The original documents are located in Box 40, folder "Water Quality Commission (3)" of the James M. Cannon Files at the Gerald R. Ford Presidential Library.

OFFICE OF THE VICE PRESIDENT

WASHINGTON

August 25, 1975

MEMORANDUM FOR THE VICE PRESIDENT

FROM : Governor Shafer

SUBJECT: Domestic Council Task Force on Water Quality - Status Report

STATUS

The task force team -- about 25 strong -- met today (August 25) for the first time and was thoroughly briefed throughout the day. They started work immediately. They were honored by your presence, and your remarks were right on target.

The task force members have been divided into two-man teams, with a technical expert and an economist on each. Within the next month, they will have combed the critical reports and have ready their assessment of all chapters of the Commission's draft report. I asked them to keep in mind three things during this work: 1) did the material cover all major issues and concerns; 2) were the reports accurate, fair and complete (enumerating any omissions and/or errors); 3) are the conclusions justified by the basic work?

In the red briefing book attached you will find a schedule (4th tab), along with a listing of the experts and their assigned tasks (2nd tab).

YOUR NEXT SUGGESTED CONTACT WITH THE GROUP

The task force will meet again as a body on September 8. This is the day before the Commission's Executive Committee meeting on September 9. By then, they will have a good view of the Commission's work and where it may be lacking. I hope that you can spare a few minutes that afternoon for a highlight briefing.

Task Force Objective

The "Domestic Council Task Force on NCWQ Review" was formed to assist the Domestic Council in the evaluation of the feasibility and desirability of implementing the Federal Water Pollution Control Act Amendments of 1972 (FWPCA), PL 92-500, as currently interpreted through regulations.

The objective of the Task Force is to assess the improvements in the environment which are achievable under the Act and the attendant impacts on our Nation's industrial vitality and economic growth, as these benefits and costs are reflected in technological and economic studies prepared for and by the National Commission on Water Quality (NCWQ). [See briefing book, at tab marked "NCWQ Study Plans"]

The Task Force will focus on:

- The direct and indirect economic costs of achieving Best Practicable Technology (BPT), Best Available Technology (BAT), and New Source Performance Standards (NSPS).
- The improvements in water quality which will result from the recommended BPT, BAT, and NSPS.

In order to assess the technological feasibility and the economic impacts, the Task Force will:

- Review the scope, adequacy, and accuracy of the data, methodology, and conclusions contained in reports prepared by contractors for NCWQ.
- Review the draft chapters of the NCWQ report to the Congress.
- Determine the extent to which the contractors' analyses are reflected in the Commission's draft report and the extent to which the Commission's conclusions are supported by the contractors' analyses.
- Determine whether the contractors' analyses and the NCWQ draft report have fully considered all relevant factors in arriving at their conclusions.

DOMESTIC COUNCIL TASK FORCE
ON NCWQ REVIEW

Coordination
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RESOURCE CENTER AND OFFICE SPACE
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Phone: 967-5397

TASK FORCE ASSIGNMENTS

BY SUBJECT

1. Coordination

Sidney R. Galler/Bruce Barrett (Technical)
Robert T. Miki (Economic)

2. Industry Studies	Technical	Economic	Review Documents
A. Review of industries considered to have "insignificant pollutant discharge or impact."	B. Barrett	W. Sullivan	Battelle, Vols. I, II, III, IV
B. Review of methodology and selected industries which are covered by a refinement and updating of EPA results.	B. Barrett J. Cox	W. Sullivan	DPRA Reports Battelle, Vols. I, II, III
C. Review of "high impact" industries			
(1) Chemicals	J. Cox (Organic) W. Shilling (Inorganic)	J. Kalt/ F. Peterson	Catalytic (tech.) Conference Board (econ.) Intl. Research & Tech. (econ.)
(2) Steam Electric Power	W. Nicholas	M. Spiro	Teknekron (tech. & econ.)
(3) Feedlots	M. Scalf	M. Cotner	Develop. Planning & Research Associates (econ.)
(4) Irrigated Agriculture	J. Witherow	M. Cotner	Toups (tech.) Iowa State University (econ.)
(5) Mining	G. Grimes	J. Flannery	Battelle, Vol. I (tech.)
(6) Canned Seafood	D. Whitaker	D. Whitaker	Battelle, Vol. II (tech.) Florida State Univ. (Commercial Fisheries: Benefits; Special Study)

	Technical	Economic	Review Documents
(7) Petroleum Refining	W. Shilling	R. Kramer	Battelle Vol. I (tech.) Eng. Science (tech.) Conference Board (econ.) NBER (econ.)
(8) Textiles	G. Grimes	W. Long	Lockwood Green Eng. (tech.) NBER (econ.)
3. Crosscut and Overview Studies			
A. Municipal Waste Treatment (State & local finance)	B. Barrett	J. Flannery	Metcalf and Eddy (tech.) Amer. Public Works Asso. (costs) Meta Systems (econ.) Data Resources (State & local finance)
B. Regional Assessments			
(1) Overview		S. Pleeter R. Kramer	NBER (Plant Closings & Regional Consequences) NCWQ Regional Chapter
(2) Kanawha	W. Nicholas	M. Spiro	Dames & Moore
(3) Merrimack-Nashua	M. Scalf	M. Cotner	Abt Associates
(4) Delaware-Delaware Bay	J. Cox	J. Kalt/ F. Peterson	Betz Env. Eng.
(5) Ohio	G. Grimes	R. Kramer	Dames & Moore
(6) Yellowstone	J. Witherow	W. Long	Stevens/Thomp.
(7) Houston-Galveston Bay	B. Barrett	W. Sullivan	B. Johnson
(8) Housatonic, River Reach	W. Shilling		Lawler, Matusky

		Review Documents
C. Macroeconomic Models	Resource persons: R. Grimes & P. Ritz	Working materials
D. International Trade	Resource person: R. Downey	Public Research Institute

BY TASK FORCE MEMBER

BRUCE BARRETT

- Industry Studies (A)
- Industry Studies (B)
- Municipal Waste Treatment (Technology)
- Houston-Galveston Bay (Regional Assessment)

MELVIN COTNER

- Feedlots (Economics)
- Irrigated Agriculture (Economics)
- Merrimack-Nashua (Regional Assessment)

JOHN COX

- Industry Studies (B)
- Chemicals, Organic (Technology)
- Delaware-Delaware Bay (Regional Assessment)

JAMES FLANNERY

- Municipal Waste Treatment (Economics)
- State & Local Financing
- Mining (Economics)

GEORGE GRIMES

- Mining (Technology)
- Textiles (Technology)
- Ohio (Regional Assessment)

JOE KALT/FRED PETERSON

- Chemicals (Economics)
- Delaware-Delaware Bay (Regional Assessment)

RONALD KRAMER

- Petroleum Refining (Economics)
- Ohio (Regional Assessment)
- Regional Assessments Overview

WESLEY LONG

- Textiles (Economics)
- Yellowstone (Regional Assessment)

W. R. NICHOLAS

- Steam Electric Power (Technology)
- Kanawha (Regional Assessment)

SAUL PLEETER

- Regional Assessments Overview

MARION SCALF

- Feedlots (Agriculture)
- Merrimack-Nashua (Regional Assessment)

WILLIAM SHILLING

- Chemicals, Inorganic (Technology)
- Petroleum Refining (Technology)
- Housatonic (River Reach Study)

MICHAEL SPIRO

- Steam Electric Power (Economics)
- Kanawha (Regional Assessment)

WILLIAM SULLIVAN

- Industry Studies (A)
- Industry Studies (B)
- Houston-Galveston Bay (Regional Assessment)

DONALD WHITAKER

- Canned Seafood (Technology & Economics)
- Commercial Fisheries (Benefits; Special Study)

JACK WITHEROW

- Irrigated Agriculture (Agriculture)
- Yellowstone (Regional Assessment)

AUGUST 1975

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
(31)						
	18 Group A Indust. Review Organize Task Force, Assemble Review Materials	19	20	21	22 Group A Indust. Review -- Initial Screening Completed	23
24	25 Task Force Organizational Mtg 10 A.M., EOB	26 Reviews; Group B Industries High Impact Industries Crossout & Overview Studies	27	28	29	30

SEPTEMBER 1975

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
Reviews ----------	1	2	3 ---------->	4 Preliminary drafts of reviews due. Send by 4 P.M. or deliver by 5 P.M.	5	6 Coordinators review preliminary drafts of reviews
7 Coordinators review preliminary drafts of reviews	8 Task Force Mtg 9 A.M., DOC Room 4830	9 Task Force team discussions Update and revision of reviews	10 } ---------->	11	12 Revised reviews due 1:30 P.M.	13 Coordinators review revised materials
14 Coordinators review revised materials	15 Task Force Mtg 9 A.M., DOC Room 4830 Additional revisions of industry and Draft body of Task Force report	16	17 other reviews } ---------->	18	19 Draft of Task Force report completed	20 Task Force review of report
21 Task Force review of report	22 Task Force Mtg 9 A.M., DOC Room 4830 Final revisions of complete report Typing and assembly	23	24 } ---------->	25	26 Task Force Report to printer	27 Printing
28 Printing	29 Printed Reports to Coordinator for disposition	30	*Send or deliver to: Keith A. Lichtenwalter Room 5510 Department of Commerce			

OCTOBER 1975

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

EVALUATION OF NCWQ INDUSTRY REPORTS

This is a "Guide" to the factors you should consider in reviewing the technological requirements and the economic impacts of the Federal Water Pollution Control Act Amendments of 1972 on specific industries, as reflected in contractors' reports for the National Commission on Water Quality (NCWQ).

The guide is not a mechanical process to be followed. It represents the core factors to be examined. It is intended to enable a review and synthesis of technological and economic considerations across industries and to serve as an initial outline for the organization of the Task Force's report to the Domestic Council.

TECHNOLOGY

The assessments of technology and engineering costs feed into the assessments of economic impacts. In your technology review you should address the following questions.

- Are the estimates of BPT for 1977 and BAT for 1983 reasonable? Other technological estimates?
- Will the equipment be available when predicted?
- Is the performance likely to be as predicted? Are there other more promising approaches?
- Are the engineering cost estimates reasonable?
- Consistency with standards issued by EPA? Reasonableness of those standards?
- What are the ranges of uncertainty in the above items?
- Are there other relevant questions?

