 10^{-4} "Maximum Exposed Actual Person" Compromise will not work.

The air toxics "compromise" contains a shutdown requirement based on a 10^{-4} Maximum Exposed Actual Person standard. This will not resolve the problems faced by the steel industry.

- o The "actual" Maximum Exposed Individual concept is an improvement over the current Senate bill, since it would premise any risk assessments on realistic exposure data. But those improvements will be marginal at best.

- o Current risk assessment methodology is based on numerous extremely conservative assumptions. The assumptions on exposure (for example, 70 years of exposure, 24 hours a day) are only part of the problem, and improving those assumptions will not change the basic flaws in the MEI methodology.

- o A risk of 1×10^{-4} for the Maximum Exposed Individual (whether actual or hypothetical) translates into a risk of one cancer incidence over 700,000 years for a source -- or a risk of one cancer incidence over the lifetime of human history. It is absurd to have a "shutdown" standard at this level of risk.

- o For coke ovens, most plants will still be unable to meet the 10^{-4} actual test.

- o To achieve the 10^{-4} actual test, the steel industry would have to attain, on average, a five fold reduction in emissions from their already controlled levels. This would require coke ovens to move to the 99% control range. EPA's best estimate is that the 96% control range is what is technologically feasible for coke ovens.

- o The "compromise" also retains the 10^{-6} hypothetical standard for new and reconstructed sources. This creates an intolerable Catch-22 for coke ovens. Coke ovens may have to be rebuilt to meet the actual 10^{-4} test. Reconstruction would subject them to an immediate 10^{-6} standard. There is no one who even argues that coke ovens can meet that standard. The bill's arbitrary use of MEI numbers thus creates a shutdown requirement for the industry within seven years of enactment. It does not, as some have claimed, allow reasonable time for the development of new research and technology.

(more)



What are the solutions needed:

o The MEI concept, whether framed as actual or hypothetical, should not function as an automatic shutdown number. The methodology underlying MEI calculations is too uncertain and capricious to support the kind of "up or down" provisions in the Senate bill.

o Before any plant is shut down and jobs are lost, there must be a consideration by EPA of an array of factors beyond the MEI, such as aggregate population risk, the time needed to research and develop new, feasible technologies and the strength of the evidence of human health risk.

o Plant reconstructions undertaken in order to meet any MACT or residual risk standard should not be subject to the new plant standards.

February 8, 1990

Telephone w/ Steve Kiser 2/21/90

Committee → all toxic risk under
discussion → getting rid of
risk #s??

Accidents at NAS already analyzing
risk assessments
1982 - Delit.

Use a single # as a criterion under
all varying circumstances
→ Econ anal. rec.

* pres approach but acknowledge
that hard to make stress-graded
→ require action if do find UNREASONABLE
RISK.

(MACT defn) → Best on that proven to be firm + effective

— also a problem — focuses on top 10%??
→ a specific source may
have very serious risks.

Thomson
Hager

343 5706
184 E Winton
4641

107 10th St. NE
S. Engr. Plaza

Rick Erdheim → Lautenberg.

national youth service
{ Crime bill }

- ILO Treaty 3:15 ~~not~~ Tues.
- School Reports

- National Service during wk.
motion to go to doc. resolve on
American

41273

- This will be taken to
closure - prob. won't
go

→ doc won't want
to keep trying to add as an amend.

members to convene for air toxics
to National Academy
*43597 Ray Keeney. → Moynihan

methodology for determining what
mission levels

site specific assessments.

No acid gases req'd ∴ no scrubbers
no test for mercury or PM

electric precipitation will be the tech.

call EPA → Congaffair 387-5195
OMB
Rosen P. M.
Only, assume or
Planning

Roger Porter

agreed w/ Dept of Energy
→ utilities industry
proceed.

title I → agent → statutory sources.

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Marie Strong

See Gent

1992 - Envt & Development Conf

* He is really the person to

of the UN Conf on Env't + development

* Ant. Gardner

Prof. Richard Gardner

212-880
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1200 - 1210

Year	Percentage (%)
1950	55
1955	45
1960	50
1965	45
1970	55
1975	45
1980	50

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* It is to be placed at the
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Handwritten signature: *Handwritten signature*

American Iron and Steel Institute

1133 15TH STREET, N.W., WASHINGTON, D.C. 20005-2701

Phone (202) 452-7100

Fax (202) 463-6573

February 19, 1990

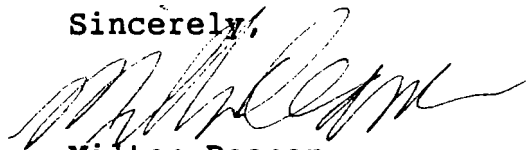
Dear Senator:

There have been rumors of a Senate fix for the coke oven problem in the clean air legislation. There is no fix which will avoid the shutdown of the coke ovens. Our position remains as I stated in my letter of February 8, the principal point of which was:

Before any plant is shut down and jobs are lost, there must be a consideration by EPA of an array of factors beyond the MEI, such as aggregate population risk, the time needed to research and develop new, feasible technologies and the strength of the evidence of human health risk.

We want to be certain that there is no confusion on this point.

Sincerely,



Milton Deaner
President

Enclosures



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Milton Deane
President

Enclosure



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(more)



What are the solutions needed:

o The MEI concept, whether framed as actual or hypothetical, should not function as an automatic shutdown number. The methodology underlying MEI calculations is too uncertain and capricious to support the kind of "up or down" provisions in the Senate bill.

o Before any plant is shut down and jobs are lost, there must be a consideration by EPA of an array of factors beyond the MEI, such as aggregate population risk, the time needed to research and develop new, feasible technologies and the strength of the evidence of human health risk.

o Plant reconstructions undertaken in order to meet any MACT or residual risk standard should not be subject to the new plant standards.

February 8, 1990

1999 FEB 20 PM 2:47

PHOTOCOPY PRESERVATION

Summary of the Air Toxics Issues

The following is a short description of each of the differences between the legislative language proposed by the Senate staff (Senate language) and the language proposed by the Administration (Administration language).

(1) Alternative Emissions Limitation for New Sources

new sources must meet 10-6

The Administration language allows both new and existing sources to apply for site-specific alternative emission limitations based on risk to actual persons. S. 1830 requires new sources to meet 10-6 health standard without waiver to 10-4 or extensions. The language proposed by Senate staff follows the pattern of the bill limiting site-specific, "actual person waivers" to existing sources.

(ADMIN, Pl, 23-6; SEN, No provision)

(2) Compliance with Health Standard

The Senate language requires compliance with the health standards (10-4 and 10-6), if technology is available to do so. The Administration language allows sources to get a site-specific alternative emissions limitation, even if they could comply with the health standard using available technology.

(ADMIN, No provision; SEN, Pl, L12-13)
(ADMIN, No provision; SEN, Pl, L10-11)

(3) State Authority to Allow Alternative Emissions Limitation

The Senate language allows states to grant alternative emissions limitation for 10-6 standard; EPA must grant alternative emissions limitation for 10-4 standard. Administration language allows states to grant alternative emissions limitations for both standards.

(ADMIN, Pl, L15; SEN, No provision)

(4) Person or Persons

The Senate language requires that the alternative emissions limitations protect the most exposed actual person. The Administration language is ambiguous, making reference to actual persons.

(ADMIN, Pl, 223; SEN, Pl L16)

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(ADMIN, P3, L18; SEN, P3, L14)

(5) Further Progress

The Senate language requires a source receiving an "actual person" alternative emission limitation at 10-6 to go beyond that level of control with a goal of 10-6, if technology is available to do so. The Administration language appears to contain no comparable provision.

(ADMIN, No provision; SEN, P2, 23-25)

(6) Definition of "Available" Controls

cost
The Senate language defines available controls to include those methods and technologies that may be employed without damaging the economic viability of the source. The Administration allows cost to be considered in defining "available" without constraint.

(ADMIN, P2, L20 - P3, L4; SEN, P2, L16-21, P3, L4-11)

(7) Additive Risks from Other Exposures

The Senate language provides that additive risks from exposure to all "carcinogens" emitted by a source not exceed 10-5 where technology is available to afford such protection. The Administration language only covers "hazardous air pollutants" excluding those carcinogens that may be emitted, but which have not been listed by EPA.

(ADMIN, P3 123- P4 L3; SEN P3, L18-22)

(8) Deadline for Submitting and Approving Health Assessment

The Senate bill provides that an application for an alternative emissions limitation and a site-specific health assessment may be submitted within two years after a residual risk standard is promulgated. The Administration language only allows one year for existing sources to apply for an alternative emissions limitation. Under Administration language, if EPA fails to act on an application for alternative emission limitation, the compliance deadline for the health standard may be extended indefinitely.

(ADMIN, P4, L11-12; SEN P4, L1-7)
(ADMIN, P4, L17-24)

(9) Stack Height Credit

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The Senate language limits stack height credit for mitigation strategies as proposed in H.R. 4. Administration language limits stack height credit for mitigation strategies in accordance with rules promulgated pursuant to section 123 of existing law.

(ADMIN, P4, L19-22; SEN, P4, L13-17)

(10) Two-Year Extension for Alternative Emissions Limitation

The Administration language allows a two-year extension for compliance with an alternative emissions limitation, if EPA finds it necessary to avoid shutdown. The Senate language contains no comparable provision. This item was not previously discussed.

(ADMIN, P5 L24 - P6 L5; SEN, No provision)
(ADMIN P16, L19-26; SEN, No provision)

(11) Health Assessment Methodology

The Senate language requires that several site-specific factors be included in health assessment methodology. The Administration language provides those factors be considered only to the extent EPA requires by rule.

(ADMIN, P6 L12- P7 L12; SEN, P5 L22 - P7 L6)

(12) Public Review of Health Assessment

should have
The Senate language parallels Superfund and provides for public review of site-specific health assessment before any permit incorporating an alternative emissions limitation based on the assessment is granted. The Administration language contains no explicit provisions for public review of health assessments.

(ADMIN, No provision; SEN, P7 L8 - P8 L3)

(13) Alternative Emission Limitation for Noncarcinogens

deletion
The Administration language authorizes an alternative emissions limitation for pollutants other than carcinogens requiring "protection of public health and environment". Senate language contains no comparable provision. This issue has not been previously discussed.

(ADMIN, P7, L16-23; SEN, No provision)

(14) Leak Detection Requirement

PHOTOCOPY
PRESERVATION

Language originally proposed by Senator Reid contained ambiguities with respect to "such substances" for which there is no reference and "covered facilities" which is an undefined term. Senate language attempts to clarify these terms. Administration language does not adopt clarifications.

of all clarify
(ADMIN, P8, L4-20; SEN, P8 L15 - P9 L20)

(15) Mercury Controls at Electric Utilities

OK
The Senate language requires MACT standards be issued for mercury emissions from electric utility boilers that are major sources. Administration language provides that mercury standards are only issued "if required" and "technologically and economically feasible".

(ADMIN, P9, L24 - 26; SEN, P10, L16)

(16) Acid Gas Controls at Electric Utilities

OK
The Senate language provides that Administrator has discretion not to issue MACT standards for acid gas emissions from electric utility boilers. Administration language deletes any authority for EPA to require scrubbers on electric utility boilers to control any hazardous air pollutant.

(ADMIN, P10, L4-7; SEN, P10 L21 - P11 L3)

(17) Coke Oven Extension

The Administration language makes reference to further extension for coke ovens. The Senate language contains no comparable provision. This issue has not been previously discussed.

(ADMIN, P10, L12; SEN, No provision)

(18) List of Source Categories

OK
The Administration language establishes a new standard for excluding source categories from the list. These would be categories of sources emitting pollutants other than carcinogens which present "negligible risk" to public health. The Senate language provides that categories of sources emitting pollutants other than carcinogens may be excluded, if emissions do not reach 10 tons for one pollutant or 25 tons for a combination and emissions of carcinogens present risk less than 10-6. This issue has not been previously discussed.

(ADMIN, P11, L7-9; SEN, P11 L19- P12 L3)

PHOTOCOPY PRESERVATION

(19) Deletion of Mobile Sources from Area Source Definition

not needed
The Administration language excludes mobile sources from the definition of "area sources" under S. 1030. The Senate language contains no comparable provision. This issue has not been previously discussed.

(ADMIN, P11, L11; SEN, No provision)

(20) Area Source Program Goal

OK
The Senate language applies 750 cancer reduction objective to hazardous air pollutants from all sources. Administration language converts objective to goal and only applies goal to sources "regulated under federal law".

(ADMIN, P11 L17 - P12 L3; SEN P12, L14-19)

(21) Area Source Monitoring Requirement

The Senate language deletes explicit requirement that each MSA greater than 250,000 conduct ambient monitoring for a list of hazardous air pollutants from area sources and allows EPA discretion to shape monitoring and emissions modeling requirements for these cities. The Administration language is somewhat more discretionary allowing monitoring requirement to be limited to an undefined subset of urban areas.

(ADMIN, P12, L8-11; SEN, P13, L2-7)

(22) Audits of Hazard Assessment

The Senate language requires that EPA audit 1.45 of the hazard assessments each year. The Administration language implies that this requirement can be passed off to the states.

(ADMIN, P12, L14; SEN, No provision)

(23) Hazard Assessments Made Discretionary

The Administration language allows the Administrator discretion in the elements to be included in a hazard assessment. The Senate language contains no comparable provision. This item has not been previously discussed.

(ADMIN, P13, L3-4; SEN, No provision)

(24) Deletion of Quantitative Elements of Hazard Assessment

PHOTOCOPY PRESERVATION

The Administration language deletes the "quantitative" elements from the hazard assessment. The Senate language contains no comparable provision. This item has not been previously discussed.

(ADMIN, P13, L3-6; SEN, No provision)

(25) Limited Health Information in Hazard Assessment

The Administration language limits the requirement that hazard assessments include health information on the extremely hazardous substances which may be released. The Senate language contains no comparable provision. This item has not been

(ADMIN, P13, L7-8; SEN, No provision)

(26) Update of Hazard Assessments

The Administration language provides that hazard assessments prepared by facilities with less than 100 tons per year of emissions only be updated every five years. The Senate bill requires an update every two years. The Senate language contains no comparable provision. This item has not been previously discussed.

(ADMIN, P13, L9-12; SEN, No provision)

(27) Eliminate Sensitivity Analysis in Hazard Assessment

The Administration language eliminates the sensitivity analysis from the hazard assessment. The Senate bill contains no comparable language. This item has not been previously discussed.

(ADMIN, P13, L19; SEN, No provision)

(28) Definition of MACT - Floor

The Senate language deletes the "top-down" procedure for determining MACT for existing sources and replaces it with a floor based on the "average of the 100 best performing sources". The Administration language deletes the "top-down" procedure and includes the average of the 100 best performing sources as a "benchmark" over all existing sources. There would be no floor for existing source MACT standards subject to judicial review for a particular source category.

(ADMIN, P14, L14-23; SEN, P14, L2-12)

PHOTOCOPY PRESERVATION

(29) Definition of MACT - Benchmark

The Senate language applies the 90% emissions reduction benchmark to each source category (rather than each source in a category). The Administration language applies benchmark over all existing sources in all categories.

(ADMIN, P14, L17-23; SEN, P14, L13-16)

(30) New Source Compliance Date

?? The Administration language authorizes site-specific alternative emissions limitations with no risk reduction target (10-6 or 10-8) for sources that begin construction or reconstruction after promulgation of health standards. Senate bill contains no comparable provision.

(ADMIN, P13 L11 - P16 L26; SEN, No provision)

(31) Delete Permit Provisions

?? The Administration language proposes to delete all permit provisions from Title III of S. 1630. The Senate language contains no comparable provision. This issue has not been discussed previously.

(ADMIN, P17, L1-7; SEN, No provision)

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PHOTOCOPY PRESERVATION

NECESSARY IMPROVEMENTS TO THE TENTATIVE SENATE AIR TOXICS AGREEMENT OF FEBRUARY 2

RESIDUAL RISK

- The proposal still calls for absolute numerical standards for acceptable risk (1 in 10,000 and 1 in 1,000,000). This does not allow the Administrator the necessary flexibility to make risk management decisions based on the uncertainties of risk assessment such as:
 - using limited animal test data to predict human health effects; and
 - activity patterns and distribution of the exposed population.

Improvement Needed:

Eliminate absolute numerical risk numbers from the proposal. The standard setting process should recognize the uncertainties in risk assessment. Standards should consider such factors as:

- the weight of the scientific evidence of human health effects;
- the uncertainties associated with the risk estimates;
- the most plausible estimate of risk and exposure; and,
- the distribution of the population at risk.

Sources should be allowed to use site-specific factors for exposure to determine compliance.

- The proposal does not require independent review of risk assessment methodologies in order to identify scientifically sound tools to assist EPA in protection of public health.

Improvement Needed:

Being done. { An independent, scientifically credible organization, like the National Academy of Sciences, should review risk assessment and recommend appropriate changes to the Administrator. Each of the factors listed above, as well as other aspects of risk assessment, should be included in this review.

TECHNOLOGY STANDARDS

- The definition of Maximum Achievable Control Technology (MACT) still does not recognize that cost must be considered. The proposed "average control achieved by the top 10%" is not a significant difference from the existing language in S. 1630 that sets MACT according to the "best of the best" sources.

Improvement Needed:

Because a source has achieved an unusually high degree of control does not automatically make that same level of control necessary or technologically efficient in other circumstances. To insure that MACT represents a tough but reasonable level of control, the definition of MACT should include an explicit consideration of (cost and cost-effectiveness) and should always represent commercially-demonstrated technology for sources in the same category or subcategory.

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PHOTOCOPY PRESERVATION

LISTING OF SOURCE CATEGORIES

- The proposal requires listing and regulation of every source category that contains even one source presenting a risk greater than 1 in 1,000,000 (10^{-6}). This will result in controlling low risk sources solely for the sake of control.

Improvement Needed:

The Administrator should determine which categories and subcategories of sources warrant listing and regulation. This decision may include such factors as the number of sources in the category, the toxicity of emissions, the degree of existing control, and the number of people exposed to emissions.

ISSUES STILL UNADDRESSED IN THE SENATE AIR TOXICS NEGOTIATIONS

CREDIT FOR EARLY REDUCTION

- Under S. 1630, sources that make a voluntary 90% reduction from 1985 through 1992 are exempt from MACT.

Improvement Needed:

The bill needs to be modified so the credit provision will work in practice. Credit for early reduction must be fully available in all states, including those with programs in place and controlling toxic emissions. A source should be exempt from MACT if:

- emissions have been reduced by 90% and
- the deadline for achieving such reductions is extended to December 31, 1995.

These incentives would induce more companies to undertake emission reduction programs early.

LISTING OF CATEGORIES OF SUBSTANCES/COMPOUNDS

- S. 1630 lists 174 individual substances as air toxics, as well as 17 categories of compounds. Many compounds within some categories are not hazardous air pollutants.

Improvement Needed:

The 17 categories at the end of the list of hazardous air pollutants in S. 1630 should be deleted or EPA should be given six months to review the categories and determine the specific substances within each category that merit regulation.

PHOTOCOPY PRESERVATION

DE MINIMIS EXEMPTIONS

- S. 1630 would require regulation of emissions of all listed pollutants, no matter how insignificant the quantity.

Improvement Needed:

For each regulated source category, the Administrator should identify de minimis amounts of each listed substance emitted from those sources. Emissions below that de minimis amount should not be subject to regulation. For example, research and development facilities may emit very small quantities of a hazardous air pollutant for a short period of time.

} ok -
working on
this.

ACCIDENTAL RELEASES

- All the accident prevention and response programs included in S. 1630 are primarily directed by EPA. S. 1630 has detailed requirements for hazard assessments that will apply to all facilities handling listed extremely hazardous substances.

Improvement Needed:

The role of OSHA in preventing and responding to accidental releases should be recognized and expanded.

Requirements for hazard assessments should be flexible. Their value as one part of a comprehensive risk management program would be diminished by unnecessary federal standardization and lengthy reviews.

MUNICIPAL SOLID WASTE INCINERATION

- S. 1630 includes all incinerators that burn industrial or municipal waste. As one way to reduce emissions from these facilities, the Administrator is authorized to take various actions to alter the composition of any consumer or commercial product that may be disposed of in an incinerator.

Improvement Needed:

Incinerator control programs should be focused on those incinerators that actually burn municipal solid waste. Authority for regulation of the contents of consumer and commercial products is more appropriately accomplished through TSCA, rather than the Clean Air Act.

-- February 13, 1990

STEEL MANUFACTURERS ASSOCIATION

Suite 304

815 Connecticut Avenue, N.W., Washington, D.C. 20006

(202) 331-7027

James F. Collins
President

February 28, 1990

Honorable Albert Gore, Jr.
United States Senate
SR-393
Washington, D.C. 20510

Dear Senator Gore:

The 47 member companies of the Steel Manufacturers Association have made substantial contributions to air quality at their 71 steel production facilities across the United States and Canada. They continue to upgrade these facilities, in line with the latest requirements of federal, state and local environmental agencies. Nonetheless, they recognize that the Congress will be amending the Clean Air Act pursuant to the need to control acid rain, mobile sources and toxic air pollutants. They are intensely concerned, however, with some of the provisions of S.1680 and HR 2585. These bills could, in fact, result in emission control standards so stringent that they could result in steel mill closures.

The bills would require EPA to promulgate technology-based emission standards for a list of 200 designated pollutants within a short period of time, followed by implementation of health-based standards. They would strip EPA of any flexibility and impose rigid "residual risk standards" that are based upon a questionable methodology. In contrast, the Administration's bill, HR 3030, would provide EPA with some flexibility in setting these standards.

Steel companies utilizing electric arc furnaces are willing to do their part with respect to the implementation of "Maximum Achievable Control Technology" (MACT), as required under the technology-based portion of the bills. However, the residual risk standards for the maximum exposed individual (MEI) have not been well documented. S.1680 would dictate a risk factor intended to represent the continuous hypothetical exposure of an individual at a fence line for 70 years. Since this does not take into account meteorological and other site-specific considerations, it cannot represent the genuine exposure of a fence-line individual. These proposals do not allow EPA to make use of realistic real-world assessments for determining health risk. This issue is further discussed in the attached copy of an article by Dr. Bernard Goldstein, former Assistant Administrator of EPA for Research and Development.

Page Two

We care about our employees and the people who live near our plants. We need them and they need the jobs we provide. Our segment of the steel industry has already proven its willingness to meet the challenge of new regulatory requirements. We have spent many millions of dollars doing so and will continue to do so. We recognize that new technologies not yet in existence will be needed in the future to guarantee cleaner air in the United States. However, based on our analysis of S.1680, we doubt the goals in that bill will be achievable using any foreseeable future technology.

If, following the installation of MACT, you provide EPA with the authority to determine what health-based standards are possible to achieve, the industry will work with the EPA and the providers of technology to meet them.

Alternatively, if the Congress adopts environmental standards that are almost impossible to achieve, that will cause a substantial decline in our competitive capabilities and possible plant shut-downs. It will not then be unrealistic to visualize a United States much more dependent on foreign steel produced in countries where the environmental controls are less stringent, or even non-existent. If that occurs, the pursuit of an unachievable environmental goal would make global pollution much worse than it is today.

Sincerely,

J.F. Collins

ROBIN L. WILLIAMS
ASSOCIATE DIRECTOR OF GOVERNMENT RELATIONS

ROHM AND HAAS COMPANY

SUITE 210
1667 K STREET, N.W.
WASHINGTON, DC 20006
(202) 872-0660

For # 872-0663



S. 1630 - Clean Air Act Amendments of 1989

Status: S. 1630, a far-reaching, 6-title bill, was reported out of the Senate Environment and Public Works Committee by a vote of 15-1. The Senate began consideration of this bill when Congress reconvened on January 23, 1990. In the House of Representatives, the Administration's proposal, introduced as H.R. 3030, was amended by the Subcommittee on Health and the Environment and awaits action by the full Energy and Commerce Committee.

Company Position: S. 1630 as reported needs substantial improvement in order to be deemed workable and acceptable. Floor amendments are required in the following areas to assure that high technology research-based companies remain competitive in world markets.

TITLE III - AIR TOXICS

1) Clarification of "MACT" (Maximum Achievable Control Technology) is needed to demonstrate that

- * • technology requirements do not undermine the integrity of U.S. patent law, product registrations, and other intellectual property protections by requiring process changes, substitution of materials, or other modifications; (see attached amendment language)
- * • consistent with SARA 313, the Community Right-to-Know law which exempts research facilities, research facilities under the proposed bill need to be exempt because emissions are low, relatively small quantities of many chemicals are involved, operations are of limited duration, and research activities take place under the close supervision of trained, technically skilled, qualified personnel; (see attached amendment language)
- point sources of de minimus emissions are exempt from the standards because their emissions are insignificant; (see attached amendment language)
- MACT is defined in terms of readily available commercially demonstrated technology, at a level other than simply the single best controlled source and that cost effectiveness, energy consumption, other impacts are to be considered. Air pollution control technology also needs to be evaluated within the context of product quality, waste generation and process safety. Maximizing air emissions control without considering other effects could lead to absurd results.

2) Specific Risk Numbers should be deleted from the bill because their inclusion precludes use of the best science available and eliminates some

* sources or industries with no assurance of any improvement in public health or consideration of costs to society. Only human health effects should be considered in residual risk determinations and continuous improvement in risk assessment techniques should be required, including evaluation and development by an independent scientific organization.

3) Credit for Early Reductions should be given to sources that achieve, in advance of requirements, emissions rates close to MACT levels. All reductions should be credited toward the percentage reduction criteria so sources that are tightly regulated under other laws are not penalized and have an incentive to do more in advance of MACT standards.

4) OSHA should retain the lead role in any accident prevention program. It makes no sense to dilute OSHA's existing accident prevention authority by creating at EPA a redundant investigatory agency.

TITLE IV - ACID RAIN

5) Industrial Boilers and industrial process emissions should be excluded. Industrial SO₂/NO_x emissions are small in the context of the 10 million ton per year reduction sought from large coal fired power plants. Including them will greatly magnify agency and industry resources needed to implement acid rain control with little additional reduction in nationwide emissions. In addition to electrical rate increases, their inclusion will discourage cogeneration (which we now do at Bristol and Philadelphia plants). Some of the proposals are estimated to cost Rohm and Haas \$200,000 per year.

TITLE V - PERMITS

6) Delete Title V. Use of existing permit programs will assure faster and more efficient implementation of the new requirements. The process of obtaining permission to act should not be a bottleneck. We cannot get quick additional abatement or build modern low-pollution plants under a RCRA-type 2-to-4 year permit process. (see attached amendment language)

TITLE VI - ENFORCEMENT

7) Unreasonable enforcement provisions should be deleted because penalties not reflecting the nature of the violation will make it difficult if not impossible to recruit and retain qualified staff.

Rohm and Haas Company is a research-based, Fortune 200 specialty chemicals company headquartered in Philadelphia, Pennsylvania. Rohm and Haas is an industry leader and innovator in polymer acrylic chemistry and has developed a wide range of specialty chemical and plastics products used in agriculture and industry.

1/24/90

AMENDMENT TO S. 1630

MACT CLARIFICATION TO ASSURE
INTELLECTUAL PROPERTY IS PROTECTED

Page 330, line 6 through line 11:

standard applies, through **post-production** application of measures, processes, methods, systems or techniques including, but not limited to, measures which --

(A) reduce the volume of such pollutants through **air pollution control** process changes, [substitution of materials, or other modifications]

Page 330, line 17:

(D) are **air pollution control** device design, equipment work practice,

Page 330, line 21:

(E) are a combination of the above, provided, however, that none of the measures described in (A) through (D) above shall in any way compromise any United States patent or United States trademark or any confidential business information, or any trade secret or any other intellectual property right.

Key: **Bold** = insert
[] = delete

Explanation: MACT Clarification

The bill as reported would give EPA the authority to impose changes in chemistry and/or process as part of the MACT requirement. It would allow EPA to regulate process technology and chemistry if EPA determines that a particular process or combination of chemicals used to manufacture a given product would create less air pollution. This could negate registration of pesticides (such as our crop protection and industrial chemical products), patents, trade secrets, and other intellectual property protection afforded U.S. research-based companies. As a specialty chemical company, Rohm and Haas could be impacted severely, and any competitive advantage gained as a result of our research effort would be undermined. The bill as written creates a tremendous disincentive for conducting further research.

It is inappropriate for EPA to evaluate and recommend standards for detailed chemistry and processes involving complicated chemical production. In-depth examination of production processes is not only labor intensive but requires highly qualified scientific specialists for each product or process being investigated. It makes no sense to require EPA to duplicate industry's technical base in order to achieve a detailed understanding of each chemical process and production unit.

Maximum Achievable Control Technology (MACT) provisions need to be amended to clarify that the technology requirements do not undermine the integrity of U.S. patent law, product registrations, and other intellectual property protections by requiring process changes, substitution of materials, or other modifications.

Therefore the amendment focuses on post-production air pollution control devices to assure continued protection for U.S. patents, U.S. trademarks, confidential business information, trade secrets, and any other intellectual property rights.

AMENDMENT TO S. 1630

STRIKE TITLE V - PERMITS

Explanation for Striking Title V:

The existing Clean Air Act contains a permit system. A new, separate system would add confusion to the permit process and delay the time it will take for facilities to get permission to install new control equipment or build modern low emission processes. The experience with RCRA is pertinent. Congress passed RCRA in 1976; EPA's first regulations were not issued until 1980 - a delay of four years. In the ten years since EPA issued its first regulations it has been unable to process and issue the approximately 1500 permits requested. Most of these permits are for simple storage areas, landfills and incinerators. None is as technologically complex as a typical chemical plant. Enactment of a new permit system in Title V guarantees a long delay in implementing new controls simply because EPA will be unable to grant the permission needed by industry to act! The existing permit system should be used as the vehicle for implementing these new controls.

To remain competitive in world markets US industry needs a strong, competent agency that will make the necessary permitting decisions promptly, preferably in 30 to 60 days. EPA's track record in RCRA - a 2 to 4 year rigid permit process - is incompatible with a US economy that can compete on a world scale. Extending such thinking to the control of air emissions will bring paralysis for any segment of our economy needing permission to act.

If the permit provisions are not eliminated from S. 1630, an amendment is required to address the special needs of research and development facilities. Such permits for emissions of hazardous air pollutants from research facilities can recognize the special needs of research and provide for flexibility in the variety of chemicals and equipment used by covering classes of compounds such as VOCs (volatile organic compounds), chlorinated hydrocarbons and particulates. This allows flexibility for changes in specific chemicals and equipment used in a research project without requiring a new or amended permit.

The following language should be incorporated at the appropriate place in Title V:

AMENDMENT TO S. 1630

PERMITTING EXEMPTION
FOR RESEARCH AND DEVELOPMENT

"Permits for emissions of hazardous air pollutants from research facilities will recognize the needs of research and provide for flexibility in the variety of chemicals and equipment used. The Administrator may grant permits for classes of compounds and allow flexibility for changes in specific chemicals and equipment used in a research project without requiring a new or amended permit."

Kate McGinty
Sen. Gore
44283

AMENDMENT to S. 1630

RESEARCH AND DEVELOPMENT EXEMPTION

Page 320, after line 3, insert the following:

(9) The term "research or laboratory facility" means any stationary source, whose primary purpose is to conduct research and development into new processes and products; such sources (a) emit, considering installed and operative controls, in the aggregate, less than 10 tons per year of any hazardous air pollutant or less than 25 tons per year of any combination of hazardous air pollutants, (b) must be under the close supervision of a technically-trained individual, (c) produce products which are not sold in commerce and (d) normally have operations of limited duration and use large numbers of different chemicals in small quantities.

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* this act - later - -
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as p. 328.

Explanation: R&D Exemption

S. 1630 as reported does not make clear how laboratories or research and development facilities would be regulated. There is no provision for a de minimis point source emission, nor any specific provision for permitting research and development facilities which, if handled as production facilities, could require hundreds of permits in order to operate. This would bottleneck the permit system and devastate the research capabilities.

The very nature of research in dealing with changes in both the chemicals and processes used to produce chemicals would be impossible were a separate permit required for each different chemical or process tested during a single research project. In research and development operations, most experiments are designed to yield specific information and therefore are carried out only one time. Processing equipment must be flexible and frequently changed. A wide variety of chemicals may be tested to refine one single process step.

Rohm and Haas is a research-based company where efficiency in getting a product from the idea stage to the market is key to our success. The logjam at the permit stage would severely hinder research and development and prevent the introduction of new and better products into the American marketplace.

Most current laws recognize the needs of research and provide for these needs through "Research Exemptions". Such exemptions are justified on the basis of acceptable risk because of the following unique factors: 1) relatively small quantities of chemicals are involved; 2) operations are of limited duration (usually for a few hours per day or for only a few days; 3) large numbers of different chemicals are used but in small quantity; and 4) operations take place under the close supervision of trained, skilled, technically qualified personnel.

SARA 313, The Community Right-to-Know Act, exempts reporting of emissions from any facility which does not manufacture or process more than 25,000 lbs. or use more than 10,000 lbs. of the listed chemical. It also excludes from threshold determination or release calculation, toxic chemicals manufactured, processed or used in a laboratory at a covered facility under the supervision of a technically qualified individual. The proposed Clean Air Act Amendments need to treat such facilities in a similar manner.

AMENDMENT TO S. 1630

DE MINIMUS EXEMPTION

Page 328, line 6:

Don't want to put this in

"(4) At the time of setting a standard for any category or subcategory of sources pursuant to subsection (d), (f), or (g), the Administrator shall also establish a minimum emissions rate for each hazardous air pollutant emitted by sources in the category or subcategory reflecting the criteria for listing a hazardous air pollutant established by subsection (b)(2). In addition, at the time of setting a standard for any category or subcategory of sources pursuant to subsection (d), (f), or (g), the Administrator shall also establish a de minimus emissions rate for each hazardous air pollutant emitted from point sources in the category or subcategory. All point sources in the category or subcategory emitting at or below the de minimus emissions rate for any hazardous air pollutant shall not be subject to standards promulgated under subsection (d), (f), or (g). All sources in the category or subcategory emitting more than the minimum emission rate for any hazardous air pollutant shall be subject to standards promulgated under subsection (d), (f), or (g). In no event shall the minimum emissions rate be greater than ten tons per year for any one hazardous air pollutant or twenty-five tons per year for any combination of such pollutants, nor less than the reportable quantity under the Comprehensive Environmental Response, Compensation and Liability Act.

ch

"(5) Notwithstanding the provisions of paragraph (4), research and laboratory facilities shall not be subject to standards promulgated under subsection (d), (f), or (g). The Administrator may establish a minimum emissions rate of more than ten tons for a category or subcategory and a pollutant for which a health effects threshold can be established, provided that, the minimum emissions rate assures, with an ample margin of

Explanation: (De Minimus Exemption)

S. 1630 as reported allows for establishment of "a minimum emissions rate for each hazardous air pollutant emitted by sources in the category or subcategory". If a very small point source emission such as from a research or testing lab or a process vent with very low emissions is part of a larger emissions source which would exceed the threshold, then presumably the laboratory would be required to meet the technology standards as well. This amendment would exempt such small sources from adhering to the standards.

United Steelworkers of America

FIVE GATEWAY CENTER, PITTSBURGH, PA. 15222

March 1, 1990

U. S. Senate
Washington, DC 20510

Dear Senator:

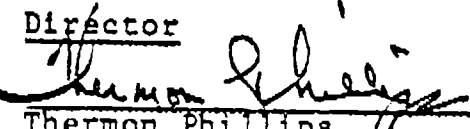
On February 27, USWA President Lynn Williams communicated with you regarding the air toxics section of the Clean Air Act Amendments (S.1630). Because carcinogenic emissions from coke ovens are causing health risks to workers and steel community residents alike, he urged that coke oven operators not be relieved of a year 2005 health-based regulations to control residual emissions; i.e., those toxic emissions still remaining after the installation of current abatement technology.

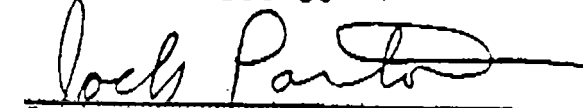
We, the undersigned, are the elected USWA District Directors of steelworkers working and/or living in coke-producing communities. We urge you--especially steel-state Senators--to reconsider the politically pragmatic-based decision to allow a special 30-year exclusion of these communities and their workers from the health-based protection of the Act. Steel communities which will be treated differently than the rest of the country will be placed in a second-class health status with regard to protection against carcinogens.

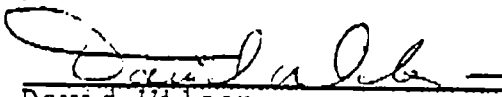
Well-financed lobbying efforts by industry representatives who do not live in, nor are responsive to, workers or residents of these communities should not be the compelling reason to justify a steel-specific exclusion to postpone a public health obligation. As elected union representatives, we do not view the air toxics section as a job loss or shutdown provision. Actually, we are concerned about the continued risk of life loss for workers and community residents.

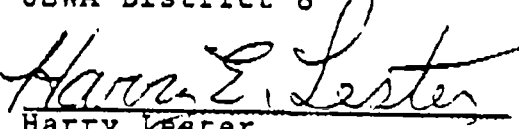
The USWA has not resisted advances in steel production technology; e.g., pulverized coal injection to displace coke in the blast furnaces, which has reduced the number of jobs in the coke ovens. But we do reject the assertion that coke oven abatement technology will not advance over the next 15 years, thereby resulting in coke oven shutdowns. Presently, 36% of coking capacity can meet the health-based requirements of S.1630. While further production technology will displace coke oven steelworkers, pollution abatement technology will not. But it will save lives.

Sincerely,

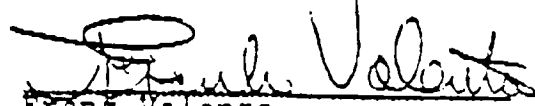
<u>Director</u>	<u>Coke Location</u>
 Thermon Phillips USWA District 36	Ala.

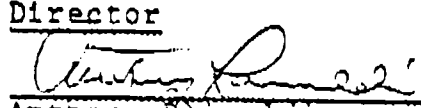
 Jack Parton USWA District 31	Ind.
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 David Wilson USWA District 8	Md.
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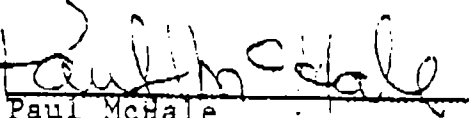
 Harry Lester USWA District 29	Mich.
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 Louis Thomas USWA District 4	NY
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 Frank Valenta USWA District 28	Ohio
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<u>Director</u>	<u>Coke Location</u>
 Anthony Rainaldi USWA District 20	Pa.