It should be noted that in the case of the irrigated agriculture report and possibly the mining reports, many of the above questions may not be pertinent or appropriate since EPA has not yet developed controls in these areas.

ECONOMICS

In your review of the economic impacts resulting from specified levels of effluent control, you should examine the data, methodology, and conclusions.

Data

You should check the sources of the basic data that are used in the report. Wherever possible compare the data with those in EPA and other studies of the industry.

- Did the economics contractor accept the engineering cost estimates without question or did the contractor make adjustments to the engineering cost data? If so, why were the adjustments made and how did the adjustments change the cost configurations?
- If surveys were used, were they methodologically correct?
- Did the contractor use a consistent base for the various data series?
- Are there any inherent biases in the data so that their use would, in the absence of other errors, yield over or under estimates?

METHODOLOGY

In most cases, the basic methodological underpinning is the "representative" or "model" plant. The concept is useful if the model unit is indeed representative of units within the industry. At the very minimum, the study should provide a statistical measure of the distribution of plant sizes around the model unit.

- Is the model plant actual or hypothetical? Is it average or exemplary?
- Are the model plant characteristics in fact representative of actual plant characteristics?

In numerous EPA industry studies, we found that the distribution of actual plants bore little relationship to the model plants or that the actual distribution was highly skewed, with the model plant being at the tail of the distribution.

- Are the data derived from the model plant multiplied by the number of plants in that segment to obtain a characterization of the total segment?
- Is this procedure appropriate for the industry you are reviewing? Are the processes so varied that such an aggregation is inappropriate?

You should examine the cost information carefully. While it may not be possible to reconstruct the whole cost picture, it is reasonable to expect sufficient background information about costs so that you can be assured of their relevance.

- Are the cost data derived from actual plant information, from survey information, or from some other source?

- Are all relevant costs counted? We found that in some cases costs could not be ascertained or adequate estimates were not available and therefore a "synthetic" cost configuration was developed. In any event, relevant cost estimates that are excluded for whatever reason must be candidly cited and hypothetical cost constructs must be explained fully.

- In some cases, land availability and the cost of land and space, especially in urban locations, may not be adequately covered. If your industry was included in the Battelle "General Industry Studies" report, determine if the land cost used by Battelle is reasonable.

- Are all appropriate technologies and their costs discussed?

- What base year is used to project effluent control costs to 1977 and 1983? You should note recent changes in relative cost and price structures--in particular, energy and construction.

The price increase and plant closure impacts depend on the financial information. You should determine whether the analysis of the financial viability of plants is methodologically sound.

- Are the cash flows and external sources of capital adequately documented? Is the financial information consistent and reasonable?

- Will the plants be able to meet operating costs and capital needs resulting from effluent controls?

- Were estimates of demand elasticity made by the contractor or by other sources? If so, are the elasticities taken into account in the analysis of cost pass-throughs and price increases?

- Where demand conditions preclude forward shifting of costs, are costs shifted backward to input markets?

- Are there any potential bottlenecks to increasing capacity?

- Does the study adequately take into account interindustry relationships? How do the interindustry relationships affect the ability of the industry under study to adjust to costs associated with effluent controls?

Conclusions

You should determine whether the conclusions follow from the methodology. You may find that while numerous caveats are contained within the analysis itself, these caveats are not evident in the conclusions and that the conclusions are more globally stated than may be appropriate. You should be careful to determine how much in the report is judgmental and assertive and how much is based on solid facts.

- Are findings or assertions relating to individual production units (model or actual) correctly generalized to the industry or industry segment?

- What are the incremental costs to the industry and what are the incremental benefits in terms of cleaner water?

- Was a sensitivity analysis performed on the costs to determine whether the conclusions would change if costs were varied? You should note that if the distribution of plants is skewed a sensitivity analysis will not substantiate the conclusions.

- Are there issues which are inadequately covered? If so, you should indicate what the issues are, why they should have been covered, and what effect their inclusion would make in the conclusions?

- Is the report useful for evaluating and, if necessary, redirecting environmental policy?

Finally, you should address the following general questions:

- Did the contractor do what he was asked to do?

- Was he given the right questions?

EVALUATION OF NCWQ CROSSCUT
AND OVERVIEW STUDIES

A "Guide" will be forthcoming

6/17/75

OUTLINE

DRAFT REPORT

Retyped 8/20/75 OEE.
Reduced from original
of 10 pages to 8 pages.

INTRODUCTION AND FINDINGS

I. INTRODUCTION

A. Declaration of national purpose; the restoration and maintenance of the quality of the Nation's waters. (Sec. 101(a).)

B. The goals, policies and objectives of P.L.92-500.

C. The charge to the Commission:

-- Section 315

-- Commission's interpretation and expansion of mandate.

II. FINDINGS

Summarization of the findings of the Commission studies addressed to the following issues.

A. Do we have the technology?

Are technologies available to meet the goals and requirements of the Act? What overall evaluations can be made? What trends are discernible? What costs are associated with different technologies?

B. Can it be applied?

What are the prospects for having best practicable and best available technologies in place by 1983?

-- For municipal systems

-- For industry.

C. What are the impediments?

Likely significant constraints toward achievement of the BPT and BAT and their relative importance.

-- Money

-- Manpower

-- Technological adaptation

-- Resource availability

-- Changing public needs and private requirements

-- Bureaucratic inertia and repetition

-- Intergovernmental cooperation or lack thereof.

D. What are the environmental impacts?

-- Of achieving or not achieving by 1983

-- Of not achieving in a longer time frame

-- Of elimination of discharge

-- Of failing to control non-point sources.

E. Who pays and how much?

What are the economic and social impacts of implementing P.L.92-500?

-- In the public sector.

-- In the private sector.

F. Who benefits and how much?

What are the expected benefits to accrue from the implementation of the Act's requirements and to whom?

-- Environmental restoration

-- Recreational benefits (public and private)

-- Social benefits

-- Economic values (public and private)

-- Public health and well-being.

G. How fast are we moving toward the goal of elimination of discharge of pollutants? When are we likely to get there? At what cost? At what advantage?

H. Uniform application of the Act's requirements: How well are they working nationally, regionally and locally?

I. Institutional structure.

Does the national water pollution control program, as set out in P.L.92-500 establish a pattern of intergovernmental relationships conducive to the most effective and productive delivery of:

-- Financial resources

-- Regulations and permits

-- Compliance and enforcement

-- Others.

J. Potential for planning.

What is the long-range potential for control of water pollution through the various planning provisions set forth in the Act?

K. How far off-course are we in 1975 from the directives and goals of the Act?

-- What mid-course corrections or adjustments seem advisable?

-- What are their implications for achievement of the goals and requirements of the Act?

- 0 -

Summarization of (1) the present water quality situation; (2) the structure and mechanics of the water pollution control program -- past and present; and (3) the existing state of control technology.

III. HOW IS THE WATER? ITS QUALITY AND QUANTITY

A summarization of what has been learned about the present quality of the Nation's waters.

-- Brief description of study strategy of minimum geographical regions.

-- Present quantity and quality, based on findings of Study Areas II and VI.a.

-- Regional concentrations and variations.

-- Trends.

IV. WHAT HAS AND IS BEING DONE ABOUT IT?

The evolution of a national water pollution control program in the context of its institutional development.

A. Pre-1972

-- WPA's contribution to construction of municipal treatment systems.

-- Role of U.S. Public Health Service.

-- Water quality standards.

-- State initiatives and actions, and federal limitations (i.e., constitutional, jurisdictional, traditional, etc.).

-- Corps of Army Engineers permit authority.

B. An articulation of national program; the Act as a mechanism for control.

-- Technology; effluent limitations.

-- Regulation; permits and enforcement.

-- Finances; construction grants.

-- Planning; non-degradation and non-point source control.

V. TECHNOLOGIES FOR ACHIEVING

An assessment of the general technological options available for alternative levels of effluent control, including BPT, BAT and EOD. Since the Act is fundamentally technologically based, the report should deal, first, with just what technological options exist or are likely to exist, their per unit costs, relative effectiveness, resource requirements including manpower, and quantity and quality of residuals remaining.

A. Point source control.

-- Industrial; in-depth and general

-- Municipal (including urban runoff)

-- Agricultural point sources.

B. Non-point source control.

C. Toxics and heavy metals.

D. Regional variations relevant to technological application.

E. Areas for research and development.

IMPACT ASSESSMENT

The impacts of the application of the requirements of P.L.92-500 evaluated under varied assumptions as to future economic circumstances in the U.S.

VI. THE ECONOMICS OF WATER QUALITY

A. Water as an economic resource.

-- The transition in the use of water from a relatively free good to an increasingly costly resource for municipal and industrial development.

-- Implications for trends in industrial and municipal use. (Conference Board and META Systems studies, supported by technology assessments.)

B. Dynamics of the economy in relation to water quality control.

1. Without the Act; continuation of present trends.

-- National level; for the public and private sectors.

-- Regional and local levels; for the public and private sectors.

2. With the Act; assumes implementation of requirements by 1977 and 1983.

-- National level; for the public and private sectors.

-- Regional and local levels; for the public and private sectors.

3. With various assumptions of achievement and non-achievement; i.e., the assessment of the effect on the economy of variabilities in time, money and resources.

-- National level; for the public and private sectors.

-- Regional and local levels; for the public and private sectors.

C. What are the requirements for capital investment and for operation and maintenance annual expenditures to meet the levels of effluent limitations required by the law for 1977, 1983 and other levels intermediate and beyond for:

-- Municipalities, including combined sewers and storm water runoff.

-- Industry

-- Agriculture

-- Non-point sources

By:

-- Region

-- National

D. Who pays: How and by whom will the facilities required by the Act be paid for and will the necessary manpower and materials be available?

-- Industrial requirements; relative impact upon specific industries and how they will likely be internalized or passed on.

-- Municipal requirements; intergovernmental transfers, indebtedness, revenue availability and competing public needs.

-- Supply constraints.

-- Social impacts.

-- Possible effects on long-term growth and productivity, including relative impact on international competitive position.

-- Regional variations.

E. Who benefits?

-- Industrial competition

-- Resource recovery

-- Commercial fisheries

-- Recreational use (including sports fishing)

-- Public and private value from water reuse

-- Social impacts

-- Public health and welfare

-- Regional variations.