 Andrew Palm USWA District 15	Pa.
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 Paul McHale USWA District 9	Pa.
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 John Reck USWA District 7	Pa.
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 Robert Petris USWA District 38	Utah
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Edgar L. Ball
International Secretary

Lynn R. Williams
International President

James N. McGeehan
International Treasurer

George F. Becker
International Vice President
(Administration)

Leon Lynch
International Vice President
(Human Affairs)

United Steelworkers of America

AFL-CIO CLC

815 16TH ST., N.W. WASHINGTON, D.C. 20006

Suite 706

Phone: (202) 638-6929

March 1, 1990

U. S. Senate
Washington, DC 20510

Dear Senator:

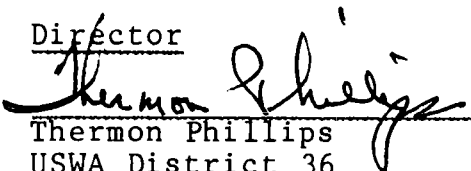
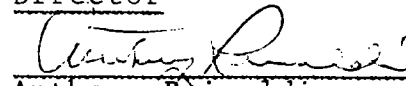
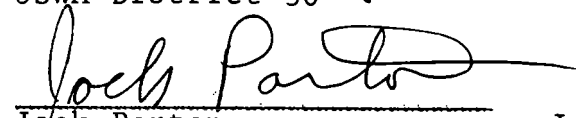
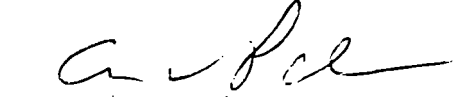
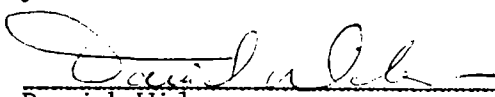
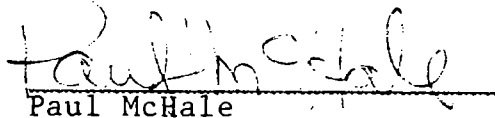
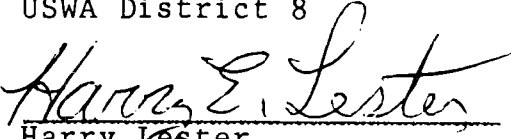
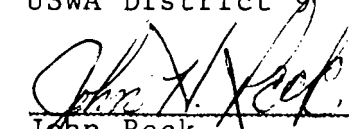
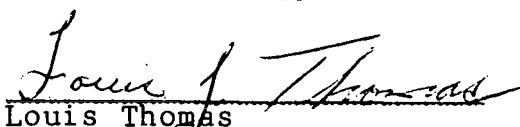
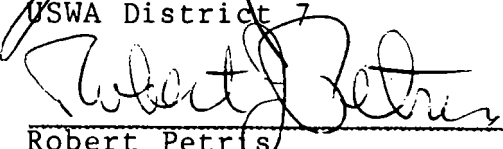
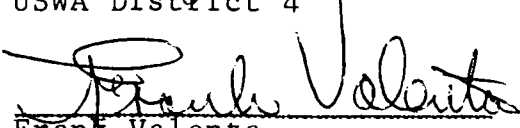
On February 27, USWA President Lynn Williams communicated with you regarding the air toxics section of the Clean Air Act Amendments (S.1630). Because carcinogenic emissions from coke ovens are causing health risks to workers and steel community residents alike, he urged that coke oven operators not be relieved of a year 2005 health-based regulations to control residual emissions; i.e., those toxic emissions still remaining after the installation of current abatement technology.

We, the undersigned, are the elected USWA District Directors of steelworkers working and/or living in coke-producing communities. We urge you--especially steel-state Senators--to reconsider the politically pragmatic-based decision to allow a special 30-year exclusion of these communities and their workers from the health-based protection of the Act. Steel communities which will be treated differently than the rest of the country will be placed in a second-class health status with regard to protection against carcinogens.

Well-financed lobbying efforts by industry representatives who do not live in, nor are responsive to, workers or residents of these communities should not be the compelling reason to justify a steel-specific exclusion to postpone a public health obligation. As elected union representatives, we do not view the air toxics section as a job loss or shutdown provision. Actually, we are concerned about the continued risk of life loss for workers and community residents.

The USWA has not resisted advances in steel production technology; e.g., pulverized coal injection to displace coke in the blast furnaces, which has reduced the number of jobs in the coke ovens. But we do reject the assertion that coke oven abatement technology will not advance over the next 15 years, thereby resulting in coke oven shutdowns. Presently, 36% of coking capacity can meet the health-based requirements of S.1630. While further production technology will displace coke oven steelworkers, pollution abatement technology will not. But it will save lives.

Sincerely,

<u>Director</u>	<u>Coke Location</u>	<u>Director</u>	<u>Coke Location</u>
 Thermon Phillips USWA District 36	Ala.	 Anthony Rainaldi USWA District 20	Pa.
 Jack Parton USWA District 31	Ind.	 Andrew Palm USWA District 15	Pa.
 David Wilson USWA District 8	Md.	 Paul McHale USWA District 9	Pa.
 Harry Lester USWA District 29	Mich.	 John Reck USWA District 7	Pa.
 Louis Thomas USWA District 4	NY	 Robert Petris USWA District 38	Utah
 Frank Valenta USWA District 28	Ohio		

Katy,

I've been trying to
telecopy this to you
for the last hour.
Hope it's helpful.

We'll have another
short analysis of
compromise bill
shortly. I'll try to fax
again.

Thanks.

Mary Ann

TOXICS
(Baghouse Versus Electrostatic Precipitators)

Depending on how EPA chooses to implement this requirement, MACT for Toxics would require either baghouses or highly efficient electrostatic precipitators (ESP). Baghouses are generally considered superior for controlling small particles (0.1 to 10 microns) especially when lower sulfur coals are being burned. (Low sulfur coal degrades the performance of ESPs.)

BAGHOUSES:

- o Cost for retrofit using Southern Company Services cost of control estimates of \$88/kW capacity (1998 dollars). ^{1,2}.
- o TVA's coal-fired system (minus Shawnee (1735 MW) which already has baghouses) is 15.9 million kW. (15.9 million kW x \$88/kW = \$1.4 billion)
- o Therefore, rough estimates for retrofitting baghouses on TVA's power system is approximately \$1.4 Billion.

HIGH EFFICIENCY ELECTROSTATIC PRECIPITATORS:

- o RETROFITTING high efficiency electrostatic precipitators can be as expensive as retrofitting baghouses. These costs range from \$50/kW to \$100/kW (depending on the sulfur content of the coal, the site specific complexity of the retrofit, and the quality of the existing ESP's). These cost estimates encompasses the cost used in the baghouse calculations.¹
- o BAGHOUSES are already in use at Shawnee with particulate emissions from TVA's other units being controlled with electrostatic precipitators and/or scrubbers. However, these non-baghouse controls probably would not achieve MACT. Retrofitting or upgrading these precipitators to achieve higher performance for the acid rain coal supplies, could cost from about \$500 million to \$1.3 billion (based on \$80/kw for retrofits and \$20/kw for upgrade). However, this may not be sufficient to achieve MACT requirements in all cases.³

1. Based on EPRI-CS-4083; June, 1985; Economic of Fabric Filters and Electrostatic Precipitators - 1984 - which reports new unit costs of \$54 to \$63/kW in 1982 dollars.
2. TVA site specific cost studies have not been done but preliminary estimates support conservatism of \$88/kW cost estimate.
3. The control effectiveness assumed for these costs estimates are not as stringent as New Source Performance Standards.

Citizen Action

February 19, 1990

P.O. Box 33304
Washington, DC 20033-0304
(202) 857-5168

Mr. Jeff Levinson
c/o The Honorable Albert Gore
U.S. Senate
Washington, D.C. 20510

Cleveland Office:
P.O. Box 14694
Cleveland, OH 44114-0694
(216) 694-6931

Dear Mr. Levinson:

As the Senate considers proposed amendments to the Clean Air Act, we believe it is critical to address mobile source of air toxics. This issue is not now addressed in Senate legislation. The enclosed report, *Cancer at the Pump*, which was researched and produced by Citizens Fund, provides up-to-date information on increasing toxic benzene emissions associated with gasoline combustion.

The recent recall of Perrier's bottled water because of benzene contamination underscores the thrust of the enclosed report. As oil companies have increased the use of aromatics (benzene, toluene and xylene) to raise the octane level of their gasoline, especially their premium grades, the emissions of benzene into the nation's air have become a great health hazard. Research demonstrates that benzene is emitted from automobile tailpipes in amounts proportionately greater than the benzene content in gasoline.

Benzene exposure causes cancer. Since 1977 benzene has been listed by the Environmental Protection Agency as a hazardous air pollutant, yet the EPA has sat on its hands and refused to regulate this toxic, carcinogenic emission from gasoline and other mobile sources.

The stationary source toxic air provisions of S. 1630 are not sufficient to protect the public from the excessive health risks associated with mobile source benzene emissions. We hope, therefore, that this report will provide you and Senator Gore with the necessary facts to set specific, stringent limits on the amount of aromatics in either a clean fuel, or reformulated gasoline standard.

If you have any questions on the report, or with regard to our position on pending legislation, please contact me directly at 857-5153.

Sincerely,



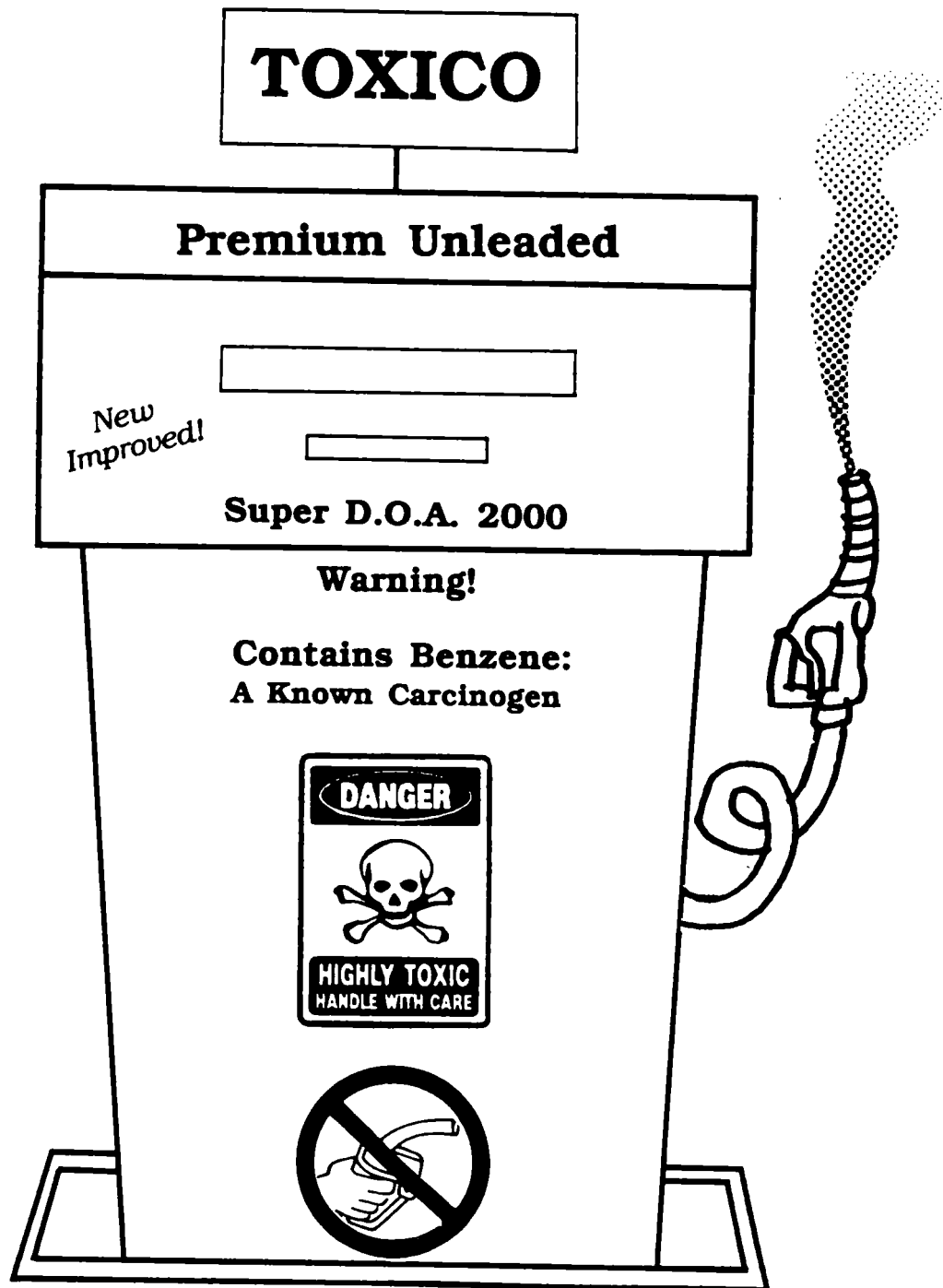
Edwin S. Rothschild
Energy/Environment Policy Director

Enclosures

P.S. The Sunday, February 18th, issue of the *Washington Post* contained a detailed article on this issue on page 3 of the Outlook section.

CANCER AT THE PUMP

- *The Toxic Chemicals in Gasoline* -



A Research Report By Citizens Fund

November 1989

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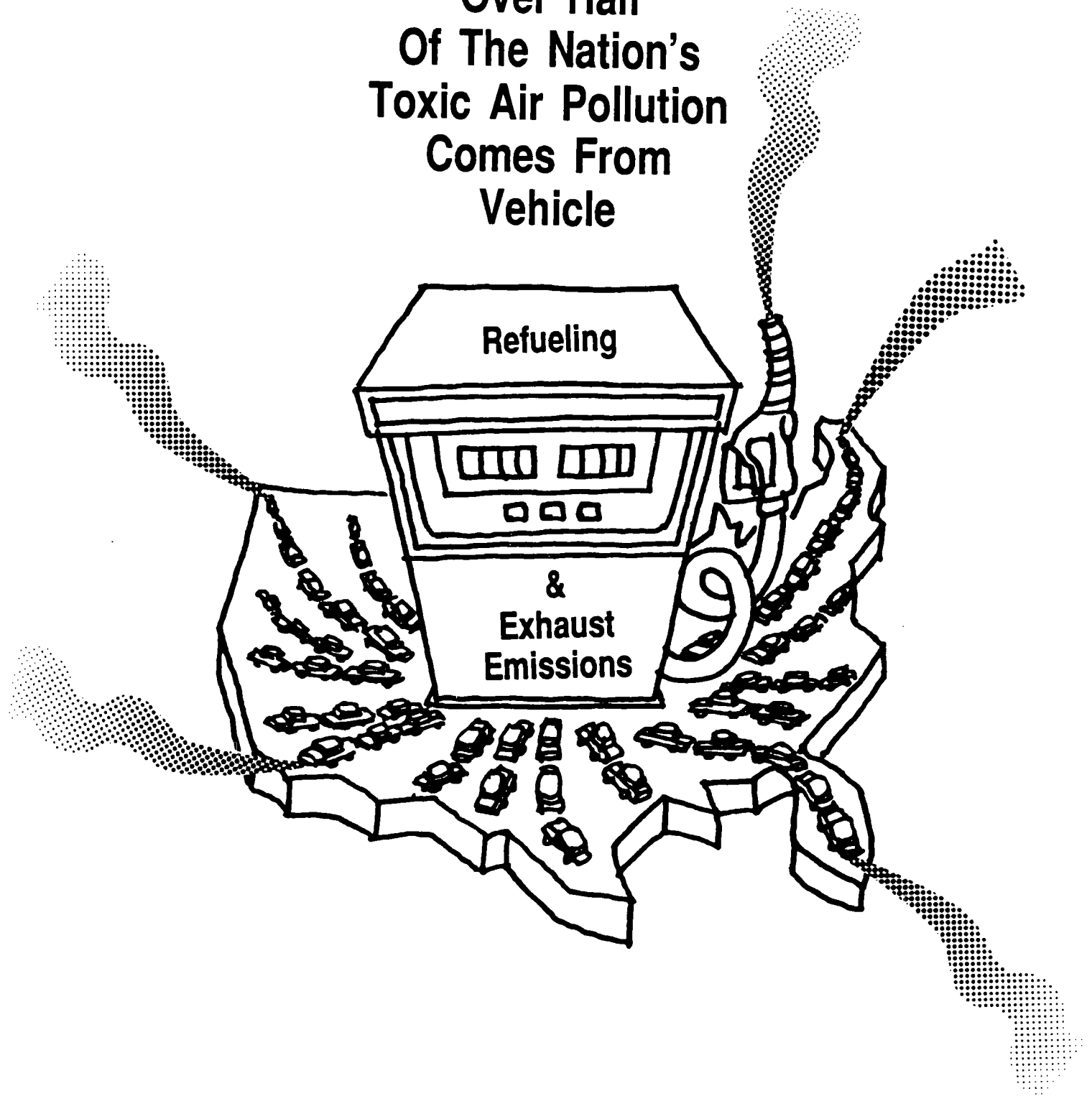
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Findings

- * Gasoline is a product *hazardous to human health*.
- * Gasoline contains *benzene* which is *a known cancer-causing agent*. It can cause leukemia and birth defects.
- * Gasoline contains toluene which can cause *mutations in living cells and can damage growing fetuses*.
- * Gasoline contains xylene which can *damage the liver, kidneys, bone marrow, skin, eyes and developing fetuses*.
- * Motorists who use self-service gasoline pumps and gasoline station attendants face *greater cancer and health risks* than the general population because of increased exposure to benzene and other harmful chemicals contained in gasoline fumes.
- * Despite test data that demonstrate increased cancer and other health risks associated with self-service gasoline, *major oil companies have not adequately informed motorists of these dangers via pump labels*.
- * Gasoline contains substantial amounts of aromatic hydrocarbons, including benzene, toluene and xylene (BTX). Benzene is emitted from automobile tailpipes when aromatic hydrocarbons are burned. *Eighty percent of airborne benzene is emitted by vehicles burning gasoline* and is not regulated by the U.S. Environmental Protection Agency (EPA).
- * Despite the health risks associated with benzene, *major U.S. oil companies have deliberately increased the level of aromatics* in their gasoline in response to EPA's decision to phase-out use of lead in automotive fuels.
- * Toluene and xylene are also highly photoreactive and thus are among the *chief culprits of urban smog*, yet another serious health hazard.
- * *Premium unleaded gasoline* (octane ratings of 91 to 94 (R+M)/2) usually contains substantially more benzene and other aromatic compounds than other unleaded grades of gasoline.

- * *Premium unleaded gasoline is more polluting*, requires more crude oil and usually *costs* consumers \$0.15 to \$0.20 *more* per gallon than regular unleaded even though the production cost difference is only about \$0.05 per gallon.
- * Oil companies *have the technology as well as substantial refining profit margins to reduce benzene* and other aromatics quickly and with minimum financial disruption.
- * Despite listing benzene in 1977 as a toxic air contaminant that posed a serious threat to human health, *although required by law to regulate toxic air emissions, the EPA has failed utterly to protect the general public from chronic exposure to benzene* and other dangerous gasoline components.
- * When it determined that lead additives in gasoline posed a serious human health threat, *the EPA did not, despite evidence to the contrary, prohibit oil companies from increasing the use of benzene and other aromatic hydrocarbons* to replace lead as components for octane enhancement.
- * Although less dangerous fuel compounds such as ethanol and ethers (known as oxygenates) have been available to enhance octane, the major oil companies have decided to use benzene and other aromatics that they can *manufacture more profitably* in their own refineries.
- * *Major oil companies have for years deceived the public about the threats to human health posed by benzene*, lead and other harmful gasoline components in much the same way that cigarette companies have tried to trivialize the deadly health consequences of cigarette smoking.
- * There are *many alternatives to continued use of high-aromatic content gasoline*. They include cleaner-burning fuels such as natural gas and ethanol and cleaner-burning fuel additives such as ETBE and MTBE; production and sale of more efficient automobiles and much greater reliance on public transportation.
- * *Oil companies have the technology and capability of substantially reducing benzene in gasoline by using standard process techniques*. Most refiners could reduce benzene from an average 1.7 volume percent to about 0.6 volume percent with existing technology.

**Did You Know That
Over Half
Of The Nation's
Toxic Air Pollution
Comes From
Vehicle**



Introduction

"It is the overwhelming consensus of the independent scientific community that there is no way of setting safe exposure levels or tolerances to any chemical agent such as benzene that can induce genetic damage or cancer. It is clear that gasoline, in all phases of production, use and disposal, is a major source of environmental and occupational carcinogens and preventable cancers."

Samuel S. Epstein, MD
Professor, Occupational and Environmental Medicine
University of Illinois
Op-Ed, L.A. Times, 3/17/89

Like millions of his/her fellow Americans, the average motorist will, once or twice a week, pull his/her automobile into the neighborhood gasoline station, stop at the pump, get out, flip a lever and start pumping between 10 and 20 gallons of gasoline into the fuel tank. Most American motorists, being good price-conscious consumers, use self-service because prices are significantly lower than full-service.

Unfortunately, lower prices at self-service pumps are luring unwary consumers into a dangerous, secret game of Russian Roulette. Except in California, the District of Columbia and a few other areas, gasoline service stations are not required to use vapor recovery systems to protect citizens from carcinogenic gasoline fumes that contain benzene and other toxic chemicals that are the mainstay of the oil industry's "modern" gasoline.¹ Inhalation of these fumes has been shown to increase the risk of getting cancer. This is in addition to the extraordinary health hazard posed for the entire population of the United States, especially urban populations, by the combustion of unleaded gasoline, particularly premium unleaded gasoline, which emits large quantities of benzene and other toxic pollutants into the air we breathe.

The major oil companies, which produce most of the nation's unleaded gasoline, have known for many years about the threats to human health posed by varying types of exposure to gasoline and its constituent chemicals. These companies have spent a great deal of time and effort trying to prevent the government from regulating these chemicals in order to protect workers and consumers. Most of these companies have deliberately chosen not to post clear and conspicuous warning labels on gasoline pumps to tell the public that gasoline contains harmful toxic substances, like benzene, which, if inhaled on a regular basis, can cause cancer, genetic damage and other adverse health effects. Ironically, there is a law that requires oil companies to provide such information to gasoline dealers in the form of documents called Material Data Safety Sheets.

The effort by major oil companies to avoid, evade or undermine regulation of their toxic gasoline components has been exceeded only by the U.S. Environmental Protection Agency's (EPA) complete abdication of its responsibility to protect the public's health. The EPA, which is legally required to protect the public, has for 13 years listed benzene as a major public health threat. Yet, despite this decision, with decades of toxicological research, the EPA has done very little to require oil companies to remove benzene from gasoline or to sharply reduce the amount of aromatic hydrocarbons which, when burned in an internal combustion engine, produce benzene emissions from the tailpipe. In fact, by its inaction the EPA has, in effect, approved the major oil company strategy of replacing lead as an octane enhancer with cancer-causing benzene and other aromatic hydrocarbons.

Most Americans are unaware of the enormous threats to their health posed by gasoline and its toxic chemical components. The major U.S. oil companies have not only deliberately kept this information well-hidden from the gasoline-consuming public, but have, astounding as it may seem, expanded the use of benzene and aromatics that threaten human health. They have done this in the course of a national campaign to increase demand for their premium, or high-octane, gasoline blends.

With U.S. gasoline demand expected to level off over the next few years and with more and more fuel-efficient cars on the road built to run on regular unleaded fuel, the major companies began to realize several years ago that they were facing a gasoline surplus. To counteract this dire profit-threatening possibility, the companies launched campaigns to sell motorists increasing amounts of higher and higher octane gasoline, even though only a few cars require high octane for optimum performance.

As oil companies grudgingly complied with the EPA rule requiring the removal of lead (another highly toxic substance) from gasoline, they replaced the octane loss by increasing the amount of aromatic hydrocarbons, primarily benzene, toluene and xylene (known collectively as BTX). And when California, a group of Northeastern States and the EPA decided to lower the volatility level of gasoline, oil companies responded again by increasing the proportion of aromatics in the nation's pool of gasoline during the summer driving months. When these chemicals are burned in automobile engines, they not only produce the highly photoreactive chemicals that cause urban smog, but also the carcinogens and toxics in the air that threaten human health.

Recently, to blunt the threat to the major oil companies' stranglehold over automotive fuels by proposed legislation requiring cleaner-burning fuels, like natural gas, ethanol and methanol, one major oil company (ARCO) announced its ability and intention to "reformulate" some of its gasoline in a way that reduces toxic air emissions and the chemical components that cause urban smog.² Neither the oil companies nor automobile companies welcomed President Bush's clean air proposal, especially his "cornerstone" that

would require automobile companies to begin producing and selling one million clean-fuel burning cars by 1997. This proposal was recently defeated in a House subcommittee markup after tremendous lobbying by major oil and automobile companies and after the White House, also under pressure from the oil and auto lobbies, decided to sabotage its own proposal.

Recognizing that clean fuels was high on President Bush's agenda, a number of major oil companies along with the American Petroleum Institute (API) lost no time in launching campaigns to discredit alternate fuels. They attacked methanol and asserted that it was more dangerous than gasoline.³ And one company, ARCO came up with a so-called "clean" fuel of their own -- "reformulated" gasoline. ARCO launched a high-profile publicity blitz of its EC-1 gasoline⁴ and saturated the media with word of its new fuel at precisely the time the House of Representatives began marking up Clean Air legislation.

One automobile industry fuels expert called ARCO's PR strike "diabolically clever," and pointed out precisely what ARCO didn't care to reveal. For example, its new fuel will be sold from pipelines and storage tanks that used to hold leaded gasoline -- a great way to flush out the remaining lead into the older vehicles that can still burn leaded gasoline. Moreover, since ARCO has not altered its refinery configuration, the aromatics that are removed from EC-1 will instead go into ARCO's unleaded fuels. Most of the public was not made aware of these facts.⁵ And ARCO, the ever aggressive marketer, to be sure has used its EC-1 product to further advance its market share in the huge and profitable California auto fuel market. Nevertheless, ARCO's EC-1 does demonstrate that all oil companies can sharply reduce dangerous pollutants in their gasoline, if their market hegemony is challenged.

The major oil companies and major automobile companies have for many years resisted pressure for change. They have lobbied continuously to stop or weaken legislation and regulations designed to improve the nation's environment and protect public health. The major oil companies have also used their economic power to keep alternative cleaner-burning fuels, especially ethanol, out of the marketplace. In response, independent ethanol producers have filed an antitrust action against most of the major oil companies alleging, among other things, that these companies have conspired to restrain trade and have lied to the public about the benefits of ethanol-enhanced gasoline or gasohol.

To summarize, the debate over clean air is a debate over:

- 1) public health and the cancer and other risks that are imposed daily on all Americans, especially children and pregnant women;
- 2) the dangers of continued gasoline consumption;
- 3) the right of the public to be adequately warned about the risks of exposure to benzene and other oil industry toxics; and
- 4) the type of transportation system that is best for the nation when all costs are taken into consideration.

Summary

"Motor vehicles account for approximately 50 percent of all toxic air problems...There are several vehicle fuels that are inherently cleaner than current gasoline, such as ethanol, methanol, natural gas, propane, and electricity...These fuels provide large reductions in cancer incidences from toxic air emissions...on the order of 90 percent or more relative to gasoline vehicles. The major toxic pollutants from gasoline are due either to compounds purposely added to gasoline to increase octane, such as aromatics, which lead to benzene emissions..."

William G. Rosenberg
Assistant Administrator
Environmental Protection Agency
Congressional Testimony - 10/19/89

Benzene is a known cancer-causing toxic chemical. It exists in our environment as a product of oil refining, gasoline combustion in automobiles and industrial use. Various regulatory agencies and health organizations have shown that benzene causes leukemia in human beings. Occupational Safety and Health Administration (OSHA) rules now limit exposure during an 8-hour workday to amounts no greater than one part per million (ppm) for all workers, except those in retail gasoline operations. At retail gasoline stations, there is no exposure limit, just a limit on how much benzene there can be in a gallon of gasoline. That limit is, given benzene's toxicity, (a very high) 5 percent. According to the Environmental Protection Agency, consumers who use self-service pumps are regularly exposed to more than one ppm during the time they are in the service-station area.

Benzene is a chemical component of gasoline. It is an aromatic hydrocarbon, one of several that are used by the oil industry to raise the octane level of gasoline. According to recent studies, exposure to environmental sources of benzene in gasoline refueling operations, evaporative emissions in automobiles and tailpipe emissions result in 200 additional cancer cases every year in the Los Angeles basin alone.⁶

Despite the scientific evidence demonstrating that human exposure to benzene increases the risk of contracting cancer, oil companies have neither adequately warned consumers, nor acted to responsibly reduce benzene levels. On the contrary, over the last few years, oil companies -- with the acquiescence and thus approval of the EPA -- have **increased the level of cancer-causing benzene** and other aromatic hydrocarbons -- specifically toluene and xylene -- in gasoline in order to increase octane levels.

Various studies have demonstrated that as oil companies reduced the amount of lead in their gasoline, they increased the amount of aromatics. Aromatic hydrocarbons now comprise about 30% to 40% of the volume of gasoline sold in the United States, up from about 20% just a few years ago. When burned in automobile engines, the higher aromatic levels in gasoline produce greater amounts of cancer-causing benzene in tailpipe emissions, even with catalytic converters that reduce emissions by as much as 90 percent.

The addition of aromatics has expanded significantly during the last few years, as oil companies have engaged in an "octane race." Major oil companies have artificially stimulated demand for high-octane gasoline through high-intensity advertising as a way to increase profits. And, of course, their advertising and promotion have had the desired effect. The demand for premium is rising more quickly than "overall gasoline demand."⁷ Even though most automobiles on the road today, which must use unleaded fuel, do not need the premium grades, many consumers have the mistaken belief, formulated and promoted by the major oil companies, that higher octane gasoline is better for cars. Many fuel experts argue, however, that the average car only needs a higher octane fuel when and if the engine begins to knock.

While it is true that aromatics are economically important octane enhancers for oil companies, it is also true that there are a number of alternatives that do not pose a comparable human health threat. These include ethanol, methyl tertiary-butyl ether (MTBE) and ethyl tertiary butyl ether (ETBE). These so-called oxygenates increase the oxygen content of gasoline, raise octane and reduce pollution. Moreover, there is substantial evidence suggesting that automobile engines perform better and run cleaner on fuels containing ethanol and other oxygenates.⁸ In fact, beginning with the 1990 model year, General Motors is recommending gasoline containing oxygenates for its automobiles.

Oil company production of aromatics occurs primarily in the refining process known as catalytic reforming, and to a lesser extent in the process called catalytic cracking. Companies with the most reforming and catalytic cracking capacity are assumed to be the largest producers of aromatics. To determine the largest producers of aromatics, U.S. oil refiners have been ranked according to their total reforming and catalytic cracking capacity. Estimates were also made of aromatic production by company for 1988. The ten companies that have the capacity to produce the largest volume of aromatics -- more than 50% of U.S. capacity -- have been designated as *The Toxic Ten*, because more than any other source, *these companies are primarily responsible for the cancer-causing benzene and other aromatics that threaten the health of all U.S. citizens.*

The **TOXIC TEN** ranked by capacity are:

Exxon Corporation
Chevron Corporation
Amoco Corporation
Shell Oil Company
Mobil Oil Corporation
BP America, Incorporated
Star Enterprises (A Texaco/Saudi Arabian Joint Venture)
Atlantic Richfield Company (ARCO)
Sun Company, Incorporated
USX Corporation (Marathon)

(*Note:* Although Sun and ARCO are listed among the companies with the largest capacity to produce aromatics, they at least have made efforts to produce and use non-aromatic chemicals (MTBE and ETBE) to increase octane and at the same time reduce air pollutants. Similarly, Crown, a large independent refiner based in Baltimore, Maryland adds up to 10% ethanol in its gasoline to boost octane with a less polluting component. Unlike ARCO, most major oil companies have not only refused to use ethanol, but have actively campaigned to limit its position in the marketplace. As a result, these companies are currently being sued under the antitrust laws by small, independent ethanol producers.)

Public Policy Recommendations

1. All pumps that dispense gasoline containing benzene and other toxic chemicals must carry clear and conspicuous warning labels on the pump face stating that exposure may cause cancer and other serious health problems.

2. Government must require oil companies to reduce benzene, toluene and xylene to levels that are safe with respect to refueling, evaporative emissions and tailpipe emissions. Such requirements must include the use of Stage II vapor recovery controls at gasoline stations as well as meaningful reductions of benzene and other aromatics in all grades of gasoline.

3. In areas of air quality non-attainment, the government must require sharp reductions in benzene and aromatics in all gasolines sold in the area.

4. Require the use of cleaner burning fuels, specifically natural gas and ethanol as well as cleaner fuel components such as MTBE and ETBE in new U.S. automobiles and other vehicles.

5. Increase significantly federal and state support for mass transit and other less energy-intensive solutions to urban and inter-city transportation.

6. Require increases in the Corporate Average Fuel Economy (CAFE) standards for all new automobiles sold in the United States.

7. Institute uniform national motor fuel quality standards and immediate and continued testing and reporting of the percentage volume of all components of gasoline and other vehicle fuels with respect to the health of the general public.

The Health Threat of Gasoline

"There is sufficient evidence that benzene is carcinogenic to man. Several case reports as well as an epidemiological case control study establish a relationship between benzene exposure and leukemia."

Fourth Annual Report on Carcinogens
U.S. Public Health Service
1985

Every year America's cars consume over 100 billion gallons of gasoline. Yet most people are unaware of the dangers posed to human health by the toxic substances used by the major oil companies to manufacture gasoline. For about 50 years the oil companies had added tetraethyl lead to gasoline as a cheap way to eliminate engine knock, or pre-ignition. Leaded gasoline was first sold in the United States in 1923, despite a strong outcry by public health officials concerned at that time about the dangers posed to human health.⁹ In spite of these concerns subsequently shown to have been totally accurate, General Motors and the Ethyl Corporation (at that time jointly owned by GM and DuPont)¹⁰ used their political and economic muscle to drown out the opposition.

Even though leaded gasoline had been shown to be a major health threat, which led in part to passage of the landmark Clean Air Act of 1970, it still took nearly 20 years to get the lead out of gasoline. The combined political and economic clout of major oil and auto companies helped delay implementation of rules requiring lead reduction. Ultimately, however, those concerned about public health prevailed and, despite their protestations to the contrary, the oil and automobile industries were quite able to manufacture products that did not require lead.¹¹

Just as in the battle over lead in gasoline, the oil and automobile industries are steadfastly resistant to change in the current battle over clean air legislation. The oil industry wants to continue selling its toxic chemical brew, commonly known as unleaded gasoline, and the automobile industry wants to continue manufacturing cars with internal combustion engines that run primarily on the oil industry's fuel.

The chemical composition of gasoline is very complex. At any one time there may as many as 200 different chemicals contained in a gallon of gasoline. Many of the chemicals are highly toxic. While much research remains to be done on many of these chemicals, research over the last 10-15 years has demonstrated the serious health risks posed to Americans by exposure to benzene. This highly toxic chemical is contained in crude oil, manufactured at oil refineries, added to gasoline¹² and is produced by the combustion of gasoline containing aromatic hydrocarbons.

Benzene enters the human body primarily through inhalation. It is absorbed rapidly from the lungs into the blood. Although the body is able to convert most of the inhaled benzene into substances that are excreted through the urine, some benzene is converted into toxic chemicals that can damage certain body parts.

The evidence that human exposure to benzene results in an increase in the number of human deaths from cancer and other diseases is not disputed. For over 40 years epidemiologists and other health researchers have demonstrated benzene's toxicity and carcinogenicity over and over again.

A January 10, 1979 report by the U.S. Environmental Protection Agency concluded:

Ample evidence exists that benzene causes chromosomal aberrations in animals and humans exposed to benzene.¹³

While the EPA found evidence that benzene causes chromosomal damage in human and animal cells, it could not determine whether such damage also occurred in the germ cells that are passed on from parents to children. But the EPA found that the chromosomal damage "may be occurring at concentrations as low as 1 part per million (ppm) in air."¹⁴

In October 1981 the International Agency for Research on Cancer (IARC) in a comprehensive review of the research on the toxicity of benzene concluded that exposure to benzene in the workplace led to an increased risk of leukemia. The IARC also concluded that there is "sufficient evidence that benzene is carcinogenic to man."¹⁵

In an information directory on toxic chemicals published by the American Petroleum Institute in 1982, benzene was listed as a very great health hazard "for chronic overexposures." The API report, written as a general guide for workplace exposure to toxic chemicals, provided the following information on the chronic effects of exposure to benzene:

Benzene produces chronic effects on the bone marrow and blood which may lead to leukopenia, aplastic anemia and leukemia. Prolonged overexposure to benzene may also cause fatigue, nausea, loss of appetite, vertigo, headache, irritability, nervousness, nosebleed, and other hemorrhagic signs.

It is important to note that as far back as 1978 the American Petroleum Institute commissioned research on the toxicity of gasoline vapors. The API research found that some test rodents developed kidney and liver tumors.

Studies on laboratory animals have raised the possibility that chronic exposure to benzene may have adverse effects on reproductive function or performance. No adverse reproductive effects in humans have been determined.¹⁶

A November 27, 1984 report by the California Air Resources Board (CARB) and the California Department of Health Services concluded:

Since the evidence strongly suggests that benzene is a known human carcinogen, since the evidence does not warrant the assumption that carcinogenicity is confined to the dose above any threshold, and since the range of conservative reasonable dose-response curves predicts a range of added lifetime cancer risks which are not negligible, the ARB staff considers available evidence sufficient to recommend listing benzene as a toxic air contaminant.¹⁷

In a 1985 study of the Santa Clara Valley in California the EPA determined that benzene caused several different kinds of blood disorders and proneness to infection.¹⁸

An April 1987 EPA study concluded that "the occurrence of liver cancer in female mice and kidney cancer in male rats provides 'sufficient' evidence in animals that inhalation of wholly aerosolized gasoline is carcinogenic..."¹⁹

In a thorough review of all the toxicological literature on the health effects from exposure to gasoline and gasoline vapors, a recent report concluded:

...that gasoline and at least one of its major constituents (benzene) are presumed human carcinogens. Exposure to gasoline and its components is also associated with other adverse health effects such as toxicity to the hematopoietic, kidney, liver, reproductive/developmental and nervous systems. Comparisons of cancer and non-cancer health criteria show that non-cancer reference doses for gasoline and benzene correspond approximately to one cancer risk in one hundred thousand.²⁰

All the studies and literature reviews that have been done conclude without disagreement that benzene is a highly toxic carcinogen that can cause leukemia. Benzene's toxicity is such that it is also considered harmful to the nervous, reproductive and development systems. It is these findings that have led health officials to support federal and state efforts to severely limit benzene emissions into the environment.

Cancer at the Gas Pump

"This product may contain up to 4.9% benzene. Repeated or prolonged breathing of benzene vapors has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal."