VII. ENVIRONMENTAL EFFECTS

A. Anticipated environmental impacts or changes from the application of:

-- BPT

-- BAT

-- More stringent than BAT

-- EOD.

(This will be a generalized assessment of incremental water quality changes attributable to the successive application of uniform effluent controls in a range of geographic regions throughout the country.)

B. Residual disposal alternatives; environmental impacts of:

-- Marine

-- Atmospheric

-- Land

-- Mass balance effects.

C. Anticipated changes nationally and regionally from achieving and not achieving in:

-- Fish, shellfish and wildlife

-- Recreational opportunities

-- Health effects

-- Aesthetic values

-- Acceptability of waste disposal options, i.e., ocean discharge of primary effluent; deep well disposal; others.

-- Areas for research.

VIII. INSTITUTIONAL ASSESSMENT

A. Overall impact of the Act and its implementation on the institutional structure and capacity of:

-- Federal government

-- State government

-- Local government

-- Private institutions.

B. Capabilities of and constraints on institutional cooperation and coordination:

-- Intergovernmental relationships (federal/state/local)

-- Intragovernmental relationships

-- Public-private relationships.

C. Evaluation of the effectiveness of:

-- Permits

-- Compliance

-- Enforcement

-- Planning

-- Construction grants.

D. Constraints on institutional performance.

-- Financing

-- Manpower

-- Time

-- Attitudes

-- Public participation.

E. State and regional variations.

IX. ALTERNATIVE SCENARIOS

A synthesizing chapter in which selected levels of treatment will be assessed for economy and social impact and implications of a selected range of variable conditions in:

-- Funding

-- Timing

-- Resource constraints

-- Capital markets and governmental fiscal policy

-- Competing public and private needs

-- Others.

- 0 -

APPENDIX

Explanation of study methodology.

CONTRACTOR REPORT STATUS

August 11, 19

INDEX

Updates: August 20, 19

CONTRACT[illegible]ORTS STATUS

I. TECHNOLOGY	NCWQ Project Director	Contractor and price	Draft REPORT Received	Comments received	FINAL REPORT RECEIVED
A(1). MUNICIPAL TREATMENT					
1. Assessment of Technologies and Costs:	Baumner	Metcalf & Eddy $447,726		Comments still coming in. Baumner will begin to send these to public affairs office week of Aug. 11 to set up "official" Commission file.	Due end of September
*Part 1. Introduction & wastewater collection			Jan.1975		
*Part 2. Wastewater treatment technology			Feb.1975		
Part 3. Sludge & Residual treatment & Disposal technology			Feb.1975		
Part 4. Formulation & presentation of study results			June 1975		
*Appendix, part 1: Needs form List of WQ segments Collection systems Urban runoff assessment			June 1975		
Appendix, part 2. Unit wastewater process cost & resource functions			June 1975		
Appendix, part 3. Unit sludge process cost & resource functions			Included in Appendix 2		
Appendix, part 4. wastewater & sludge processes			"		
*Addendum: Revisions & additions to above reports: Part I, chapter 4 Part I, chapter 6 Part 2, chapter 8 Part 2, chapter 10 Revision to Appendix A5 (part 1)			July 1975		
A(2). 2. Costs associated with meeting requirements of PL92-500 ("NEEDS")	Baumner	American Public Works Asso. $78,000	Dec.1974		May 1975
A(3). Local Agency Needs (questionnaire)	Baumner	Asso.Metro.Sewer Agencies $2,115.	No report		No report
A(4). Urban Runoff	Baumner	Black, Crow &Eidsness $82,000	July 1975		
Economic Input: Municipal Compliance (Micro)	Burt	Meta Systems (see p.10)	July 1975		

	I. TECHNOLOGY (continued)	NCWQ Project Director	Contractor & Price	Draft Report Received	Comments received	Final Report Received
A(5)	Water Savings (Questionnaire) (see also Batelle #34, Gen.Industry)	Erickson	Amer.Water Works Foundn $7,000	July 1975		
B.	Innovative Technology (to meet "no discharge" after 1983)	Wilcox	Water Purification & Process $65,000	30 July/1975		
C.	Agriculture					
C(1)	Irrigation Return Flow	Wells	Toups $75,000	5 copies rec'd Aug.18		Same as draft
	Economic impact:(including non-irrigated)	Sokoloski	Iowa State $41,000	Draft final July 1975	(w/Hargrove critique)	
C(2)	Feedlots	Wells	Dev.Planning Res. Asso. $50,000	June 1975		Due mid-Sept.
	Task Force (advisory)	Nelson	U.Calif Davis $12,500	None due		None due
	Economic Impact:	Sokoloski	DPRA, Vol. III	(combined w/above technology report)		
D.	NonPoint Sources (non-irrigated agriculture, constr,,silviculture,)	Wells	Midwest Res. $35,000	July 18, 1975		
	Economic Impact:		No Study			
E.	Consultants		Beychak, Downing, Masselli			

I. TECHNOLOGY (continued)	Project Director	Contractor and Cost	Draft Report Received	Comments Received	Final Report Received
F. Industry					
1. Iron & Steel	Wilcox	Arthur G. McKee $220,000	March & May 1975	P.A.file set up 7/21/75	Overdue
Economic: Iron & steel	Dale W	NBER	Jan.1975	See II, Economics	No
" Blast Furn & steel mills	"	Conf. Board	June 1975		May 12, 1975
2. Organic Chemicals	Kissell	Catalytic $333,130	Feb. 1975	P.A.file set up 6/16/75	June 1975
Economic:	Burt	IRT	8/15	See II, Economics	
	DW	Conf. Ed.	Jan.1975	"	2/21/75
3. Inorganic Chemicals	Kissell	Catalytic (see above)	Feb. 1975	P.A.file set up 6/16/75	July 1975
Economic:	Burt	IRT	8/15	See II Economics	
4. Petroleum Refining	Large	Eng.Science Texas $168,000	Jan.1975	P.A.file set up 5/5/75	June 1975
Economic:	DW	NBER	June 1975	See II, Economics	
	DW	Conf. Board	Jan. 1975	"	July 1975
5. Pulp and Paper	Large	Hazen & Sawyer $173,000	Jan.1975	P.A. file set up 5/15/75	May 16, 1975
Economic:	D.W. DW	NBER	June 1975	See II, Economics	
	D.W.	Conf. Ed.	Jan. 1975	"	June 26,1975
6. Electroplating	Wilcox	Lancy Labs $189,200	4/30/1975	P.A. file set up 6/30/75	
Economic:	Dale W.	NBER	6/15/75	See II, Economics	
7. Fruits & Vegetables	Large	Env. Assc. $182,000	April 1975	P.A. file set up 6/3/75	June 1975
Economic:	AS	DPRA, Vol. IV	June 1975	See II, Economics	

I. TECHNOLOGY (Continued)	NCWQ Project Director	Contractor & Price	Draft Report Received	Comments Received	Final Report Received
F. Industry (continued)					
8. Plastics	Kissell	Procon, Inc. $170,000	March 1975	Yes. P.A. file not set up	Overdue
Economic:	Burt	IR&T	by 8/15	See II, Economics	
9. Textiles	Large	Lockwood Green Eng. $167,500	Feb. 1975	P.A. file set up 5/20/75	June 1975
Economic:	DW	NBER	June 15, 1975	See II, Economics	
10. Steam Electric Power	Large	Teknekron $184,200	April 1975 (w/appendix)	Yes. P.A. file set up 8/20	Due mid-Sept.
Economic:	DW	Teknekron	July 13, 1975	See II, Economics	
11. General Industry (38) Grouping (see page 8 for description)	Kissell	Batelle Columbus $377,000	Vol.I-IV Feb. 1975		July 2 & 3
Volume 1, BY CATEGORY:					July 2, 1975
C A 1a Ore Mining & Milling 1b Ore Mining and Dressing				P.A.file 6/23/75	
Economic:		None			
C 2. Coal Mining				P.A. file 7/7/75	
Economic:		None			
C 3. Petroleum & Gas Extraction				P.A. file 7/8/75	
Economic:		None			
C 4. Mineral Mining & Processing				P.A. file 7/8/75	
Economic :		None			

I. TECHNOLOGY (continued)		NCWQ Project Director	Contractor & Price	Draft Report Received	Comments Received	Final Report Received
F. 11.	General Industry (continued)	Kissell		(see p.4)		
	Volume 1 (continued)					
Grouping A	5. Fish Hatcheries and farms				P.A. file 7/14/75	
	Economic:		None			
B	6a. Meat Products & Rendering (Red Meat)				(P.A.file 7/22/75	
B	6b. Meat Products & Rendering (Poultry)				(	
	Economic:	A.S.	DPRA, Vol.V			
	1. Meat Packing			6/15/75		
	2. Meat Processing			6/15/75	See II, Economics	
	3. Poultry			6/15/75		
	4. Independent rendering			6/15/75		
	Volume II, by category:					July 3, 1975
B	7. Dairy Products processing				P.A. file 7/23/75	
	Economic:	A.S.	DPRA, Vol. VI	June 1975	See II, Economics	
B	8a. Grain Mills - Wet Milling				(P.A. file 7/28/75	
A	8b. Grain Mills, Dry Milling				(	
	Economic:	A.S.	DPRA Vol. VII	June 1975	See II, Economics	
B	9. Sugar Cane Processing				P.A. file 8/6/75	
	Economic:		None			
B	10. Beet Sugar processing				P.A.file 8/6/75	
	Economic:		None			
C	11. a.&b. Canned & Preserved Seafood processing				P.A. file 8/7/75	
C	12. Miscellaneous Food & Beverages (Brewing)				No P.A. file yet	

I. TECHNOLOGY (continued)		NCWQ Project Director	Contractor & Price	Draft Report Received	Comments Received	Final Draft Received
F. 11. General Industry (continued) Grouping		Kissell		(See p.4)		
	Volume II (continued)					
A	13. Timber Products processing					
	Economic:		None			
A	14. Furniture and Fixtures manufacturing					
	Economic:		None			
B	15. Builder's Paper & Board Mills					
	Economic:		None			
	VOLUME III, by category:					July 3, 1975
A	16. Paint and Ink formulation & printing					
	Economic:	Burt	IRT	Due 8/15	See II, Economics	
A	17. Soap & Detergent manufacturing					
	Economic:		None			
A	18. Phosphates manufacturing					
	Economic:		None			
B	19. Fertilizers manufacturing					
	Economic:	A.S.	DPRA, Vol IX	June 1975	See II, Economics	
A	20. Paving & Roofing materials					
	Economic:		None			
B	21. Rubber Processing					
	Economic:		None			
C	22. Leather Tanning & finishing					
	Economic:	A.S.	DPRA Vol VIII	June 1975	See II, Economics	

I. TECHNOLOGY (continued)		NCWQ Project Director	Contractor and Price	Draft Report Received	Comments Received	Final Report Received
F.11.	General Industry (continued)	Kissell		(see p.4)		
	VOLUME III (continued)					
Grouping						
A	23. Glass Manufacturing					
	Economic:		None			
A	24. Cement manufacturing					
	Economic:		None			
A	25. Structural Clay Products					
	Economic:		None			
A	26. Pottery & related products					
	Economic:		None			
A	27. Concrete, Gypsum & Plaster products					
	Economic:		None			
A	28. Asbestos					
	Economic:		None			
	VOLUME IV, by category					July 3, 1975
A	29. Insulation Fiberglass manufacturing					
	Economic:		None			
B	30. Ferroalloys manufacturing					
	Economic:		None			
	Mfg.					
B	31a. Nonferrous Metals/- Al,Cu,Pb,Zn					
A	31b. Nonferrous Metals - Bauxite (refinishing)					
	Economic:	D.W.	NBER	June 1975	See II, Economics	
C	32. Machinery and Mechanical Products Mfg.					
	Economic:		None			
B	33. Transportation Industries					
	Economic:		None			

I. TECHNOLOGY (continued)	NCWQ Project Director	Contractor and Price	Draft Report Received	Comments Received	Final Report Received

F.11. General Industry (continued)

VOLUME IV (continued)

Groupings

C 34. Water Supply (see also p.2)
Economic: None

A 35. Steam Supply
Economic: None

A 36. Auto & Other Laundries
Economic: None

A 37. Foundries
Economic: None

A 38. Nonferrous Mill Products
Economic: None

General Industry Groupings:

A - 21 industries considered to have "insignificant pollutant discharges or impact"

B - 12 industries that can be"adequately assessed by a refinement and updating of EPA results"

C - 9 industries that have water pollution problems and require "analysis in greater detail than found in EPA efforts"

42 (includes four industries broken into two categories)

NOTE RE ECONOMIC IMPACT REPORTS INCLUDED IN ABOVE

The above indicated reports, along with other economic impact studies, are shown in more detail in II following. Other economic impact industry report (not shown w/ above technology reports):

-- Alkalies & Chlories (Conf. Board) Final report June 1975
-- Drugs (IRT), report due
-- Plant Closing & Regional Consequences, draft report 6/1/75 (NBER)
-- Executive Summaries, NBER (Report Jan. 15, 1975)

II. ECONOMIC	NCWQ Project Director	Cont[illegible] and [illegible]	Draft Report Received	Comments Received	Page Final R Received
A. Industry (Micro)					
1. General Industries	Burt	Nat'l Planning Asso. $89,000	Overdue (contract will probably be canceled)		
2. Framework of Industrial Studies and Review of selected industries: D.W.		Conf.Bd.$69,300 plus			
(1) Blast Furnaces & Steel Mills		$50,000	(1) 6/28/74		May 12, 1975
(2) Petroleum Refining			(2) Jan.1975		July 8, 1975
(3) Pulp, Paper & Paperboard Mills			(3) Jan. 1975		June 26,1975
(4) Alkalies & Chlorine			(4) Jan.1975		June 30, 1975
(5) Industrial Organic Chemicals			(5) Jan.1975		Feb. 21, 1975
3. Industry (Micro)	Burt	Int'l Research & Tech.			
(1) Organic Chemicals		$192,500	8/15		
(2) Inorganic Chemicals					
(3) Plastics					
(4) Drugs - did not do					
(5) Paints - did not do					
3. Industry (Micro) Executive Summaries	D.W.	Nat'l Bureau of Economic Research	Jan. 1975		
Reports: (1) Iron and Steel		$379,400	(1) Jan. 1975		
(2) Petroleum Refining			(2) June 1975		
(3) Electroplating			(3) June 1975		
(4) Textiles			(4) Feb. 1975		
(5) Pulp and Paper			(5) June 1975		
(6) Non-ferrous metals			(6) June 1975		Due mid-Aug.
(7) Plant Closures & Regional Consequences			(7) June 1975		
4. Industry (Micro)	A.S.	Development Planning & Research	June 1975:		
(1) Fruits & Vegetables		$202,779	(1) Vol. IV		
(2) Feedlots			(2) Vol. III		
(3) Meat products			(3) Vol. V (4 parts)	———	1. Meat Packing
(4) Grain Milling			(4) Vol. VII		2. Meat Processing
(5) Leather Tanning			(5) Vol. VIII		3. Poultry
(6) Fertilizers			(6) Vol. IX		4. Independent Rendering
(7) General Methodology (with addendum-tables)			(7) Vol. II		
(8) Dairy Products			(8) Vol. VI		

II. ECONOMIC (continued)	NCWQ Project Director	Contractor and Price	Draft Report Received	Comments Received	Final Report Received
A. Industry, Micro (continued)					
5. Steam Electric Power	D.W.	Teknekron $77,400	Aug.8,1975		
B. Municipal Options (Micro)	Burt	Meta Systems $120,000	April 1975 & July 1975		
C. International Trade (Micro)	D.W.	Center for Naval Anal. $115,000	July 30, 1975		
D. Economic Sector Activity (MACRO)					
SEAS MODELLING	A.S. & Korty		Working Input		Question of final Report
		IRT	$65,000		
		CONSAD	126,500		
		Control Data	95,000		
		IIRF	15,000		
		U.Va.	10,000		
		Boeing	15,000		
E. Economic Incidence (Macro)	Burt	Urban Systems $91,400	Prel (incomplete) June 1975		Due Sept. 1
F. Miscellaneous (Macro)					
1. Forecasting (State/local finance)	A.S.	Adv.Comm. Int. Rel. $16,500	1974		
2. Economic Study Design	A.S.	PIEC $23,700	1974		
3. Long-range task Schedule	A.S.	Control Data $10,000	1974		
G. Special Issues					
1. Financial Markets Conference	A.S.	Conf. Board $25,000	July 1975		None due
2. State & Local Financing	Burt	Data Resources $69,600	Summary report due Aug. 20 Full report, end of August		
(Contracts not let on supply constraints and Inflation)					

II. ECONOMIC (continued)	NCWQ Project Director	Contractor and Price	Draft Report Received	Comments Received	Final Report Received
H. Economic Benefits					
1. National Recreation	Erickson	Nat'l Planning Asso. $192,500	Pre-draft in		
2. Beach Closings and reopenings	Burt	Battelle Memo. $99,000	Yes		July 14, 1975
3. Property Value	Erickson	Dornbusch $141,400	June 2, 1975		
4. Commercial Fisheries	A.S.	Fla. State U. $76,674	Prel.draft in. Draft due 9/1 (includes also Environmental Impact -- see page 15)		
I. SOCIAL IMPACTS					
1. Social Impacts	Loe	Abt Asso. $193,800	June 9, 1975		
2. Analysis of Social Impacts (Lake Washington-Lake Union)	Loe	Human Resources Planning Inst. $42,230	June 1975		
J. CONSULTANTS					
Resources for the Future		$7,500			
Center for Environment & Man		5,000			
5 individuals (critique & evaluation)		20,000			
K. AGRICULTURAL (see page 2 for economic impacts, Feedlots & Irrigated Agr.)					

Project Directors (see above initials)

A.S. - Adam (Dan) Sokoloski, Program leader
D.W. - Dale Wittington
Korty - Doug Korty
Burt - Bob Burt
Loe - Roy Loe
Erickson - Ray Erickson

		NCWQ Project Director	Contractor and Amount	Draft Report Received	Comments Received	Final Received
III.	ENVIRONMENTAL					
A.	Advisory Committee					
	The Institute for Ecology (TIE)		TIE	No reports		
	Phase I		$45,000			
	Phase II & III		$86,552			
	Logistics Support, Center for Environment and Man		CEM $28,403	No reports		
B.	River Reaches					
Scopes:	Study Area II - present Water Quality Study Area VIc- environmental impacts					
Site No.						
II & VIc	1. St. John's River, Maine	Meyer	Meta Systems $48,600	May 5, 1975		
II & VIc	2. Boston Harbor-Charles R.,Ma.	Peterson	Process Res. $68,964	June 9, 1975		
II & VIc	3. Conn. R., Mass & Conn.	Meyer	Center for Env & Man $55,166	April 1975		
II & VIc	4. Housatonic R. Mass.	Meyer	(Lawler,Matusky ($103,450)	June 1975		
II & VIc	5. Susquehanna R., N.Y.	Meyer	(Lawler,Matusky	Report in (1 cy only)		
VIc	6. Potomac R. Md. & Va.	Peterson	Academy of Nat. Sciences,Phila. Part of $112,000	July 31, 1975		
II.	6. Potomac R. Md. & Va.	Meyer	GKY Asso. $15,300	Feb. 1975		
II & VIc	7. Yadkin-PeeDee, N.C.,S.C.	Range	TRW Inc. $52,400	June 5, 1975		
II	8. Santee, N.C., S.C.	Peterson	Water Res.Eng. Part of $63,700	April1975		
VIc	8. Santee, N.C., S.C.	Peterson	Academy of Nat. Sciences,Phila. Part of $112,000	July 1975		