Material Data Safety Sheet
Chevron
January 1, 1987

In 1984 the EPA issued an analysis of benzene and other gasoline emissions that posed a public health risk. According to the agency, "the emissions from gasoline marketing sources may induce public health risks which require control on a national basis."²¹ Moreover, the Environmental Health Committee of the EPA's Science Advisory Board concluded, "wholly vaporized unleaded gasoline vapors should be classified as probably carcinogenic to humans..."²² The EPA also noted that "vehicle refueling controls not only reduce ambient concentrations of VOC and hazardous emissions dispersed from the service station, **but also reduce the much higher exposures to hazardous pollutants during self-service refueling.**"²³ (Emphasis added)

Researchers have found that gasoline consumers who purchase gasoline at self-service pumps are routinely exposed to an average benzene level of 1 ppm with a maximum of 4 ppm every time they fill their gasoline tanks.²⁴ Consumers who purchase premium unleaded gasoline face even more risk, because this grade of gasoline tends to have greater amounts of cancer-causing chemicals than the regular unleaded grades.²⁵ The EPA has estimated that there are about eight chances in one hundred thousand of developing cancer from self-service refueling based on continuous lifetime exposure to 1 ppm benzene levels.²⁶ According to the U.S. Senate Environment & Public Works Committee, a 1% risk translates to an increase of 220 cancers a year in the Los Angeles Basin.²⁷ EPA has also concluded that citizens living in the vicinity of gasoline stations, terminals and refineries are exposed to even higher levels of benzene.²⁸

The Office of Technology Assessment of the U.S. Congress states that "refueling emissions are the last significant source of vehicle emissions to remain largely uncontrolled."²⁹

According to one expert on gasoline,

Of the aromatics in gasoline, benzene has the lowest boiling point at 176°F. Except for ortho-xylene, it has the lowest octane quality with an average blending (R+M)/2 of 97. Unfortunately, being the lightest aromatic, it is also the one most likely to contribute to evaporative emissions in concert with other light hydrocarbons. *Vehicle fueling, especially in self-service stations, is probably the critical point for benzene exposure to humans from motor fuel.*³⁰ (Emphasis added)

The risk to consumers as they refuel their automobiles was clearly recognized by CARB in 1987 when it concluded:

...The greatest risk from service station benzene emissions is due to direct exposure during vehicle fueling and is estimated to effect over one million persons [in California]. The lifetime cancer risk associated with this exposure is 7 to 51 cases per million persons.³¹

In its August 1989 report on the risks and health effects of exposure to gasoline and gasoline vapors, the Northeast States for Coordinated Air Use Management (NESCAUM) concluded that average lifetime cancer risk from exposure to benzene during self-service operations was almost two per million and that the maximum risk was two per one hundred thousand. The risks from benzene in gasoline satisfy the two necessary conditions by which risk assessments are made -- potency and exposure. Benzene exhibits a fairly high potency (the ability to cause cancer). Potential exposure may also be very high under certain exposure conditions, such as refueling.³²

While there is some variance (EPA in 1984 estimated the risk as 2 cases per million while the CARB in 1987 projected 7 to 51 cases per million) as to the lifetime cancer risk associated with exposure to benzene during automobile refueling, there is no debate over the fact that Americans are dying and will die from cancers caused by exposure to benzene, a carcinogenic chemical that can be removed from or substantially reduced in gasoline. This has been shown by ARCO's production of EC-1.

Some jurisdictions -- California, the District of Columbia and St. Louis -- have implemented Stage II vapor recovery controls for gasoline pumps. These devices reduce consumer exposure to benzene and gasoline vapors. As the EPA has pointed out,

...vehicle refueling controls not only reduce ambient concentrations of VOC and hazardous emissions dispersed from the service station, but also reduce the much higher exposures to hazardous pollutants during self-service refueling.³³

Data demonstrate that vapor recovery systems at the gasoline pump can sharply reduce - by a factor of 10 (from 1.5 ppm to .13 ppm)³⁴ -- benzene exposure for both motorists and service station attendants. A consumer who purchases 20 gallons of gasoline a week at a self-service pump without vapor recovery experiences "an added individual risk of 7 to 51 excess lifetime cancers per million person."³⁵

Vapor recovery controls for gasoline pumps will be far more effective than on-board canisters in automobiles primarily because of the fact that only new cars can be equipped with canisters thereby limiting the effectiveness of this strategy. As has been pointed out,

If on-board control is required it will not be as effective as the proposed service station measure at reducing individual fueling risk or reducing areawide and neighborhood benzene exposure for the next 15 to 20 years (until controlled vehicles replace the uncontrolled vehicles).³⁶

California, the state with the most serious air pollution problems, is seeking even more stringent controls on benzene emissions.

Vapor recovery at service stations, emission standards for hydrocarbons (HC) from new vehicles, and the inspection and maintenance (I&M) program for in-use vehicles have greatly reduced benzene emissions. New measures anticipated for vehicles would reduce benzene emissions more. However, *a considerable risk of cancer from benzene in the ambient air will remain despite the implementation of these measures.* Any substantial reduction of this residual risk will require more control of benzene emissions from gasoline-powered vehicles. One possible means of this control is by adjusting the composition of gasoline. Our investigation shows that reducing the benzene content of gasoline has as great a potential for reducing benzene emissions as do all anticipated vehicular controls combined.³⁷

Removing benzene from gasoline or sharply reducing the volume percentage of benzene in gasoline will certainly further reduce the risk of exposure during self-service refueling. There is, however, debate over how much benzene reduction will effect benzene emissions from automobile tailpipes due to the fact that combustion of gasoline high in aromatics and containing no benzene, still produces benzene emissions.

Benzene -- The Poison in Our Air

"Overall, mobile sources dominate the nationwide benzene emission inventory. In 1982, mobile sources contributed about 85 percent of the emissions. Of the mobile source portion, exhaust emissions contribute about 82 percent, evaporative emissions about 17 percent, and refueling emissions the remaining 1 percent. Over 95 percent of mobile source benzene emissions arise from gasoline-powered vehicles."

Charles L. Gray, Jr.
Director
Emissions Control Technology Div.
Environmental Protection Agency
5/15/86

Benzene, a highly toxic and carcinogenic chemical, a proven threat to human health, its exposure sharply limited in the workplace is present in increasing quantities in our urban air.

In general, there are two types of exposures involved with mobile source incidences. The first is exposure of the general public to ambient benzene concentrations (ambient exposures), and the second is exposure of individuals to more highly localized concentrations of benzene, such as during refueling operations (individual exposures). Exhaust, evaporative and refueling emissions from mobile sources all contribute to ambient concentrations of benzene and thus to ambient exposures. However, in addition to their contribution to ambient exposures, refueling emissions also pose an additional individual exposure risk.³⁸

Most of the benzene present in the ambient air is generated by the use and combustion of gasoline. The rest is generated by industry and other stationary sources (See Figure 1.)

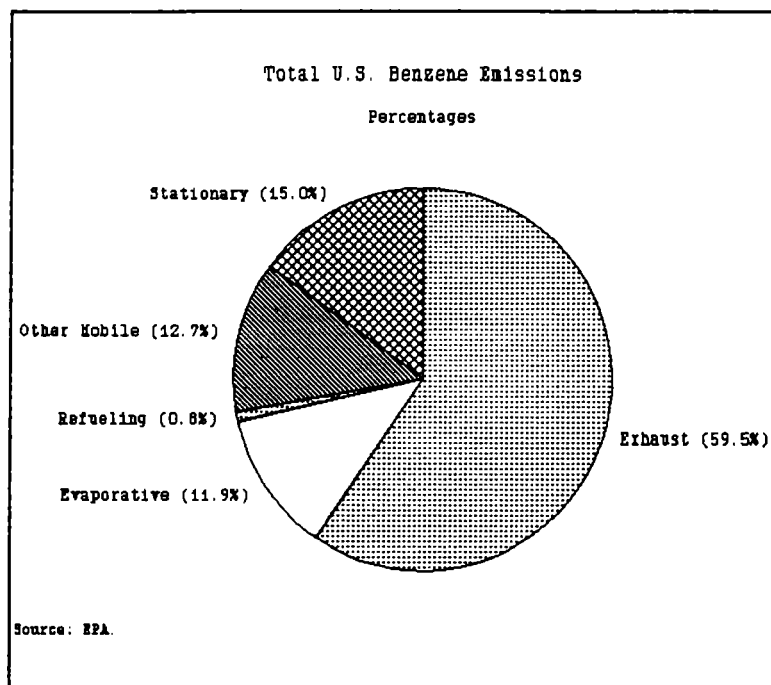


Figure 1

According to the EPA "In 1982, mobile source benzene emissions were roughly 250,000 metric tons, or 85 percent of the total benzene emissions. Of the mobile source contribution, 70 percent comes from exhaust, 14 percent from evaporative emissions and 1 percent from motor vehicle refueling."³⁹ (See Figure 2)

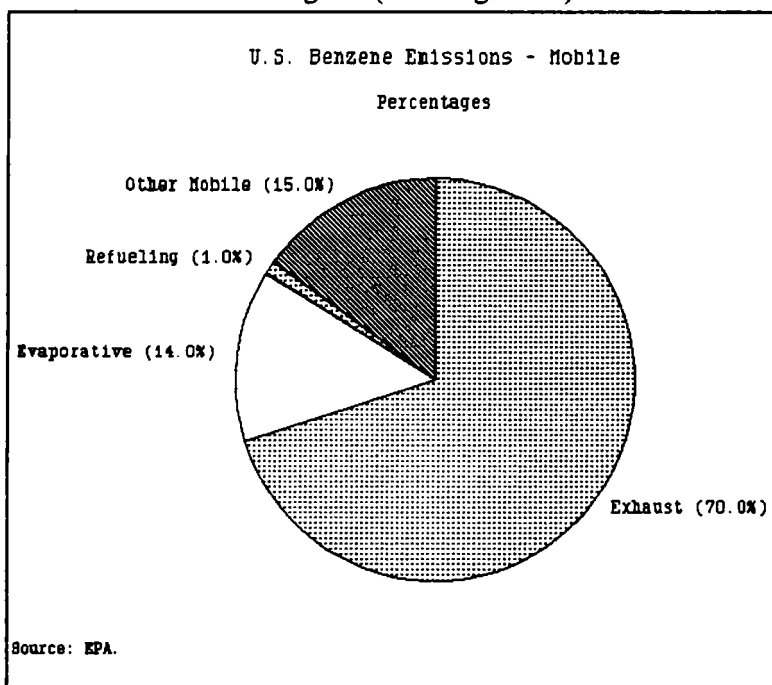


Figure 2

According to a study prepared for the Department of Energy, "Ambient monitoring data indicate that benzene levels range from 1 to 100 parts per billion (ppb) with the highest values reported in metropolitan areas suggesting a major contribution from automobile exhaust."⁴⁰ EPA estimates that on a population weighted average basis, urban benzene concentrations due to mobile sources are 7.1 ppb, while rural concentration levels average .51 ppb.⁴¹ Based on this assessment, EPA estimates "the annual cancer risk from mobile source benzene is 155 in 1986."⁴² The CARB uses the range of 22 to 170 potential cases per million people exposed for 70 years to one ppb as the carcinogenic potency of benzene in the ambient air.

In 1984, benzene was the first chemical identified as a toxic air contaminant by the CARB staff. Benzene was chosen not just because it is a known human carcinogen, but because "it is ubiquitously emitted by the marketing and burning of gasoline, it is persistent in the atmosphere and its presence in the atmosphere is well documented." The staffs of the CARB and Department of Health Services reported that "Motor vehicles contribute about 93% of the estimable benzene emissions in California, or about 15,000 tons per year."⁴³ The report also concluded that evaporative emissions from gasoline marketing, a stationary source, contributed an estimated 300 tons per year; all stationary sources contributed 1,110 tons a year; and automobile evaporative emissions totaled 1,600 tons. This same report found that automobile exhaust emissions contributed 83% of total mobile source benzene emissions.

A recent draft report by the South Coast Air Quality Management District (SCAQMD) came up with another disturbing finding. Usually, analysis of risk from exposure to air toxics, such as benzene, are based on the exposure to such pollutants in the ambient air. However, SCAQMD conducted an in-vehicle analysis of toxics and found "that concentrations of compounds directly related to motor vehicle emissions including carbon monoxide, benzene, toluene, xylene, ethylene dibromide, ethylene dichloride, and lead are **2 to 4 times higher in commuting vehicles than they are outdoors.**"⁴⁴ (Emphasis added)

Most importantly, the SCAQMD study concluded:

Of the pollutants evaluated, benzene contributes the greatest risk to the Basin's commuters. The estimated risk from in-vehicle exposure is about 15 percent of the total risk, or an added one-in-one-hundred thousand chance of contracting cancer, assuming 1-1/2 hours of commuting time every day of the week, and assuming all other exposures were from outdoor concentrations of benzene.⁴⁵

As with most advances in protecting the public from dirty air, the State of California is considerably ahead of the Federal Government with respect to the dangers posed to consumers from benzene emissions. In 1985 the CARB listed benzene as a "toxic air contaminant." This listing began a procedure by the CARB to develop ways of controlling benzene emissions.

Unlike most states, California has already taken many steps to reduce the public's exposure to benzene. These include: vapor recovery at service stations⁴⁶, emission standards for hydrocarbons (HC) from new vehicles and a regular inspection program. New control measures that are going into effect will further reduce benzene emissions. But, according to CARB officials, "...a considerable risk of cancer from benzene in the ambient air will remain despite the implementation of these measures." To address this, CARB is now considering requiring changes in the composition of gasoline. In other words, they are setting upper limits in the amount of benzene in gasoline.⁴⁷

The fact that California represents perhaps the largest single market for both new automobile and gasoline sales gives it a great deal of influence in the way automobile manufacturers and oil companies make decisions. With its corporate finger in California's wind, General Motors has often anticipated the regulatory direction on clean air. Joseph Colucci, the head of GM's Fuels and Lubricants Department, believes that regulators will begin to turn their attention to the problems posed by aromatics. In Colucci's view, reducing aromatics will not just reduce photochemical reactivity of automobile emissions, but will also reduce engine deposit formation, which, it turns out, increases the need for higher octane gasoline.⁴⁸

Benzene -- Mobile Sources

"Data on the recent actual and expected future amounts and compositions of gasoline are available from a survey of refiners. Respondents who account for 90 percent of the gasoline supplied to California provided the data...Benzene will average about 2 percent of gasoline by 1995, a marked increase from the mid-1980's, when the estimate was 1.4 percent."

Richard Vincent
Air Pollution Specialist
California Air Resources Board, 3/89

The amount of benzene found in the air that pollutes many of America's cities is directly related to the amount of benzene and other aromatic hydrocarbons contained in gasoline. The benzene released in refueling and evaporation is directly proportional to the amount of benzene in the fuel. However, benzene that is emitted to the air from automobile tailpipes -- 70% of mobile source emissions -- is related both to the benzene and aromatic content of the gasoline.

As early as 1980 it was recognized that benzene was formed in the gasoline combustion process.⁴⁹ Subsequently, a study prepared for the American Petroleum Institute suggested that "the use of very low benzene content fuel may not result in proportionately lower benzene exhaust emissions, thus indicating that the combustion process itself may be responsible for some benzene formation."⁵⁰ The EPA, in 1984, stated that "Benzene tailpipe emissions are not affected substantially by benzene removal, since benzene is formed in the combustion process."⁵¹ Further research like the 1986 study by the National Institute for Petroleum and Energy Research (NIPER) concluded that:

The benzene content of the exhaust HC...increased by about 0.75 weight percent for each incremental increase of 1 volume-percent fuel benzene. Likewise, increasing the aromatic content of the fuel from 25 volume percent to 40 volume percent resulted in an average increase in the benzene content of the exhaust HC of about 1.3 weight-percent. The increase in benzene emissions with increasing level of nonbenzene aromatic content of fuel suggests that the higher molecular weight aromatics are precursors of benzene.⁵²

More recent data demonstrate that the higher the aromatic content of gasoline, the higher the benzene emissions. A 1989 study reached the following conclusions:

1. The relative effect of benzene (in fuel) on benzene emissions were much greater than that of the aromatic species studied.
2. All of the non-benzene aromatic components tended to increase exhaust benzene levels. The components studied -- toluene, ethylbenzene, xylenes, and heavy reformat (C⁺⁹) -- had an average effect of about 8% of that of benzene.
3. Estimates of benzene emissions...were about 12% lower than the observed levels for two commercial fuels. The discrepancy might be due to the presence of other (nonaromatic) benzene precursors, such as naphthenes and olefins, in these fuels.⁵³

In recent years oil companies have been raising the aromatic levels in unleaded gasoline for several reasons. In the first place, lead phasedown required gasoline refiners to find alternatives to lead as an octane booster. Almost all refiners chose to boost octane with higher levels of BTX (benzene, toluene and xylene). These aromatic hydrocarbons are produced, for the most part, through the refining operation known as catalytic reforming⁵⁴ and secondarily through the operations known as catalytic cracking and hydrocracking.

As the National Petroleum Council reported,

Catalytic reforming is the octane generator and determinant in the gasoline-oriented refinery. The gasoline-range material recovered from other operations, such as FCC, alkylation, hydrocracking, and polymerization, are of relatively fixed octane quality. The catalytic reforming process is capable of efficiently yielding gasoline products ranging in octane number from the low 80s to over 100 Research clear (unleaded).⁵⁵

Similarly, the Energy Information Administration (EIA) has concluded:

The U.S. refining operations of the FRS [major oil] companies have been the focus of two ongoing strategies during the 1980s: first, reduction of crude oil distillation capacity and, second, upgrading of remaining capacity to use lower quality crudes and produce a greater proportion of lighter, higher octane products.⁵⁶

Between 1981 and 1987, the major oil companies in the U.S. increased their "downstream refining capacity," as a percentage of distillation capacity, from 63.7% to 73.3 percent.⁵⁷

The EIA also reported that during 1988, oil refiners continued to upgrade their facilities to increase production of high octane gasoline. "Premium unleaded gasoline accounted for 23.1 percent of the domestic gasoline market during the summer of 1988 (June through August) compared to 18.8 percent of the market during the summer of 1987. Premium unleaded gasoline requires more extensive treatment by complex refinery processes than does regular unleaded gasoline."⁵⁸

Oil companies have not only increased their investment in catalytic reforming technology, but have also increased the "severity" of reforming to further increase the production of octane-rich aromatics. Refiners have gone further. They have also raised the octane level of their gasolines such that premium unleaded grades have increased from 91 to 93 (R+M)/2 octane, with one company, Sun, producing a 94 (R+M)/2 octane grade of premium unleaded. Sun, however, to its credit, adds 15% MTBE, an oxygenate, to all its premium gasoline in order to raise octane.

According to a survey of major refiners, the National Petroleum Council (NPC), an industry advisory group, found that the average benzene content of all gasoline would rise from 1.72 volume % in 1984 to 1.81 volume % in 1988. The greatest increase -- 15% -- however, occurs in unleaded premium which was expected to rise from 1.54 volume % in 1984 to 1.77 volume % in 1988.⁵⁹ The NPC survey also reported that "Refiners are shifting reformer feedstocks and operating conditions to produce more high-octane reformate. More importantly, shifting reformer feedstock to reform additional hydrocarbons with six carbon atoms (benzene has six carbon atoms) **can significantly increase the benzene content of reformate -- from 1 to 3 percent, for example.**"

A number of experts have examined the trend in the increased reliance of refiners on aromatics to raise octane levels. William E. Morris, an independent consultant, observed in early 1985,

Aromatic content increased from 22% in 1970 to 27% in 1980 and 1984 as reforming severity was increased to achieve the required increase in unleaded pool octane. As leaded gasoline is phased out, aromatic content will increase further to about 35%.⁶⁰

Similarly, gasoline refining expert George H. Unzelman writes,

Today the naphtha reformer contributes about 34 volume percent of all the gasoline blend stock manufactured in the United States. It also generates about 60 volume percent of the aromatics that make up marketed gasoline. Most of the rest of the aromatics come from cat-cracked gasoline.⁶¹

Unzelman further points out that in their effort to increase octane, refiners will increase the severity of reformer operation. As reformer severity is increased, less gasoline is produced per unit of input⁶², while aromatic production increases dramatically. For example, at low severity producing reformat with an octane rating $[(R+M)/2]$ of 74.2, the aromatics volume is about 26 percent. On the other hand, operating a reformer at high severity will raise octane to 91.8, but with an increase in aromatics volume to 57 percent.

Thus, it is not surprising that the average level of aromatics in gasoline has risen from about 20 volume percent in the late 1970s to about 40 volume percent today -- a doubling in a few short years (See Figure 3).

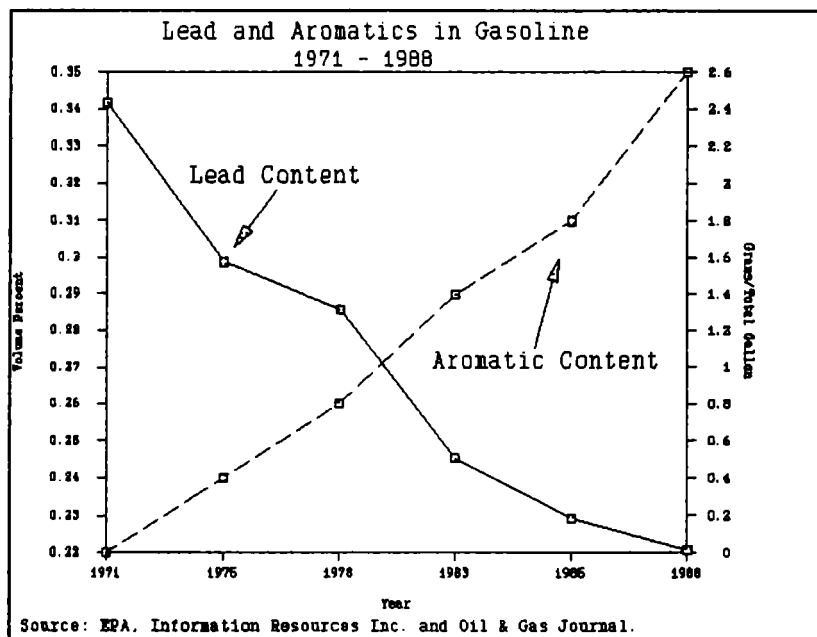


Figure 3

A study by the Coordinating Research Council (CRC) found that "a change of aromatic content (no benzene) from 25% to 40% in gasoline results in a 25% to 100% increase in the benzene contribution to exhaust gas hydrocarbons."⁶³

The decision by the Northeastern states and EPA to lower the volatility level of gasoline has also led to greater use of aromatics in place of butane⁶⁴ which was either reduced or removed from gasoline to meet the lower Reid Vapor Pressure (RVP) standards.⁶⁵ The trade-off for lower vapor pressure, however, has been an increase in benzene emissions and relative reactivity of the remaining aromatic hydrocarbons.

In short, the major oil companies bear the full responsibility for virtually all of the mobile source benzene emissions. Their deliberate decisions to increase production of aromatics (BTX) are why benzene has become such a serious health threat both at the self-service pump and in the ambient air. Benzene and aromatic hydrocarbons occur in crude oil and are manufactured in refineries and can be lowered or raised by chemical engineering. ARCO has already demonstrated that gasoline can be manufactured to meet automotive specifications without large amounts of either benzene or aromatic hydrocarbons.

Gasoline -- What is it and How is it Made?

"A complex mixture of relatively volatile hydrocarbons, with or without small quantities of additives, that has been blended to form a fuel suitable for use in spark-ignition engines."

Petroleum Supply Monthly
Energy Information Administration
July 1989

Typically, gasoline can be formulated with as many as 200 different chemicals⁶⁶ called hydrocarbons. These hydrocarbons include paraffins, olefins and aromatics. In general, unleaded gasoline contains 40-60 percent paraffins, 30-50 percent aromatics and about 10 percent olefins.⁶⁷

Gasoline is manufactured or chemically engineered from crude oil. Crude oil produced from one area or field is often quite different from crude oil produced from a different field. Specific gravity and sulfur content are just two basic crude oil variables. In a refinery, depending on its complexity, crude oil is broken down into different chemical components. Most major oil company refineries incorporate processes that maximize the production of gasoline. While most refineries convert 50% of their crude oil and other feedstocks into gasoline, there are some that are capable of converting between 70% and 100%!

When crude oil is heated in a refinery, the varying chemical fractions can be separated. This is a process called distillation. Some percentage of gasoline, depending on the crude oil, can be recovered from distillation. Most modern day refineries include additional processes utilizing heat, pressure and catalysts to separate and make additional hydrocarbons used in the manufacture of gasoline. These processes include primarily, catalytic cracking⁶⁸ and catalytic reforming⁶⁹, and secondarily, thermal cracking⁷⁰, catalytic hydrocracking⁷¹, alkylation⁷² and isomerization.⁷³

When blending the hydrocarbon components to make different grades of gasoline (except for some areas where leaded regular is still sold, most major refiners manufacture and sell three grades of unleaded -- regular, midgrade and premium), refiners seek to maximize octane, but at the same time minimize cost. The reason for manufacturing three grades has more to do with the marketing of octane, the characteristic most often associated with the "perception of quality." The octane rating of gasoline is the measure of the capacity of gasoline to withstand or prevent engine knock, not with any other state or federal specifications, standards or regulations.

The American Society for Testing and Materials (ASTM) has issued specifications governing the physical properties for each grade of gasoline, such as boiling point, sulfur content, phosphorus content, lead content, vapor pressure, octane rating and volatility limits. The Federal Government promulgated regulations governing lead content and more recently volatility standards, following decisions by a number of states to reduce the volatility gasoline during summer months. The higher the vapor pressure or the greater the volatility of gasoline, the more ozone-creating pollutants contained in gasoline are emitted into the air. There are, however, no standards regarding the volume percentage of aromatics (there is a 5% volume limit on benzene per gallon) that oil companies may include in their gasolines.

The production and sale of gasoline is the most profitable aspect of refining operations. Over the last several years, refining margins have been at all time high levels. This means that oil companies have the ability to absorb additional costs that are required to reduce the toxicity of their main product. Certainly, reducing benzene emissions by reducing the volume of benzene and aromatics or by implementing Stage II recovery systems can be done, but at a cost. The cost, however, is small in relation to the number of cancer deaths that can be prevented.⁷⁴

The Octane Race

"In most vehicles, no benefit is gained from using gasoline that has a higher octane number than is needed to prevent knock."

"Gasoline for Your Car"
American Petroleum Institute
April 1986

In the 1920's automobile manufacturers and oil refiners discovered that the addition of tetraethyl lead to gasoline reduced engine "knocking" by slowing the rate at which gasoline ignited. The ability of gasoline to resist knocking is measured by its octane number.⁷⁵ The higher the octane number the greater the resistance to knocking. Automobile engines require gasoline with a certain minimum octane level. As the compression ratio increases, so too does the octane requirement. Octane rating, however, does not measure power or fuel economy.⁷⁶

During the 1960's oil companies began adding more and more lead to gasoline in order to increase the octane level of gasoline required by the automobile industry's production of more and more "muscle cars" (high compression engines with greater horsepower). But the increasing amount of lead in gasoline (as much as 2.5 grams per gallon during the late 1960's) resulted in commensurate increases in lead emissions into the environment creating a major public health hazard.

In 1970 Congress passed a sweeping set of amendments to the Clean Air Act, which, among other things, established air quality standards for six pollutants including lead. As part of the Clean Air Act of 1970 Congress required automobile manufacturers to reduce carbon monoxide and hydrocarbon exhaust emissions through the use of catalytic converters. Congress also included a section that authorized the newly created Environmental Protection Agency to control or prohibit fuels or fuel additives that threatened human health or welfare or impaired the performance of emission control devices.⁷⁷ Thus, the primary moving force behind lead phasedown was the introduction in 1975 of catalytic converters to reduce hydrocarbon, carbon monoxide and other emissions as required by the Clean Air Act. Because leaded gasoline contaminated catalytic converters, oil refiners were inexorably forced to manufacture gasoline without lead.

Secondarily, EPA based its regulatory decisions to phase out the use of lead in automotive fuels on the epidemiological and medical evidence demonstrating that lead emitted into the air from the combustion of gasoline accounted for about 90% of the lead in the air that represented a major cause of lead poisoning in children.⁷⁸

When the EPA set about proposing regulations to require the introduction of unleaded fuels, the major oil companies assailed efforts to reduce gasoline's lead content. Mobil Oil took out advertisements attacking the emission standards and labeled them "the \$66 billion mistake." The major oil companies, for the most part, cared little about the public health consequences of their actions. Their primary concern during the debate in the 1970's over leaded gasoline is not very different from their primary concern in the current debate over the benzene and aromatic content of gasoline -- the maximization of profit and control over competition.

Oil company complaints about their inability to meet unleaded gasoline octane requirements were not lost on the EPA. When it issued its lead phasedown regulations in December 1973, the EPA, although it concluded the aromatic content of gasoline would increase "5 to 7 percent," made no attempt to assess the health impacts of such an increase. To its credit the EPA did acknowledge that the increase in aromatic content would result in an "increase in the reactivity of automobile exhaust."

As lead was being phased out during the late 1970's and early 1980's, major oil companies shifted their octane-enhancing capacity from lead to aromatics. Although the companies had other "cleaner" alternatives, namely alcohol and ethers (oxygenated hydrocarbons), they selected aromatics. This choice was made, primarily because aromatics could be manufactured at the oil industry's refineries. Alcohol production was not in the control of the major oil companies, and large scale production would have required investments outside of the oil industry -- something in which the companies were, and are still, not interested in. The EPA bowing to the claims of the major oil companies agreed stating, "Although increases in the aromatic content of gasoline are not the sole means of maintaining octane requirement, it appears to be the only practical means of reaching this objective rapidly."⁷⁹

As the major oil companies began to upgrade their refineries, especially during the 1980's,⁸⁰ their capacity to manufacture aromatics increased substantially to the point where in 1985 the capacity to produce octane exceeded demand. As a result of what the industry itself called an "octane surplus" the companies began an octane race that has resulted in raising the octane level of premium unleaded gasoline from 91 to 93 (R+M)/2. The decisions to increase the octane level of unleaded gasoline was driven far less by demand, and much more by the companies' determination to utilize their excess octane-producing capacity. Demand was spurred by high-intensity mass advertising. As one oil company executive put it,

Octane demand is a situation forced on customers as a marketing advantage over competitors because major companies have installed so much octane equipment.⁸¹

And, of course, their advertising and promotion have had the desired effect. The demand for premium is rising more quickly than "overall gasoline demand."⁸² Even though most automobiles on the road today, which must use unleaded fuel, do not need the premium grades, many consumers have the mistaken belief that higher octane gasoline is better for their cars.⁸³ Many fuel experts argue, however, the average car only needs a higher octane fuel, if the engine begins to knock. According to John Fobian, the director of the American Automobile Association's Automotive Engineering Department,

...don't look at the octane rating as a measure of the quality of the gas.⁸⁴

Similarly, according to the American Petroleum Institute, the oil industry's principal trade association,

In most vehicles, no benefit is gained from using gasoline that has a higher octane number than is needed to prevent knock.⁸⁵

Otherwise, unless consumers drive automobiles with high compression engines (which require high octane fuel), the lower octane grades of 86-87 or the mid-grade 89 should be acceptable.⁸⁶ Oil companies are introducing the mid-grade as a substitute for regular leaded gasoline⁸⁷ -- a product with a lower margin of profit.⁸⁸

Of course, most major oil companies increased octane by increasing "reformer severity" (running catalytic reformers at higher temperatures to produce higher octane reformat) and thereby producing more and more aromatic components, particularly more benzene.

The major oil companies are expressing concern as well as typical industry indignation that state and federal public officials are considering restrictions on the use of aromatics and benzene in gasoline. According to Phillips Oil Co. executive,

Since naphtha reforming makes octane mainly by converting other hydrocarbons to aromatics, limits on gasoline aromatics content could reduce refiners' ability to fully utilize installed reforming capacity, or require expensive alternative processing. Since about a third of the gasoline pool is reformat, any reduction in reformat octane would have a very significant impact on premium gasoline production capability. Any regulatory time table on aromatics in gasoline is likely to extend into at least 1990, and discussion will initially focus on benzene.⁸⁹

In a self-serving argument reminiscent of similar claims as to why it was too "costly" to get the lead out of gasoline, the major oil companies insist that it is too costly to remove benzene from gasoline, even though the technology to do so exists!

...it is both difficult and expensive, requiring significant new investment out of proportion with investments currently being incurred to meet lead phasedown. The added burden on the refiner would result in higher cost from the refinery, thus impacting the competitive position of the U.S. refining industry⁹⁰

Some oil industry officials attempt to mislead lawmakers and the public with regard to the status of benzene in gasoline. An Amoco executive, for example, had the temerity to testify before the House Subcommittee on Energy and Power of the Committee on Energy and Commerce that,

Benzene is not added to gasoline...Gasoline contains benzene because benzene is a natural component of crude oil and some is produced in the refining process. Most gasoline contains 1 to 3 percent benzene.⁹¹ (Emphasis in the original)

The fact is that oil refiners have technology that can **remove** benzene, just as they have technology to remove sulfur and other contaminants. ARCO has already proven that the oil industry can easily cut back on benzene and aromatic hydrocarbons. Thus, oil company executives are merely erecting a strawman when they argue that "benzene is not added to gasoline." The point is irrelevant, since it is the removal of benzene from both gasoline and emissions that is at issue.

Benzene -- A History of Regulatory Failure

"Attempting to resolve one of the country's most difficult pollution issues, the Environmental Protection Agency yesterday announced regulations on benzene that officials said would eliminate 90 percent of industry emissions of the cancer-causing chemical in the air...The new rules do not address the largest source of benzene pollution -- the automobile."

The Washington Post
9/1/89

The chemical benzene is found as a component of crude oil and is produced in oil refineries by a number of processes. It is used with other aromatic hydrocarbons to improve the octane rating of gasoline and is thus a chemical which refiners blend with roughly 200 other chemicals to make different grades of gasoline. Benzene is also produced when gasoline containing benzene and aromatic hydrocarbons is burned in automobile engines. And research now has demonstrated that gasoline containing aromatics but no benzene, still produces substantial benzene emissions when consumed in automobile engines.

Benzene is a known carcinogen. It causes cancer. According to the U.S. Public Health Service, "There is sufficient evidence that benzene is carcinogenic to man." Furthermore, "a relationship exists between benzene exposure and leukemia."⁹²

Health researchers have concluded that there is no threshold that can be considered safe for purposes of benzene exposure. Over the years health officials have continually lowered the level of exposure limits. Between 1946 and 1963 U.S. government health officials recommended lowering the benzene exposure limit from 100 ppm to 25 ppm. In 1971 the Occupational Safety and Health Administration adopted this exposure level for workers exposed to benzene in a given eight hour work period. In 1974, however, U.S. Government hygienists recommended a further reduction of the exposure limit to 10 ppm. Three years later OSHA issued an emergency temporary standard at this level. Despite the Carter Administration's effort to protect workers from exposure to this dangerous chemical, the American Petroleum Institute fought the new standard all the way up to the Supreme Court. On July 20, 1980 the Supreme Court handed down a decision upholding a lower court ruling vacating the new OSHA safety standard. The Court did, however, much to the oil industry's dismay, rule that before OSHA could issue a new standard it must make a determination that a "significant risk" existed and that a new standard would significantly reduce or eliminate that risk.

The oil industry's strategy to prevent tougher regulation of benzene went far beyond litigation. Because the Supreme Court had set out the guideline of "significant risk," it

became the industry's objective to promote the view that benzene did not pose a "significant risk" such that a lower exposure level was required. Fearful that a scientifically reputable agency whose pronouncements on benzene and the risk of cancer would threaten their legal position, the major oil companies in 1982 prevailed on the National Cancer Institute (NCI), a taxpayer-funded cancer research agency, to prevent publication by the prestigious International Agency for Research on Cancer (IARC) of a risk assessment for benzene. Such a risk assessment would have been published in 1982 based on an October 1981 conclusion by a panel of highly regarded cancer scientists "that workers regularly exposed to small amounts of benzene might contract leukemia at three times the expected rate."⁹³

Science magazine reported,

In January (1982), representatives from the Shell Oil Company, Exxon Corporation and Chemical Manufacturers Associations held a meeting with NCI official Richard Adamson to complain that the risk estimate in the IARC draft was faulty partly because it did not state the limitations of the data and suffered from "procedural flaws." According to an internal memo written by Curtis Smith of Shell Oil, they met with Adamson "to solicit his support...Dr. Adamson understands the regulatory impact of risk assessment and does not believe that the IARC should be engaged in this activity."⁹⁴

Adamson was a smart choice by the companies, because he controlled NCI's funding of the IARC. He agreed to use his influence to persuade the director of the IARC, Lorenzo Tomatis, not to publish the benzene risk assessment. Once again, *Science* magazine reported,

In July, when the benzene report was published, it was apparent that Tomatis had expunged the estimate. Specifically, he deleted a calculation predicting that exposure over a lifetime to 10 ppm daily might result in 17 excess leukemia deaths per 1000 workers. His action was highly unusual because changes in IARC's monographs are customarily cleared with the original discussion group before publication. But in this instance, members of the IARC group were not polled for consensus.⁹⁵

The Reagan Administration, true to its "protect the polluters" policy, continued to study the issue, but refused to consider issuing a new rule lowering the exposure limit to 1 ppm despite new evidence of benzene's toxicity. On December 10, 1985, under the pressure of a writ of mandamus brought before the U.S. Court of Appeals for the D.C. Circuit by several trade unions and other organizations, OSHA announced a proposed new rule.

While OSHA officials were considering the evidence and testimony on the rule, a U.S. District Court on December 12, 1986 in a landmark decision, *Skeen v. Monsanto*, awarded \$100 million to the family of a refinery worker who died from leukemia induced by exposure to benzene at a level of 1 ppm in the workplace. A Monsanto official commented at the time of the decision that Wilbur Jack Skeen had an average exposure to benzene of 1 ppm or less, while "the average person is exposed to higher levels at the gasoline pump."⁹⁶ Six months later, another court ruled that Firestone Tire & Rubber Workers had the right to sue under California's workers compensation law for "present and physical" injuries resulting from workplace exposure to benzene. Finally, on September 1, 1987 OSHA published final regulations reducing on-the-job exposure to benzene to an average of 1 ppm over an eight-hour workday. When the rule was issued, the head of OSHA stated unequivocally, "It has been proven beyond a shadow of a doubt that benzene poses a significant risk of leukemia and other blood diseases to those exposed." This decision, however, exempted gasoline service stations and facilities, other than refineries, that distribute, transport, store or otherwise handle gasoline. These sources as well as mobile sources of benzene tend to fall within the purview of the EPA.

The Clean Air Act of 1970 gives the Administrator of the Environmental Protection Agency the authority to control or prohibit any fuel or fuel additive that

...causes, or contributes to, air pollution which may reasonably be anticipated to endanger the public health or welfare.

The available epidemiological and case studies provide convincing evidence that benzene, xylene and other aromatic compounds endanger the public health, but the EPA has dragged its feet for more than 15 years with respect to these toxic hazards. The way in which the EPA took action on lead and volatility suggests that the agency made a calculated decision to allow the major oil companies to increase production of aromatics.