III. ENVIRONMENTAL (continued)		NCWQ Project Director	Contractor and Price	Draft Report Received	Comments Received	Final Report Received
B. River Reaches (continued)						
Scopes	Site No.					
II & VIc	9. Chesapeake Bay, Md, Va.	Range	Va.Inst. $59,100	Aug. 1975 (Vol.I & II)		Draft is final report
II & VIc	10. Lower Miss. R. & Delta	Allen	Coastal Ecosystems Mgmt $65,000	Overdue (1 copy in)		
II & VIc	11. Escambia Bay & R.,Fla.	Range	Atlantis Sci. Part of $102,160	June 30, 1975		
II & VIc	12. Trinity R., Texas	Peterson	Water Res.Eng. Part of $170,335	June 19, 1975		Due now
	(Upper Mississippi)					
II	13. Minn-Miss-St.Croix Confl. Minnesota & Wisconsin	Peterson	Water Res.Eng. Part of $68,700 MRI	July 31, 1975		None due
VIc	13. Minn-Miss-St.Croix Confl.	Peterson	/No.Star Res. Part of $87,300	May 1975		
II & VIc	14. Lower Missouri, Mo.	Peterson	Midwest Res. $75,000	June 30, 1975		
II	15. Iowa-Cedar River, Iowa	Peterson	Water Res. Eng Part of $68,700 MRI	May 1975		None due
VIc	15. Iowa-Cedar River, Iowa	Peterson	/No.Star Res. Part of $87,300	July 1975		
II & VIc	16. San Antonio-Guad. Basin,Tex.	Peterson	Water Res.Eng. Part of $170,335	June 1975		Due now
II & VIC	17. South Platte R., Nebr.	Allen	Tetra Tech. Part of $311,935	June 9, 1975		
II	18. Upper Rio Grande, N.M.,Tex.	Peterson	Water Res.Eng. Part of $ 65,700	March 1975		
VIc	18. Upper Rio Grande, N.M.,Tex.	Peterson	Aca.Nat.Sci.Phila. Part of $112,000	June 1975		

III. ENVIRONMENTAL (continued)		NCWQ Project Director	Contractor and Price	Draft Report Received	Comments Received	Final Report Received
B. River Reaches (continued)						
Scopes	Site No.					
II	19. Columbia R., Oregon, Wash.	Allen	Tetra Tech Part of $311,935	Feb. 1975		March 1975
VIc	19. Columbia R., Oregon, Wash.	Allen	Parametrix Part of $69,130	May 1975		
II	20. Snake River, Idaho, Oregon	Allen	Tetra Tech. Part of $311,935	Feb. 1975		
VIc	20. Snake River, Idaho, Oregon	Allen	Parametrix Part of $69,130	April 1975		
II & VIc	21. Gulf of Alaska, Alaska	Allen	Tetra Tech Part of $311,935	May 1975		
II & VIc	22. Hawaii	Allen	Tetra Tech Part of $311,935	June 17, 1975		
II & VIc	23. Puerto Rico	Allen	Tetra Tech. Part of $311,935	July 7, 1975		
II & VIc	24. So. Calif. Bight, Calif.	Allen	Tetra Tech Part of $311,935	June 9, 1975		
II & VIc	25. Hudson R. & N.Y. Bay	Meyer	Lawler, Matusky $69,700	Aug. 5, 1975		
II & VIc	26. Illinois R., Illinois	Peterson	Env. Analysts $50,000	Canceled in Mid-July		
II & VIc	27. Utah Lake-Jordan R., Utah	Allen	Env. Dynamics $50,000	Overdue		
II & VIc	28. Biscayne Bay, Florida	Peterson	Water Res. Eng. Part of $170,335	May 19, 1975		
II & VIc	29. St.John's R.Estuary,Fla.	Range	Atlantis Sci. Part of $102,160	July 2, 1975		
II & VIc	30. Percy Priest Res.,Tenn.	Range	Vanderbilt U. $50,000	Overdue		

	NCWQ Project Director	Contractor and Price	Draft Report Received	Comments Received	Final Report Received
III. ENVIRONMENTAL (continued)					
C. Special Studies					
1. Ocean Discharge, less than secondary treatment	Meyer	SCCWRI $9,500	Recd. Aug. 15		
Municipal effluents	Meyer	Eng. Science $14,200	"		
2. Residual Disposal	Meyer	Env. Q. Systems $230,000	Due Aug. 11		
3. Commercial Fisheries	Range/ A.S.	Fla. State U. $33,250	August 1975 (includes also economic impact -- see page 11)		
4. Water Quality Modelling	Allen	Hydroscience $59,115	No report due		
IV. INSTITUTIONAL					
1. Construction Grants Grants & Financing	Freshman	Touche Ross $172,200	April 30, 1975	P.A.file established 8/12	Aug. 8, 1975
2. Planning	Freshman	Wise $106,316	May 30, 1975	P.A. will have file 8/30	Due Aug. 20
3. Regulation & Envforcement					
a. Permit System	Reiter	Energy & Env. R126,600	May 1975	P.A.file established 8/12	Aug. 8, 1975
b. Compliance Monitoring	Braubach	Energy Resrs $71,150	June 1975		
c. Enforcement	Reiter	Env.Law Inst. $127,500	April 30, 1975	P.A.file established 8/14	Due late Aug.

	NCWQ Project Director	Contractor and Price	Draft Report Received	Comments Received	Final Report Received
IV. INSTITUTIONAL (continued)					
4. Resources and Constraints					
a. Public Participation	Ziegler	Ragan Asso. $80,195	June 1975	P.A.file established 8/19/75	
b. Attitudes	Reiter	Oregon Res.Ins. $119,400			Due mid-Aug.
c. Legal Issues (Stat.Authority)	Schenendorf	Bu.Nat'l Affairs $19,050			
d. Problems of "Doers" Municipal & Agricultural Industry	Clark	Hartley/Price $23,200 In-House	July 1, 1975 Due now		
5. Draft Study Design		Haskell $2,000	No report		
V. REGIONAL ASSESSMENTS					Final reports due about mid-September
Study Design	Jaisle	A.D.Little $21,500			
1. Merrimack-Nashua	Chandler	Abt Asso. $190,724	June 20, 1975 Vol. I & II		
2. Delaware-Delaware Bay	Fickessen	Betz Env.Eng. $225,000	June 1975 Vol. I & II		
3. Ohio	Jaisle	Dames & Moore $211,000	June 1975 Vol. I & II		
4. Kanawha (W.Va.)	Jaisle	Dames & Moore $225,000	June 1975 Vol. I & II		
5. Lake Erie	Jaisle	Dalton/Little $225,000	June 1975 VOL. I,II & III		
6. Chattahoochee-Flint-Apalachicola	Harris	Hammer/Siler $200,000	Aug. 1 (3 parts)		

V. REGIONAL ASSESSMENTS	NCWQ Project Director	Contractor and Price	Draft Report Received	Comments Received	Final Report Received
7. Houston-Galveston Bay	Harris	B.Johnson $263,220	June 20, 1975 (3 parts)		
8. Yellowstone	McCann	Stevens/Thomp. $200,000	June, 1975 Vol. I & II & appendix,Pt.I		
9. Colorado	Reznek	Utah State U. $225,000	March 7, 1975 (several volumes)		
10. S.F.Bay-Central Valley	Reznek	A.D.Little $275,000	Yes (no date) Vol. I & II		
11. Puget Sound-Lake Washington	Chandler	Stevens,Thomp. $215,000	June 1975 Vol. I & II		
Economic Division, staff Coordination	Corcoran				

U.S. DEPARTMENT OF COMMERCE
Office of the Secretary
Washington, D.C. 20230

July 30, 1975

MEMORANDUM FOR: Governor Raymond Shafer

From: (SIGNED) JOSEPH E. KASPUTYS
Joseph E. Kasputys
Assistant to the Secretary

Subject: Review of the National Commission on Water Quality Metal Finishing Studies

In accordance with your request, the Department of Commerce has reviewed intensively the technology, costs, and economic impacts of the Federal Water Pollution Control Act Amendments of 1972 on the metal finishing industry. Our review is based on two reports prepared for the National Commission on Water Quality, namely, a report on technology and costs prepared by Lancy Laboratories, Inc., and a report on the economic impact, prepared by the National Bureau of Economic Research, based upon the technological and cost considerations specified by Lancy Laboratories. We have also reviewed supporting materials and industry submissions in the National Commission on Water Quality files.

A copy of our report is attached. Our report concludes that:

- The EPA regulations are more stringent than the Lancy approach.
- Lancy estimates of BPT attainability are reasonable.
- Lancy estimates of BAT and NSPS are not reasonable.
- The EPA no discharge requirement is not technically feasible.
- There is inadequate environmental data to permit analysis and comparison of costs and benefits of various levels of pollution control.
- There are serious limitations in using chemicals purchased as a control point.

- The universe of plants in the industry is overstated.
- Capital investment requirements to meet FWPCA requirements are massive.
- NBER underestimated the cost point at which plants will close.
- The economic impact in terms of plant closures will be severe.
- NBER has inadequately considered the difficulties of industry transition and the accompanying disruption to other industries.

Narrowly viewed, the reports prepared by Lancy Laboratories, Inc., and the National Bureau of Economic Research were of acceptable quality. They tried, to the extent possible, to base their analyses on actual plant data and plant configurations, rather than on hypothetical constructs, as has been the case in numerous other studies. Nevertheless, we have raised sufficient questions regarding data and methodology to justify detailed scrutiny of the other industry reports. We recommend that such evaluations of the technical and economic analyses be made.

From our discussion on July 29, it appears that there are some general methodological shortcomings with the industry reports, although these are not all present in the metal finishing report itself. The major problems are cited below:

- NCWQ has, in some cases, used contractors who previously prepared industry economic studies for EPA in the process of guideline formulation. This procedure builds in biases and methodological errors that were present in the previous work.
- The EPA and NCWQ analyses are based largely on so-called representative plants. Unfortunately, the representative plants (hypothetical or actual) do not appear to be representative, as reflected in the studies we reviewed and other studies done for NCWQ and previously for EPA.

- While the analyses are directed basically to the determination of costs to industry and the immediate impacts on plant closures, employment, prices, etc., they do not adequately estimate the secondary and other "ripple" effects that industries, consumers, and the economy may face.

- The technological bases of the analyses are often deficient, representing parts of technology available to specific firms, but not necessarily to the industry in general. These bits and pieces are put together within the context of a hypothetical or actual new plant (our "six-million dollar man" example.) Also, land and space are assumed to be available to adapt existing plant configurations to accommodate pollution abatement equipment.

- The industry-by-industry approach will not provide meaningful insights on aggregate impacts. Given the methodological shortcomings, the estimates of industry impacts cannot be aggregated. When interindustry relationships are considered, with each industry itself facing effluent guidelines, the total impact is likely to be larger than the sum of the individual industry impacts.

- The analyses do not provide data on benefits, i.e., clean water and therefore a relationship between benefits and costs cannot be related for policy evaluations. The studies examine technological and economic factors, but superficially cover environmental factors. Further, they do not adequately relate these aspects, even when they are considered.

These are serious shortcomings. However, even with the limitations, I believe some positive results can be achieved by the NCWQ through the following steps:

1. Recognizing there may be problems in the industry reports similar to those found in pulp/paper and metal finishing, go through all the reports and summarize the cost of achieving BPT, BAT, NSPS and any other intermediate levels of pollution control common to the reports. At the very least, this will provide a first approximation to the aggregate cost of achieving the various levels of pollution control mandated by the 1972 Act. To the extent that criticisms of the two reports reviewed by CEA and Commerce are representative, these costs will be conservative.

2. We understand that NCWQ is conducting regional studies of the aggregate impact on water quality which will be brought about by the recommended BPT, BAT and NSPS. These studies should be completed, since they represent the overall benefit of implementing the Act. Hopefully, this will be done against baseline data on conditions that would exist without the Act.

3. The Commission should then be in a position to arrive at qualitative judgments on the feasibility and desirability of implementing the Act, at least as currently interpreted through regulations. Given the costs in the metal finishing industry alone, it appears that a complete reevaluation of the Act is in order, but a definite decision on this course of action should be deferred until the work is completed.

If the studies had adequate data on benefits to permit sensitivity analyses on the degree of pollution control achieved at varying cost levels, they would be of great value in any reevaluation of the Act. However, as has been pointed out, they were written under the assumption that a postulated BPT and BAT would be a firm requirement.

As you know, Secretary Morton has a keen interest in environmental matters as they relate to our Nation's industrial vitality and economic growth. Accordingly, we are prepared to participate in a review along the lines noted above and as developed in our meeting yesterday.

Attachment

DEPARTMENT OF COMMERCE REVIEW OF THE METAL FINISHING INDUSTRY REPORTS PREPARED FOR THE NATIONAL COMMISSION ON WATER QUALITY

I. INTRODUCTION

In any review of the impact of the Federal Water Pollution Control Act Amendments of 1972 (FWPCA), it is particularly appropriate that attention be focused on the metal finishing industry. The reasons are:

- The industry is a heavy polluter in terms of toxicity, although not in terms of quantity.
- Pollution abatement requirements portend to be severe.
- It is an example of an industry in which a number of separate sections of the FWPCA must be considered in concert.
- The industry is characterized by a large number of small establishments.
- There is the prospect of the most drastic changes in industry structure of any industry for which effluent guidelines have been promulgated.

The analysis of the metal finishing industry was made for the National Commission on Water Quality by Lancy Laboratories, Inc. (Lancy), which examined the technological aspects and developed cost estimates of technology, and by the National Bureau of Economic Research (NBER), which examined the economic impacts associated with the costs of effluent control and abatement.

In our review, we have not replicated the quantitative estimates contained in the Lancy and NBER reports. To do so would have required access to the data, the equations, and the model through which the results on economic impact were ascertained. These are not fully presented in the reports. For example, the cost and energy equations were not shown in the NBER report.

Our review consisted of (1) evaluating the accuracy and usefulness of the basic data contained in the reports, (2) working back from the results to the basic information to

determine if the results and the conclusions drawn from them were consistent with the input information, and (3) determining if the conclusions are applicable to actual industry conditions.

II. SUMMARY AND CONCLUSIONS

The metal finishing industry is composed of thousands of captive and job shops engaged in Plating and Polishing (Standard Industrial Classification or SIC code 3471) and Metal Coating and Allied Services (SIC 3479). According to the 1972 Census of Manufacturers, there are approximately 4,700 establishments in these classifications, which are now covered by Environmental Protection Agency (EPA) effluent guidelines. Lancy Laboratories, Inc. (Lancy) covers metal finishers in these classifications and extends the analysis to metal finishers in other industries which may subsequently be subject to EPA guidelines. Thus, Lancy's universe totals 60,000-80,000 establishments. The actual universe of establishments has been a continuing problem in determining the severity of the impact of effluent guidelines on this industry.

Direct comparison of EPA and Lancy standards is not possible. In general, Lancy's standards are less stringent than EPA's. We accept the Lancy Best Practicable Technology (BPT) and level of control. We have reservations about the technical and economic feasibility of Best Available Technology (BAT) and New Source Performance Standards (NSPS) as proposed by Lancy. We agree with Lancy that "no discharge" by 1985 is not technically feasible. Finally, we do not concur with Lancy's deletion of a small plater category.

On technical grounds, we agree with Lancy's proposal for "chemical consumption" as a measure of Best Available Technology. However, the concept requires study as to its applicability as a general guide to be used in other industries. As yet, chemical consumption has not been reconciled with economic data. It is not a useful indicator of the economic consequences that will result from its administrative use by regulatory bodies. As proposed, it will not allow evaluation of trade-offs between environmental protection and economic costs. Equitable application of the criterion will be difficult.

On the basis of Lancy's technological assessment of the requirements of the Federal Water Pollution Control Act Amendments (FWPCA) and the costs of technologies, the National Bureau of Economic Research (NBER) estimated the impact of 1977 (BPT), 1983 (BAT), and 1985 (no discharge)

requirements. According to NBER, 65 percent of the plants would not be able to meet the BAT level costs and are therefore subject to closure. Seventy-five percent of the plants would be subject to closure if the no discharge goal is to be achieved. More than 40 percent of the endangered captive shops are small. Although they represent only 3 percent of the total industry capacity, these plants comprise 31 percent of the capacity that is most likely to close.

Further, according to NBER, the construction of 5,606 medium-size plants will be required between 1977 and 1983, and another 10,893 new plants will be required by 1985 to compensate for production lost if the EPA regulations are enforced.

We believe that the impact of the costs of abatement are in many ways understated by the NBER analysis. For example, the $5,000 criterion used by NBER to determine plant closures is too low in light of overall price increases in the economy since 1973 (the base date for the analysis) and the recent increases in energy costs. The criterion also inadequately covers the considerable variations in costs to individual operations.

Irrespective of whose universe definition is used, the total cost of control will be huge. The metal finishing industry, with roughly $6 billion in present capital requirements, will be called upon to invest $44.6 billion in new plant and equipment--four times more than the petroleum industry will have to spend to comply with air and water standards by 1983.

Massive restructuring of the industry will occur between now and 1983. The transition will involve considerable disruption of other industries' production behavior. The use of metal finishing, although small in terms of dollar value, is critical in many industries. Thousands of products rely upon metal finishing for durability and quality.

While much of our evaluation is critical of both the Lancy and NBER reports, we must emphasize that this does not imply that we disagree with the general tenor of their

findings and conclusions in regard to the impact of the Federal Water Pollution Control Act Amendments of 1972 on the metal finishing industries, and the net result on the national economy.

We are critical of the accuracy and reliability of many of their gross figures largely because inaccuracies could lead to an unwarranted discrediting and depreciation of the import and conclusions to be drawn from figures of that general magnitude.

We further note that the reports have not adequately presented the whole picture. We emphasize this concern not because a more thorough and comprehensive analysis would reverse or even derogate the general conclusions, but because it would reinforce and support the inference that enforcement of the FWPCA through the particular regulations, requirements and mandated abatement levels presently imposed on the industry will have a very serious and unjustifiably severe impact on the industry and the national economy..

III. ANALYSIS OF TECHNICAL AND ECONOMIC REPORTS PREPARED BY LANCY LABORATORIES, INC., AND THE NATIONAL BUREAU OF ECONOMIC RESEARCH

A. Technology of Waste Treatment

1. Technology

Direct comparison of Lancy's work with that of the Environmental Protection Agency (EPA) and their contractors is precluded because they use different technical measurement bases. EPA has consistently used weight of pollutant per unit of area plated as their basis for standards. This is, in effect, the imposition of a water use limitation on the industry. Lancy, on the other hand, believes that water use will be minimized because of cost factors, and recommends BPT, new source, and pretreatment controls on the basis of pollutant concentration, and BAT controls by regulation of chemical consumption--a new concept for these types of regulations.

The following discusses the Best Practicable Treatment (BPT), Best Available Technology (BAT), New Source Performance Standards (NSPS), and Pretreatment technologies, their reasonableness, performance, uncertainties, and alternative approaches.

Best Practicable Treatment (BPT). There are several basic differences between Lancy and EPA. First, the BPT technology recommended by Lancy (identified as APL-1) includes the unit operations and processes envisioned by EPA. However, due to the complexity and variations in plating facilities, Lancy envisions that additional unit processes as well as more sophisticated operational control will be required for some plants to meet the Lancy report concentration standards. These additional unit processes include flocculation, the addition of coagulating agents, and additional automated process controls. The Environmental Protection Agency's effluent limitations (mg/m^2/operation) are based on the attainment of total suspended solids concentrating of 20 mg/l and a limit of 0.5 mg/l for each of several heavy metals, e.g. copper, nickel, chromium, and zinc. The EPA limitations

are for total heavy metals (soluble and insoluble). Alternatively, Lancy recommends APL-1 concentration standards of 20 mg/l total suspended solids, and 1 mg/l for each heavy metal in the soluble form. For total heavy metals (soluble and insoluble) the recommendation is 2 mg/l. Thus, Lancy finds it will take technology in addition to that identified by EPA to meet limitations less stringent than those promulgated as BPT by EPA.

Second, EPA has established a small platers subcategory in which a lesser technology is permitted, i.e., cyanide destruction, neutralization, and equalization. Lancy does not discuss or provide such a small plater subcategory for BPT.

Third, the EPA limitations are expressed in terms of weight of pollutant per unit area plated which, in effect, creates a flow restriction on the discharger. Lancy recommends that the limitations be expressed in terms of concentration.

Both Lancy and EPA consider the potential effects which may follow the use of chelating and complexing agents and co-precipitation on the treatment system's performance. These uncertainties are not universally quantifiable. Evaluation of the effects of these phenomena can only be accomplished on a case-by-case basis.