Both the aromatics and volatility problems associated with severe naphtha reforming were predicted by technical observers at the beginning of the lead phasedown. Some improvements in the reforming process helped to modify the amount of light ends from the unit but the basic problem remained. Aromatics are the high octane hydrocarbons in reformat and to reduce them means a lower-octane end product,⁹⁷

When EPA issued its first lead phasedown regulations in December 1973, its officials did note that there would be an increase in aromatics. The EPA stated, "If the use of lead is restricted, **the refiner must use greater quantities of blending stocks with high aromatic hydrocarbon concentrations**, or substitute anti-knock additives, to increase gasoline octane levels." While the EPA stated that it had evaluated the impact of higher aromatic gasoline content on auto emissions and on health, it had determined that "neither the reactivity of automobile exhaust nor the emissions of polynuclear aromatics will

increase above current levels due to lead regulations."⁹⁸ The EPA made no conclusion regarding changes in benzene emissions and the effect on public health.

The EPA in 1972 and 1973 accepted without much analysis or criticism the contention of the major oil companies that there was only one practical or economic (read profitable) way to replace the octane lost by removing lead -- increasing aromatics. That the EPA shared this view is clear.

[R]eduction in lead in fuel results in increases in aromatic content to maintain octane number...Although increases in the aromatic content of gasoline are not the sole means of maintaining octane requirement, it appears to be the only practical means of reaching this objective rapidly. The rate and amount of increase in aromatic content will be determined by the selection of a schedule for removal of lead additives from gasoline.⁹⁹

The EPA and the major oil companies appear to have had a mutual understanding with regard to lead phasedown and aromatics phaseup. In its study for the EPA on the impact on refinery operations of the shift to unleaded fuel, the consulting firm of Arthur D. Little found that a lead-free gasoline pool would only be achieved "by blending all the available reformat, and large fractions of fluid catalytic cracked gasoline and alkylate."¹⁰⁰ The major oil companies also favored aromatics as the preferred octane enhancement strategy, because, unlike a number of other octane boosters, the capacity to produce aromatics was, in large part, already available. Of course, small refiners who competed with the majors, did not have such sophisticated refining capacity. To this day, many small, independent refiners still cannot afford to install the necessary refining capacity. As a result the major companies are in near total control of the premium, unleaded gasoline market. It is this control over the gasoline market, probably the most profitable segment of the industry, that is so important for the companies to protect. It is the reason they have fought benzene and other health, safety and environmental regulations and legislation for so many years.

While the issue of benzene risk to workers was before OSHA, the risk to the general population came under the jurisdiction of the EPA. In 1977 the EPA, in response to a petition by the Environmental Defense Fund listed benzene as a "hazardous air pollutant" under Section 112 of the Clean Air Act of 1970. Sec. 112 specifically requires the EPA to regulate hazardous air pollutants that "cause or contribute to air pollution which may be reasonably be anticipated to result in an increase in mortality or an increase in serious irreversible, or incapacitating reversible, illness." The agency recommended that benzene emissions be reduced to the "lowest possible level."

Although the EPA had listed benzene as an air toxic, although a 1985 EPA study concluded that just 17 toxic air pollutants (including benzene) cause an estimated 2,000

excess cancers in the United States each year, and although the agency had determined that there is no safe "minimum threshold" exposure level for benzene, the agency spent the years of the Reagan Administration engaged in "cumbersome and bureaucratic" processes and shifting approaches to standard setting.¹⁰¹

In November of 1983 William D. Ruckelshaus, the then-administrator for EPA made a commitment to Congress that he would speed up the Sec. 112 regulatory process. Ruckelshaus told Congress, "We intend to make decisions on the benzene...standards as quickly as possible." Four years later the EPA had only promulgated regulations for only one of the major source categories of benzene emissions that covered all of 6,000 tons out of a total of 130,000 tons.

In actuality Ruckelshaus talked a good game, but did exceedingly little. In June 1985 Lee M. Thomas became EPA Administrator. Thomas lost little time in announcing a comprehensive new strategy to combat air toxics problem. Unfortunately, Thomas only made a bad situation worse. He decided to abandon the standard for the protection of public health contained in Section 112. This provision clearly states that toxic air emission standards will be set at a level that "provides an ample margin of safety to protect public health." Thomas's approach made the major oil companies happy and comfortable. This, however, changed when the policy was reviewed by the courts. The Court of Appeals for the D.C. Circuit, in a July 1987 en banc decision written by Judge Robert Bork (who reversed his own previous ruling on the matter) held that the EPA must set emission standards for hazardous air pollutants which have no threshold for adverse effects. The EPA was told to determine a "safe" level of emissions and to decide the reductions needed to assure an "ample margin of safety."¹⁰²

On August 31, 1989, despite all the evidence of benzene's serious threat to human health, despite the knowledge that airborne toxic pollutants are more hazardous than pollutants in water or land, the EPA still only proposed modest regulations that would require reductions in stationary sources of benzene air emissions. These new proposed regulations only cover 20% of total U.S. benzene emissions. They do not address emissions that take place during automobile refueling or automobile operation -- emissions that account for 80% of the total. The EPA rules did not address the most conspicuous source of benzene emissions -- unleaded gasoline.¹⁰³ In other words, the EPA continues to demonstrate a hands-off policy with respect to the major oil companies and their toxic fuel.

The EPA's reluctance to regulate benzene and other air toxics was recently written into the latest Clean Air Act amendments. In a compromise agreed to by Reps. Dingell (D-MI) and Waxman (D-CA), provision is made to let EPA conduct an 18-month study of motor vehicle emissions of benzene and other toxics followed by a 4 1/2 year period in which to issue regulations requiring the greatest feasible reduction of such emissions.¹⁰⁴

Although William Reilly, President Bush's EPA Administrator, is someone far more committed to cleaning up the environment when compared to his predecessors in the Reagan Administration, his willingness to consider enforcing the law with regard to benzene emissions must be questioned. Reilly takes full credit for implementing the EPA's rules requiring reduced gasoline volatility during the summer driving months. Yet, when asked about plans to reduce aromatics, Reilly insisted that EPA's new volatility standard "will have the effect of causing refiners to reduce the aromatics..."¹⁰⁵ The fact is, to meet the new standard refiners removed butane and increased aromatics!¹⁰⁶

This point was made very clearly in an internal EPA memo written in May of 1986. It stated quite clearly, "RVP control is likely to lead to increases in the benzene and total aromatic content of gasoline, which in turn increases the benzene mass fraction in exhaust and evaporative emissions."¹⁰⁷

The EPA is supposed to protect the public from cancer-causing chemicals like benzene. Too often, however, administrators have skirted the law in order to accommodate the economic interests of polluters. For the past 12 years the EPA has not done its job with regard to benzene. It has allowed millions of Americans -- men, women and children -- to face repeated and unnecessary exposures to this dangerous carcinogen. And bird-dogging the EPA every step of the way has been the American Petroleum Institute, the major oil companies' Washington-based trade association.

The American Petroleum Institute Response

"On the basis of studies available human data, it does not appear that there is significant risk from normal exposures to gasoline vapors. However, the results of tests with some laboratory rodents have caused some companies to request API to prepare hazard communications material."

Charles J. DiBona
President
American Petroleum Institute
6/24/83

Although the Reagan Administration tried to slow down the federal effort to regulate public exposure to benzene emissions in both the workplace and in the environment, the serious health risks associated with benzene exposure drove the regulatory efforts forward. For example, on March 19, 1982 OSHA issued a proposed Hazard Communication Standard which required gasoline refiners, among others, to identify the hazards of their products and communicate such information through "material data safety sheets" to users of the products and on November 1, 1982 OSHA began an overview of risk assessments and studies on benzene.

Along with assessing the health risks and communicating risk information to those handling gasoline and benzene, both OSHA and EPA would address controlling benzene emissions. On April 14, 1983 a petition was filed with OSHA requesting an Emergency Temporary Standard for reducing workplace benzene exposure to 1 ppm. And on June 6, 1983 the EPA proposed setting standards for limiting benzene emissions from stationary sources, including gasoline pumps.

Knowing that they had to do something to respond and to minimize any impact these regulatory efforts might have on the production, distribution and sale of gasoline throughout the nation, the major oil companies through their trade association, the American Petroleum Institute (API), tried to seize the initiative. The API citing animal studies it had commissioned to test the toxicity of gasoline and its components, announced on June 24, 1983 that it was mailing to all API members some proposed pump labels warning, among other things, that "Long-term exposure to vapors has caused cancer in laboratory animals." At the time an API spokesman said that consumers who use self-service are exposed to between 0.5 ppm and 3 ppm of gasoline vapors at the time.

The mounting epidemiological and case study evidence that human exposure posed a serious health threat and the potential for lawsuits charging oil companies with liability in the event of sickness or death of customers using self-service pumps, prompted the API

in June 1983 to send its member companies warning labels stating that gasoline fumes may cause cancer in laboratory animals.¹⁰⁸

It had become clear to lawyers advising their oil industry clients that sellers of products have a duty to warn both customers and employees of the hazardous nature of their products. In other words, the risks of the workplace were, in the legal sense, not very different from similar risks encountered in other settings.¹⁰⁹

Since OSHA rules do not apply to gasoline stations, gasoline consumers have never been informed of the risks they face when they fill up with their favorite brand and grade of gasoline. Consumers do not know, for example, what is contained in Material Safety Data Sheets which are sent to gasoline stations, but which are never posted on gasoline pumps.

The OSHA rule also required employers to inform workers about the hazards of benzene exposure through signs and labels, material safety data sheets and information and training.

A January 1, 1987 Material Safety Data Sheet issued by Chevron for its "Regular Gasoline" contains the following information on benzene:

This product may contain up to 4.9% benzene. Repeated or prolonged breathing of benzene vapors has been associated with the development of chromosomal damage in experimental animals and various blood diseases in humans ranging from aplastic anemia to leukemia (a form of cancer). All of these diseases can be fatal.

A similar sheet published by Shell Oil Co. stated "A chronic inhalation study...found that fully vaporized unleaded gasoline exposure produced dose-related incidences of kidney cancer in male rats. Gasoline exposure also produced an increase of liver cancer at high doses in female mice."¹¹⁰

While most oil companies do not post warnings on their gasoline pumps, some do. Those that do usually post a warning either identical or similar to the one below:

GASOLINE

HEALTH WARNING

Harmful or fatal if swallowed.

Long-term exposure to vapors has caused cancer in laboratory animals.

-
- * Avoid prolonged breathing of vapors.**
 - * Use as motor fuel only. Do not use for any other purpose.**
 - * Keep face away from container opening.**
 - * Keep away from eyes and skin.**
 - * Never siphon by mouth.**

Failure to use caution may cause serious injury or illness.

There are no federal standards or requirements for pump labels to disclose anything other than octane ratings and lead. A number of states have pump label requirements, but most of these require the disclosure of the content of alcohol in the fuel. The U.S. General Accounting Office conducted a survey to determine the kinds of information state officials thought should be included in federal pump label requirements. Several states urged the disclosure of any gasoline ingredient that posed a public health threat. The State of Texas, for example, wanted a specific benzene warning.¹¹¹

The API and its member companies have throughout the last ten years been very successful in efforts to dissuade EPA officials from either restricting the use of benzene and aromatics in gasoline, or requiring vapor recovery systems on gasoline pumps. It is interesting to note that following the announcement of President Bush's Clean Air Program, the API was critical of both the alternative fuels initiative and the decision to require vapor recovery systems. Said API, "We also are disappointed that the administration chooses inconvenient pump nozzle controls at gasoline service stations, when EPA has never favored this option as a federally mandated measure." Congress' Office of Technology Assessment, after a thorough review of the field, concluded that

"Stage II controls at gasoline stations are more cost-effective than Onboard controls installed on motor vehicles."¹¹²

Fouled Engines and Octane Increase

While the greatest threat from the oil industry's growing production of benzene and other aromatics is to human health, it is also clear that the greater volume of aromatics and olefins in gasoline is responsible for fouling automobile engines, decreasing automobile fuel efficiency and increasing demand for higher octane fuel. This is the reason why, after an unusual public complaint by the Chairman of General Motors in 1985 about how changes in gasoline composition were affecting automobile driveability, oil companies began adding "detergents" to their gasoline.

Beginning in 1985 auto manufacturers began to produce cars with fuel injectors rather than carburetors to increase fuel efficiency. Automotive engineers soon discovered, however, that gasolines with high aromatic and olefin content tended to foul and clog fuel injectors. To deal with this problem, oil companies were forced to develop, produce and/or purchase chemicals, called "detergent additives" that would remove these engine deposits to keep the engine running efficiently.

Part of the reason demand for higher octane gasoline has increased is that as engine deposits accumulate, engine compression ratios increase. This means that engines begin to "knock," unless a higher octane gasoline is used. But, of course, as long as oil companies produce premium gasoline with greater and greater proportions of aromatics, the engine deposit problem will worsen, unless of course the detergent additives can remove such deposits. It is interesting to note that oil companies tend to put more of their detergents in their premium gasoline, not because it will clean the engine "better," but because the higher aromatic and olefinic gasoline will foul the engine more.

The tendency for automobiles that are manufactured to operate on gasoline at a certain octane level (recommendations for most new cars are still for 87 octane) to need a higher octane level is called Octane Requirement Increase (ORI). This phenomenon is "most often the result of deposits that can form in the combustion chamber and intake valves."¹¹³ According to GM's Joseph M. Colucci, deposits in the combustion chamber can increase octane requirements by four to eight octane numbers. Oil companies have been trying to find better additives. One company, not an oil company, claims to have developed and manufactured an additive that virtually eliminates all engine deposits. The results yield a 1.5% improvement in fuel economy and a 10% reduction in hydrocarbon exhaust emissions. This additive, according to Mark Nelson, president of Polar Molecular Corp. reduces ORI by 70% meaning that oil companies, if they so chose, could reduce, to some extent, the aromatic content of their gasoline and thereby reduce toxic benzene emissions.¹¹⁴

Recently, the head of GM's Research Laboratories, Joseph M. Colucci suggested that ongoing research indicates, that "reduced aromatic content could provide...lower, less photochemically reactive, vehicle exhaust hydrocarbon emissions, less benzene in gasoline and lower benzene emissions and less engine deposit formation."¹¹⁵

The Toxic Ten

Based on refinery capacity data submitted to the Department of Energy's Energy Information Administration and the fact that approximately 75% of aromatics that are produced in the nation's refineries are generated by two processes -- Fluid Catalytic Cracking (FCC) and Catalytic Reforming, the table below ranks each oil company by its total FCC and catalytic reforming capacity as of January 1, 1989. Thus, the top ten companies can be considered the top ten producers of aromatics and are thus ranked as **The Toxic Ten**, in view of the fact that aromatics are primary contributors to mobile source benzene pollution.

The second table is an attempt to estimate, to the best of our ability, the volume of aromatics produced by each major oil company using the capacities reported for their downstream refinery processes that contribute to the production of gasoline.

**CATALYTIC REFORMING AND CRACKING
CAPACITY
(As of January 1, 1989)**

Company	Reform Capacity	FCC* Capacity	Total
Exxon	279,000	515,000	794,000
Chevron	349,600	404,300	753,900
Amoco	281,500	419,800	701,300
Shell	304,000	319,500	623,500
Mobil	255,500	350,000	605,500
BP America	192,700	257,100	449,800
Star	136,000	260,000	396,000
ARCO	214,000	167,000	381,000
Sun	170,900	203,000	373,900
USX	156,500	190,000	346,500
Ashland	96,000	148,000	244,000
Citgo/Venez	91,000	150,000	241,000
Unocal	135,800	105,000	240,800
Phillips	68,000	155,400	223,400
Texaco	107,000	95,500	202,500
DuPont	81,900	116,500	198,400
Koch	80,000	97,500	177,500
Solomon	46,900	126,500	173,400
Coastal	67,200	94,500	161,700
PDVSSA	52,000	68,000	120,000
Total	51,000	69,000	120,000
Fina	55,000	59,000	114,000
Kerr McGee	38,600	70,000	108,600
Diam/Sham	40,500	65,500	106,000
Tosco	43,000	60,000	103,000
Horsham	42,500	51,000	93,500
Crown	36,000	56,000	92,000
Murphy	31,000	47,900	78,900
Sinclair	28,000	49,000	77,000
Am Ultr	14,500	38,000	52,500
Farmland	21,300	23,000	44,300
Mapco	10,000	30,000	40,000
United	16,000	20,000	36,000
Texas East.	16,600	18,000	34,600
Thrifty	19,000	13,500	32,500
Rock Island	10,000	19,000	29,000
Placid	10,000	18,500	28,500
Lion	9,000	18,500	27,500
Sargent	8,200	12,000	20,200
LL&E	20,000	0	20,000
Frontier	6,500	12,000	18,500
Pennzoil	17,820	0	17,820
Nat Coop	15,000	2,000	17,000
Pauley	6,700	9,450	16,150
Cstl/Sino	15,000	0	15,000
Gary Energy	6,800	5,400	12,200
Pacific Res.	12,000	0	12,000
Tesoro	12,000	0	12,000
Paramount	11,500	0	11,500
Time Oil	6,000	0	6,000
Hunt Oil	6,000	0	6,000
Total	3,801,020	5,009,350	8,810,370

U.S. Total	3,910,880	5,324,320	9,235,200
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* Fresh Feed

Source: Petroleum Supply Annual 1988, EIA.

**GASOLINE AND ESTIMATED AROMATICS
PRODUCTION - 1988**

Company	Gasoline Production bbl/day	Aromatics Production bbl/day	Percent Aromatics
Chevron	587,727	198,694	33.8%
Shell	476,923	175,814	36.9%
Exxon	566,603	154,727	27.3%
Amoco	458,603	137,568	30.0%
Mobil	424,903	133,105	31.3%
Arco	300,054	124,293	41.4%
BP America	348,666	108,239	31.0%
Sun	283,529	99,189	35.0%
Unocal	210,809	78,080	37.0%
Star	264,091	74,488	28.2%
USX	277,613	64,168	23.1%
Texaco	160,125	57,982	36.2%
Citgo	173,564	51,760	29.8%
Ashland	171,641	50,993	29.7%
Conoco	171,784	48,627	28.0%
Soloman	93,880	46,143	38.6%
Koch	136,054	45,628	33.5%
Coastal	117,790	44,744	37.9%
Phillips	173,661	40,495	23.3%
Total	107,835	32,585	30.2%
Fina	74,743	29,491	39.5%
PDVSSA	89,126	29,325	32.9%
Dmnd-Shmrk	92,376	25,706	27.8%
Horsham	77,310	24,836	32.1%
Kerr-McGee	82,911	24,080	29.0%
Tosco	80,247	23,855	29.7%
Crown	65,058	19,972	30.7%
Sinclair	53,942	16,144	29.9%
Murphy	51,403	15,887	30.9%
MAPCO	27,054	5,548	20.5%
Total	6,200,025	1,982,166	32.0%
US Total	6,955,650	2,225,808	32.0%

Sources: Annual Reports, EIA Petroleum Supply Annual, Octane Week, George H. Unzelman, William E. Morris, Citizens Fund estimates.

Appendix I

Methodology for Calculating 1988 Aromatic Production

Total Gasoline production data was obtained either directly from company annual reports or estimated based on reported gasoline sales for the year 1988. A formula was then used to calculate each refinery's production of gasoline from different refinery operations. The formula was based refinery yield data obtained from George Unzelman and several other sources and then applied to each refinery. The basic formula used was as follows:

$$(DC \cdot CU \cdot SR\%) + (CC \cdot CU \cdot CG\%) + (FCCC \cdot CU \cdot FCG\%) + (RC \cdot CU \cdot R\%) + (CHC \cdot CU \cdot CH\%) + (IC \cdot CU \cdot IG\%) + (AC \cdot CU \cdot AG\%) + \text{Butane}$$

Where:

DC=Distillation Capacity

CC=Coker Capacity

FCCC=Fluid Catalytic Cracker Capacity

RC=Reformer Capacity

CHC=Catalytic Hydrocracker Capacity

IC=Isomerization Capacity

AC=Alkylation Capacity

CU=Capacity Utilization

SR%=Straight Run %

CG%=Coker Gasoline %

FCG%=Cracked Gasoline %

R%=Reformate %

CH%=Hydrocrackate %

IG%=Isomerate %

AG%=Alkylate %

Butane=7% of Total Gasoline

Except where company annual reports provided data, data on capacity utilization and downstream utilization for each PADD was obtained from the EIA's Petroleum Supply Annual for 1988 and applied to the capacity for each company's refinery within the specified PADD. The gasoline production figures thus obtained were then adjusted to conform with the total gasoline production by company. This entailed raising or lowering capacity utilization or yield factors for the gasoline producing facilities. The numbers were then compared to data published by Octane Week on the composition of gasoline (leaded regular, regular unleaded, midgrade unleaded and premium unleaded) by company to obtain agreement on volume and octane levels. Once a total production figure was arrived at, it was assumed that 55 percent of the gasoline output of the reformer was aromatics and that this amount represent approximately 60% of the aromatics contained in gasoline, which permitted a calculation of a refiner's total production of aromatics.

Refiners were compared on total production of aromatics as well as on the basis of aromatics as a percent of total gasoline production. Clearly, refiners which have the largest reformer and catalytic cracking capacity tend to be the companies with the largest production of aromatics.

Footnotes

1. "Making a Modern Gasoline," Shell Science & Technology, Issue No.4, December 1985.
2. "That Cleaner Fuel May Be Gasoline," *The New York Times*, August 23, 1989.
3. "Methanol: Panacea with Problems," Mobil Oil Corp. advertisement in *The New York Times*, September 7, 1989.

This ad, like many other Mobil ads, is aimed at discrediting methanol as an automotive fuel. The ad states, for example, "the general use of methanol as an automotive fuel could create as many new environmental problems as it would solve..."

Similarly, Amoco has produced ads (See *National Petroleum News*, July 1984) that state, "It's highway robbery the way gasolines with methanol cut your mileage."

4. ARCO ads in major newspapers (See *The Washington Post*, September 19, 1989) stated:

"ARCO EC-1 is a significant advance in gasoline formulation to reduce vehicular pollution. To make it, we eliminated all lead; eliminated one-half of the benzene and up to one-third of other aromatics and olefins; reduced sulfur by up to 80 percent; and reduced vapor pressure by a full pound per square inch below the California standard, the most stringent in the nation."

5. "New ARCO Gas Called PR Coup," *Automotive News*, September 25, 1989.
6. Clean Air Standards Attainment Act of 1987, Report 100-231, 100th Cong., 1st Sess., November 19, 1987, p.185.
7. "Rising Octane Demand Puts U.S. Refiners In Supply Vise," *Oil & Gas Journal*, June 27, 1988, p.15.
8. Private communication with DuPont chemical engineer, August, 1989.

9. D. Rosner and G. Markowitz. A "Gift of God"?: The Public Health Controversy over Leaded Gasoline During the 1920's. *American Journal of Public Health*, Vol. 75, No. 4, 1985, pp. 344-352.

10. Daniel Sperling and Jennifer Dill, "Unleaded Gasoline in the United States: A Successful Model of System Innovation," *Fuels*, Transportation Research Record, Transportation Research Board, National Research Council, 1988, pp. 45-52.

11. *Ibid.*

12. Richard Vincent, "Modifying Gasoline to Reduce Vehicular Benzene Emissions," California Air Resources Board, paper submitted to Air and Waste Management Association, March 1989.

...Some of these blend stocks (intermediate gasoline components) contain benzene. Some of that benzene was present in the crude oil and some is the result of chemical processing needed to raise the octane of blend stocks.

13. U.S. Environmental Protection Agency, *Carcinogen Assessment Groups's Final Report on Population Risk to Ambient Benzene Exposures*, January 10, 1979.

14. *Ibid.*

15. International Agency for Research on Cancer, *Evaluation of the Carcinogenic Risk of Chemicals to Humans*, May 1982.

16. Medical Management of Chemical Exposures in the Petroleum Industry, prepared for the American Petroleum Institute by Clayton Environmental Consultants, Inc., 1982, p. 39.

17. Staff Report of the Air Resources Board and the Department of Health Services, *Report to the Scientific Review Panel on Benzene*, November 27, 1989.

18. Environmental Protection Agency, "Santa Clara Valley Environmental Management Project," San Francisco, California, October 1985.

19. U.S. Environmental Protection Agency, Carcinogen Assessment Group, *Evaluation of the Carcinogenicity of Unleaded Gasoline*, April 1987, p. xii.

20. Northeast States for Coordinated Air Use Management, Air Toxics Committee, *Evaluation of the Health Effects from Exposure to Gasoline and Gasoline Vapors, Final Report*, August 1989, p. xxxiii.

21. U.S. Environmental Protection Agency, *Evaluation of Air Pollution Regulatory Strategies for Gasoline Marketing Industry*, July 1984, p. 1-1.
22. "EPA Unit Suspects Cancer Lurks in Unleaded-Gas Vapor," *Automotive News*, November 26, 1984.
23. *Ibid.*, p.1-7.
24. NESCAUM, p.5-24.
25. In data provided to the California Air Resources Board in June 1989, Texaco stated that in the 1988 its premium unleaded gasoline in California contained an average of 41.7% aromatics compared to 33.7% for its regular unleaded.
26. U.S. Environmental Protection Agency, *Evaluation of Air Pollution Regulatory Strategies for Gasoline Marketing Industry*, July 1984, p.1-18. (This was updated by the EPA in July 1987 from 1 in 100,000.)
27. Report 100-231, 100th Cong., 1st Sess., U.S. Senate, *Clean Air Standards Attainment Act of 1987*, November 20, 1987.
28. U.S. Environmental Protection Agency, Office of Research and Development, *Total Exposure Assessment Methodology (TEAM) Study*, 1987.
29. *The Feasibility and Costs of More Stringent Mobile Source Emission Controls*, Sierra Research Inc. for U.S. Congress Office of Technology Assessment, January 20, 1988, p.1-5.
30. George H. Unzelman, "Future Role of Ethers in U.S. Gasoline," a speech presented to the annual meeting of the National Petroleum Refiners Association, March 19-21, 1989.
31. California Air Resources Board, *Proposed Airborne Toxic Control Measure for Emissions of Benzene from Retail Service Stations*, Staff Report, May 22, 1987, p.v.
32. NESCAUM, pp. 11-30 - 11-31.

The issue of risk acceptability encompasses two issues which are distinctly different from risk comparisons. First, risks may be deemed acceptably low, as determined by societal values and ideally reflected in formulations of regulatory agency policies, positions, and decisions. Second, risks--even unusually high risks--may be deemed acceptable at least temporarily if they have been minimized relative to all feasible alternatives. In such cases, agencies may appropriately attempt to drive technologies toward improved performance with respect to health risk issues. In the case

of risks associated with gasoline an example of this principle is the reduction of the lead content in gasoline.

33. U.S. Environmental Protection Agency, July 1984, p.1-7.

34. California Air Resources Board, Technical Support Document to "Proposed Airborne Toxic Control Measure for Emissions of Benzene From Retail Service Stations," May 22, 1987, p.A-21.

35. *Ibid.*, p.A-22.

36. California Air Resources Board, "Proposed Airborne Toxic Control Measure for Emissions of Benzene from Retail Service Stations," Addendum, September 1987, pp.7-8. See also Sierra Research Inc., *The Feasibility and Costs of More Stringent Mobile Source Emission Controls*, prepared for the U.S. Congress, Office of Technology Assessment, January 20, 1988.

A decision between Stage II vapor recovery systems at gasoline stations and Onboard refueling emissions control systems on motor vehicles has been debated for over ten years. Both approaches are technologically feasible and cost-effective relative to other adopted control measures. The cost and performance advantage is with Stage II.

37. Richard Vincent, "Modifying Gasoline to Reduce Vehicular Benzene Emissions," paper submitted to Air and Waste Management Association, March 1989.

38. U.S. Environmental Protection Agency, *Control of Gasoline Volatility and Evaporative HC Emissions from New Motor Vehicles*, Draft Regulatory Impact Statement, May 1987.

39. Jonathan M. Adler and Penny M. Carey, U.S. Environmental Protection Agency, *Air Toxics Emissions and Health Risks from Motor Vehicles*, 1989, p.8.

40. *Gasoline Octane Enhancement: Technology, Economics, and Environmental, Health and Safety Considerations*, a report prepared for the U.S. Department of Energy, Contract No. DE-AC01-84PE72013, July 1985, p. VI-15.

41. *Op. Cit.*, Adler and Carey, p.9.

42. *Ibid.*, p.10.

43. California Air Resources Board and the Department of Health Services, *Report to the Scientific Review Panel on Benzene*, November 27, 1984.

44. SCAQMD, *In-Vehicle Characterization Study in the South Coast Air Basin*, May 1989, p.1.
45. *Ibid.*, p.2.
46. In 1987 in order to reduce ambient concentrations of benzene, the State of California finalized regulations requiring refueling controls at all service stations with a monthly gasoline throughput of over 240,000 gallons per year.
47. Richard Vincent, California Air Resources Board, *Modifying Gasoline to Reduce Vehicular Benzene Emissions*, submitted to Air and Waster Management Association, March 1989.
48. "GM: Octanes Most Important Property," *Octane Week*, April 17, 1989.
49. Black, F.M., L.E. High, and J.M. Lang, "Composition of Evaporative and Tailpipe Hydrocarbon Emissions, *Journal of the Air Pollution Control Association*, November 1980, pp. 1216-1221.
50. Mueller Associates, Inc. for the American Petroleum Institute, *Analysis of Benzene Emissions from Vehicles and Vehicle Refueling*, March 1984.
51. U.S. Environmental Protection Agency, July 1984, pp.1-22 - 1-24.
52. Donald E. Seizinger, William F. Marshall, Frank W. Cox, and Martin W. Boyd, "Vehicle Evaporative and Exhaust Emissions as Influenced by Benzene Content of Gasoline," prepared for Coordinating Research Council, Inc. by the National Institute for Petroleum and Energy Research, April 1986.
53. William F. Marshall and M. Daniel Gurney, *Effect of Gasoline Composition on Emissions of Aromatic Hydrocarbons*, National Institute for Petroleum and Energy Research, September, 1989.
54. William L. Leffler, *Petroleum Refining for the Non-Technical Person*, Pennwell, 1979. p. 70.

"Cat reforming is a primary source for benzene, toluene and xylenes."
55. *U.S. Petroleum Refining*, National Petroleum Council, October 1986, p. C-7.
56. *Performance Profiles of Major Energy Producers 1987*, Energy Information Administration, January 25, 1989, p.41.

57. Performance Profiles of Major Energy Producers 1987, Energy Information Administration, January 25, 1989.

The Energy Information Administration's definition of downstream refining capacity includes catalytic reforming, fresh feed catalytic cracking, hydrocracking and alkylation capacities.

58. Energy Information Administration, *Petroleum Supply Annual 1988*, January 25, 1989, p.65.

59. National Petroleum Council, *U.S. Petroleum Refining*, October 1986, pp. 99-101.

60. William E. Morris, "Gasoline Compositions in No-Lead Era," *Oil & Gas Journal*, March 18, 1985, pp. 99-106.

61. George Unzelman, "Aromatics From the Naphtha Reformer Good for Octane Unfavorable for the Environment," *Alcohol Outlook*, August 1989, p.15.

62. *Gasoline Octane Enhancement: Technology, Economics, and Environmental, Health and Safety Considerations*, prepared for the U.S. Department of Energy, July 1985, p.IV-5.

Typically, increasing reformer severity sufficiently to raise the reformat RON by one number decreases reformat volume by 1 percent.

63. Fred C. Chanslor, "An Opportunity for CO and Benzene Emissions Reductions from Mobile Sources," *Toxic Substances Journal*, Vol. 6.

64. U.S. Environmental Protection Agency, *Control of Gasoline Volatility and Evaporative HC Emissions from New Motor Vehicles*, Draft Regulatory Impact Analysis, May 1987.

The EPA projected that RVP reductions of 1 psi and 2 psi would result in aromatic content increases of 0.6 percent and 2.8 percent, respectively.

65. *Ibid.*, p.68

EPA noted that the volatility reductions are the maximum possible without installation of capital equipment at refineries. However, this regulation will have an impact on refiners as they will have to find low volatility octane enhancers for use in motor gasoline blending. Normally, butanes are used as a motor gasoline blending component. However, since the RVP of normal butane is 52 psi, refiners are searching for substitutes for butanes as a motor gasoline blending component. Low volatility substitutes in use now include the ether compound MTBE, and the more expensive xylene and toluene.

66. *Op. Cit.*, NESCAUM, p. 3-4.

The relative concentrations of gasoline components may vary considerably depending upon the crude oil source, refinery process, and product line...Typical gasoline product lines may contain more than 150 separate compounds, although as many as 1200 compounds have been identified in some blends.

67. *Ibid.*, p.3-5.

68. Energy Information Administration, *Petroleum Supply Annual 1988*, May 18, 1989, pp. 64-68.

The catalytic cracking process converts heavy gas oil into high octane gasoline and other light distillates. Catalytic cracking produces an 18-percent average gain in product volume. The gasoline produced through catalytic cracking has higher octane ratings than gasoline using distillation or thermal cracking.

69. *Ibid.*

Catalytic reforming is an important process for upgrading low octane naphthas to a high octane blending component (reformate). As the octane number of reformate goes up, the percentage volume (yield) of reformate goes down. This is because, to obtain higher octane gasoline, the reformer is operated at extremely high temperatures, resulting in a greater volume of gas components as opposed to liquids. Thus, production of premium unleaded gasoline requires greater supplies of low octane naphthas, and consequently greater supplies of crude oil, than does production of regular unleaded gasoline.

70. *Ibid.*

Thermal cracking is a process used to increase the yield of lighter products and to make petroleum coke...Coking generally produces a significant gain in the volume of lighter oils produced compared to the volume of crude oil input to the coker.

71. *Ibid.*

Catalytic hydrocracking is a process which uses hydrogen and a platinum-based catalyst to reduce heavy gas oils into gasoline, jet fuel and diesel fuels...Hydrocracking is more effective than catalytic cracking in converting

previously cracked gas oils to lighter products (hydrocracking produces a 25-percent average gain in product volume).

72. *Ibid.*, p. 141.

A refining process for chemically combining isobutane with olefin hydrocarbons (e.g. propylene, butylene) through the control of temperature and pressure in the presence of an acid catalyst, usually sulfuric acid or hydrofluoric acid. The product, alkylate, an isoparaffin, has high octane value and is blended with motor and aviation gasoline to improve the antiknock value of the fuel.

73. *Ibid.* p. 65.

Isomerization is a process used to increase the octane number of the light gasoline components, normal pentane and normal hexane, which are abundant in light straight run gasoline.

74. *Op. Cit.*, California Air Resources Board, May 22, 1987.

75. "Making a Modern Gasoline," Shell Science & Technology," December 1985.

76. *Gasoline Octane Enhancement: Technology, Economics, and Environmental, Health and Safety Considerations*, prepared for the U.S. Department of Energy, July 1985, pp. III-8&9.

77. *Op. Cit.* Sperling and Dill.

78. Control of Lead Additives in Gasoline, 38 *Federal Register*, pp. 33734-33741, December 6, 1973.

79. U.S. Environmental Protection Agency, A.P. Altschuller, "Estimation of Reduced Use of Lead in Gasoline on Vehicle Emissions and Photochemical Reactivity," Research Triangle Park, North Carolina, February 1972.

80. Energy Information Administration, *Performance Profiles of Major Energy Producers* 1987, January 25, 1989, pp. 40-43.

The U.S. refining operations of the FRS companies have been the focus of two ongoing strategies during the 1980s: first, reduction of crude oil distillation capacity and, second, upgrading of remaining capacity to use lower quality crudes and produce a greater proportion of lighter, higher octane products

81. *Oil & Gas Journal*, "Rising Octane Demand Puts U.S. Refiners in Supply Vise," June 27, 1988, p. 16.

82. *Op. Cit.*, *Oil & Gas Journal*, 1988.

83. *Octane Week*, "Octane Value Determined by Profitability of Premium," May 22, 1989.

The growth in premium sales proves that price is not necessarily the motorist's primary criterion in selecting his gasoline.

The so-called "Octane Race," has brought more drivers over to the premium pump. Raising octane postings provides a clearer product differentiation in the minds of many consumers. The advertising and marketing promotion that accompany new product rollouts are, if nothing else, attention-getting.

84. *AAA World*, "All About Octane," July/August 1988, p.15.

85. *Op.Cit.*, API, p.2.

86. *Op.Cit.*, *Oil & Gas Journal*, p.17.

All current GM models except the Cadillac Allante are designed to run on regular unleaded gasoline. That's also mostly true of other automakers.

87. Lundberg Letter, "Mid-Grade Arrives on the Scene," June 10, 1988, p.1.

88. *Oil & Gas Journal*, "Product Demand Surge Keeps Leaner U.S. Downstream Humming," March 30, 1987, p.53.

Some are already offering an 89 octane mid-grade unleaded fuel to replace leaded regular grade because some refiners say that leaded gasoline at 0.1 g/gal is more expensive to produce than an 89 octane unleaded. (Emphasis added)

89. Joseph W. Kaufman, "Octane in the Post-Lead Environment," a speech presented at the 1988 American Petroleum Institute Pipeline Conference, Houston, Texas, April 26-27, 1988.

90. *Op. Cit.* National Petroleum Council Study, p. 101.

It is important to note that the NPC's Committee on U.S. Petroleum Refining included the chairmen or chief executive officers of most large oil companies, including

Exxon, Texaco, Arco, Mobil, Ashland, Unocal, Amerada Hess, Standard Oil of Ohio, Marathon, and Kerr-McGee.

91. Testimony of K.W. McHenry, Vice President, Research and Development, Amoco Oil Company, before the Subcommittee on Energy and Power of the Committee on Energy and Commerce, Hearing on Alternative Transportation Fuels, July 9, 1989.

92. U.S. Department of Health and Human Services, Public Health Service, *Fourth Annual Report on Carcinogens*, Summary 1985.

93. *Science*, "Risk Assessment Vanishes from Benzene Report," Vol. 217, September 3, 1982, p. 914.

94. *Ibid.*

95. *Ibid.*

96. *Chemical Week*, "Monsanto Loses a Round in a Benzene Case," December 24, 1986.

97. *Octane Week*, George H. Unzelman, "Naphtha Reforming -- Pluses and Minuses," July 17, 1989.

98. Control of Lead Additives in Gasoline, 38 Federal Register, pp. 33734-33741, December 6, 1973.

99. U.S. Environmental Protection Agency, A.P. Altshuller, "Effects of Reduced Lead in Gasoline on Vehicle Emissions and Photochemical Reactivity," February 1972.

100. Arthur D. Little, Inc., "Impact of Motor Gasoline Lead Additive Regulations on Petroleum Refineries and Energy Resources, 1974-1980," PB-234185, May 1974.