We believe the technology recommended by Lancy is reasonable and will perform as estimated. It should be noted that the technology may not meet the EPA BPT limitations. We concur with Lancy that the control of heavy metals should be on the soluble form. We do not believe the recommendations for a separate limitation on total metals for control of the insoluble fraction is necessary. The insoluble fraction can be adequately controlled through a total suspended solids limitation.

Technically from an enforcement viewpoint we prefer that limitations be expressed in terms of concentration standards. However, standards based on concentration must be linked to water flow and variables which enable determination of economic impact.

Available information on operating experience indicates that the performance of Lancy's "BPT" (APL-1) should attain the predicted results. The "BPT" recommended contains sophisticated (but probably necessary) process controls which should increase the reliability of the system's performance. No other feasible technology appears more promising given the "state of the art" of the recommended technology and the remaining time period for compliance.

Best Available Technology (BAT). The EPA BAT limitations require no discharge of pollutants. Lancy states that it is not possible to operate a metal finishing process as a totally closed system with no waste discharge. We concur that reliable technology sufficient to achieve no discharge is not currently available, and that there is no assurance that it will be available by 1983. Lancy proposes not a BAT technology per se, but rather a mechanism whereby the discharge of pollutants is further reduced by control of the purchase and consumption of chemicals. This approach has potential merit, but would require additional development prior to implementation to overcome many problems including the following:

1. It has not been demonstrated that all of the required chemical regenerative processes are fully developed and ready for use. Furthermore, the economic feasibility of the proposed BAT technology is at best uncertain due to the questionable marketability of some of the regenerative chemicals.

2. Chemicals used in metal finishing may well be used in nonmetal finishing operations in a multiproduct facility and thus would create an inventory accountability problem.

3. An equity problem would develop between those plants now practicing conservation measures, and those not practicing conservation measures because Lancy envisions an across-the-board percentage reduction.

4. The ability to implement this approach in a regulatory program is questionable.

As previously stated, the technology(ies) to achieve BAT is (are) not well advanced. Therefore, it would be speculative to predict the likely performance of the proposed systems. We agree that the technologies advanced by Lancy as well as EPA represent several promising approaches. Significant research and development is needed to advance the "state of the art" of the proposed BAT treatment technology. If the proposed BAT technologies are not developed, further reduction from the BPT limitations could be achieved by the addition of vacuum filtration to the BPT treatment system.

New Source Performance Standards (NSPS). For new sources, Lancy proposes concentration limitations one half of the APL-1 limitations. This would presumably be accomplished through segregation of the various waste streams and optimum pH precipitation, but otherwise using APL-1 technology. We agree that optimum pH precipitation will generally achieve lower effluent concentrations, but we are unable to predict from the data given in the report a specific percentage reduction such as the 50 percent reduction Lancy proposes.

The technology proposed for new source performance standards may achieve the effluent concentrations predicted. But, Lancy has failed to demonstrate the cost effectiveness of the recommended systems. Further documentation is required before these recommendations are accepted as a universal regulatory approach.

Another approach for reduction of pollutants from new sources is process water reduction. This can be accomplished in new sources because of less stringent space or configuration limitations as compared to additions to existing sources. Therefore, water reduction, separation of waste streams, and effluent filtration, as mentioned in the discussion on BAT, seem to be promising approaches.

Pretreatment. The recommended pretreatment technology is reasonable, and the anticipated control levels appear to be feasible when viewed in the light of the previous discussion concerning BPT technology. However, the suggested pretreatment technology for small metal finishing and job shops omits listing of cyanide destruction, a necessary pretreatment step.

Lancy recommends that wastes from metal finishing plants be limited to 5 percent of the flow in the municipal treatment system, and that no discharger over 100,000 gpd should be permitted to discharge to a municipal system if suitably sized receiving waters are available for direct discharge. We find these recommendations to be arbitrary and believe that such decisions are best left to the municipalities.

2. Consistency with Standards Issued by EPA

BPT and NSPS. Since Lancy has chosen to recommend a concentration limitation approach and has not quantified water usage in its report, a direct comparison with EPA's promulgated BPT and NSPS weight limitations cannot be made. If one compares the concentrations EPA utilized in its development of limitations with Lancy's effluent concentration projections, it can be concluded that the EPA standards would not be attained. However, EPA's method of calculating total plant limitations should allow the limitations to be met for all complex, multiline facilities. Therefore, EPA standards could be described as reasonable for such large plants, not because of technical feasibility but rather because of the method of calculation.

The Lancy report does not develop limitations for both maximum daily values and 30-day average values. EPA has set the maximum day limitation at two times the 30-day average limitation. In our view, statistical analyses indicate that EPA's maximum day is too low. Thus, dischargers are guaranteed to be in noncompliance several days per year. Lancy should address this problem in the final report.

BAT. Lancy does not advocate the complete elimination of process wastewater pollutants as promulgated by EPA for Phase I industries. As previously discussed in the Technology section, we do not believe that a no discharge limitation is reasonable due to both technical and economical factors.

Pretreatment. Since EPA has not yet promulgated pretreatment standards for the metal finishing industry, it is not possible to compare Lancy's proposal with EPA's. It is our understanding that EPA is currently evaluating the pretreatment standards for the electroplating and other industries and contemplates significant changes in the approach to setting pretreatment standards.

3. Availability of Pollution Control Equipment

Based on Bureau of Domestic Commerce (BDC) surveys of manufacturers of wastewater treatment equipment in 1965, 1968, and 1970, that group of industries had combined annual sales of $300 million while operating at about 30 percent of capacity. This picture has changed due to acceleration of pollution control expenditures. Discussions with manufacturers indicate that there is still excess capacity and that capacity can be readily increased.

As a rule of thumb, about 30 percent of capital invested in industrial wastewater facilities is accounted for by equipment. Applying this 30 percent factor to data from the Bureau of Economic Analysis (BEA) on capital expenditures by U.S. businesses for water pollution abatement plant and equipment, we find that in 1974 equipment expenditures were approximately $560 million with 1975 expenditures expected to be $650 million. The only data available for estimating total national expenditures for wastewater equipment is for 1972. In 1972, BEA has estimated total expenditures for water pollution abatement at $8.3 billion of which approximately $6.0 billion was capital expenditures; applying the 30 percent factor gives an estimated $1.8 billion in equipment purchases in 1972.

If we assume that $60 billion must be invested in wastewater treatment by the metal finishing industry as suggested in the NBER report, the capacity of wastewater treatment equipment manufacturing plants would have to be expanded over 30 times just to meet the needs of pollution control in metal finishing alone, not including the increasing needs of municipalities and other industries. It is highly unlikely that such expansion of capacity could be realized in the time frame of the effluent limitations guidelines.

However, discussions with staff of EPA suggest that an average expenditure of $50,000 per treatment plant is a reasonable estimate. If that estimate is applied to the 60,000 to 80,000 establishments estimated by Lancy, the value of total equipment required would be between $0.9 billion and $1.2 billion, which the equipment manufacturers could tool up to provide.

Other information available to EDC indicates that the average treatment plant capital costs, based on 50,000 gallons per day effluent flow, is about $100,000 or about double the NPA estimate. On the basis of this higher cost, the value of total equipment required would be $1.8 billion to $2.4 billion. We believe that the equipment manufacturers could tool up to meet these requirements.

B. Economic Impact of FWPCA and Water Treatment Technology

1. Scope of Industry Coverage

Lancy's study covers Electroplating and Polishing, SIC 3471, and Metal Coating and Allied Services, SIC 3479, and operations in all industrial categories in which metal surfaces are prepared for finishing or are finished, including removal and scale in steel rolling mills, preparation of rotogravure plates. Lancy has expanded the scope of its study to include operations that do not now come under EPA promulgated guidelines.

EPA guidelines cover (1) establishments which are primarily engaged in all types of electroplating, coloring, anodizing, and finishing metals and formed products (SIC 3471), and (2) establishments which are primarily engaged in enameling, lacquering, and varnishing metal products, hot-dip galvanizing, engraving, chasing, and etching (SIC 3479). Most of the work performed by both of these industries is on materials owned by their customers.

Lancy's universe of plants engaged in metal finishing totals between 60,000 and 80,000 industrial establishments. Few industry representatives agree that the number is as large, a more likely number being 25,000 even within the expanded universe of industrial operations covered by the Lancy report.

Specifically, SIC 3471 and 3479 include 4,762 establishments, according to the 1972 Census of Manufacturers.

SIC	Number of Establishments	Book Value ($ mil.)	Value Added ($ mil.)	Value of Shipments ($ mil.)
3471	3,265	450	745	1,040
3479	1,497	220	372	702

Since the total number of establishments and the number discharging to public sewers in Lancy's universe is larger than the EPA universe, the NBER assessment of economic impact extends to operations which are not now covered by the EPA guidelines but which may be covered under subsequent regulations.

Further, it should be noted, according to Bureau of Domestic Commerce (BDC) industry data, of the 4,762 establishments in SIC 3471 and 3479, 126 establishments used in excess of 30,000 gallons of water per day in 1970. Total water use for the 126 was about 27 million gallons per day, of which about 15 million gallons per day was discharged to public sewers.

The remaining 4,600 establishments presumably utilize public sewers for essentially all of their waste discharge and will be subject to pretreatment regulations when promulgated.

2. Economic Methodology

The NBER analysis of economic impact was based upon the technological capabilities of the industry to meet the effluent abatement levels specified by the Environmental Protection Agency (EPA) and the costs associated with the technologies. This information was derived from the technical report prepared by Lancy.

Cost Estimates. Even though the construction of cost estimates for actual "representative" plants is an improvement over the use of model or exemplary plants, the methodological criticisms of the model plant approach are applicable. The main shortcoming of model plant analysis as performed in the EPA studies was the failure to relate the characteristics of the model plant to actual plants in the industry. The analyses performed for NCWQ do not demonstrate that the actual plants are in fact representative of the industry. Indeed, in the analyses, six existing plants (plus a survey of 70 plants in three cities) provide the basis for developing equations to estimate capital and operating-maintenance costs which are generalized to a population of 4,000 job shops and 66,000 captive shops. Moreover, the three cities which

served as the source of additional data on costs are not necessarily representative of the distribution of plants geographically. The degree to which the firms are not or may not be representative are not clearly indicated. Under such circumstances, the extent to which biases are present is not known or is not specified. Thus, generalizations are hazardous.