101. Clean Air Standards Attainment Act of 1987, Report 100-231, 100th Cong., 1st Sess., November 20, 1987, p.192.

102. *Ibid.*

103. *The Washington Post*, "EPA Sets Rules to Curb Benzene," September 1, 1989; *The New York Times*, "U.S. Adopts Limits on Use of Benzene," September 1, 1989; *The Wall Street Journal*, "EPA Announces Steps to Protect Public from Cancer-Causing Vapors of Benzene," September 1, 1989.

104. *The Wall Street Journal*, October 3, 1989.

105. *Octane Week*, "Q&A With EPA Administrator William K. Reilly," April 24, 1989.

106. The Reid Vapor Pressure (RVP) of many aromatics is quite low relative to butane and several oxygenate components. Toluene, for example, has an RVP of 1.2 pounds per square inch (psi) compared to MTBE which has an RVP of 8 psi.
107. U.S. Environmental Protection Agency, Memorandum from Charles L. Gray Jr. to Richard D. Wilson concerning "Mobile Source Benzene Emissions and a Preliminary Estimate of Their Health Impacts," May 15, 1986.
108. Letter to API Members from Charles J. DiBona, President, American Petroleum Institute, June 24, 1983.
109. National Oil Jobbers Council, Legal memorandum regarding the "Posting of Labels Warning of Potential Hazards of Gasoline Vapors" from Barbara Faulkner, General Counsel, July 26, 1983.
110. Material Safety Data Sheet, Shell Oil Co., September 18, 1986.
111. U.S. General Accounting Office, *Gasoline Marketing: States' Programs for Pump Labeling of Gasoline Ingredients*, January 1989.
112. Sierra Research, Inc., *The Feasibility and Costs of More Stringent Mobile Source Emission Controls*, prepared for U.S. Congress Office of Technology Assessment, January 20, 1988, p. 8-2.
113. *Octane Week*, "Texaco, Others Tackle Subtle Octane Message of ORI," June 5, 1989.
114. *Ibid.*
115. Joseph M. Colucci, "Automotive Fuels for the 1990's: Challenges and Opportunities," a paper presented to the 1989 Petrochemical Review, Houston, TX, March 28-30.

AIR TOXIC

Electric Utility Boilers

Beginning on page ___ at line ___ strike all through line ___ on page ___ and insert in lieu thereof:

"(5)(A) The Administrator shall conduct, and transmit to the Congress not later than three years after the date of enactment of this paragraph, a study of emissions of hazardous air pollutants which are particulates from electric utility steam generating units considering the rate and mass of such emissions, the health and environmental effects of such emissions, technologies which are available to control such emissions and the costs of such technologies.

"(B) The Administrator shall conduct, and transmit to the Congress not later than four years after the date of enactment of this paragraph, a study of mercury emissions from electric utility steam generating units considering the rate and mass of such emissions, the health and environmental effects of such emissions, technologies which are available to control such emissions and the costs of such technologies.

"(C) Notwithstanding the requirements of subsection (c), standards under subsection (d) for the control of emissions of hazardous air pollutants which are particulate and mercury emissions from electric utility steam generation units shall be promulgated not sooner or later than five years after the date of enactment of this paragraph only if

(the Administrator finds that such regulations are appropriate and necessary after considering the results of the completed studies required by (A) and (B) above. ~~not-sooner-or-later~~ ~~than-five-years-after-the-date-of-enactment-of-this~~ paragraph. Electric utility steam generating units shall be in compliance with any such standards not later than eight years after the date of enactment of this paragraph.

("(D) Notwithstanding the provisions of this section, the Administrator shall not be required to promulgate standards to control emissions of organic or inorganic acid gases from electric utility steam generating units unless the Administrator finds that such standards are warranted to prevent a serious risk of adverse effects on ~~protect~~ public health ~~or-the-environment~~. Nothing in this section shall be construed to authorize the Administrator to promulgate standards requiring use of flue gas stream scrubbing technology by electric utility steam generating units for the control of hazardous air pollutants.

"(E) Notwithstanding the provisions of this section, the Administrator shall not promulgate standards to control emissions of any hazardous air pollutant, ~~other-than~~ ~~mercury~~, which is emitted in gaseous form from electric utility steam generating units, if the emissions of such pollutant are less than 10 tons per year.

"(F) Emissions of organic and inorganic acid gases shall be included in determining whether an electric utility steam generating unit is a major source of hazardous air

(pollutants which are particulates or mercury under this section.

Edgar L. Ball
International Secretary

Lynn R. Williams
International President

James N. McGeehan
International Treasurer

George F. Becker
International Vice President
(Administration)

Leon Lynch
International Vice President
(Human Affairs)

United Steelworkers of America

AFL-CIO

815 16TH ST., N.W. WASHINGTON, D.C. 20006

Suite 706

Phone: (202) 638-6929

March 27, 1990

U. S. Senate
Washington, DC 20510

Dear Senator:

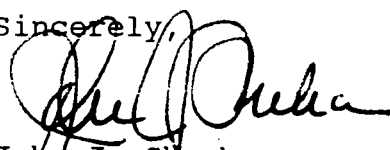
The "steel fix" allows coke producers, whether independent or integrated with steel mills, to avoid a health-based emissions standard until the year 2020--30 years from now.

An amendment by Senator Metzenbaum would assure that the communities in which these facilities are located shall at least be the recipient of the health evaluations or assessments which these communities would otherwise have been entitled to except for the stretch-out. While the amendment does not change the avoidance feature of the fix, the communities will be given the opportunity to know the extent of the health risk resulting from coke oven emissions.

The amendment has a second objective. The steel fix provides that independent coke oven producers may install a more lenient category of MACT technology and still be eligible for the 30-year stretch, while integrated producers are required to install a more stringent technology. The Metzenbaum amendment would restrict the eligibility to this more lenient obligation only to those producers and capacity existing as of January 1, 1990. Otherwise there could be a loophole whereby additional communities would be subjected to a longer period of exposure and workers dislocated from integrated facilities.

**USWA urges you to support the Metzenbaum
amendment on the coke ovens.**

Sincerely,


John J. Sheehan
Legislative Director

JJS/tlm

To: 224-0588

From: NRDC - WASHINGTON, DC

3-21-90 12:00pm p.8

RI	CRANSTON	C.R. BARD, INC.	ETHYLENE OXIDE	COMMERCIAL STERILIZATION	> 1 in 1,000	> 1 in 10,000
SC	CHARLESTON	MACALLOY	CHROMIUM	FERROCHROME	> 1 in 1,000	> 1 in 10,000
SC	KINGSTREE	BAXTER HEALTH	ETHYLENE OXIDE	COMMERCIAL STERILIZATION	> 1 in 1,000	> 1 in 10,000
TN	CHATTANOOGA	BASF	BUTADIENE	STYRENE BUTADIENE RUBBER	> 1 in 1,000	> 1 in 10,000
TN	MEMPHIS	VACUDYNE	ETHYLENE OXIDE	COMMERCIAL STERILIZATION	> 1 in 1,000	> 1 in 10,000
TN	MEMPHIS	VELSICOL	CARBON TETRACHLORIDE	PESTICIDE PRODUCTION	> 1 in 1,000	> 1 in 10,000
TX	BAYTOWN	EXXON	BUTADIENE	BUTADIENE PRODUCTION	> 1 in 1,000	> 1 in 10,000
TX	BEAUMONT	DUPONT	CARBON TETRACHLORIDE	CHLORINATED HYDROCARBON USER	> 1 in 1,000	> 1 in 10,000
TX	BEAUMONT	DUPONT	CHLOROFORM	CHLORINATED HYDROCARBON USER	> 1 in 1,000	> 1 in 10,000
TX	BEAUMONT	GOODYEAR TIRE	BUTADIENE	POLYBUTADIENE	> 1 in 1,000	> 1 in 10,000
TX	BEAUMONT	MOBIL	BUTADIENE	BUTADIENE PRODUCTION	> 1 in 100	> 1 in 1,000
TX	CORPUS CHRISTI	AMERICAN CHROME	CHROMIUM	CHEMICALS PRODUCTION	> 1 in 100	> 1 in 1,000
TX	CORPUS CHRISTI	OCCIDENTAL	BUTADIENE	BUTADIENE PRODUCTION	> 1 in 1,000	> 1 in 10,000
TX	DEER PARK	SHELL OIL	BUTADIENE	BUTADIENE PRODUCTION	> 1 in 100	> 1 in 1,000
TX	EL PASO	ASARCO	ARSENIC	PRIMARY COPPER SMELTER	> 1 in 1,000	> 1 in 10,000
TX	HOUSTON	GOODYEAR	BUTADIENE	STYRENE BUTADIENE RUBBER	> 1 in 1,000	> 1 in 10,000
TX	HOUSTON	MOBAY	BUTADIENE	NEOPRENE	> 1 in 1,000	> 1 in 10,000
TX	HOUSTON	TEXAS PETROCHEM	BUTADIENE	BUTADIENE PRODUCTION	> 1 in 1,000	> 1 in 10,000
TX	ODESSA	GEN CORP	BUTADIENE	STYRENE BUTADIENE RUBBER	> 1 in 1,000	> 1 in 10,000
TX	ORANGE	FIRESTONE	BUTADIENE	POLYBUTADIENE	> 1 in 1,000	> 1 in 10,000
TX	ORANGE	POLYSAR	BUTADIENE	POLYBUTADIENE	> 1 in 1,000	> 1 in 10,000
TX	PORT NECHES	AMERIPOL SYNPOL	BUTADIENE	STYRENE BUTADIENE RUBBER	> 1 in 100	> 1 in 1,000
TX	PORT NECHES	AMERIPOL SYNPOL	BUTADIENE	STYRENE BUTADIENE RUBBER	> 1 in 1,000	> 1 in 10,000
TX	PORT NECHES	TEXACO	BUTADIENE	BUTADIENE PRODUCTION	> 1 in 10	> 1 in 100
TX	PORT NECHES	TEXACO	ETHYLENE OXIDE	ETHYLENE OXIDE PRODUCTION	> 1 in 1,000	> 1 in 10,000
UT	PROVO	GENEVA STEEL	COKE OVEN EMISSIONS	COKE OVEN	> 1 in 100	> 1 in 1,000
VA	COVINGTON	WESTVACO	CHLOROFORM	PULP & PAPER	> 1 in 1,000	> 1 in 10,000
WV	BELLE	OCCIDENTAL	CHLOROFORM	CHLORINATED HYDROCARBON PROD.	> 1 in 1,000	> 1 in 10,000
WV	E. STEUBENVILLE	WHEELING-PITT	COKE OVEN EMISSIONS	COKE OVEN	> 1 in 1,000	> 1 in 10,000
WV	MOUNDSVILLE	LCP CHEMICALS	CHLOROFORM	CHLORINATED HYDROCARBON PROD.	> 1 in 1,000	> 1 in 10,000
WV	WASHINGTON	GENERAL ELECTRIC	BUTADIENE	STYRENE BUTADIENE RUBBER	> 1 in 1,000	> 1 in 10,000

Sources: "Updated Source-Specific Cancer Risk Information from the Environmental Protection Agency Office of Air and Radiation Air Toxics Exposure and Risk Information System (ATERIS)," provided to Representative Henry A. Waxman, January 10, 1990.

U.S. EPA, "Coke Oven Maximum Individual Risk Estimates," March 1989, also provided to Representative Waxman.

To: 224-0580

From: NRDC - WASHINGTON, DC

TX	MEMPHIS	VACUDYNE	ETHYLENE OXIDE	COMMERCIAL STERILIZATION	1 in 1,000	1 in 10,000
TX	MEMPHIS	VELSICOL	CARBON TETRACHLORIDE	PESTICIDE PRODUCTION	1 in 1,000	1 in 10,000
TX	BEAUMONT	DUPONT	CARBON TETRACHLORIDE	CHLORINATED HYDROCARBON USER	1 in 1,000	1 in 10,000
TX	BEAUMONT	DUPONT	CHLOROFORM	CHLORINATED HYDROCARBON USER	1 in 1,000	1 in 10,000
TX	BEAUMONT	GOODYEAR TIRE	BUTADIENE	POLYBUTADIENE	1 in 1,000	1 in 10,000
TX	BEAUMONT	MOBIL	BUTADIENE	BUTADIENE PRODUCTION	1 in 100	1 in 1,000
TX	CORPUS CHRISTI	AMERICAN CHROME	CHROMIUM	CHEMICALS PRODUCTION	1 in 100	1 in 1,000
TX	DEER PARK	SHELL OIL	BUTADIENE	BUTADIENE PRODUCTION	1 in 100	1 in 1,000
TX	EL PASO	ASARCO	ARSENIC	PRIMARY COPPER SMELTER	1 in 1,000	1 in 10,000
TX	HOUSTON	GOODYEAR	BUTADIENE	STYRENE BUTADIENE RUBBER	1 in 1,000	1 in 10,000
TX	HOUSTON	MOBAY	BUTADIENE	NEOPRENE	1 in 1,000	1 in 10,000
TX	ODESSA	GEN CORP	BUTADIENE	STYRENE BUTADIENE RUBBER	1 in 1,000	1 in 10,000
TX	ORANGE	FIRESTONE	BUTADIENE	POLYBUTADIENE	1 in 1,000	1 in 10,000
TX	ORANGE	POLYSAR	BUTADIENE	POLYBUTADIENE	1 in 1,000	1 in 10,000
TX	PORT NECHES	AMERIPOL SYNPOL	BUTADIENE	STYRENE BUTADIENE RUBBER	1 in 100	1 in 1,000
TX	PORT NECHES	AMERIPOL SYNPOL	BUTADIENE	STYRENE BUTADIENE RUBBER	1 in 1,000	1 in 10,000
TX	PORT NECHES	TEXACO	BUTADIENE	BUTADIENE PRODUCTION	1 in 10	1 in 100
TX	PORT NECHES	TEXACO	ETHYLENE OXIDE	ETHYLENE OXIDE PRODUCTION	1 in 1,000	1 in 10,000
TX	PROVO	GENEVA STEEL	COKE OVEN EMISSIONS	COKE OVEN	1 in 100	1 in 1,000
TX	COVINGTON	WESTVACO	CHLOROFORM	PULP & PAPER	1 in 1,000	1 in 10,000
TX	BELLE	OCCIDENTAL	CHLOROFORM	CHLORINATED HYDROCARBON PROD.	1 in 1,000	1 in 10,000
TX	E. STEUBENVILLE	WHEELING-PITT	COKE OVEN EMISSIONS	COKE OVEN	1 in 1,000	1 in 10,000
TX	MOUNDSVILLE	LCP CHEMICALS	CHLOROFORM	CHLORINATED HYDROCARBON PROD.	1 in 1,000	1 in 10,000
TX	WASHINGTON	GENERAL ELECTRIC	BUTADIENE	STYRENE BUTADIENE RUBBER	1 in 1,000	1 in 10,000

Source: Updated Source-Specific Cancer Risk Information from the Environmental Protection Agency Office of Air and Radiation Air Toxics Exposure and Risk Information System (ATERIS) Provided to Representative Henry A. Waxman, January 10, 1990; and U.S. EPA, Coke Oven Maximum Individual Risk Estimates, March 1989.

M E M O R A N D U M

DATE: March 21, 1990

TO: Katie

FROM: Greg + Dini

SUBJECT: Pigdogs of Industry

Vacudyne (901) Memphis

✓ Velsicol (901) 324-4401
1199 Warford
Memphis, TN 38108

✓ DuPont (409) 722-3451
Highway 347 South
Beaumont, TX 77705

✓ Goodyear Tire Co. (409) 794-5230
Interstate 10 W
Cheek, TX 77705

✓ Mobil Oil Co. (409) 833-9411
End of Burt
S. Beaumont, TX 77701

✓ American Chrome (512) 883-6421
3800 Buddy Lawrence
Corpus Christi, TX 78469

✓ Shell Oil Co. (713) 241-6161
5900 Highway 225
Deer Park, TX 77536

✓ ASARCO (915) 541-1800
2301 Lake Taisno
El Paso, TX 79922

✓ Goodyear Tire Co. (713) 672-9481
8977 Market St.
Houston, TX 77029

✓ Mobay Co. (713) 477-8821
Park Place Blvd.
Houston, TX 77017

✓ GEN CORP (915) *ODESSA, TX*

✓ Firestone Co. (409) 886-3601
106 Farm to Market Rd.

✓ Orange, TX 77630

Polysar (409) 883-9990

Farm Road 106

✓ Orange, TX 77630

Ameripol Synpol (409) 722-8321

✓ 1215 Main St.

Port Neches, TX 77651

Texaco Chemical (409) 722-8381

✓ Hwy 366-6001

Port Neches, TX 77651

✓ Geneva Steel (801) 227-9000

1600 W. Center St.

Orem, Utah 84057

Westvaco Co. (703) 969-5000

✓ Riverside Ave.

Covington, VA 24426

✓ Occidental Co. (304) 949-4515

Dupont Ave.

Belle, WV 25015

✓ Wheeling-Pitt (614) 283-5000

S. Third St.

Steubenville, OH 43952

✓ LCP Chemicals (304) 843-1310

Route 2

Moundsville, WV 26041

✓ General Electric (304) 424-5411

Parkersburg Center

5th and Avery Streets

Parkersburg WV 26102

✓ Champion Paper Co.

Box C-10

Canton, NC 28716

✓ Occidental (919) 675-7200

5408 Holly Shelter Rd.

Castle Hayne, NC 28429

LTV Steel (216) 696-7400

✓ 45 Prospect Ave. W

Cleveland, OH 44115

W.R. Grace
(502) 683-1561
5525 US 60 East
Owensboro, KY 42303

Armtek
(504) no listing in Baton Rouge, LA

Shell Chemical Co.
(504) 473-4261
River Hwy 75
Geiser, LA 70734

Firestone Rubber and Latex
(318) 882-1211
Hwy 108
Lake Charles, LA 70601

Dupont Co.
(504) 536-1141
Hwy 44 River Road
La Place, LA 70068

Union Carbide
(504) 468-7300
Route 3142 Stargate
Taft, LA 70057

Westvaco
(301) 359-3311
300 Pratt St.
Luke, MD 21540-1099

Detroit Coke
(313) 842-6222
✓ 7819 West Jefferson
Detroit, MI 48209

Baxter Health
(601) 843-9421
Hwy 61 North
Cleveland, MS 38732

Asarco
(406) 227-7100
Smelter Road
East Helena 59635

8195 Industrial Blvd.

Covington, GA 30209

(this co. has another address at tel #404-786-9570. we need to call back to get it)

✓ Dow Chemical Co.

(404)277-2200

1468 Prosser Dr. SE

Dalton, GA 30720

✓ Acme Steel (COKE Plant)

(312) 933 5000

100730 Burley Ave.

Chicago, IL

National Steel (this company appears on the printout as being in Granite City, IL but the operator had no listings other than this one in Jamaica Queens, NY)

(718)739-0391

145-64 Liberty Ave.

Jamaica, NY 11435

Inland Steel

✓ (219) 399-1200

3210 Watling St.

East Chicago, IN 46312

USX Industries

(219) 888-2000

no answer at this tel number

6 ACY, IN.

Citizens Gas

(317) 924-3341

2020 Meridian

Indianapolis, IN 46202

✓ Welsh Coke

(812) no listing in Terre Haute, IN

✓ Armco, Inc.

(606)329-7111

US 23

Ashland, KY 41105

American Synthetics

✓ (502)449-8300

4500 Campground Rd.

Louisville, KY 40216

Sloss Industries
3500 35th North
✓ Birmingham, AL 35207 (?)
(205)254-7803

Gulf States Steel
174 South 46th St.
Gasden, AL 35904
(205) 543 6100

Empire Coke
✓ End of Maine Street
Holt, AL 35904

AKSO, Inc.
not listed in Lemoyne, AL

ABC Coke
✓ (205) 849-1330
Alabama St. and Huntsville Ave.
Tarrant, AL 35217

✓ Koppers
(205) 744-5653
2134 Koppers Dr
Dolomite, AL 35061

ASARCO, Inc.
(602)356-7804
✓ 64 Asarco Dr.
Hayden, AZ 85235

Dow Chemical Co., U.S.A.
(203)464-7211
✓ Alayn's Point Route 12
Gales Ferry, CT 06335-0068

Reichhold Chemicals
✓ (302) 736-9100
821 Silver Lake Blvd
Dover, DE 19901

Goodyear, Inc.
(404) 629-9561
✓ 1601 Highway SW
Calhoun, GA 30701

C.R. Bard, Inc.
(404) 786-9051

USX (216) 277-2000

1807 E. 28th St.

Lorain, OH 44055

Armco Inc. (513) 425-5000

703 Curtis St.

Middletown, OH 45043

New Boston (614) 456-4154

600 River Ave.

Portsmouth, OH 45662

Toledo Coke Co. (419) 691-4641

2563 Front St.

Toledo, OH 43605

LTV Steel (216) 622-5000

2234 Main St. SW

Warren, OH 44482

Bethlehem Steel (215) 694-2424

701 E. 3rd St.

Bethlehem, PA 18016-7699

USX (412) 675-7920

400 State St.

Clairton, PA 15025

BASF (412) 728-6900

370 Frankfort Rd.

Monaca, PA 15061

Sharon Steel (412) 684-1000

345 Donner Ave.

Monessen, PA 15062

LTV Steel (412) 227-4000

4650 Second Ave.

Pittsburgh, PA 15207

Shenango Coke Co. (412) 281-0987

C.R. Bard, Inc.

Macalloy (803) 722-8355

1800 Pittsburgh Ave.

Charleston, SC 29405

Baxter Health (803) 382-2315

Hwy 52 N

Kingstree, SC 29556

BASF (615) 855-2300

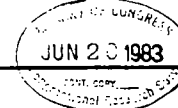
Pittsburg

Cranston, RI

220 Polymyer Dr.
Chattanooga, TN 37421

REPORT BY THE U.S.

General Accounting Office 06553



Siting Of Hazardous Waste Landfills And Their Correlation With Racial And Economic Status Of Surrounding Communities

" This report provides information on the racial and economic characteristics of communities surrounding four hazardous waste landfills in three southeastern States. It also describes Federal criteria for siting landfills and provides data on public participation and how the Environmental Protection Agency's (EPA's) proposed hazardous waste facility permit changes will affect it. "



GAO/RCED-83-168

JUNE 1, 1983

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UNITED STATES GENERAL ACCOUNTING OFFICE
WASHINGTON, D.C. 20548

RESOURCES, COMMUNITY
AND ECONOMIC DEVELOPMENT
DIVISION

B-211461

The Honorable James J. Florio
Chairman, Subcommittee on Commerce,
Transportation and Tourism
Committee on Energy and Commerce
House of Representatives

The Honorable Walter E. Fauntroy
House of Representatives

By letter dated December 16, 1982, you requested us to determine the correlation between the location of hazardous waste landfills and the racial and economic status of the surrounding communities. As agreed with your offices, we focused our review on offsite landfills--those not part of or contiguous to an industrial facility--found in the eight southeastern States comprising the Environmental Protection Agency's (EPA's) Region IV. You also asked for information on site location standards, public participation requirements for siting offsite hazardous waste landfills, and EPA's class permit proposal which addresses the permitting, as a group, less complex waste management facilities such as storage tanks.

We found that:

- There are four offsite hazardous waste landfills in Regions IV's eight States. Blacks make up the majority of the population in three of the four communities where the landfills are located. At least 26 percent of the population in all four communities have income below the poverty level and most of this population is Black.
- The determination of where a hazardous waste landfill will be located is currently a State responsibility. Federal regulations, effective in January 1983, require that selected sites meet minimal location standards. EPA has just begun its review process to determine if sites meet these standards.
- Federal legislation requires public participation in the hazardous waste landfill permit process except for the approval of disposal for polychlorinated biphenyls (PCBs), which are regulated under separate legislation that does not provide for public participation. Because of delays in issuing final regulations three of the four landfills in Region IV have not yet undergone the final permit

process where public participation is required. The fourth is a PCB landfill and even though not subject to Federal requirements, had undergone this process. Only one site in the Nation (in Region VI) has been granted a final hazardous waste landfill permit and had been subjected to the public participation process.

--EPA's class permit proposal for regulating facilities, such as tanks or containers that use proven technology, would change public participation at the local level by limiting the issues to be discussed. However, class permits would not apply to landfills.

OBJECTIVE, SCOPE, AND METHODOLOGY

~~Our objective was to determine the correlation between the location of hazardous waste landfills and the racial and economic status of surrounding communities.~~ As agreed with your office, we reviewed offsite hazardous waste landfills in EPA's Region IV (consisting of Alabama, Florida, Georgia, Kentucky, Mississippi, North Carolina, South Carolina, and Tennessee).

We reviewed files and interviewed responsible officials at EPA and the Bureau of the Census headquarters in Washington, D.C. We also performed work at the EPA Regional Office in Atlanta. Because the Warren County PCB landfill was specifically referred to in the request letter and was the newest site in Region IV, we also did work at North Carolina's Department of Crime Control and Public Safety (the State's lead agency for PCB cleanup and disposal) and the Department of Human Resources in Raleigh. To obtain local information, we interviewed Warren County health officials. We also met in Atlanta with an official of the Southern Christian Leadership Conference to discuss racial issues surrounding the Warren County site selection.

To determine the location of offsite landfills in Region IV, we reviewed files at EPA headquarters and its Region IV office and interviewed officials by telephone in all eight States. We identified four offsite hazardous waste landfills--Chemical Waste Management, Sumter County, Alabama; Industrial Chemical Company, Chester County, South Carolina; SCA Services, Sumter County, South Carolina; and the Warren County PCB landfill, North Carolina.

To obtain information on communities surrounding these landfills, Bureau of the Census, Department of Commerce, officials located the sites on maps that delineated census areas and provided 1980 racial and economic data for census areas in which the landfills are located and other census areas that

have borders within about 4 miles. Bureau of the Census officials also provided similar data for the county and State where the landfills are located.

~~As agreed with your office we did not verify Bureau of the Census supplied data nor determine why the sites were selected, the population mix of the area when the site was established, the distribution of the population around the landfill, nor how the communities' racial and economic status compared to others in the State. Also, we did not determine whether any of these sites pose a risk to the surrounding communities.~~

We also reviewed the landfill siting and public participation requirements of the Resources Conservation and Recovery Act of 1976 and the Toxic Substances Control Act of 1976. We reviewed EPA's headquarters public participation files but cannot judge the public participation process for landfill permits because only one final RCRA landfill permit had been issued.

At your request, we did not obtain agency comments. However, the matters presented in this report were discussed with agency officials and their comments are incorporated, where appropriate.

~~Our work was conducted from December 1982 to April 1983.~~ Except as noted above, we made our review in accordance with generally accepted government audit standards.

RACIAL AND ECONOMIC DATA

Based on 1980 census data at three of the four sites--Chemical Waste Management, Industrial Chemical Company, and the Warren County PCB Landfill--the majority of the population in census areas (areas within a county such as a township or sub-division) where the landfills are located is Black. Also, at all four sites the Black population in the surrounding census areas has a lower mean income than the mean income for all races combined and represents the majority of those below poverty level (the poverty level was \$7,412 for a family of four in the 1980 census).

1980 Census Population, Income, and Poverty Data
For Census Areas Where Landfills Are Located

<u>Landfill</u>	<u>Population</u>		<u>Mean family income</u>		<u>Population below poverty level</u>		
	<u>Number</u>	<u>Percent Black</u>	<u>All races</u>	<u>Blacks</u>	<u>Number</u>	<u>Percent</u>	<u>Percent Black</u>
Chemical Waste Mgmt.	626	90	\$11,198	\$10,752	265	42	100
SCA Services	849	38	16,371	6,781	260	31	100
Industrial Chemical Co.	728	52	18,996	12,941	188	26	92
Warren County PCB Landfill	804	66	10,367	9,285	256	32	90

Appendix I contains maps and related population, income, and poverty data for communities surrounding the four landfills.

FEDERAL SITE LOCATION STANDARDS

The determination of where a hazardous waste landfill will be located is currently a State responsibility, but Federal legislation requires that selected sites meet minimal location standards. These location standards are contained in the Resource Conservation and Recovery Act's (RCRA's) implementing land disposal regulations for the permitting of hazardous waste landfills except those used to dispose of PCBs. These land disposal location regulations, effective in January 1983, pertain to a site's proximity to earthquake fault zones and floodplains. In February 1983, EPA started its review process to determine if hazardous waste landfills meet these standards.

PCB landfill location regulations--implementing the Toxic Substances Control Act (TSCA)--require areas (1) with silt and clay soils, (2) in terrain of low to moderate relief, (3) above the historical groundwater table, and (4) protected from floods. (See app. II.)

RCRA requires that any company owning or operating a hazardous waste landfill must be permitted. The act provides procedures to allow landfills that were in operation on November 19, 1980, to continue to operate under "interim status" until a final permit is issued.

PUBLIC PARTICIPATION

Before permitting hazardous waste landfills under RCRA, EPA is required to accept and respond to comments, hold public hearings upon written request, and notify the public of available appeal procedures. However, these procedures do not apply to the PCB disposal approval process. RCRA landfill permitting, including assuring opportunity for public participation, is a Federal responsibility. Because of delays in issuing final regulations, as of April 30, 1983, only one landfill (in Region VI) had been issued a permit and as required EPA provided for public participation.

CLASS PERMIT PROPOSAL

You also asked for information on how EPA's class permit proposal will impact on the public participation process. EPA is in the early stages of formulating class permit regulations and plans to publish proposed regulations in late October 1983.

Current RCRA regulation treats every hazardous waste management facility as being unique and highly complex. However, unlike landfills some facilities such as tanks or containers are neither unique nor complex. EPA believes such facilities employ relatively simple and well-proven technology which varies little with the locality and can be regulated in groups. The class permit concept, as currently outlined, would change public participation at the local level by limiting the issues to be discussed. The class permit proposal will not change public participation at the national level. For example, local public participation is to focus on whether (1) the facility is in the specified class, (2) the applicant can comply with the permit conditions, and (3) the additional site-specific factors are considered. (See app. II.)

A more detailed discussion of our information is contained in appendixes I and II.

As arranged with your office, unless you publicly release its contents earlier, we will make this report available to other interested parties 14 days after the issue date. At that time copies of the report will be sent to appropriate congressional committees and State delegations; the Administrator, Environmental Protection Agency; the Secretary, Department of Commerce; the Director, Office of Management and Budget; and the Governors of North Carolina, South Carolina, and Alabama.

J. Dexter Peach
J. Dexter Peach
Director

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ABBREVIATIONS

EIS	Environmental Impact Statement
EPA	Environmental Protection Agency
PCB	polychlorinated biphenyls
RCRA	Resources Conservation and Recovery Act
TSCA	Toxic Substances Control Act

RACIAL AND ECONOMIC DATAON FOUR HAZARDOUS WASTE SITESCHEMICAL WASTE MANAGEMENT

In 1977 Chemical Waste Management established a commercial hazardous waste treatment, storage, and disposal facility. The facility is located in western Alabama on State Highway 17 in Sumter County. The landfill has RCRA interim status and is approved by EPA for PCB disposal.

As shown in figure 1 on the following page, the landfill is located in area A which has a 90-percent Black population. Also, Blacks represent 100-percent of the population that is below the poverty level.

Areas that have borders within 4 miles of the site are area B, still in Sumter County, which is 84 percent Black and area C, in Mississippi, which is 69 percent Black. In these areas, Blacks make up over 93 percent of those below the poverty level.

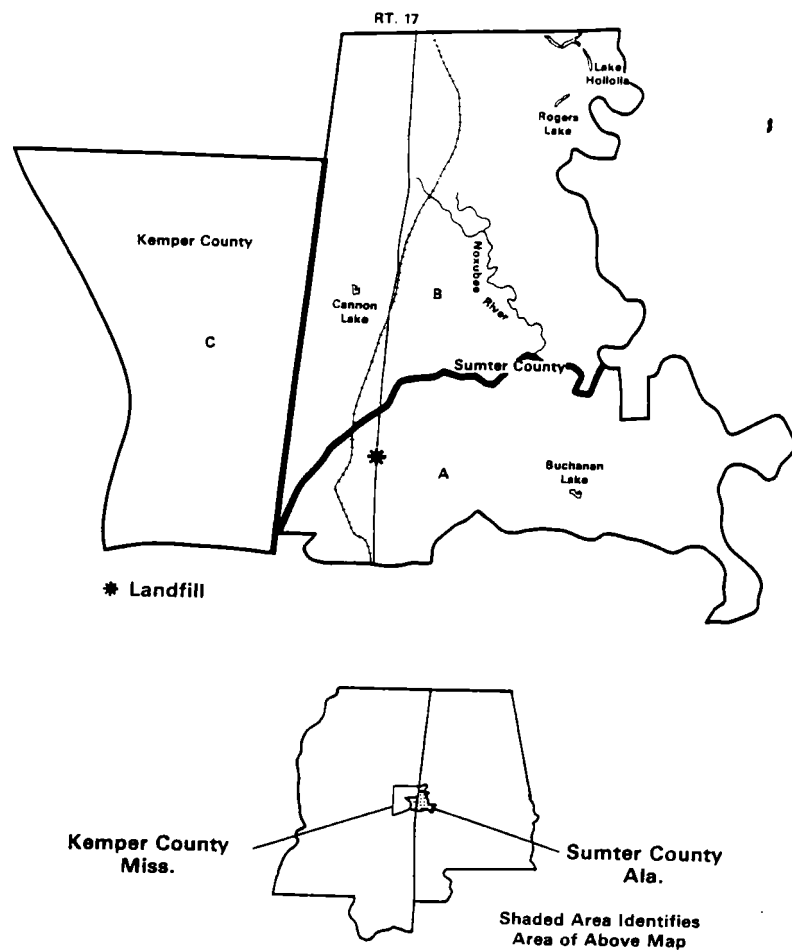
Chemical Waste Management
1980 Census Data

<u>Location</u>	<u>Population</u>		<u>Mean family income</u>		<u>Population below poverty level</u>		
	<u>Number</u>	<u>Percent</u>	<u>All races</u>	<u>Blacks</u>	<u>Number</u>	<u>Percent</u>	<u>Black</u>
		<u>Black</u>					
Alabama	3,893,888	26	\$19,199	\$12,655	719,905	19	52
Sumter Co.	16,908	69	16,573	11,015	5,508	33	93
Area A	626	90	11,198	10,752	265	42	100
Area B	1,335	84	12,025	9,375	620	46	96
Mississippi	2,520,638	35	17,722	11,424	587,217	24	65
Kemper Co.	10,148	54	13,418	9,428	3,757	37	80
Area C	1,060	69	14,257	9,041	532	50	93

Note: Areas represent subdivisions of political jurisdictions designated by census for data gathering.

FIGURE 1

Chemical Waste Management, Sumter County, Ala.



SOURCE: Based on Bureau of the Census maps that delineate 1980 census areas.

SCA SERVICES

In 1977 SCA Services established a commercial hazardous waste treatment, storage, and disposal facility. The facility is located in Sumter County near Lake Marion and close to Clarendon and Calhoun Counties, South Carolina. The facility has RCRA interim status.

As shown in figure 2 on the following page, the landfill is located in area A with a 38-percent Black population. However, in areas that have borders within 4 miles--B, C, and D--Blacks make up the majority of the population. In all four areas Blacks represent 84 percent or more of those below the poverty level.

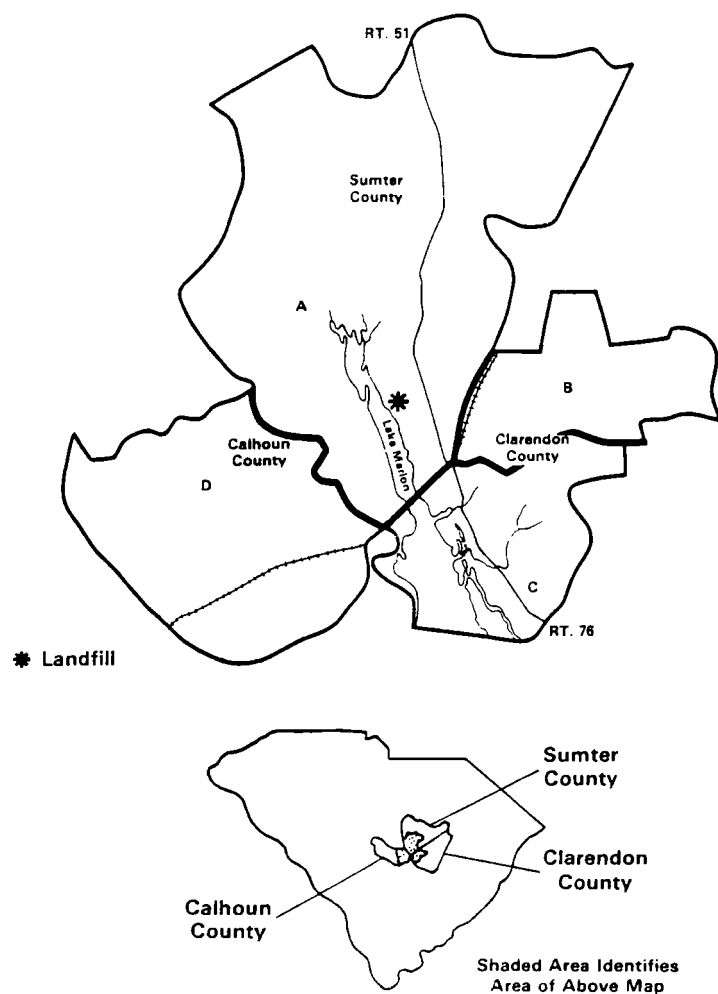
SCA Services, Inc.,
1980 Census Data

Location	Population		Mean family income		Population below poverty level		
	Number	Percent Black	All races	Blacks	Number	Percent	Percent Black
South Carolina	3,121,820	30	\$19,582	\$13,508	500,363	16	61
Sumter Co.	88,243	44	16,424	10,978	20,029	23	81
Area A	849	38	16,371	6,781	260	31	100
Clarendon Co.	27,464	57	15,202	11,219	7,985	29	81
Area B	607	92	11,203	11,814	244	40	84
Area C	484	74	12,192	11,385	167	35	96
Calhoun Co.	12,206	55	16,991	12,510	2,683	22	85
Area D	724	69	19,282	11,066	216	30	91

Note: Areas represent subdivisions of political jurisdictions designated by census for data gathering.

FIGURE 2

SCA Services, Sumter County, S.C.



SOURCE: Based on Bureau of the Census maps that delineate 1980 census areas.

INDUSTRIAL CHEMICAL COMPANY

In 1972 the Industrial Chemical Company established an offsite landfill to dispose of its own hazardous waste. The site is located in Chester County on U.S. Highway 21 near York and Lancaster Counties, South Carolina. In 1982 the State prohibited the company from disposing of any more waste in the landfill. During our review the site, however, still had interim status under RCRA.

As shown in figure 1 on the following page, the landfill is located in area A, which has a 52-percent Black population, and Blacks represent 92-percent of those below the poverty level. Areas that have borders within 4-miles show that the Black population ranges from 30-percent to 56-percent. The number of Blacks below the poverty level range from 24-percent in area B to 100-percent in area C.

Industrial Chemical Co.,
1980 Census Data

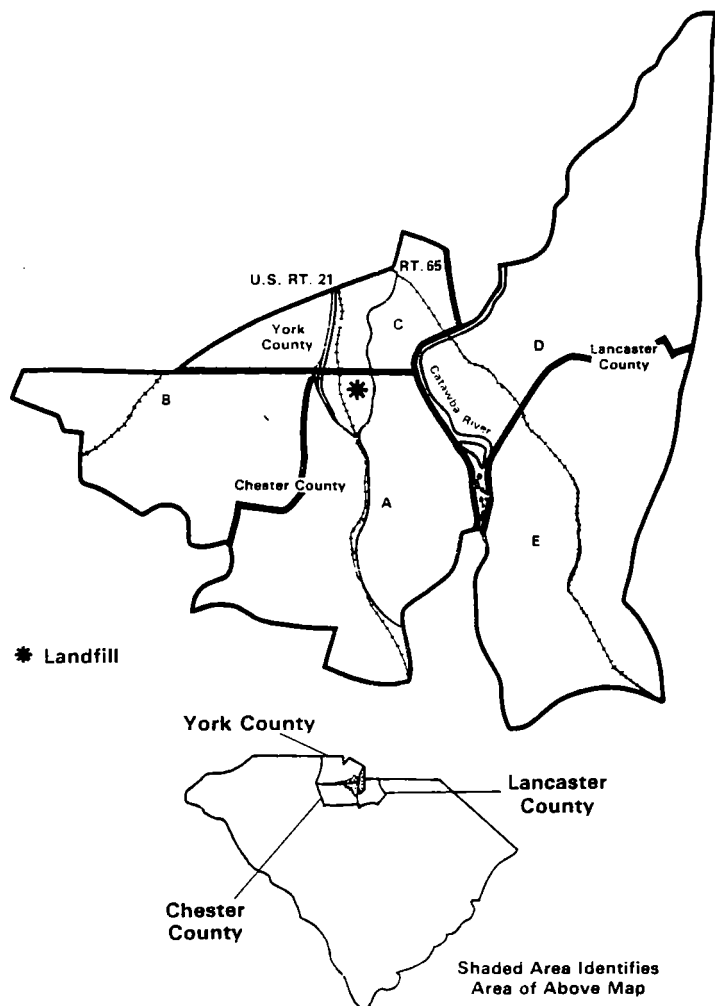
Location	Population		Mean Family Income		Population Below Poverty Level		
	Number	Percent Black	All races	Blacks	Number	Percent	Percent Black
South Carolina	3,121,820	30	\$19,582	\$13,508	500,363	16	61
Chester Co.	30,148	39	18,153	14,221	4840	16	70
Area A	728	52	18,996	12,941	188	26	92
Area B	922	30	21,430	17,988	35	4	100
York Co.	106,720	22	21,530	15,383	11,407	11	50
Area C	420	41	18,946	13,200	35	8	a/
Lancaster Co.	53,361	24	19,372	14,880	5,930	11	49
Area D	923	56	18,307	15,945	148	16	79
Area E	1,125	30	17,535	17,240	136	12	24

a/Information not available from census.

Note: Areas represent subdivisions of political jurisdictions designated by census for data gathering.

FIGURE 3

Industrial Chemical Company, Chester County, S.C.



SOURCE: Based on Bureau of the Census maps that delineate 1980 census areas.

WARREN COUNTY PCB LANDFILL

The Warren County landfill was established to dispose of PCBs that were illegally dumped during 1978 along 241 miles of North Carolina roads. The site is located in Shocco Township in Warren County, N.C. In 1979 EPA approved the site for PCB disposal.

As shown in figure 4 on the following page, Shocco Township and three of the five areas that have borders within 4 miles--Sandy Creek, Warrenton, and Fork Townships--have a majority Black population and Blacks make up the majority of those below the poverty level. The population of Judkins Township is 48 percent Black and Fishing Creek Township is 44 percent Black and 47 percent American Indian. The American Indians make up 49 percent of those below poverty level.

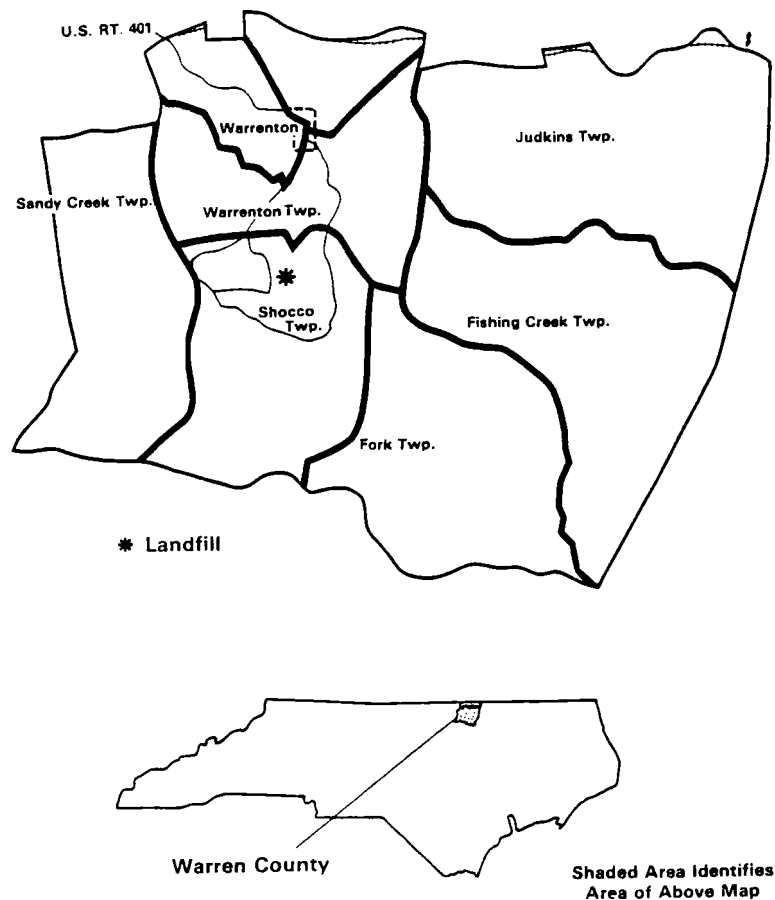
Location	PCB Landfill 1980 Census Data						
	Population		Mean family income		Population below poverty level		
	Number	Percent Black	All races	Blacks	Number	Percent	Percent Black
North Carolina	5,881,766	22	\$19,513	\$13,648	839,950	14	46
Warren Co.	16,232	60	15,053	11,463	4,880	30	80
Shocco Township	804	66	10,367	9,285	256	32	90
Sandy Creek Township	1,331	70	14,009	11,806	545	41	91
Warrenton Township	4,596	61	15,812	11,746	1,360	30	90
Fishing Creek Township	1,285	44	11,454	10,296	425	33	39
Fork Township	556	81	10,897	10,378	179	32	81
Judkins Township	850	48	35,329	a/	259	31	a/

a/Information not available from census.

Note: Warren County census data was available by Township.

FIGURE 4

PCB Landfill, Warren County, N.C.



SOURCE: Based on Bureau of the Census maps that delineate 1980 census areas.

The State considered several options for disposing of the PCB-contaminated soil including incineration, transportation to an existing landfill in Alabama, treatment along the roads, or development of a landfill within North Carolina. However, EPA had not approved the incineration and treatment-in-place processes, and the State had determined that transportation to Alabama was too costly. Therefore, the State chose the development of a landfill in North Carolina as the best available alternative.

After the State evaluated over 90 locations, it determined that Warren County was the best available site. The State considered available tracts of State-owned land and those offered by private individuals, corporations, and county governments. The State used the TSCA landfill requirements for PCBs and its own siting criteria to screen and evaluate possible locations. The PCB regulations require that a landfill be in an area of low to moderate relief, with silt and clay soils, and above the historical groundwater table. The State wanted the landfill to be in an area (1) bounded by the counties where the PCB spills had occurred, (2) with a minimum area of 16 acres, (3) isolated from highly populated areas, and (4) accessible by road with a deeded right-of-way.

Most of the 90 proposed sites were eliminated, according to a State-prepared Environmental Impact Statement (EIS), because they did not meet one or a combination of the evaluation standards. Although 11 of the remaining sites were considered to have a high probability for meeting the PCB landfill criteria, 9 were rejected after the State performed detailed subsurface investigations. The remaining two sites were in Chatham and Warren Counties.

The State evaluated Chatham and Warren County sites essentially equivalent. However, the Chatham site was publicly owned and the county would not sell it, and according to the State Attorney General, the State did not have the power of eminent domain to take over the land. The Warren County site was selected for the landfill because it met the evaluative criteria and was available.

The Warren County landfill is located on 5 acres in the middle of a 142-acre area. The acreage around the landfill serves as a buffer zone. According to the EIS, the landfill site met PCB landfill requirements for topography, hydrology, and soil conditions and the additional State criteria including size, isolation from population centers, access, and location in an area of the PCB spill.

APPENDIX I

APPENDIX I

At the State's initiative, a public hearing was held in Warren County on January 4, 1979, to inform the public of the site's selection and to discuss public concerns. Although EPA approved the site in June 1979, construction was delayed for 3 years because of two court suits brought against the State to prevent the site from being used as a PCB landfill. Both suits were settled in favor of the State, and construction of the landfill began on June 26, 1982.

A final attempt to stop the landfill occurred on July 2, 1982. At that time, the local chapter of the National Association for the Advancement of Colored People requested, on the basis of racial discrimination, a preliminary injunction in a Federal district court to prohibit the placement of PCBs in Warren County. The court denied the request and stated in its decision that race was not an issue because throughout all the Federal and State hearings and private party suits, it was never suggested that race was a motivating factor in the location of the landfill. The court went on to state that various criteria and standards were used in selecting the sites, and Warren County was chosen mainly because of site availability.

APPENDIX II

APPENDIX II

FEDERAL LOCATION STANDARDS,
PUBLIC PARTICIPATION REQUIREMENTS,
AND CLASS PERMITS

RCRA and TSCA do not regulate landfill site selection but require that selected sites meet certain location standards. RCRA requires that the public have the opportunity to participate in the landfill permitting process. TSCA makes no provisions for public participation in its regulation governing approval for PCB disposal. As of May 1, 1983, only one landfill has completed this process. Unlike landfills, certain hazardous waste facilities are not unique or complex, and EPA wants to simplify its permit process.

FEDERAL LOCATION STANDARDS

RCRA requires that any company owning or operating a hazardous waste landfill must be permitted. The act authorized landfills that were in operation on November 19, 1980, to continue to operate under "interim status" until a final permit is issued. Final regulations for landfills became effective on January 26, 1983. However, during our review only one final landfill permit had been issued and EPA anticipates that it may take about 8 years to permit all landfills.

Because of PCB's potential for environmental harm, the Congress also passed in 1976 a special provision to control PCBs under TSCA. Among other things, the act required EPA to prescribe acceptable methods for PCB disposal. EPA's regulations implementing TSCA provide specific criteria for approval for PCB disposal. PCBs were the only chemical that the Congress identified for special action under TSCA.

RCRA's January 26, 1983, land disposal regulations provide two location standards--seismic and floodplain. According to these regulations, a landfill cannot be located within 200 feet of a fault. If a landfill is located in a 100-year floodplain, it must be designed, operated, and maintained to prevent washout of any hazardous waste unless the permittee can demonstrate that waste can be safely removed before floodwaters reach it. Although there are no other location standards, there are performance oriented standards, such as groundwater monitoring and design and operating requirements, which were formulated to ensure protection of human health and the environment.

FEDERAL PUBLIC PARTICIPATION REQUIREMENTS

Before permitting hazardous waste landfills, EPA must assure that the public has the opportunity to participate in the permitting process. The regulations provide that:

--The EPA regional office develop mailing lists of interested persons. The list includes names of persons who have participated in past permit proceedings and individuals who request that their names be included. EPA must also notify the public periodically through public press and environmental news bulletins, State and regional funded newsletters, and State law journals about the opportunity to be put on the lists.

--EPA must provide a minimum of 45 days for public comment after a draft permit is prepared. Notice of the draft permit must be sent to people on the mailing list, broadcasted over local radio stations, printed in local newspapers, and announced in any other medium designed to elicit public participation.

--EPA must provide a hearing if requested in writing during the comment period. Notification of the hearing must be at least 30 days before the hearing, and the public comment period is extended until the close of the hearing.

After the public hearing the EPA regional office responds to public comments, indicates changes made in the permit, and either issues or denies the permit. Public notice of this decision and appeal procedures is sent to interested parties, persons who submitted comments, and hearing participants. Thirty days is allowed to file an appeal petition. The Administrator is permitted a "reasonable amount of time" (not specified in the regulations) either to grant or deny the appeal petition.

Experience with RCRA participation requirements

As of May 1, 1983, EPA had permitted only one landfill--the IT landfill in Ascension Parish, Louisiana. The landfill was permitted in December 1982, using temporary land disposal regulations, which were in effect until EPA's final regulations became effective in January 1983. However, the temporary regulations required the same public participation process as outlined in the regulations.

The draft permit for the IT landfill was publicized on July 23, 1982, in two local newspapers, on three radio stations, and notices mailed to about 1,000 people. These announcements invited the public to provide written comments by September 22, 1982, and oral comments during a September 8 and 9, 1982, public hearing. Based on a request, the comment period was extended to October 1, 1982. In December 1982, EPA responded to comments, approved the permit, and provided notice for appeal, as required by regulation. However, the permit was appealed to the Administrator, but as of April 19, 1983, no decision had been reached.

EPA'S CLASS PERMIT PROPOSAL

Current RCRA regulations treat every hazardous waste management facility as being unique and highly complex. However, EPA believes some classes of hazardous waste management facilities, particularly those that store or treat hazardous waste in tanks, piles, or containers, are neither unique nor complex. Such facilities employ relatively simple and well-proven technology, which varies little with the locality. According to an EPA July 22, 1982, concept paper on class permits, a permit issued to one such facility, in most respects, would be quite similar or even identical to permits issued to many other such facilities. As defined by this paper, class permits would not be used for landfills.

According to EPA's Program Manager, Permits Branch, EPA plans to develop class permit regulations using the standard accepted practices for the storage and treatment of hazardous waste in tanks, piles, or containers. In formulating class permit regulations, EPA plans at the national level to follow public participation procedures when proposing class definitions, national permit conditions, and abbreviated application procedures. At the local level, after an abbreviated application is submitted, EPA plans to issue a public notice in the area where the facility is located. Public comments are to be accepted and if requested a public hearing will be held. ~~Public participation is to focus on whether (1) the facility is in the specified class, (2) the applicant can comply with the permit conditions, and (3) the additional site-specific factors are considered.~~ According to EPA's Program Manager, Technology Branch EPA anticipates that these proposed regulations will be published in the Federal Register in late October 1983.

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Control of emissions from certain sources

As with other sections in this Title, the Senate recedes, and the conferees adopt the House language. Several features of the House amendment merit emphasis.

Study and report. -- Subsection 183(e) requires the Administrator to prepare and submit to Congress, within three years, a study of emissions of volatile organic compounds (VOC) into the ambient air from consumer and commercial products. The study is to determine the potential of such products to contribute to ozone levels in areas which violate the NAAQS and to establish criteria for regulating such products or classes or categories thereof. The conferees recognize that this is a new area of regulation for the Administrator which could potentially affect hundreds of thousands of products throughout the country. Accordingly, it is expected that the Administrator will prepare the study and report with close consultation and comment by interested parties, such as state environmental agencies, appropriate federal agencies, affected industries and the general public.

Regulations. -- Paragraph 183(e)(3) provides that, upon submission of the report, the Administrator shall list those categories of consumer or commercial products which, based on the study, account for at least 80 percent of the VOC emissions (on a reactivity-adjusted basis) from such products in areas that violate the NAAQS for ozone. At such time, the Administrator is also to divide the list into 4 groups and establish priorities for subsequent regulation based upon the criteria set forth in paragraph

PHOTOCOPY PRESERVATION

2. These criteria require the Administrator to consider the following attributes of consumer or commercial products: uses, benefits, and commercial demand; health or safety functions; VOC reactivity; ease of cost-effective controls; and the availability of alternative products which are of comparable costs, considering health, safety and environmental benefits.

Thereafter, the Administrator is to promulgate regulations as to each of the 4 groups in seriatum priority order every two years until all four are subject to regulation. The regulations shall require best available controls as defined in this subsection and may exempt health use products. The potential systems of regulation are broad and include the use of CTGs in lieu of regulations where CTGs would be substantially as effective as regulations in reducing emissions of VOCs to the ambient air in areas which violate the NAAQS for ozone.

It is important to note here that regulations/CTGs are to be applied only at the level of the manufacturer, processor, wholesale distributor or importer, and are to take into account technical and commercial feasibility, costs, lead time and competition. The conferees recognize that some States have begun to act with respect to consumer and commercial product VOC emissions and that some manufacturers of such products have already made and are making reductions in the VOCs released to the ambient air from their products. These are positive developments for which credit is to be accorded by the Administrator in developing regulations/CTGs. Thus, this section requires that the Administrator to give credit

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toward the 80 percent emissions calculation for emission reductions made after the date of enactment and that, as regulations/CTGs are developed, similar credit will be applied to those products which have made reductions.

State administration and consultation. -- While the Administrator must promulgate regulations/CTGs under this subsection, the States may develop and submit to the Administrator procedures under State law for implementing and enforcing those regulations/CTGs. If the Administrator finds the State procedure adequate, it shall be approved. The conferees are well aware that most consumer and commercial products are intended to be marketed nationwide in interstate commerce. Accordingly, the conferees believe that uniformity of regulation is an important objective. Thus, this subsection also requires the Administrator to establish a clearinghouse of information, studies, and regulations proposed and promulgated, and to disseminate such information collected as requested by States. Further, any State which proposes regulations other than those promulgated by the Administrator must consult with the Administrator regarding whether any other State has promulgated or is promulgating regulations as to products covered by this subsection, and no State regulations regarding the size, shape or labeling of a product may be promulgated unless the Administrator finds that such regulations are useful in meeting any NAAQS.

Definitions. -- Regulations promulgated by the Administrator under this subsection as to each of the 4 groups of products must apply best available controls as defined in paragraph 1. This

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definition is new and specific to this subsection and requires that any controls be technologically feasible, economically feasible, and consider health, environmental and energy implications. Further, consistent with best available controls, the regulations under this subsection may include any system of regulation as the Administrator deems appropriate, including requirements for registration and labeling, self-monitoring and reporting, prohibitions, limitations, or reasonable fees, charges, and other economic incentives (including marketable permits and auctions of emissions rights) concerning the manufacture, processing, distribution, use consumption, or disposal of the product. Thus, it may be that the most effective technique for regulating VOC emissions from a particular product would be a revision to the directions for time of use of the product. The most effective technique for some other product could be feedstock substitution or reformulation where that was technologically and economically feasible for that product. The ultimate objective is to reduce VOC emissions to the ambient air in nonattainment areas from products where those emission reductions are technologically and economically feasible for a product consistent with the other criteria mentioned in this subsection.

Paragraph 1 also defines the term consumer and commercial products for purposes of this subsection. This definition is extremely broad. Excepting certain specific items listed at the end of the definition, such products include any substance, product or article the use, consumption, storage, disposal, destruction or

PHOTOCOPY PRESERVATION

decomposition of which results in the release of VOCs. The specification of some products in the definition, i.e., "including paints, coatings, and solvents ... any container or packaging," is not intended to exclude other products or detract from the breadth of this definition. Indeed, according to OTA's Catching Our Breath report, industrial solvent use accounts for the largest percentage of total solvent use in nonattainment areas. Thus, for example, substances and products used in industrial applications are obviously an important area for study and regulation under this subsection.

CABLE: CROMOR
FACSIMILE (RAFICOM): 205-225-2110
W. U. I. (INTERNATIONAL) 04344
W. U. (DOMESTIC) 55-2448



AMERICAN FURNITURE MANUFACTURERS ASSOCIATION

Office For Government Affairs 918 16th Street NW Suite 402 Washington, DC 20006 Phone 202.466.7362

January 24, 1990

MEMORANDUM

TO: Katie McGuinty

FROM: Barbara Steakley

RE: Industry Information for the Clean Air Act Debate

Furniture manufacturing in Tennessee employs more than 24,000 people. Twenty-one of Tennessee's furniture manufacturers are members of AFMA. See the attached list. While AFMA's membership is broad, it tends to lean toward larger manufacturers. However, it is sufficiently broad to be representative of the entire industry.

The American furniture manufacturing industry employs several hundred thousand people and produces sales of approximately \$17 billion annually. American furniture manufacturers cross the spectrum in terms of size -- from very large to quite small manufacturers. However, two-thirds of the manufacturing facilities employ 20 or fewer people.

Furniture manufacturing often is thought to be a regional industry -- concentrated in the mid-Atlantic states. While it is true that a large number of manufacturers are located in North Carolina, Tennessee and Virginia, major manufacturing facilities also are in Southern California, Kentucky and Iowa, as well as other areas throughout the United States. In Southern California, furniture manufacturing is the second largest employer. However, an increasing number of furniture manufacturers in Southern California are relocating to Mexico due to the increased cost of environmental regulation.

The American furniture manufacturing industry is highly competitive, both domestically and internationally. Most manufacturers operate on a very narrow profit margin. The price a consumer pays for furniture is the single most important factor in the decision to buy.

AFMA Members in Tennessee

Athens Furniture Inc.	Athens
The Bean Station Furniture Factory Inc.	Bean Station
The Berkline Corporation	Morristown
Bushline Inc.	Tazewell
Campbell & Dann Mfg. Co. Inc.	Tullahoma
Capiso USA Inc.	Surgoinsville
Cleveland Chair Company Inc.	Cleveland
Crescent Manufacturing Company	Gallatin
The Davis Company	Memphis
Empire Furniture Company	Johnson City
England Upholstery Mfg. Co. Inc.	Tazewell
Hart Casual	Collierville
Imperial of Morristown	Morristown
Jackson Manufacturing Company	Cleveland
Jamison Bedding Inc.	Franklin
The Lane Company Inc.	Smyrna
Pullman Couch Company	Cleveland
Samsonite Furniture	Murfreesboro
Silver Furniture Company Inc.	Knoxville
Don P. Smith Chair Co. Inc.	Loudon
Universal Bedroom Furniture Ltd.	Morristown



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AMERICAN FURNITURE MANUFACTURERS ASSOCIATION
concerns with S. 1630
TITLE III -- AIR TOXICS

Technology standards: Many furniture manufacturing facilities will be considered major sources of air toxics under S. 1630 -- those emitting either at least 10 tons of any one substance or 25 tons in the aggregate. Most of the substances emitted by furniture manufacturers are both precursors to ozone formation and are on the air toxics list.

Although S. 1630 allows EPA to consider the cost of achieving the reductions, the bill also states that the goal of the reductions for existing sources is 90% from uncontrolled levels. The only known control measures that will achieve that kind of reduction for furniture manufacturers are incinerators and carbon adsorption systems. Both are prohibitively costly. The capital cost alone for an incinerator or carbon adsorption system in the furniture manufacturing industry is at least \$250,000 for each spray booth. For example, for one facility in a rural attainment area with 185 employees, 11 spray booths and annual furniture production of \$11 million, the capital cost would be \$3 million. This cost would be 27% of that plant's annual production and is independent of also expensive operating and maintenance costs. The reductions obtained from improving transfer efficiency vary throughout the industry, but are thought to be around 10-20%. The use of water-based coatings is not now technologically, nor aesthetically, achievable throughout the finishing process nor on an industry-wide basis, despite the expenditure of more than \$250 million by furniture manufacturers and suppliers in search of a solution.

Currently there is not a control technique guideline (CTG) for furniture manufacturing, although, EPA has started to develop one. AFMA is concerned about timing of the promulgation of a final CTG and of the MACT standard. It is unreasonable to expect furniture manufacturers to, say, in 1993 implement RACT controls (now probable due to CTG development), only to be told in 1994 that they must implement MACT controls, especially without due consideration of or credit for the RACT controls.

Technology standards should be flexible enough to reflect the wide variety of sources affected. Even within a category or subcategory of sources, there will be differences among the sources. The determination of MACT within a category or subcategory should be based on more than the experience of just one source.

Credit for early reductions: Facilities in nonattainment areas or in states that have their own air toxics programs will already have

achieved some reductions of substances on the toxics list. For furniture manufacturers, the same substances are controlled for both purposes. S. 1630 exempts a source from the technology standard only if it has achieved a 90% voluntary reduction from no earlier than 1985 emission levels by Dec. 31, 1992. First, the only way that a furniture manufacturer could achieve a 90% reduction is by installing incinerators or carbon adsorption systems for each spray booth, which is not feasible. Second, there is an inherent inequity in "punishing" facilities that happen to be located in states or localities that on their own initiative implemented measures to reduce emissions. Also, facilities in states or localities that have taken no independent action gain a competitive advantage because they generally will have to spend comparatively less for controls. The voluntary requirement should be deleted.

The situation is further complicated by S. 1630's requirement that to gain a 5-year extension for compliance with the technology standard, any RACT (reasonably available control technology) requirement (generally for existing sources in nonattainment areas) must achieve an 80% reduction from uncontrolled levels. For furniture manufacturers, only incinerators or carbon-adsorption systems are likely to meet this requirement. The 80% requirement should be deleted.

Accidental releases: All furniture manufacturers will have to comply with the provisions related to accidental releases. Many of the requirements will be unnecessarily burdensome due to some redundancy with OSHA and Community-Right-to-Know requirements. S. 1630 specifies several substances common in furniture manufacturing for each of which detailed hazard assessments must be prepared and updated biennially. The requirements of the hazard assessments will be particularly burdensome on smaller furniture manufacturers who do not have the in-house expertise to adequately comply. In fact, even among the larger manufacturers, only one appears to have an in-house environmental engineer. For example, facilities could be required to supply information about the meteorology of their areas. Certainly that requirement is far outside the expertise of furniture manufacturing employees. Therefore, such requirements would necessitate the hiring of expensive consultants.

Any accidental release provision should provide a coordinated federal framework for an accidental release program. The list of substances for which hazard assessments should be developed should be determined by EPA. Updated hazard assessments should be required every five years (instead of 2), unless there is a significant change in the use of one of the listed substances.

Residual risk: S. 1630 specifies risk values to be applied after the implementation of the technology-based standards. Due to the severe limitations of current risk assessment methods and research, specific values should be determined by EPA as the risk assessment process is improved. Furthermore, evaluations of residual risk should account for site-specific factors.



Barbara E. Steakley

Director of Congressional & Regulatory Affairs

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SECTION 112

CLEAN AIR WORKING GROUP

January 17, 1990

Dear Senator:

Within the next few weeks, Senate floor action is anticipated on the Clean Air Act Amendments (S. 1630) as reported by the Senate Environment and Public Works Committee last November.

We, the Section 112 Clean Air Working Group, a coalition representing thousands of companies, farm groups and trade associations, want to bring your attention to the concerns and adverse effects that portions of S. 1630 could have on small business including farmers.

The attached packet of informational materials summarizes our view of the sweeping requirements that would be triggered by enactment of the bill's seven titles. Even in attainment areas, thousands of small businesses will be regulated for the first time under pending clean air legislation. Most companies are eager to do their part to control air pollution. However, they have serious concerns with the proposed legislative language on the regulatory requirements, permits, enforcement and accidental release provisions of S. 1630.

Members of the coalition will be touching base with you and your staff to provide further explanation regarding the specific provisions of the bill.

Sincerely,

Section 112 Clean Air Working Group

Section 112

**CLEAN AIR
ACT**

**INDUSTRY'S
VIEW**

**PHOTOCOPY
PRESERVATION**

TESTIMONY OF

JOHN D. GRAHAM^{*}

**S.816 The Toxics Release Prevention
Act of 1989**

September 21, 1989

**Subcommittee on Environmental Protection
Committee on Environment and Public Works
U.S. Senate**

**Associate Professor of Policy and
Decision Sciences
Harvard School of Public Health
677 Huntington Avenue
Boston, Massachusetts 02115**

THANK YOU VERY MUCH FOR THE OPPORTUNITY TO SPEAK TODAY. I WOULD LIKE TO BEGIN BY DESCRIBING THE NATURE OF THE AIR TOXICS PROBLEM IN THE UNITED STATES AND THEN CONCLUDE BY OFFERING SOME PRINCIPLES THAT I BELIEVE SHOULD GOVERN THE WRITING OF LEGISLATION IN THIS AREA. THE THEME OF MY REMARKS WILL BE BETTER USE OF RISK ASSESSMENT IN AIR TOXICS REGULATION.

THE PHRASE "AIR TOXICS" IS USED VERY LOOSELY TO REFER TO ALL AIR POLLUTANTS THAT MAY CAUSE SERIOUS HEALTH EFFECTS BUT FOR WHICH EPA HAS NOT ESTABLISHED A NATIONAL AMBIENT AIR QUALITY STANDARD. YOU ARE UNDOUBTEDLY AWARE THAT THERE ARE SEVERAL HUNDRED TOXIC AIR POLLUTANTS EMITTED BY VARIOUS INDUSTRIAL SOURCES. EPA HAS ESTIMATED THAT AT LEAST 2.7 BILLION POUNDS OF TOXICS ARE EMITTED INTO THE AIR EACH YEAR. LET'S BE SPECIFIC: WE ARE TALKING ABOUT POLLUTION FROM OIL REFINERIES, COKE PLANTS, PULP AND PAPER MILLS, DRY CLEANERS, BAKERIES, CHEMICAL FACTORIES, MOTOR VEHICLES, ELECTRIC POWERPLANTS, WOOD STOVES AND A VARIETY OF OTHER SOURCES. THE DIMENSIONS OF THE PROBLEM MAY SEEM FRIGHTENING, BUT IT IS IMPORTANT TO KEEP THE MAGNITUDE OF THE PROBLEM IN PERSPECTIVE.

FIRST, WHILE THERE IS A LOGICAL BASIS FOR PUBLIC HEALTH CONCERN, THERE IS NO DIRECT EVIDENCE THAT OUTDOOR EXPOSURES TO TOXIC AIR POLLUTANTS ARE RESPONSIBLE FOR A SIGNICANT FRACTION OF DISEASE OR MORTALITY. IT IS TRUE THAT DIRECT EVIDENCE OF PUBLIC HEALTH DAMAGE HAS BEEN DEMONSTRATED FOR CRITERIA POLLUTANTS SUCH AS OZONE, SULPHUR AEROSOLS, AND FINE PARTICULATES, AND THAT THE INDOOR AIR TOXICS PROBLEM MAY ALSO BE QUITE SERIOUS. IN THE CASE

OF OUTDOOR EXPOSURE TO TOXIC AIR POLLUTANTS, HOWEVER, HEALTH CONCERNS ARE INFERRED FROM EITHER LONGTERM ANIMAL STUDIES OR EPIDEMIOLOGICAL STUDIES OF HIGHLY EXPOSED WORKERS. THE LEVELS OF TOXICS THAT PEOPLE BREATHE IN DAILY LIFE ARE TYPICALLY SEVERAL FACTORS OF TEN SMALLER THAN THE LEVELS THAT HAVE BEEN STUDIED BY SCIENTISTS. NONETHELESS, THE AVAILABLE STUDIES ARE A SOUND BASIS FOR PUBLIC HEALTH CONCERN.

SECOND, DESPITE THE LACK OF DIRECT EVIDENCE, EPA RISK ASSESSMENTS SUGGEST THAT INHALATION OF AIR TOXICS MAY INCREASE THE INCIDENCE OF DISEASE, ESPECIALLY CANCER AMONG HIGHLY EXPOSED POPULATIONS. BASED ON A STUDY OF 65 TOXIC AIR POLLUTANTS, EPA ESTIMATES THAT UP TO 3,000 ADDITIONAL CANCERS MAY OCCUR EACH YEAR IN THE UNITED STATES. BY WAY OF COMPARISON, KEEP IN MIND THAT 900,000 NEW CASES OF CANCER ARE DETECTED IN THE UNITED STATES EACH YEAR.

IN A RECENT REPORT TO THE CONGRESSIONAL RESEARCH SERVICE, MY RESEARCH TEAM EXAMINED THE SCIENTIFIC BASIS OF EPA'S RISK ASSESSMENT PROCESS. WE FOUND THAT ALTHOUGH EPA HAS DEVELOPED A CANCER RISK ASSESSMENT PROCEDURE, THE AGENCY HAS NOT YET DEVELOPED A PARALLEL PROCEDURE FOR OTHER HEALTH EFFECTS SUCH AS NEUROTOXICITY AND REPRODUCTIVE EFFECTS. EPA'S WIDELY QUOTED CANCER RISK ESTIMATES SHOULD BE TREATED WITH CAUTION BECAUSE THEY ARE BASED ON SOME QUESTIONABLE ASSUMPTIONS -- FOR EXAMPLE, THAT HUMANS ARE AS SENSITIVE AS THE MOST SENSITIVE TESTED ANIMAL SPECIES, AND THAT ANY HUMAN EXPOSURE TO A CARCINOGEN, NO MATTER HOW SMALL, RESULTS IN SOME INCREASE IN CANCER RISK. WHILE THESE ARE PRUDENT ASSUMPTIONS

TO MAKE IN THE ABSENCE OF SOUND DATA, EPA HAS NOT ALWAYS BEEN RESPONSIVE ABOUT REVISING ITS ASSUMPTIONS IN LIGHT OF SCIENTIFIC ADVANCES. FOR EXAMPLE, EPA'S RISK ESTIMATES FOR BENZENE, FORMALDEHYDE, GASOLINE VAPOR, AND PERCHLOROETHYLENE ARE SCIENTIFICALLY OUTDATED AND NEED TO BE REVISED.

LET ME STRESS THAT REVISION OF RISK ESTIMATES BASED ON SCIENCE CAN RESULT IN EITHER MORE OR LESS PUBLIC HEALTH CONCERN. IN RECENT RESEARCH PERFORMED AT RESOURCES FOR THE FUTURE, DR. ADAM FINKEL HAS SHOWN THAT REVISION OF RISK ESTIMATES BASED ON SCIENCE CAN EITHER REDUCE OR INCREASE ESTIMATED RISK, DEPENDING UPON THE SPECIFIC POLLUTANT AND EXPOSURE SCENARIO. ALTHOUGH MANY INTEREST GROUPS IN THIS TOWN WOULD LIKE TO SEE LARGER OR SMALLER RISK ESTIMATES FOR THEIR OWN REASONS, THE PURPOSE OF INCORPORATING SCIENCE INTO RISK ASSESSMENT IS TO PROVIDE A MORE ACCURATE BASIS FOR PUBLIC POLICY DECISIONS. AFTER READING OUR REPORT TO CRS, EPA ADMINISTRATOR WILLIAM REILLY WROTE THE CONGRESS ON AUGUST 10TH AND PROMISED THAT THE AGENCY WOULD IMPROVE THE RISK ASSESSMENT PROCESS.

THIRD, PEOPLE WHO LIVE VERY CLOSE TO INDUSTRIAL SOURCES OF TOXIC AIR POLLUTANTS (E.G., COKE OVENS) MAY EXPERIENCE SUBSTANTIAL ELEVATIONS IN LIFETIME CANCER RISK, SAY, IN THE RANGE OF 1 IN 100 TO 1 IN 1,000. WHILE THE NUMBERS OF PEOPLE SEVERELY AFFECTED MAY BE RELATIVELY SMALL, THESE LOCALIZED "HOT SPOTS" OF RISK PRESENT A SERIOUS EQUITY ISSUE THAT CONGRESS SHOULD ADDRESS. WHILE I AM CONVINCED THAT SUCH HOT SPOTS ARE A POTENTIALLY SERIOUS PROBLEM, WE SHOULD KEEP IN MIND THAT THE EPA'S RISK ESTIMATES TO THE "MAXIMALLY EXPOSED INDIVIDUAL" OR "MEI" ARE HYPOTHETICAL. THEY

ASSUME, FOR INSTANCE, THAT PEOPLE LIVE OUTDOORS AT THE FENCELINE OF A MAJOR SOURCE FOR 70 YEARS, 24 HOURS PER DAY. MORE OFTEN THAN NOT, THE RISK ESTIMATES TO THE MEI ARE BASED ON PREDICTED OR MODELED EXPOSURES RATHER THAN ACTUAL PERSONAL EXPOSURES OR STATION MONITOR READINGS. EPA RISK ASSESSORS ARE AWARE THAT THEY NEED TO DEVELOP A MORE REALISTIC PROCEDURE FOR CALCULATING RISKS TO THE MAXIMALLY EXPOSED INDIVIDUAL.

HAVING SUMMARIZED THE NATURE AND MAGNITUDE OF THE AIR TOXICS PROBLEM, LET ME BRIEFLY OFFER THREE GUIDELINES FOR LEGISLATION.

FIRST, CONGRESS SHOULD REPLACE THE "AMPLE MARGIN OF SAFETY LANGUAGE" IN SECTION 112 WITH TECHNOLOGY-BASED STANDARDS FOR THE FIRST PHASE OF POLLUTION REDUCTION. WE ALSO NEED DEADLINES AND SO-CALLED "HAMMERS" TO ACCOMPANY THE TECHNOLOGY-BASED STANDARDS.

SECOND, CONGRESS SHOULD DIRECT EPA TO USE THE BEST AVAILABLE SCIENCE WHEN ASSESSING THE RISKS OF AIR TOXICS, ESPECIALLY IN THE SECOND PHASE OF THE PROCESS, IN WHICH RESIDUAL POLLUTION IS REGULATED. IN PARTICULAR, CONGRESS SHOULD ORDER EPA TO REVIEW ITS RISK ASSESSMENT GUIDELINES WITHIN TWO YEARS AND REVISE ITS RISK ESTIMATES FOR SELECTED POLLUTANTS IN LIGHT OF NEW SCIENTIFIC KNOWLEDGE. THERE ARE ALREADY SOME PROVISIONS FOR RISK ASSESSMENT IN S. 816, BUT THEY NEED TO BE REFINED AND MADE MORE SPECIFIC. WE ALSO NEED DEADLINES AND HAMMERS TO BETTER ASSURE THE USE OF SCIENCE IN EPA RISK ASSESSMENTS. TOUGH LANGUAGE WOULD STRENGTHEN THE HANDS OF THOSE EPA OFFICIALS WHO WANT TO UPGRADE THE AGENCY'S REPUTATION FOR SCIENTIFIC CREDIBILITY IN REGULATORY DECISION MAKING.

FINALLY, CONGRESS SHOULD RESIST THE TEMPTATION TO ESTABLISH

ARBITRARY RISK CUTOFFS SUCH AS ONE IN TEN THOUSAND OR ONE IN A MILLION FOR THE REGULATION OF RESIDUAL RISKS. WHILE QUANTITATIVE RISK ASSESSMENT HAS IMPROVED IN THE PAST DECADE, IT IS STILL AN INEXACT SCIENCE. IT WOULD BE FOOLISH TO PRETEND THAT SCIENTISTS KNOW WHETHER THE CANCER RISK POSED BY A PARTICULAR SOURCE EXCEEDS OR FALLS SHORT OF SOME PRECISE RISK NUMBER. INDEED, CONGRESS SHOULD INSTRUCT EPA TO INFORM THE PUBLIC OF THE UNCERTAINTIES IN RISK ASSESSMENT AS THEY ARISE ON A CASE-BY-CASE BASIS. RATHER THAN INSIST ON COMPLIANCE WITH INFLEXIBLE RISK CUTOFFS, CONGRESS SHOULD INSTRUCT EPA TO STRIVE FOR A BALANCE OF HEALTH, ECONOMIC AND TECHNOLOGICAL CONSIDERATIONS -- IN OTHER WORDS, APPLY AN UNREASONABLE RISK TEST.

IF THE PURPOSE OF THE SO-CALLED BRIGHT LINES IS TO PUT PRESSURE ON INDUSTRY TO REDUCE RESIDUAL EMISSIONS, I RECOMMEND AN ALTERNATIVE STRATEGY FOR ACHIEVING THAT GOAL. CONGRESS SHOULD COMPEL EPA TO PUBLISH EACH YEAR A LIST OF SPECIFIC PLANTS AND COMPANIES THAT POSE SIGNIFICANT RESIDUAL RISKS -- EITHER TO MAXIMALLY EXPOSED INDIVIDUALS OR TO THE GENERAL POPULATION. IN LIGHT OF THE PUBLIC'S GROWING INTEREST IN ENVIRONMENTAL QUALITY, I AM CONFIDENT THAT THE EMBARRASSMENT FACTOR WILL DO AN EFFECTIVE JOB OF CREATING INCENTIVES FOR CLEANUP OF RESIDUAL EMISSIONS. THE EFFECTIVENESS OF THIS STRATEGY WILL BE ENHANCED WHEN EPA'S RISK ASSESSMENT PROCESS EARNS A GREATER DEGREE OF CREDIBILITY WITHIN THE SCIENTIFIC COMMUNITY.

THANK YOU VERY MUCH FOR YOUR TIME AND I WOULD BE HAPPY TO ANSWER ANY QUESTIONS THAT YOU MIGHT HAVE.

ATTACHMENTS SUBMITTED FOR THE RECORD

(1) JOHN D. GRAHAM, DAVID R. HOLTGRAVE, AND MARY JEAN SAWEY, "THE POTENTIAL BENEFITS OF CONTROLLING HAZARDOUS AIR POLLUTANTS," in THE HEALTH BENEFITS OF AIR POLLUTION CONTROL: A DISCUSSION, EDITED BY JOHN BLODGETT, CONGRESSIONAL RESEARCH SERVICE, WASHINGTON, D.C., FEBRUARY 27, 1989.

(2) LETTER FROM WILLIAM K. REILLY TO HONORABLE JOHN D. DINGELL, AUGUST 10, 1989 WITH ATTACHED COMMENTS.

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EXECUTIVE SUMMARY

Clean Air Legislation: What Cost to Small Business?

For the first time in more than a decade, Congress is likely to revise the federal Clean Air Act. One of the bills being considered was presented by President Bush. The measure, H.R. 3030/S. 1490, contains seven titles covering all aspects of air pollution: acid rain, urban pollution, automobiles and off-the-road vehicles, air toxics, permits and enforcement. This paper deals with the issues of permitting and enforcement titles. NAM's complete, soon-to-be-released, white paper on the subject addresses *all* titles of the legislation.

The current law imposes high costs on manufacturers and needs revision. It requires that all national air quality standards be met by December 31, 1987. That date came and went and the nation did not attain the standards. This created a risky and unstable economic environment for manufacturers. Many cities have failed to meet federal air quality standards and face economic sanctions or construction bans. Such actions slow economic growth and prevent the building of factories or

modernization of existing factories. Much of the nation's productive manufacturing capacity is located in our larger cities where air pollution is complex.

Industry has made substantial progress in

cleaning up the nation's air. More than two decades of controlling factories and automobiles have reduced emissions of air pollutants such as lead, sulfur dioxide, carbon monoxide and even smog. This has cost industry \$34 billion a year.

According to the Environmental Protection Agency (EPA), more than 100 metropolitan areas do not meet the ground-level ozone or "smog" standard. This makes smog the most common air pollution problem. Smog results from hydrocarbons and nitrogen oxides that "cook" in the sunlight and form pollution. It is an irritant that can pose a health threat at high levels of concentration. Most of the new controls in the

pending clean air legislation affecting small businesses are designed to control substances that make smog.

What Does NAM Want?

1. Streamline the permit process and improve emissions data without forcing companies to use expensive continuous (24-hours-a-day) monitoring equipment. Paperwork burdens in permitting should be minimized.
2. Small "batch" manufacturers should not have to repermit every time a company retools or makes production-line changes.
3. Encourage the use of group permits or permits by rule-making for categories of industrial sectors to speed up the permit process.
4. Permitting fees should realistically reflect the cost of administering a permit program and should not be used to balance government deficits.
5. Fines and penalties should match the seriousness of the offense. Criminal prosecution and jail sentences are not appropriate for late submittal of forms, permit records, or payment of routine administrative fees. NAM supports criminal prosecution where fraud has been established.
6. The legislation should provide technical assistance and guidance materials to small manufacturers to reduce common air pollution problems resulting from the use of solvents, paints, coatings and inks.

SECTION 112

CLEAN AIR WORKING GROUP

S. 1630 : SMALL BUSINESS REALITIES

The regulatory scheme proposed in S. 1630 will result in unnecessary burdens on small businesses. The proposed program requirements often will be redundant or duplicative. Moreover, the requirements far exceed the technical and financial capabilities of most small businesses. Discretionary EPA regulatory authority for dealing with small sources are likely to prove illusory due to sweeping mandated provisions.

Small business concerns with S. 1630 include:

- Consideration must be given to the control requirements of other Clean Air Act provisions and other federal statutes. The EPA Administrator should be directed to ensure that additional control requirements are not redundant or unnecessarily costly.
- Credit should be provided for all prior emissions reductions, both voluntary and mandatory.
- Smaller sources *—emitting as little as 10 tons per year—* may be designated as “major sources” subject to maximum achievable control technology standards instead of relying on cost effective and generally available control technologies for small emission sources.
- Implementation of an urban air toxics control strategy for the smallest of emission sources within only nine years of enactment **will virtually guarantee** a poorly designed program that may provide **no health benefit to the public at an enormous cost** (*including job losses*) to small businesses.
- There is **no** assurance that protection of the hypothetical most exposed individual from an infinitesimal risk of cancer is technologically feasible.
- Plant closures *—from near zero emission standards for some chemicals—* are likely.
- Small companies tend not to have professional staff capable of understanding complex emission control standards and permit requirements. *Even with a Small Business Technology Assistance Program*, they will be forced to vie for expensive outside consultants for permit application development and monitoring reports.
- In requiring facility emission permits for small sources, unnecessary delays in plant expansions and modifications will result due to the lack of permit authority resources.

**An alternative to S. 1630, Title III of S. 1490,
the President's proposal, is based upon a more rational
approach to regulating hazardous air pollutants.**

SECTION 112

CLEAN AIR WORKING GROUP

S. 1630 : ACCIDENTAL RELEASES

Section 129 of S. 1630 requires facilities using certain substances to develop detailed hazard assessments to anticipate the consequences of a range of accidental releases of these substances, including worst-case events. The bill also provides for the creation of a Chemical Safety and Hazard Investigation Board with broad and intrusive powers to investigate accidental releases. S. 1630 specifies an initial list of 28 substances subject to its accidental release provisions, and requires that an additional 22 be added.

Effects on small business would be:

- Monitoring, recordkeeping, training, and reporting requirements would impose tremendous administrative and paperwork burdens.
- Hazard assessments requiring sophisticated, and expensive modeling efforts are beyond the reach of most small businesses. Updates would be required every other year.
- Several substances included in the initial list are not listed under SARA Section 302 --*thus should not be considered "extremely hazardous."*
- Responsibility for developing a list of substances and substance and hazard assessment elements has been assigned to the Chemical Safety Board. However, some initial determinations have already been proposed in Section 129. Such decisions should be made only after a *thorough* evaluation by the appropriate body.
- Worst-case estimates of the potential for accidental releases --*regardless of their probability*-- must be prepared by facilities. These publicly available estimates would further heighten public hysteria and mistrust of industry and government.
- Many Section 129 provisions duplicate existing SARA, RCRA, HMTA, and OSHA regulations.

SECTION 112

CLEAN AIR WORKING GROUP

CLEAN AIR CONSEQUENCES: EXAMPLES FROM YOUR NEIGHBORHOOD

Clean air bills currently being considered in Congress will place control requirements on small businesses. -- many for the first time. The effects on these small operations should be reviewed carefully and the cost of control versus improvements in public health should be weighed thoughtfully. These are examples of what can happen if pending clean air legislation is not modified to avoid duplicative requirements and to assure full consideration of the economic and other impacts on small business.

SERVICE STATIONS

- Under air toxics provisions, service stations would be subject to emission controls either as major sources or area sources. In addition, under non-attainment requirements, "Stage II" vapor recovery equipment, at \$40,000-\$60,000 per pump, would be required on **all** pumps. Yearly maintenance will cost over \$4,000 for **each** owner *even if* oil companies cover initial installation costs.

PRINT SHOPS

- Printing, with 36,000 shops, is a huge manufacturing industry in the U.S. Enormous emission reduction costs for small shops --*estimated at more than half of annual income*-- would result from severe legislation.
- If categorized as a "major source," *regardless of size or output*, all print shops would most likely have to buy new machinery --at an approximate cost for the average print shop of between \$160,000-\$300,000. Encasing equipment to capture further fugitive emissions would have additional cost.

AUTO BODY REPAIR SHOPS

- Body shops would be required to purchase new equipment for applying paint (i.e., spray guns), alter the interior configurations of the repair shop, or install control equipment --*costing up to \$100,000--* to capture emissions.
- Paint colors would be limited as manufacturers reformulate to comply with new standards. More reformulated paint may be needed to achieve the same quality paint job.
- Restrictions on the use of degreasers, solvents, paints and lacquers will also place a burden on garages.

DRY CLEANERS

- Fifty percent of all dry cleaners have no more than \$100,000 in receipts per year. Permitting costs and control equipment purchases may cause many small-to-mid sized cleaners to go out of business.
- The average dry cleaner would be required to install "state of the art" pollution control equipment – *not an "add on" to existing equipment but rather, totally new equipment.* Costs vary (by size and output of shop) but average \$40,000-50,000.
- With an average 3-5 employees, dry cleaning establishments lack personnel to complete operating permit applications, to perform continual monitoring of emission standards compliance or to maintain necessary recordkeeping .

BAKERIES

- Those delicious aromas wafting from bakeries may be a thing of the past. Emissions control equipment would be required to burn off those hydrocarbons, by-products of the baking process, before they leave the exhaust stack.

FURNITURE FINISHERS

- Furniture finishers have few options to reduce or control emissions. Use of water-based finishes for a significant part of the finishing process *to date has been unsuccessful* . Add-on controls such as incinerators cost \$250,000, at a minimum, per spray booth. Carbon adsorption systems are similarly costly. *(For example, one plant with 185 employees which produces \$11 million in furniture annually, estimates the cost of control equipment at its plant alone to be \$3 million.)*

RESTAURANTS

- Charcoal grills for bar-b-qued steaks and other foods would have to install containment units to reduce emissions.

AGRICULTURE

- Farmers would be forced to reduce pesticide, nutrient and fertilizer emissions –*in some cases by 75%*– without assurances that substitute products or technologies are available.
- Almost **all** pesticide applications will require emission controls –even though most routine releases are already regulated under FIFRA.
- Emission controls would be expanded *beyond* non-attainment areas to the entire country.
- Outright bans on some nutrients, fertilizers and pesticides may occur.
- Farmers (not scientists) would be mandated to complete hazard assessments.
- *Non* -carcinogenic nutrients, fertilizers, solvents, propellants and pesticides would be regulated – even if there are no known harmful effects.

SECTION 112

CLEAN AIR WORKING GROUP

PERMITS: SMALL BUSINESS CONCERNS

Even in attainment areas, thousands of small businesses will be regulated for the first time under pending clean air legislation. Most companies will have to obtain a permit to continue to do business while doing their part to control air pollution. Detailed emission analyses, compliance schedules, compliance certification and permit violations must be submitted to local, state, or federal environmental protection agencies.

Small business concerns follow:

- A permit system must be streamlined to keep paperwork to a minimum and not hinder business.
- Any permitting system should be *cost-effective*.
- Existing permits should not be thrown out "en mass" before a new program is in place.
- Group permits or permits by rulemaking would limit expense and manpower for some industries.
- Permit fees should be reasonable, *based on administrative costs*, and not used as a deficit reduction mechanism.
- Fines, penalties, and criminal prosecution should have a **direct correlation** to the seriousness of the violation. Paperwork violations such as late submissions of forms or delayed payment of routine administrative fees, *which cause no public harm*, should not be treated the same as willful or negligent emissions violations.
- More than 80% of the new jobs in the past decade were created by small business. Capital costs and human resource allocation are critical for their success. Continuous emissions monitoring which requires specialized equipment –*typically costing between \$50,000 to \$250,000*– and a computer dedicated to managing and analyzing the data are just too much and could cause many small businesses to fail.
- Contents of a permit application and compliance plan should be treated as *privileged information* and protected for "trade secrets." Disclosure should be **limited** to that which is vital to protect the health of workers and the general public.



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An organization of municipally
and cooperatively owned electric power
systems purchasing power from the
Tennessee Valley Authority.

ACID RAIN FACT SHEET

The Tennessee Valley Public Power Association ("TVPPA") represents the 160 consumer-owned electric utilities that buy power from the Tennessee Valley Authority ("TVA"). TVPPA member utilities distribute electricity to eight-million consumers in the seven-state TVA region.

TVPPA has carefully examined the President's acid rain proposal (H.R. 3030; S. 1490), S. 1630, as reported by the Senate Environment and Public Works Committee and the draft amendments endorsed by House Energy and Commerce Chairman, Rep. John Dingell. To promote fairness and to help limit the high cost of compliance with the national Clean Air program, TVPPA urges the adoption of the following changes:

o **Air Toxics.** The President's bill proposes that electric utilities be exempt from regulation of air toxic pollutants for a period of three years, during which time the Environmental Protection Agency ("EPA") is to conduct a study of the need for regulating such emissions. The Senate bill, S. 1630, exempts utilities from regulation of chlorine only and would probably require controls for emissions of metals and other substances that are released when coal is burned. Many utilities, including TVA, believe that the Senate bill would require the installation of expensive baghouses, and possibly scrubbers, to comply with the air toxic requirements. This would dramatically increase the cost of the Clean Air program across the nation. Until there is conclusive evidence of a significant health risk, Congress should defer action on utility air toxics.

TVPPA urges that Congress support the three-year study of utility contributions to air toxic pollutants, as proposed in the President's bill, in lieu of requiring immediate regulation of utility sources as provided in S. 1630.

*TVA
Bob Rayne

*EQUITY

*Cap NOX
DMS Fed*

- o **Nitrogen Oxide ("NOX") Emissions.** S. 1630 subjects electric utilities to a tonnage formula for emissions of NOX, similar to the treatment of SO2 emissions. The President's bill and the Dingell draft require the EPA Administrator to establish a NOX emissions rate for utility boilers. The tonnage approach is more limiting for utilities, like TVA, that are highly dependent on coal-fired generation. Offset options, e.g., scrubbing or fuel switching, that are available to meet SO2 reduction requirements are not available with the current state of NOX control technology. In addition, certain boilers--cyclone, wet bottom, and cell burner wall fired boilers--cannot be retrofitted with low NOX burners to achieve the targeted NOX burners. The NOX "cap" approach, as proposed in S. 1630, could create a ceiling on coal-fired electrical generation that would restrict economic development in the Valley and other coal-dependent regions of the country.

TVPPA supports the provisions of the President's bill that require EPA to impose a NOX emissions rate on electric utilities. TVPPA opposes the NOX tonnage formula contained in S. 1630.

- o **Enforcement of Allowance System.** S. 1630 and H.R. 3030 state that, when EPA conducts its end-of-the-year review of each utility's compliance with the new proposed Clean Air requirements, it will enforce the allowance system on a unit-by-unit basis. In the legislative report accompanying S. 1630, however, the Senate suggests that EPA may allow system-by-system compliance, giving utilities greater operational flexibility. This operational flexibility would lend to more cost-effective compliance plans and thus, better economic conditions for the utility's service area. TVA has 63 coal-fired units and could choose the most system-wide cost-effective compliance strategy.

TVPPA urges the House and Senate to adopt language to ensure that enforcement of the emissions allowance program be on a system-by-system basis, not unit-by-unit.

- o **Federal Facilities.** To ensure that the federal government sets a good example, the Senate Environment Committee adopted an amendment that requires each "federal facility" to make all energy conservation improvements that are cost-effective. This language was apparently intended to cover federal facilities as purchasers or consumers of energy, not as generators or transmitters.

The Senate amendment also requires each federal facility to meet 10% of its energy needs through renewable and alternative clean technologies by 1995. Hydropower, one of the Valley's richest energy resources, is not included on the list of renewable and clean technologies.

TVPPA supports the goal of energy efficiency, but believes that an amendment is needed to distinguish between federal facilities that use energy and those that generate or transmit it and to specify that hydro is an approved renewable resource.

For additional information, contact Jerry Campbell (615) 756-6511.

NATIONAL CLEAN AIR COALITION

1400 16th Street, N.W.

Washington, D.C. 20036

(202) 797-5436

January 29, 1990

Dear Senator:

The Senate will soon face one of the clearest public health choices in the Clean Air Act debate. Twenty years ago, Congress made a promise to the American people to protect their health from cancer-causing emissions. On behalf of more than 20 million Americans represented by the National Clean Air Coalition, I urge you to stay true to that promise by **retaining and strengthening S.1630's health standards for toxic air emissions**, and by **rejecting any amendment to eliminate those health standards or cripple their implementation**.

S.1630 establishes a two-step process for regulating major industrial emitters of air toxics: A technology-based first step (the "maximum available control technology" considering cost), followed by a health-based second step targeted where the MACT standard is not sufficient to meet even minimal standards for protecting public health from pollutants that cause cancer or other illnesses.

Industry groups, aided and abetted by the Administration, are seeking to eliminate the critical second step of health standards. They would substitute an express policy of cost-benefit analysis (called "unreasonable risk") under which anyone's life can be forfeit if government and industry cost accountants don't think it is worth the expense of saving.

The American people reject the notion that lives and health should be bought and sold this way. In poll after poll, they have signaled their support for a Clean Air Act that protects public health.

Twenty years after the Clean Air Act was passed, major industries are still emitting more than 2.6 billion pounds of toxic air pollutants. According to their own reports under the 1986 Right to Know Act, the vast majority of sources emitting cancer-causing pollutants are still operating with no air pollution control equipment.

The EPA estimates that just a sub-set of the cancer-causing pollutants cause as many as 2700 fatal cancers each year. Over our lifetimes, that means almost 200,000 preventable cancer deaths due to air toxics. About half the toll is due to

stationary sources. (The other half is due to vehicle emissions, another powerful argument for S.1630's two rounds of auto tailpipe standards.)

People living near the most dangerous industrial facilities are exposed to incredibly high cancer risks: Lifetime cancer risks greater than **1-in-10** for the most exposed people living near a Texaco chemical plant in Port Neches, Texas, that emits butadiene. **One-in-55** for the persons most exposed to coke oven emissions near the Clairton Works in Pennsylvania. More than **1-in-100** for persons living near certain uranium mines in the West.

The National Clean Air Coalition believes that **all** Americans, especially the people who are most heavily exposed, are entitled to protection from airborne cancer.

Industry lobbyists are deliberately mis-stating what the health standards in S.1630 require, and over what timeframe. Here is what the bill requires:

First, after the first-step MACT standards are met, EPA must determine whether there are people still exposed to more than a 1-in-10,000 chance of getting cancer. If so, then EPA must set a health standard that reduces the cancer risk for those people below that level.

Under S.1630, **every source** can have **at least until 2005** to meet this health standard. Some sources get **until 2013**. That's **15-23 years** for industries that emit cancer-causing pollutants to meet the first health standard under the bill.

The bill also sets a 1-in-1,000,000 standard. Most sources will be able to meet this level. **But no facility will ever be required to close under the bill because of the 1-in-1,000,000 standard.** If sources which come up short show that they are doing all they can, then they are entitled to extensions that can be renewed without limit every five years.

It is simply incredible that industry would attack a bill that gives them **15-23 years** to meet any public health standard for cancer-causing air pollutants, and then only the 1-in-10,000 standard at that. This is a very long time -- far too long, in fact -- to wait for only a modest level of health protection from cancer-causing air pollutants.

The attack on S.1630's health standards is all the more curious in light of carcinogen policies of some of the nation's leading chemical companies. At least three major companies -- Monsanto, Union Carbide, and DuPont -- have publicly declared the objective of **eliminating** their cancer-causing emissions. Against the policies of these companies, how credible are the complaints

of trade associations and lobbying groups against S.1630's far less ambitious health standards?

The industry attack on the health standards is based on grossly exaggerated cost estimates. The Business Roundtable's biggest numbers, which pertain to 1-in-100,000 and 1-in-1,000,000 standards, have nothing to do with reality. S.1630 simply does not require any source to reach these levels if it is already using all the controls it can afford.

Further, both industry and the Administration have chosen to base their dire predictions on an assumption that **no successful or knowledgeable businessman would ever make:** That companies working to comply with health standards 15-23 years from now will be limited to the technology that is available today.

Any sound businessman knows better than that. The history of the Clean Air Act shows that if "technology-forcing" signals are given and ample leadtime is allowed, industry succeeds in making the necessary advances in pollution control techniques. Look at the development of automobile emission controls. In 1970, and again in 1977, the auto industry claimed it could not meet the emission standards then under consideration. But Congress set deadlines, and the industry developed the catalytic converter. Look also at the story of the CFCs. Just a few years ago, industry claimed they were irreplaceable. Now, with the expectation of a total phase-out by the end of the century, CFCs are being rapidly and successfully replaced.

If the health standards are stripped out, or if loopholes are allowed in the already overly generous deadline, there will be no significant effort to develop better or cheaper pollution control equipment or process changes. The toxic cloud on our health will then be permanent.

The National Clean Air Coalition believes the air toxics provisions of S.1630 need to be strengthened, not weakened. For the sake of millions of people whose lives are endangered by cancer-causing pollutants, I urge you to support amendments to speed up this vital program, and to reject amendments that would strip out or cripple S.1630's essential public health standards.

Sincerely,

Richard Ayres
Richard E. Ayres
Chairman

✓ ~~Geophila~~
Chlorides

air toxics

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3 yrd study approach

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TVA mtg 1/31

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but if only NSPS no good - TVA has 1

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than

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facilities

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electric generation transmission
facilities except for

* take TVA →
rates set by board.

② all toxics

study - acid rain provisions

* at least 3X costs $\begin{cases} \text{scrubbers} + \\ \text{baghouses.} \end{cases}$

③ system - comp. → * Will will ask Congress
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④ will lead to control cycles + cell burners
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NA

S. 1630 Amendment
Deferring Toxic Regulation of Utilities

Both the Senate and House bills vastly expand the regulation of hazardous or toxic air emissions to encompass many more pollutants and their sources. Coal contains minute quantities of many substances, including several which would be deemed toxic under the legislation. Burning coal in utility boilers can release toxic substances but in relatively dilute concentrations; consequently, coal-fired utility units have not been viewed by EPA and others as a major source of toxic pollutants. Nevertheless, the collective amount of all of these pollutants emitted by a utility unit may be sufficient to have it deemed a major toxic emitter under the proposed legislation.

Since regulation as a toxic pollutant emitter would require use of maximum achievable control technology, utilities could be forced to install scrubbers and/or baghouses on every unit. The cost of doing this could easily exceed the cost of the acid rain control requirements of the legislation and undermine the schedule specified for utility reductions in the acid rain control provisions of the legislation.

H.R. 3030 precludes EPA regulation of utility units as toxic pollutant emitters for three years to give EPA time to determine what effect the legislation's other requirements (e.g. acid rain controls) will have on utility emissions. S. 1630 precludes such regulation for three years only as to chlorine compounds, which, depending on the type of utility boiler and coal burned, may not be sufficient to preclude the regulation of utility units for other toxic air emissions. H.R. 3030's approach should be substituted for S. 1630's.

S. 1630 Amendment

Amend Section 301 (revised section 112(e)(5)) (pages 335-336; lines 22-24, 1-2) by deleting it in its entirety and substituting the following:

(5) The Administrator shall perform a study of the hazards to public health reasonably anticipated to occur as a result of emissions by electric utility steam generating units of pollutants listed under subsection (b) after imposition of the requirements of this Act. The Administrator shall report the results of this study to the Congress within three years after the date of enactment. The Administrator shall develop and describe in his report to Congress alternative control strategies for emissions which may warrant regulation under this section. The Administrator may not regulate electric utility steam generating units under this section unless he finds such regulation is appropriate and necessary after considering the results of the study required in this subsection.

**BACKGROUND MEMORANDUM
ON THE IMPACT OF THE AIR TOXICS TITLE
OF S. 1630 ON
THE ELECTRIC UTILITY INDUSTRY**

Background

The Senate Committee bill would amend Section 112 of the Clean Air Act by establishing a new two-phase program for regulating the emission of nearly two hundred "air toxics," or "hazardous air pollutants." The existing Section 112 requires EPA to list as a "hazardous air pollutant" any substance which may be reasonably anticipated to result in mortality or increase serious illness. Once a substance is listed as a hazardous air pollutant, the EPA must establish an emission standard to protect the public health. Thus far, EPA has listed eight such substances (mercury, beryllium, asbestos, vinyl chloride, benzene, radionuclides, inorganic arsenic and coke oven emissions) and issued air emission standards for seven of those. (No standard has been promulgated for coke oven emissions.)

Effect of S. 1630

Title III of S. 1630 would fundamentally restructure Section 112 by requiring the Agency to list 191 specific substances as hazardous air pollutants and to regulate emissions of those substances through an initial technology-based regulatory scheme to be augmented by a subsequent standard based on health risk. Any facility that in the aggregate emits either (1) ten tons per year or more of any single pollutant or (2) twenty-five tons per year or more of any combination of pollutants would be a "major source" subject to regulation. In addition, the bill permits regulation of an "area source," which it defines as any stationary source of hazardous air pollutants that is not a major source.

In the first phase of the new program, the EPA would have to establish a list of all major sources of these pollutants and promulgate standards to achieve the maximum degree of reduction in emissions of each air pollutant, relying on the installation of the maximum achievable control technology ("MACT"). In the second phase, which is to occur not later than five years after an initial standard is promulgated, the Administrator must eliminate all residual risks which exist after the application of MACT standards.

During the first phase of the program, the Administrator must take into account the cost and any non-air-quality health, environment, and energy effects; however, in no event can the degree of reduction be less than the most stringent level achieved in practice. As noted, the authors of the bill presume that even MACT will not reduce emissions sufficiently to remove all health and environmental risks associated with the emission of hazardous air pollutants, and, thus, require that EPA promulgate "residual

risk" standards and, using those standards, perform a so-called residual risk assessment. For carcinogens, the bill sets out two residual risk standards, for which the Agency may not consider emission control costs. Sources must meet a standard that would reduce risks of contracting cancer to less than 1-in-1,000,000 for the most exposed individual (that is -- less than 1 excess cancer for each 1,000,000 persons exposed to emissions from a source in the category at maximum levels over a 70-year period.) Sources which demonstrate that this standard is not achievable may receive an exemption, but will be subject to an alternative standard designed to reduce health risks to 1-in-10,000.

Effect of S. 1630 on Utilities

Among the targeted pollutants to which the standards of Title III would be applied are a number of metals and chemicals which are emitted as trace elements by utilities that burn fossil fuel. By virtue of the immense quantity of fossil fuel that must be burned to produce electricity (several million tons of coal per year for a large coal-fired plant), aggregate emissions of pollutants at a typical plant may well exceed the 25 tons per year threshold. Thus, EPA may determine that many utility power plants are "major sources" or, simply, an "area source" subject to new emission standards and require the installation of emission control devices (MACT) beyond those required in the other provisions of the bill that deal with sulfur dioxide and nitrogen oxides. (Possible control devices include so-called scrubbers and baghouses.) Additional controls of this sort -- beyond those required in the Acid Rain Title of S. 1630 -- would double to triple the compliance cost of S. 1630. For example, the cost at a typical 1,000 MW power plant could be an estimated \$285 million (e.g., \$85/kw baghouse = \$85 million and \$200/kw scrubber = \$200 million).

Utility plant emissions fall into two categories: solids found in the flyash portion of the flue gas (like manganese and nickel) and gases vaporized by the high temperature of the flue gas (like hydrochloric acid). EPA already regulates utility power plant emissions extensively under various sections of the Clean Air Act. For example, particulate emissions are regulated by EPA and the states with limitations on opacity, or density of smoke, and emission rates in lbs/mmBtu. In order to meet these standards, electrostatic precipitators with a particulate collection efficiency of ninety-nine percent are necessary. To regulate and require further removal beyond ninety-nine percent would be tremendously expensive. In addition, under the existing Section 112 of the Clean Air Act, EPA has addressed the question of whether additional regulation of power plants is necessary to control "air toxic" emissions in order to protect the public health. EPA thus far has studied a number of compounds for which emissions data and some indicator of chronic toxicity exist: arsenic, beryllium,

cadmium, hexavalent chromium, formaldehyde, and radionuclides. EPA found that with regard to these compounds additional regulation of power plants was unnecessary. For a substantial number of other substances listed in S. 1630, very little scientific evidence exists about either emission rates or effects on the environment. This is particularly true for mercury and other volatile compounds.

Necessary Amendment

Given the fact that so little evidence is available, and that which is available reflects a very low risk associated with the trace amounts of elements emitted from utility power plants, mandating EPA to regulate these sources under Section 112 is premature at best. Before Congress mandates such regulation, EPA should be required to study these source emissions and the associated health risk thoroughly. When, and if, a public health risk warranting regulation is demonstrated, or even suggested with a sufficient degree of credibility, EPA should consider regulating these sources.

In recognition of the largely inconclusive scientific evidence on utility air emissions, the Administration included a provision in its clean air proposal which would direct EPA to perform a study of the sort outlined above. The House Subcommittee accepted this proposal when it included an identical provision in its clean air legislation. (See H.R. 3030, Section 301). A similar provision should be incorporated into S. 1630.

01/09/90
(No. 1)

Amendment

to S. 1630 as Reported by the Senate
Environment and Public Works Committee
(Report No. 101-228, December 20, 1989)

Subject: Include requirement that EPA study air toxics emissions from fossil fuel fired electric utility steam generating units.

Explanation:

1. What the Bill Requires.

The Senate Committee bill would amend section 112 of the Clean Air Act by establishing a new program for regulation of emissions of "air toxics," or "hazardous air pollutants." The stringent emission standards that EPA would impose under this new program would require installation and operation of expensive emission control technology for emissions of scores of substances for many categories of industrial, commercial, and institutional facilities, possibly including electric utility steam generating facilities. In addition, the bill would require EPA to impose additional control requirements -- even beyond the stringent technology requirements described above -- to reduce public health risks to minuscule levels.

EPA has addressed the question whether regulation of "air toxic" emissions from electric utility steam generating units is warranted under the existing section 112 to protect the public health. The Agency has never found that regulation of these units is warranted. Because of existing controls, emissions of potentially hazardous pollutants from these facilities are extremely low and the resulting public health risks are negligible.

The proposed Clean Air Act amendments approved by the House Subcommittee on Health and the Environment direct EPA to perform a study of any public health hazards reasonably anticipated to occur as a result of emissions by fossil fuel fired electric utility steam generating units of pollutants listed under the bill. EPA is to report the results of the study to Congress within three years after enactment. The House bill prohibits regulation of these units under section 112 unless EPA finds that regulation is appropriate and necessary considering the results of the study.

Because of the extremely low level of emissions of these substances from fossil fuel fired electric units, and the correspondingly low level of public health risk, regulation of these units under section 112 has already been shown to be unwarranted. At a minimum, EPA should be required to conduct the study mandated by the House Subcommittee bill before it takes the unprecedented step of imposing emission standards on this industry under section 112. For these reasons, the Senate Committee bill should be changed to include the three-year study provision for utilities. The following makes this change.

Before any additional controls are imposed EPA should conduct a thorough scientific and technical study of the nature and extent of any hazards imposed by electric utility generating units. This study should not be a simple reiteration of the analyses conducted to date. Rather, a serious investigation into the emissions, effects and possible mitigation methods should be conducted before EPA takes the unprecedented step of imposing emissions standards on this industry under section 112.

Under Title III, a "new source" is defined as a source which commences construction or reconstruction after the date on which EPA proposes emissions standards. There is a need to make clear that modifications made at a electric utility plants to comply with the acid rain provisions of Title IV do not make that plant a "new source" subject to even stricter control under Title III.

Amendment:

Amend Paragraph 112 (a) (7) (page 319, lines 18-23) to read as follows:

"(7) Electric Utility. -- The term 'electric utility steam generating unit' means a stationary source that is any fossil fuel fired steam electric generating unit and associated facilities constructed for the purpose of supplying more than one-third of its potential electric output capacity and more than 25 megawatts electrical output to any utility power distribution system for sale. Any steam supplied to a steam distribution system for the purpose of providing steam to a steam-electric generator that would produce electrical energy for sale is also considered in determining the electrical energy output capacity of the facility."

Amend Subsection 112(s) (pages 378-379) by designating the existing text to be paragraph "(1)" and adding the following new paragraph:

"(2) Electric Utilities. -- The Administrator shall perform a study of the hazards to public health reasonably anticipated

to occur as a result of emissions by electric utility steam generating units of pollutants listed under this section after imposition of the requirements of this Act. The Administrator shall report the results of this study to the Congress within three years after the date of enactment. The Administrator shall develop and describe in his report to Congress alternative control strategies for emissions which may warrant regulation under this section. The Administrator may not regulate electric utility steam generating units under this section unless he finds such regulation is appropriate and necessary after considering the results of the study required in this subsection. The Administrator shall conduct, as part of a completed study, actual monitoring of emissions from coal fired boilers such that a characterization of the emissions of hazardous pollutants for a statistically representative sample of boiler types and coal types can be made (where monitoring techniques are lacking the Administrator shall develop such techniques); an analysis of the source receptor relationship for each type of boiler and coal for each hazardous air pollutant; an examination of alternative control strategies for any pollutants which may warrant control under this section; and incorporate the results of the study conducted in paragraph (1) of this subsection in making any recommendations or conclusions. Prior to finding that any regulation is appropriate and necessary the Administrator shall weigh any anticipated health effects from emissions of hazardous air pollutants against any anticipated health effects associated with secondary effects of regulation, including job losses and dislocation."

Amend paragraph 112 (a)(4) (page 319, lines 3-7) by adding the following sentence to the end

"Notwithstanding the preceding sentence, no physical change at an existing source submitted as part of a compliance plan under section 408 shall render such source a new source under this section."

**BACKGROUND MEMORANDUM
COMPLIANCE DEADLINES OF THE ACID RAIN
TITLE OF S. 1630**

Background

S. 1630, as amended in the Environment and Public Works Committee, alters the program timing of the Administration bill by pushing forward twelve months the Phase I and Phase II sulfur dioxide emission control deadlines from December 31, 1995 and December 31, 2001 to January 1, 1995 and January 1, 2001, respectively. It makes little sense at this stage to undo the already stringent timetable developed by the Administration or to place unnecessary time and cost burdens upon industry's efforts to comply with this bill.

Necessary Amendment

The amendment makes technical changes to conform to the Phase I and Phase II timetables in the Administration bill. By accelerating Phase I and Phase II deadlines, S. 1630 reduces the chances of timely and economical compliance with its own requirements. The bill calls for EPA to formulate regulations on performance standards, permits, allowances, continuous emission monitors (CEMs), offsets, and the like. Once this process is complete, utilities will need to submit compliance plans and permit applications which will in turn need to be reviewed and approved by EPA. Realistically, this will leave very little time to make the considerable efforts required to attain compliance. Clearly, to shorten the compliance deadlines by a full year is to drastically underestimate the time which will be required for EPA and industry to achieve compliance.

Acceleration of the bill's deadlines will also result in significant increases in the cost of compliance. Such an unnecessary escalation of compliance costs runs counter to the President's goal of a cost-efficient reduction approach. Additionally, increased compliance costs could directly result in long-range utility planning problems and affect the development and demonstration of clean coal technologies.

Finally, the NAPAP Interim Report makes clear that there is no need to accelerate reduction requirements. The benefits, if any, of the proposed 1-year acceleration of compliance deadlines, therefore, cannot justify the additional time and cost burdens it will entail.

01/09/90
(No.3)

Amendment

to
S. 1630 as Reported by the
Senate Environment and Public Works Committee
(Report No. 101-228, December 20, 1989)

Subject: Amendments to program timing.

Explanation:

1. What the Bill Requires.

The bill tinkers with the stringent, but reasonable, program timing of the Administration bill. It makes little sense at this stage to undo the timetable carefully developed by the Administration.

2. What the Amendment Does.

The amendment restores the timetables of the President's bill.

Amendment:

1. Amend proposed sections 403(e) (page 456, lines 7-20), 405 (page 465-469), 406(b)(page 470), 407(b)(pages 470-471), 408(e)(pages 477-478), 409(pages 478-480), and 410(c)(page 481) by changing the date "January 1, 2000" to read "December 31, 2000" each place it appears.

2. Amend proposed sections 404(a)(page 457) and 412(c)(page 485) by changing the date "January 1, 1995" to read "December 31, 1995" each place it appears.

January 29, 1990

The Honorable Albert Gore, Jr.
SR-393
Russell Senate Office Building
Washington, D. C. 20510-4202

Dear Senator Gore:

The undersigned organizations encourage you to review the enclosed letter from EPA to the staff of the Environment and Public Works Committee regarding the accident prevention provisions (Section 304) of S. 1630 (Clean Air Act Amendments of 1989). These provisions originally were included in separate legislation (S. 816) that was added to S. 1630 during Committee markup.

As noted in the enclosed letter and as discussed in the Committee report accompanying S. 1630, Committee staff developed an initial list of substances to be subject to the proposed accident prevention provisions (proposed Section 129(c) of the Act) based solely upon summary information presented in an August 1988 Acute Hazardous Events Data Base (AHE/DB) draft report. The EPA letter describes numerous limitations of the AHE/DB and urges that selection of "substances [to be subject to the accidental release provisions] not be based on accident history alone and clearly not on the AHE data base report summary tables." (Emphasis added.)

Many of the substances that would be included on the initial list in Section 129(c) (e.g., acetone, methyl ethyl ketone, methylene chloride, perchloroethylene) are commonly used by small- and medium-size companies throughout the United States. Their appearance in the AHE/DB is evidence, not of their "potential to cause death, injury, or evacuation in the event of an accidental release," but rather of their widespread use in myriad industrial applications. As the enclosed letter points out, almost one-half of the events in the AHE/DB tables are the result of transportation incidents, which are beyond the scope of this legislation.

The Committee's dependence on the AHE/DB for selecting substances to be listed under Section 129(c) will not significantly improve our nation's ability to prevent Bhopal-like incidents. It will result, however, in a significant cost to the affected facilities. Hazard assessments costing as much as \$20,000 to \$40,000 per substance could needlessly be required at many facilities.

The undersigned organizations support Congress' interest in effective regulation of "air toxics," including measures to prevent chemical accidents. We believe, however, that the Committee's approach to new Clean Air legislation, as evidenced by S. 1630, is flawed. The Committee's failure to heed EPA's specific cautions concerning the use of the AHE/DB is an example of the Committee's larger failure to devote sufficient attention to the important and complex legislative issues inherent in any amendment to the Clean Air Act.

We strongly encourage you to oppose efforts to establish an initial list of substances to be subject to additional accident prevention provisions as part of any amendments to the Clean Air Act, and to provide EPA (and OSHA) with the authority and responsibility to determine what substances should be subject to such provisions. We also urge you to carefully evaluate S. 1630 in comparison to the Administration proposal, which recognizes the importance of appropriate discretion in the effective implementation of Clean Air legislation.

Sincerely,

Adhesive and Sealant Council

Alliance of Textile Care Associations

American Furniture Manufacturers Association

Halogenated Solvents Industry Alliance

International Fabricare Institute

National Association of Metal Finishers

National Association of Solvent Recyclers

U. S. Chamber of Commerce

Enclosure



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

OCT 19 1989

OFFICE OF
SOLID WASTE AND EMERGENCY RESPONSE

Jimmy Powell
Senate Environment and Public Works Staff
Dirksen Office Building

Dear Mr. Powell:

Following our meeting last Friday (Oct 13), we raised concerns with you about the list of chemical substances in the draft Clean Air Act legislation (S. 816) under Sec. 129(b). Here are comments on these substances as you requested.

The draft legislation (S. 816) calls for the Administrator to establish a list of "substances with the greatest likelihood to cause death, injury, property damage, or evacuations as the result of sudden accidental releases". According to the Congressional Record text of Senator Durenburger's introduction to the legislation, the purpose of the chemical accident prevention portion of the bill is "to prevent chemical accidents like that which occurred at Bhopal..." and that a list of substances "which have the greatest potential to cause death, injury, or evacuation in the event of an accidental release" should be prepared. These statements clearly indicate that the focus should be on those substances that adversely impact the public if a sudden accidental release occurs.

Many of the substances listed in the draft legislation however, do not meet the characteristics described above. Several are not Extremely Hazardous Substances as defined by SARA Title III Section 302. The list appears to have been derived from tables summarizing death/injury events and evacuation events in the Acute Hazardous Events Database (AHE) draft report dated August, 1988.

The AHE is not a precise listing of the frequency of events, quantities released or consequences associated with a particular substance. The data used to compile the AHE has not been analyzed or

screened for this purpose. The AHE does present a gross estimate of the kinds of events that have historically occurred. To use the AHE summary tables to target substances for prevention measures because they appear to have a history of "catastrophic" type events is misleading because the direct cause of the death, injury or evacuation is rarely given in sources used in the AHE. For example, a serious chemical warehouse fire results in the evacuation of nearby residents - a prudent measure because smoke from any fire can pose a hazard to the surrounding community. The fire may involve the structure but not the substances stored there yet the report used in the AHE database will list the substances as if they were directly "responsible" for the event. Often, more than one substance is listed and the one directly involved may not be specifically identified. The fact that the substances were stored there may have nothing to do with the origin of the fire. A similar situation occurs for incidents involving deaths. The driver of a tank truck may be killed in the initial collision, but not from exposure to the substance carried on-board, yet the event is shown as a release with a fatality. Injury reporting is also suspect since it is not entirely clear whether injuries resulted exclusively because of exposure to the substance or other circumstances. Finally, evacuation information is not always accurate. Workers and/or public at a particular site may be asked to leave to allow for response to an incident. These incidents are counted as evacuations even though residents living near the site may not even be aware of the incident. The reports used in the AHE do not give these insights and the summary tables imply that the event is directly caused by that substance when, in fact, it isn't. In addition, many transportation events (about 47%) are included in the AHE tables that are not covered by this legislation. Because more than one substance may be involved, the cause cannot be specifically linked to a particular substance, transportation events are included, many events involve small liquid spills that do not leave a facility boundary and many substances do not pose a Bhopal like catastrophe upon release, the substances listed in the AHE summary tables should not be used as a basis for identification of substances for this legislation. A more appropriate approach is to determine the characteristics or definition of a catastrophe and then identify those substances that may have been involved in serious accidents along with consideration of their physical/chemical properties and handling that poses a catastrophic threat to the community. EPA has already begun this process with the list of Extremely Hazardous Substances.

Some key points are presented below for substances we believe should not be on the list:

POLYVINYL CHLORIDE: (PVC)

PVC is a solid plastic material often used for water pipes and electrical insulation in many homes and businesses. It is not a hazardous material and a "catastrophic" Bhopal-type release cannot occur. All of the events in the AHE database for PVC are fires where pipe or insulation was burned. Injuries appear to be from smoke inhalation or burns which can occur in any fire. This substance should not be listed.

SODIUM HYDROXIDE: (caustic)

Sodium hydroxide is a common industrial chemical that has a wide variety of uses including cleaning. It can be in solid form (concentrated) and often in liquid solutions. It is not combustible. Injuries result from contact of the material with skin or eyes resulting in a burn. It is not readily vaporized and cannot generate a Bhopal-type scenario. The AHE data for this chemical are based on many transportation related events, fires (as above, sodium hydroxide is listed but it can't burn, thus another substance is the cause) and spills to land or water. No evacuations were required except in one instance where caustic was spilled at a country day school and the students were evacuated for cleanup. Injuries were most likely to workers who may have been exposed attempting to fix leaks or cleanup spilled material. This substance should not be listed.

PHOSPHORIC ACID:

This substance is a viscous, colorless, odorless liquid. The AHE events for this substance are almost entirely transportation related although one event does occur at a furniture strip shop that erroneously mixed chemicals causing a release. Only employees were affected.

NITRIC ACID and SULFURIC ACID:

Both of these substances, like phosphoric acid above, are corrosive and will burn the skin if in contact. Both in concentrated form will release vapors that are very irritating (corrosive). Following the kind of analysis described above, they could very well be the kinds of substances

that should be targeted for prevention efforts since they are very common and many releases have occurred and they are very reactive (contact with certain other substances can cause explosions, etc.). As above however, a large portion are transportation related events and some are liquid spills to waterways involving weak acid solutions that do not generate airborne emergency situations (unlike a catastrophe). The AHE should not be the basis for selection and listing of these substances.

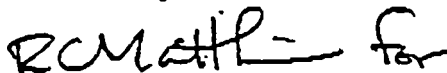
FORMALDEHYDE:

Formaldehyde is a water white liquid; most everyone knows about it as an embalming fluid or biology lab preservative. It is listed as an EHS under SARA Title III Section 302 in its gas form (primarily industrial use) and could very well pose a threat to a surrounding community in that form. As above however, nearly all the AHE events are transportation related. One event occurred at a school (a janitor knocked over a jar in a lab) and the other at a hospital (spill in the lab). These are not catastrophes and do not provide a sound basis for listing formaldehyde.

Some of the substances shown in the list are not discussed here - this is not an endorsement that they should remain listed. Many of the substances could end up as "target" substances for prevention action based on an analysis of accidents, physical properties, etc. as described above. Our primary concern is that the substances not be based on accident history alone and clearly not based on the AHE database report summary tables.

We hope you find this information useful. If you have any questions, please call me at 475-8600 or Craig Matthiessen at 475-9871.

Sincerely;



Elaine Davies, Director
Chemical Accident Prevention Staff

cc. C. Matthiessen
J. Wiltse
T. Mohin

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COMMITTEE ON ENVIRONMENT AND PUBLIC WORKS

WASHINGTON, DC 20510-8175

EPA's April 1989 announcement of data on toxic releases to the environment: The data showed that in manufacturing industries released 2.7 billion pounds of toxic pollutants in 1987
February 5, 1990
Dear Colleague:

The pending Clean Air bill includes critical controls of toxic air pollutants -- carcinogens like asbestos and benzene, and poisons like arsenic -- that threaten public health. The bill provides safeguards against disastrous chemical accidents. We are writing to urge you to support air toxics provisions that are protective of public health.

Five years ago, accidental chemical releases into the air over Bhopal, India killed thousands. Recent history suggests it can happen here. Between 1982 and 1986, over 11,000 chemical accidents in the United States injured 11,000, killed 300, and forced evacuations of a half million people. According to EPA, 17 of these accidents could have been as disastrous as Bhopal.

In addition to accidents, industry routinely and intentionally pours tons of toxic chemicals into the air, posing long-term risks to Americans' health. A staggering 2.7 billion pounds of air toxics were released nation-wide in 1987 by just those companies covered by the Community Right-To-Know law. Add toxics from sources not covered by the Right-To-Know law, like automobiles and hazardous waste management facilities, and total emissions of air toxics triple to quintuple!

* The toll on our health is high. Of 2650 facilities surveyed by EPA, more than one-fourth presented cancer risks of greater than one in ten thousand to the most exposed individual. At one plant, toxic chemicals pouring out of its stacks actually presented a risk greater than one in ten. If these sites were abandoned waste dumps, risks of that magnitude would qualify them for cleanup under the federal Superfund program.

An EPA study found that just 40 out of the hundreds of toxic air pollutants caused 2,700 cancer cases a year. In other words, 190,000 Americans now alive are expected get cancer from air toxics. Another EPA study concluded that toxic air pollutants posed a high risk of cancer, respiratory ailments, and birth defects when compared to other types of pollution.

Despite this mountain of evidence, EPA has used its existing powers under the 1970 Clean Air Act to select just 8 chemicals for regulation as hazardous air pollutants. Even then, many kinds of factories that emit those 8 chemicals remain unregulated. EPA's inaction calls for reform.

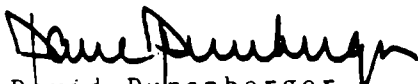
The Senate air toxics bill requires EPA to regulate those companies that release high levels of 191 hazardous air pollutants. Over a 10-year period, facilities already spewing large amounts of air toxics would be required to install advanced anti-pollution technology, taking into account cost and feasibility. This is the so-called "maximum achievable control technology" or "MACT".

Five years after these initial steps are in place, EPA would take a second look, to measure the remaining pollution and estimate the remaining health risks, or so-called "residual risk". Factories would have to take additional steps if their remaining emissions pose a cancer risk to the most exposed individual of greater than one in a million or did not protect public health or the environment. If a facility cannot technologically meet the one in a million standard, it can get renewable five-year exemptions. However, after the first five-year exemption -- 15 years after enactment of the bill -- the facility must not pose a risk of cancer greater than one in 10,000.

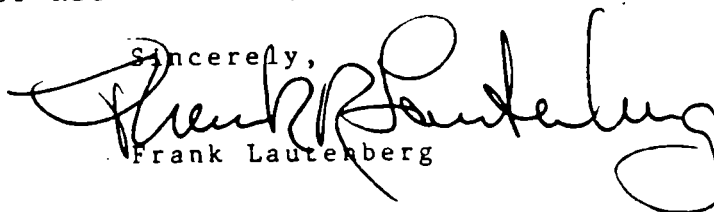
Some argue that this "residual risk" standard is too tough and inflexible. We disagree. Without a clear standard, we would have the same kind of bureaucratic inaction we have seen for the past two decades. The standard is no tougher than some state air toxic laws and other federal laws and regulations, like those on pesticides and toxic cleanup, that affect worker and environmental safety. It is not too much to ask our most innovative minds to meet the test within 15 years. Some major companies already have pledged themselves to achieving zero cancer-causing emissions.

The pending air toxics measure has the broad support of the environmental and health communities. Significantly, it also enjoys the support of the United Steel Workers, the International Chemical Workers, the Oil, Chemical and Atomic Workers, and the United Rubber, Cork, Linoleum and Plastic Workers Unions, which represent workers in industries that would have to make some of the largest adjustments. Yet, they are workers who face some of the greatest risks of disease and injury.

If you have any questions about the air toxics title of S.1630, please talk to us, or have your staff contact Jimmie Powell (Committee staff) 4-2376 or Ric Erdheim (Sen. Lautenberg) 4-9731.


David Durenberger


Max Baucus

Sincerely,

Frank Lautenberg

CRS DISPUTES ADMINISTRATION'S COST ESTIMATES
OF SENATE AIR TOXICS BILL

On January 31, 1990 CRS cast major doubts on the Administration's cost estimates of the Senate bill. CRS stated,

"CRS believes that EPA's analysis significantly overstates the costs of the Senate bill in several respects: in particular, the methods used and the conclusions reached with respect to utilities and residual risks (which account for about half the total costs of both bills) are flawed."

CRS pointed out that about half of the cost difference between the toxics provisions of the Administration's bill and the Senate bill is accounted for by the residual risk provisions. According to CRS, the portion of EPA's cost estimate of the residual risk provisions attributable to possible plant closure is flawed. EPA derived virtually all of the costs from the faulty premise that plants in affected categories closed, and from a resulting calculation of lost sales from the closed facilities. CRS states,

"This method substantially overstates the cost of closure," since it assumes that lost sales to one facility are never replaced, whether by other existing facilities or the same company, by new facilities of the same company, by competing American companies, or by imports." (emphasis added).

In addition, the cost estimate of the new Senate bill prepared by EPA is based on the assumption that no new technology will be developed to control hazardous air pollutants. EPA itself calls this an "unreasonable" assumption in the paper accompanying the estimate.

The residual risk health standards do not go into effect until 2005 -- 15 years after the bill is enacted. The history of the Clean Air Act suggests that many new technologies will be developed by that date. The catalytic converter for automobiles was available within 5 years after Congress required a 90% reduction in tailpipe emissions. Scrubbers for powerplants have only been used for 15 years and industry is already looking to a new generation of clean coal technology. New technologies will reduce the cost of the health standards.

EPA's cost estimate using the "unreasonable" assumption that no new pollution control technology will be developed indicates that the health standards of S. 1630 may result in 11,000 to 14,000 jobs lost beginning in 2005. These losses would be spread

over 8 years averaging 1500 per year. The U.S. economy recorded a 364,000 net increase in jobs over the last 3 months.

According to information provided by CRS, 20,000 new jobs will be created for every \$1 billion in pollution control capital expenditures.

A final point CRS emphasizes is that the Administration's bill itself could impose costs within the range of costs EPA projects for the Senate bill. While the Senate bill allows EPA less discretion in setting standards, CRS points out:

"Nevertheless, under the discretion in the Administration bill, EPA could impose requirements for which costs are within the range of costs projected for S. 1630."

The bottom line is clear: EPA's estimates are not a sound basis for sacrificing the vital health protections that S. 1630 will provide.

Q & A ON HEALTH STANDARDS FOR AIR TOXICS IN S. 1630

How do the health standards in the Senate bill differ from those proposed by the Administration?

The Senate bill puts the health of Americans first. While it allows consideration of cost on industry and limits on technology, it sets a clear health standard that must be met, to prevent cancer and other diseases caused by toxic air pollutants. The Administration bill rejects the adoption of any clear, inviolable health standard.

What is that health standard? The Senate bill takes the middle ground. S. 1630 has a goal of a 1-in-1,000,000 cancer risk, but allows flexibility up to a lifetime risk of 1-in-10,000. Congressman Waxman has introduced legislation prohibiting emissions above a 1-in-1,000,000 cancer risk level. The Administration wants no firm standard, only authority to regulate "unreasonable risks", which would allow health to be sacrificed by cost and other factors. It is weaker than the health standard in the law for pollutants which are not hazardous.

Putting health first is not new. Since 1970, the Clean Air Act has included a strong health standard for hazardous air pollutants. Emissions standards to "protect public health with an ample margin of safety" were supposed to be implemented for all source categories 15 months after a substance was listed. The problem is that little has actually been done. The Senate bill would break the regulatory ice, by changing the approach. Instead of focussing on the risk of emissions first, as the current law does, the Senate bill would focus first on getting the most advanced anti-pollution technology in place.

Are there precedents for the health standards that are established by S. 1630?

Many states have already adopted a similar risk assessment approach in their air toxics program. 28 use or plan to use quantitative risk assessment techniques and most of the states employ acceptable risk levels of 1-in-1,000,000. The Senate provision is strongly supported by the states.

The Superfund program uses an approach to risk reduction which is similar to the standard-setting process for air toxics under the Senate bill. A risk of 1-in-1,000,000 is to be achieved with Superfund remedies, if technically feasible. If not, alternative remedies with risks up to 1-in 10,000 can be implemented, but EPA is required to review the site every 5 years to determine whether new technology makes a more protective cleanup possible.

The Senate bill is consistent with the two-step process for regulating carcinogens which Judge Robert Bork established in the vinyl chloride case. The Administration's "unreasonable risk" standard is not consistent with Judge Bork's opinion because it

allows the definition of acceptable risk to be diluted by cost considerations.

How serious is the health threat?

The health standard is needed. Some people living near industrial facilities face very high risks of cancer. There is one plant in Texas where 3 of every 10 people exposed to the emissions may be expected to get cancer. A risk of 2-in-100 is not uncommon near other plants. One-quarter of all plants inspected by EPA have risks exceeding 1-in-10,000 for persons living nearest the plants. EPA estimates that 10% of all facilities will have "residual risks" above 1-in-10,000, even after the "maximum achievable control technology" is installed. 40% will have risks above 1-in-1,000,000.

While some assumptions in EPA's risk assessment model are conservative, there are other factors not considered in the model which may add to cancer risks. These include the risks from secondary exposure, exposure to multiple pollutants, exposure from multiple sources, and the heightened risks to sensitive populations. The bill includes a study of risk assessment methods to assure better science in the future.

Is the Administration proposal a workable alternative?

The Administration's proposal to act on "unreasonable risks" just won't work. It is the same standard used in Toxic Substances Control ACT (TSCA) and the Federal Insecticide Fungicide and Rodenticide Act (FIFRA). Only one pollutant (asbestos) has been regulated in 14 years under TSCA. FIFRA, the pesticide law, is notorious for its failures. In fact, the President has proposed amendments to FIFRA which would replace the "unreasonable risk" standards with an explicit risk range between 1-in-100,000 and 1-in-1,000,000.

Congress should determine a safe level of exposure to cancer-causing agents. In the absence of a clear standard, EPA looks to the plant or facility in the source category least able to afford or install controls as the basis for standard-setting. It takes an approach that allows the economic and technical capability of the least viable plant to set the emissions standard for the whole industry. Health protection that could be accomplished at other plants is sacrificed, as a result. The Senate bill sets firm health standards and gives individual plants case-by-case waivers.

THE THREAT POSED BY AIR TOXICS

Public Health

Air toxic emissions from industrial sources required to report emissions under the federal Right-To-Know program were 2.7 billion pounds in 1987. (see attached sheet)

Total air toxic emissions are up to 5 times higher after considering sources of emissions not included in the Right-To-Know program such as motor vehicles and small industrial sources.

A 1989 EPA study estimated a national annual cancer incidence of up to 2700 cancer cases from exposure to just 30 air toxics. 190,000 now alive (2700 annually x 70 year life span) are expected to contract cancer from exposure to air toxics.

According to an EPA report released a few weeks ago, the risk of cancer to the most exposed individual exceeded 1 in 10,000 at 149 facilities across the nation.

EPA says cumulative impact of smaller sources in our urban areas represents a large portion of the risks posed by air toxics.

For example the lifetime risk of cancer from toxic air emissions in Chicago is 3 in 1,000.

Air toxics also pose significant noncancer risks including respiratory disease, birth defects, and harm to the nervous and respiratory systems.

Environment

Deposition of toxics from the air accounts for roughly 50% of the total toxic loading to the Great Lakes.

A draft EPA report concludes that atmospheric deposition also may be an important source of toxics to estuaries and coastal waters.

Toxics in water can cause tumors, reproductive failures, and growth and developmental abnormalities in fish and shellfish and make fish unsafe to eat.

Public Safety

Over 300 deaths and almost half a million people were evacuated between 1982 and 1986 as a result of chemical accidents.

17 events had the potential for more damage than occurred from the chemical release at Bhopal, India where 3,400 died and 200,000 were injured.

SUMMARY OF TITLE III OF S. 1630 - AIR TOXICS

Industrial Sources

EPA is to set emissions standards for facilities that release more than 10 tons per year of any one of 191 hazardous substances. These standards would require installation of advanced pollution control technology taking cost and feasibility into account. This is so-called "maximum achievable control technology", or "MACT". Facilities would have 3 years to install this technology.

If remaining emissions are found to present a significant risk of adverse effects on human health or threat to the environment, facilities will have to further reduce their emissions to eliminate these "residual risks".

For carcinogens, which have no safe level of emissions, facilities must reduce their emissions to levels which pose less than a 1-in-1,000,000 risk of cancer to the most exposed individual.

Facilities which cannot achieve this level using all available technology can, for renewable five year terms, continue to operate as long as their emissions pose a risk less than 1-in-10,000.

But facilities which cannot achieve the 1-in-10,000 level would be eligible for a one-time 5-year extension. No facility would have to meet the 1-in-10,000 standard until 15 years after the enactment of the bill.

Urban Air Toxics

The bill requires EPA to regulate emissions from the small sources not covered by the MACT standards of 10 toxics which pose greatest threat to health in the largest number of urban areas.

Public Safety

The bill requires facilities handling certain levels of extremely hazardous substances to prepare hazard assessments to determine the potential for an accident. Also establishes an independent Chemical Safety and Hazard Investigation Board. Chemical Board will investigate and report on chemical accidents involving death, serious injury and substantial property damage and make recommendations to EPA for action to prevent or mitigate chemical accidents. EPA must respond in writing to each recommendation, EPA is given authority to promulgate accident prevention regulations, and EPA must require leak detection systems.

STATE BY STATE TOXIC AIR POLLUTION DATA

State Emissions Rank	State	# Facilities Reporting	Total Emissions	% of Reported Emissions
9	Alabama	288	98,339,784	3.70
29	Alaska	7	31,707,083	1.19
53	Amer Samoa	2	56,250	0.00
35	Arizona	118	16,565,691	0.62
18	Arkansas	234	54,559,906	2.05
14	Calif	1,288	82,708,429	3.11
40	Colorado	144	11,010,395	0.41
31	Conn.	318	26,078,031	0.98
41	Delaware	48	6,036,385	0.23
21	Florida	326	50,196,070	1.89
11	Georgia	470	93,586,285	3.52
50	Hawaii	13	1,064,495	0.04
44	Idaho	35	4,176,707	0.16
8	Illinois	963	99,226,761	3.74
7	Indiana	566	112,870,299	4.25
26	Iowa	219	39,238,921	1.48
32	Kansas	150	24,738,143	0.93
19	Kentucky	251	51,666,181	1.95
3	Louisiana	209	138,254,193	5.21
36	Maine	66	14,607,382	0.55
34	Maryland	143	20,234,753	0.76
30	Mass	467	30,061,360	1.13
6	Michigan	588	116,359,932	4.38
23	Minnesota	224	42,095,160	1.59
17	Miss.	203	57,285,976	2.16
20	Missouri	403	50,623,710	1.91
43	Montana	24	5,255,856	0.20
37	Nebraska	111	14,403,622	0.54
52	Nevada	26	742,389	0.03
38	New Hamp.	96	12,983,935	0.49
24	New Jer.	683	41,983,116	1.58
45	New Mex.	28	3,831,726	0.14
12	New York	623	89,399,757	3.37
10	N.C.	650	94,568,576	3.56
51	N. Dak.	24	935,275	0.04
2	Ohio	1,011	172,685,650	6.50
27	Oklahoma	165	36,445,117	1.37
33	Oregon	157	20,941,392	0.79
13	PA	810	87,547,598	3.30
39	Puer. Ric	128	12,867,913	0.48
42	R.I.	126	5,927,841	0.22
16	S.C.	315	64,215,277	2.42
47	S.D.	27	2,441,359	0.09
4	Tenn.	413	135,010,665	5.08
1	Texas	823	238,817,765	8.99
15	Utah	81	77,327,036	2.91
49	Vermont	39	1,379,661	0.05
48	V.I.	1	2,033,873	0.08
5	VA	327	132,436,076	4.99
25	Wash	243	40,637,496	1.53
28	W.V.	91	35,564,455	1.34
22	Wis.	507	48,656,361	1.83
46	Wyoming	17	3,154,641	0.12
TOTAL		15,289	2,655,542,710	100.00

Data is for 1987 emissions compiled by EPA under Right to Know Law. Data covers mandated reports from about 15,000 facilities of their emissions of the 308 chemicals and 20 chemical categories covered by the Right to Know law.

W I INTERNATIONAL CHEMICAL WORKERS UNION

FRANK D. MARTINO, PRESIDENT
W. J. CORNER, SECY-TREAS

E. ROBERT MARLOW, VICE PRESIDENT, REGION 4
PHONE (202) 659-3747
659-3748



January 31, 1990

Dear Senator:

Our unions strongly support the air toxics provisions of S. 1630, the clean air legislation now before the Senate. We urge you to reject amendments that would eliminate or undermine any of the bill's vital measures for protecting public health.

Toxic air pollutants impose a staggering toll of death, injury, and illness. Nearly 2.7 billion pounds of air toxics were reported released in the "routine" operations of large industrial facilities in 1987, causing cancer risks as high as 1-in-10 for the people most heavily exposed. In addition, more than 11,000 chemical accidents occurred in the 1980s, killing more than 300 people and injuring 11,000 others.

The dangers from these pollutants fall hardest on the working men and women who are doubly exposed from working in major industrial facilities and living in the surrounding communities, and on their families and communities.

To control so-called routine emissions, S. 1630 establishes a two-stage program for major industrial facilities: "Maximum available control technology" standards, followed by health-based standards to reduce cancer risks when they remain high. Both parts of this program, including the firm deadline for reducing cancer risks below 1-in-10,000, are vital. The health standards, coupled with the bill's more than adequate leadtime, will encourage the development of efficient new control measures where necessary.

We urge you to reject calls from some in industry to eliminate S. 1630's health standards in favor of an "unreasonable risk" approach. This is familiar code language for cost benefit analysis. It would be totally unacceptable to working men and women for cost-benefit analyses to govern these life and death decisions.

S. 1630's chemical accident program is equally essential to protecting health and safety. We support the bill's "hazard assessment" process, requiring companies that handle extremely dangerous substances to analyze and disclose their potential for accidental releases. These hazard assessments will lead many companies to discover and correct dangerous conditions before they take lives or destroy productive facilities.

We also support the bill's creation of an independent Chemical Safety Board to investigate and report on the causes of serious accidents when they do occur. Too often, it is left up to companies themselves to investigate the causes of accidents. Like the National Transportation Safety Board on which it is modelled, the Chemical Safety Board will help prevent past tragedies from being needlessly repeated.

We favor S. 1630's provision for coordination between EPA and OSHA in accident safety rulemaking. We ask you to support provisions assuring that important rights under OSHA (such as "walk-around rights" during official inspections) are extended to EPA and the Chemical Safety Board as well.

In short, as representatives of working men and women and their families, our unions urge you to support S. 1630's air toxics amendments. We ask you to reject any effort to eliminate, delay, or cripple the vital health protection provisions of this bill.

Sincerely,



E. Robert Marlow, Vice President
International Chemical Workers
Union



Milan Stone, President
United Rubber, Cork, Linoleum and
Plastic Workers of America



Jack Sheehan
Assistant to the President
United Steel Workers of America



Nolan W. Hancock
Citizenship-Legislative Director
Oil, Chemical and Atomic Workers
International Union

STAPPA / ALAPCO

STATE AND TERRITORIAL
AIR POLLUTION PROGRAM
ADMINISTRATORS

ASSOCIATION OF
LOCAL AIR POLLUTION
CONTROL OFFICIALS

January 26, 1990

S. WILLIAM BECKER
EXECUTIVE DIRECTOR

Honorable Dave Durenberger
SR-154, Russell Senate Office Building
Washington, DC 20510

Dear Senator Durenberger:

Thank you for your letter requesting the views of the State and Territorial Air Pollution Program Administrators (STAPPA) and the Association of Local Air Pollution Control Officials (ALAPCO) on the use of a numerical risk level to measure residual risk from exposure to toxic air pollutants.

STAPPA and ALAPCO strongly support the approach taken in S. 1630 to address residual risk. The associations believe that to responsibly protect public health, it is imperative that to require compliance with a specific numerical risk level--a "benchmark" or "bright line"--rather than to allow for evaluation of residual risk based upon a discretionary cost-benefit analysis, as proposed in H.R. 3030. We base our endorsement of a "benchmark" approach on the following.

First, based upon the experience of state and local air pollution control agencies, the provisions of S. 1630--which require all sources to meet a one-in-10,000 residual risk standard and to work toward a standard of one-in-1,000,000--appear to be feasible and without adverse economic impact. Currently, 14 states use a standard of one-in-1,000,000 as an acceptable risk limit, while five states consider one-in-100,000 an acceptable risk.

Second, S. 1630 provides sources with ample time--in fact, up to 20 years--in which to adopt controls and comply with the one-in-10,000 residual risk limit. A specific risk limit combined with a reasonable timeframe allows industry to work toward a known goal while avoiding the continued degradation of our air quality and threat to public health that would likely result from a discretionary control approach.

Third, a maximum individual risk of one-in-10,000, with an ultimate goal of one-in-1,000,000, provides a level of public health protection that is consistent with that found in other

environmental programs. The Environmental Protection Agency has reported that risks to public health from air toxics are far greater—in some cases 1,000 times greater—than those from most other environmental media ("Unfinished Business: A Comparative Assessment of Environmental Problems," 1987). Currently, there exist sources of toxic air pollutants that pose a risk as high as one-in-167. Clearly this is unacceptable; yet, without specific standards to guard against it, such risk could easily continue.

Finally, a discretionary evaluation of unreasonable risk could reduce all control to a level achievable by the industry considered to be the most difficult to control—the lowest common denominator. Because such an approach seeks to ensure that the lowest common denominator will not suffer adverse economic effects, it results in a failure to challenge industries that could, in fact, adopt more stringent controls beyond the minimal requirements.

A health-based residual risk standard, such as the one set forth in S. 1630, requires sorely needed stringent controls for sources of dangerous toxic air pollutants, while maintaining flexibility that will allow industries to participate in protecting our nation's health and, at the same time, avoid economic devastation. This, indeed, provides an effective and responsible solution to a controversial problem.

Thank you again for requesting the associations' views on this important issue. If STAPPA and ALAPCO can be of further assistance, please do not hesitate to contact either of us or STAPPA/ALAPCO Executive Director S. William Becker.

Sincerely,

Brad Beckham
Bradley J. Beckham
STAPPA President

J. M. Lents
James M. Lents
ALAPCO President

NATIONAL CLEAN AIR COALITION

1400 16th Street, N.W.

Washington, D.C. 20036

(202) 797-5436

January 29, 1990

Dear Senator:

The Senate will soon face one of the clearest public health choices in the Clean Air Act debate. Twenty years ago, Congress made a promise to the American people to protect their health from cancer-causing emissions. On behalf of more than 20 million Americans represented by the National Clean Air Coalition, I urge you to stay true to that promise by retaining and strengthening S.1630's health standards for toxic air emissions, and by rejecting any amendment to eliminate those health standards or cripple their implementation.

S.1630 establishes a two-step process for regulating major industrial emitters of air toxics: A technology-based first step (the "maximum available control technology" considering cost), followed by a health-based second step targeted where the MACT standard is not sufficient to meet even minimal standards for protecting public health from pollutants that cause cancer or other illnesses.

Industry groups, aided and abetted by the Administration, are seeking to eliminate the critical second step of health standards. They would substitute an express policy of cost-benefit analysis (called "unreasonable risk") under which anyone's life can be forfeit if government and industry cost accountants don't think it is worth the expense of saving.

The American people reject the notion that lives and health should be bought and sold this way. In poll after poll, they have signaled their support for a Clean Air Act that protects public health.

Twenty years after the Clean Air Act was passed, major industries are still emitting more than 2.6 billion pounds of toxic air pollutants. According to their own reports under the 1986 Right to Know Act, the vast majority of sources emitting cancer-causing pollutants are still operating with no air pollution control equipment.

The EPA estimates that just a sub-set of the cancer-causing pollutants cause as many as 2700 fatal cancers each year. Over our lifetimes, that means almost 200,000 preventable cancer deaths due to air toxics. About half the toll is due to

stationary sources. (The other half is due to vehicle emissions, another powerful argument for S.1630's two rounds of auto tailpipe standards.)

People living near the most dangerous industrial facilities are exposed to incredibly high cancer risks: Lifetime cancer risks greater than 1-in-10 for the most exposed people living near a Texaco chemical plant in Port Neches, Texas, that emits butadiene. One-in-55 for the persons most exposed to coke oven emissions near the Clairton Works in Pennsylvania. More than 1-in-100 for persons living near certain uranium mines in the West.

The National Clean Air Coalition believes that all Americans, especially the people who are most heavily exposed, are entitled to protection from airborne cancer.

Industry lobbyists are deliberately mis-stating what the health standards in S.1630 require, and over what timeframe. Here is what the bill requires:

First, after the first-step MACT standards are met, EPA must determine whether there are people still exposed to more than a 1-in-10,000 chance of getting cancer. If so, then EPA must set a health standard that reduces the cancer risk for those people below that level.

Under S.1630, every source can have at least until 2005 to meet this health standard. Some sources get until 2013. That's 15-23 years for industries that emit cancer-causing pollutants to meet the first health standard under the bill.

The bill also sets a 1-in-1,000,000 standard. Most sources will be able to meet this level. But no facility will ever be required to close under the bill because of the 1-in-1,000,000 standard. If sources which come up short show that they are doing all they can, then they are entitled to extensions that can be renewed without limit every five years.

It is simply incredible that industry would attack a bill that gives them 15-23 years to meet any public health standard for cancer-causing air pollutants, and then only the 1-in-10,000 standard at that. This is a very long time -- far too long, in fact -- to wait for only a modest level of health protection from cancer-causing air pollutants.

The attack on S.1630's health standards is all the more curious in light of carcinogen policies of some of the nation's leading chemical companies. At least three major companies -- Monsanto, Union Carbide, and DuPont -- have publicly declared the objective of eliminating their cancer-causing emissions. Against the policies of these companies, how credible are the complaints

of trade associations and lobbying groups against S.1630's far less ambitious health standards?

The industry attack on the health standards is based on grossly exaggerated cost estimates. The Business Roundtable's biggest numbers, which pertain to 1-in-100,000 and 1-in-1,000,000 standards, have nothing to do with reality. S.1630 simply does not require any source to reach these levels if it is already using all the controls it can afford.

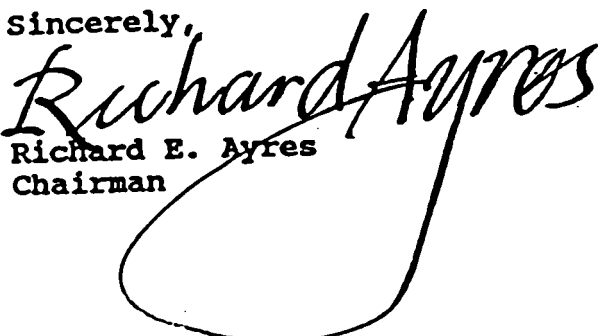
Further, both industry and the Administration have chosen to base their dire predictions on an assumption that no successful or knowledgeable businessman would ever make: That companies working to comply with health standards 15-23 years from now will be limited to the technology that is available today.

Any sound businessman knows better than that. The history of the Clean Air Act shows that if "technology-forcing" signals are given and ample leadtime is allowed, industry succeeds in making the necessary advances in pollution control techniques. Look at the development of automobile emission controls. In 1970, and again in 1977, the auto industry claimed it could not meet the emission standards then under consideration. But Congress set deadlines, and the industry developed the catalytic converter. Look also at the story of the CFCs. Just a few years ago, industry claimed they were irreplaceable. Now, with the expectation of a total phase-out by the end of the century, CFCs are being rapidly and successfully replaced.

If the health standards are stripped out, or if loopholes are allowed in the already overly generous deadline, there will be no significant effort to develop better or cheaper pollution control equipment or process changes. The toxic cloud on our health will then be permanent.

The National Clean Air Coalition believes the air toxics provisions of S.1630 need to be strengthened, not weakened. For the sake of millions of people whose lives are endangered by cancer-causing pollutants, I urge you to support amendments to speed up this vital program, and to reject amendments that would strip out or cripple S.1630's essential public health standards.

Sincerely,


Richard E. Ayres
Chairman



February 3, 1990

SUPPORT CHEMICAL ACCIDENT PREVENTION PROVISIONS OF CLEAN AIR ACT

Dear Senator:

We are writing to urge your support for Section 304 of the Clean Air Act Amendments on "Prevention of Sudden, Accidental Releases" which is now pending on the Senate floor.

Recent major chemical accidents have underscored the need for these provisions. The late 1989 explosions at the Phillips Petroleum plant in Pasadena, Texas and at the Exxon facility in Baton Rouge, Louisiana killed 25 workers and injured many more. Unfortunately, these are but two of the hundreds of recent chemical accidents which have caused death, injuries and trauma to workers and communities.

In 1988, the Environmental Protection Agency (EPA) released its database on "Acute Hazardous Events." It revealed 11,048 accidents with "extremely hazardous substances" from 1982 to 1988, resulting in 11,341 injuries and 309 deaths. In addition, EPA reported 15 "Bhopal-equivalent" accidents in the 1980's. One EPA official explained that we had escaped Bhopal-scale results in some cases only because of "the way the wind was blowing."

Currently, EPA and the Occupational Health and Safety Administration (OSHA) are virtual non-players in major hazard/process safety matters. Despite small corps of dedicated employees and some laudable post-Bhopal process safety efforts, neither agency is able to regulate the fast-growing chemical industry.

EPA and OSHA have few appropriate regulations, almost no qualified staff, and have suffered from no clear Congressional or Administration mandate to improve process safety regulation.

S. 1630 seeks to remedy these problems by requiring certain industries to evaluate risks associated with accidental releases and to prepare risk management plans. It also establishes an independent Chemical Safety and Hazard Investigation Board, modeled after the National Transportation Safety Board. Most importantly, S. 1630 authorizes the EPA Administrator to establish accident prevention regulations for those facilities handling extremely hazardous substances.

We hope you will support these provisions and oppose all weakening amendments.

Sincerely,

Dr. Fred Millar
Director, Toxics Project

1990 FEB -7 AM 9:27