It is estimated that for most categories and for the industry as a whole, pollution abatement costs equal or greater than $5,000 per ton of chemicals consumed will price metal finishing shops out of the market. The estimate of $5,000 seems to be of dubious value for two reasons. First, in view of its aggregate nature, it does not distinguish differences in firm sizes and location of firms. Second, the cost data used by NBER understate the current cost of pollution abatement and control. All costs are estimated using June 1973 prices. Since June 1973, the percentage change in energy costs has been vastly greater than the general price level. This fact has resulted in the price of goods which are energy intensive in their production to also increase at a rate greater than the general price level. The metal finishing industry uses considerable energy and energy intensive goods to produce metal finishing services. Thus, costs will be higher than 1973 based estimates.

The industry's response to water pollution controls is based on the industry's historical water use. However, when costs rise, the search for economy will result in substitution of different materials. NBER does not cover the effects of substitution.

It is not clear how the domestic price elasticity for metal finishing is estimated to be in the neighborhood of 4 percent. Normally this means that for every 1 percent increase in price, the quantity of the good or service in question decreases by 4 percent. How is quantity measured in such a diverse industry? Furthermore, a good economic analysis should consider the product quality aspects of price elasticity because pollution abatement cost may result in a different quality of product.

"Chemical Consumption" as a Criterion. Lancy advocates the use of chemicals consumed (purchased) as the best indicator

for evaluation of the impacts of electroplate effluent limitations guidelines on the environment and on economic activity. In Lancy's view, chemicals purchased is the only common denominator which can characterize in a single measure the whole industry--70,000 plants using more than 600 different production processes.

Chemicals consumed (purchased) can be a sound measure for evaluating environmental impact. Clearly, if the vast majority of chemicals are discharged in effluents, then chemical purchases are an indication of environmental impact. However, if all effluents are to some extent already treated--as is the case--then the chemicals purchased approach loses its potency as an indicator of environmental impact. The approach advocated deals with the industry on a theoretical basis, not as the industry now exists. Further, this approach, which requires the measurement of inputs, does not eliminate the need to measure outputs, that is, effluent discharges.

A more basic objection is that chemicals purchased, as used in the analysis, is not an indicator of economic activity. The studies require that it be possible to evaluate the relationships between economic and environmental effects and their trade-offs. Clearly, if chemicals purchased is to be the criterion for effluent control, it must be related to an economic variable. Lancy contends that chemicals do not correlate with any of the available economic variables; specifically, that chemicals purchased cannot be indexed with number of employees, water purchased or effluent volume, surface area processed, or value added in manufacture. The basis for not using surface area or value added seems to be data unavailability. The unsuitability of employees and water measures is based on data from surveys by Environment Canada and Lancy. This data fails to show a positive correlation with chemicals, employees, and effluent volumes.

If the statistical analysis had been properly conducted, the Lancy results would be meaningful. In this case, we would expect correlation between these variables since production requires the use of chemicals and the cost of chemicals would encourage minimizing their use. Given this expectation, proper inquiry requires an explanation of the lack of correlation. Considerable variations in the quantities of chemicals used between plants imply specific production-related reasons for the variations in quantities

used. The text (Appendix D, page 25) cites an example from the Lancy survey of the extreme variations in chemical use. Two finishing plants, both having 1-5 employees, reported chemical use as divergent as 17 lbs./year/employee and 22,800 lbs./year/employee. Framing this in terms of the rate of chemical usage, the second plant uses 1,341 times as many chemicals as the first plant. A difference of this magnitude implies no correlation between employees and chemicals used, but a lack of correlation in this context makes no economic sense. This strongly suggests that explanatory factors are missing from the analysis. Considering the widely varying use rates and the existence of over 600 different chemical and electrolytic production processes, it is not unreasonable to find chemical usage, as used here, to be a poor economic indicator.

The conclusion that chemical use rates are a poor indicator for all 70,000 plants is not grounds to assert that chemicals per employee, and other factors are inappropriate as a criteria until they have been examined on a production process basis. The Lancy survey requested data on the generic types of chemical and electrolytic processes used--a total of 34 process types. This data would permit analysis by process. There is no analysis or data presented which shows on a process basis, that chemical usage does not correlate with employees or water volumes. We strongly suspect that if such analysis were performed, there would be correlation between these sets of variables.

3. Economic Impact

Both Lancy and NBER leave questions to be answered or at least treated qualitatively in the Commission's final evaluation and report. First and foremost of these are the effects on other industrial segments, given a major restructuring of the metal finishing industry. We have not been able to quantify these, but based on the similar situation caused by air pollution abatement regulations already experienced in the foundry industry, the effects will be substantial. Second, although detailed and comprehensive direct costs have been developed or estimated and extrapolated to the industry as a whole, the net economic effects on both the industry and its customers, suppliers and alternate process/product competitors have not been explored. The relevance and critical impact of such factors as short-term disruption of customer/supplier relationships,

increased import dependency, and side effects of alternatives and substitutions for conventional metal finishing are mentioned but left largely unexamined. Similarly ignored are potentially significant secondary results, such as the environmental effect on ocean dumping of highly concentrated toxic wastes (arbitrarily accepted as the most viable alternative in achieving BAT zero discharge); and the side effects of increased energy consumption.

We are faced with essentially qualitative assessments even though major efforts have been made to quantify the gross estimates that lead to the overall NBER conclusions.

The thrust of the Lancy and NBER reports, as we see them, are as follows:

1. Abatement costs, though impossible to quantify within very close limits, will be huge in the macro sense and even more impressive in relation to productive capital investment.

2. Most finishing operations will not be able to raise the required capital unless they are part of substantially larger operations (captive shops).

3. Plant closures will not be uniformly spaced over the time period from the present to 1984 but will occur en mass in 1977 and 1983, minimizing the chance of maintaining adequate capacity by a more orderly transition (if this possibility exists) from uneconomic to economic operations. NBER makes this inference but then uses a methodology based on orderly transition.

The findings of these two reports, though more detailed and inclusive, generally parallel the previous findings of Battelle and A. T. Kearney under contract to EPA.

Based on the above, it is obvious that the impact on the industry structure will be severe. Survivors will be only those with the most critical product and least elastic demand. It is also easy to envision periods of high import dependence and/or significant shifts to out-of-country metal finishing during interregnums in the maintenance of adequate domestic capacity at the 1977 and 1983 peak closure periods.

Capital Investment. NBER concludes that, in order to meet water pollution abatement standards, the average metal finishing shop will have to invest more money in pollution control equipment than it presently has invested in productive capital assets. NBER uses the example of a modest-size shop currently complying with BPT requirements (1977 deadline). The shop, with $120,000 worth of equipment ($30,000 of it for waste treatment), adds less than $75,000, at current prices, to the goods it handles. In order to meet the BAT (1983 deadline) abatement levels, that shop can be expected to spend $500,000 in capital equipment and $50,000 annually in operating and maintenance costs. It is virtually impossible for such a shop to raise the necessary investment capital. Even if it could, the enterprise would not be able to operate profitably without sharp increases in prices.

The NBER analysis provides the following range of estimates of cumulative expenditures directly attributable to the guidelines for pollution abatement (in $ billions):

	Static Analysis	Dynamic Analysis
1977 (BPT)	$10,258	$ 7,929
1983 (BAT)	44,566	31,163
1985 (GOAL)	68,078	44,686

Thus, by 1985 when the regulatory goal of "no discharge of pollutants" comes into effect, an industry with roughly $5 billion in present capital investment will be called on to invest $44.6 billion in new plant and equipment.

To put this into better perspective, we can compare it to the expenditures which the petroleum industry will have to make in order to comply with federal air and water quality standards by 1983. Chase Manhattan Bank estimates that between now and 1983 oil companies will make nearly $1 trillion in overall capital investments. Of this sum, the Council on Economic Priorities estimates that $3.35 billion will be spent for pollution controls. The EPA estimate is $4.5 billion and that of the American Petroleum Institute is $10 billion.

Therefore, it appears that the metal finishing industry will have to spend four times more than the oil industry in order to meet federal pollution standards.

Under such circumstances, it is not surprising that the NBER Study estimates that 35,623 of the 70,000 metal finishing shops could close before the 1977 BPT regulations go into effect.

Plant Closure Estimates. The dynamic analysis of economic impact is performed by positing the replacement of 35,623 old plants with 3,675 new plants which will meet New Point Source (NPS) standards. The new plants are said to be able to supply metal finishing services at pre-FWPCA prices. According to our estimates, the new plants, each of which replaces 9.7 old plants, have a total capital cost of $2 million of which $120,120 is for abatement capital. Of the $120,120, $37,320 is for abatement capital cost due to the FWPCA. Neither Lancy nor NBER provided such a breakdown of NPS model costs. The abatement costs for replacement plants (as listed in Exhibit 38) do not agree with cost estimates which are alluded to in a footnote on page 139. That footnote provides the only dollar cost reference to new model plants. Further, the cost analysis uses this new plant cost data incorrectly. The NBER states that their cost estimates contain a significant omission--the cost of closing the old plants. While NBER has not included the production capital portion of new plant capital costs in their overall costs to comply with the FWPCA, they should include such costs, since they are the costs of old plant closings. By not doing so, costs are understated and the resulting impacts are understated.

NBER estimates that 65 percent of the plants will close, through 1985, as a result of pollution abatement requirements. This plant closure figure, or equivalent in industry capacity restructuring, is a highly significant factor in that it materially affects all subsequent conclusions as to cumulative metal finishing industry abatement cost, ultimate price increases passed on to the consumer or user industries, the indirect effects of customer/supplier dislocations (both short- and long-term), and similar economic consequences. The NBER closure figure, however, is arbitrary, despite the fact that it is largely based on abatement costs developed by the Lancy report. NBER applies an across-the-board assumption that any plant that will incur abatement costs equal to or greater than an annualized expense of $5,000 per ton of chemicals consumed will close. The $5,000 figure is subject to reservations, as we have noted previously. On balance, it appears that the $5,000 criterion is low and that closures would exceed the NBER estimate.

The closures will be particularly severe in the case of small plants. The small plants are unorganized and unrepresented by trade associations. For example, the industry trade association has 800 members out of the roughly 5,000 job shops. It

should be noted also that the comments received by EPA were from trade associations and large metal finishers. Small metal finishers have had little voice in making known their technological and economic problems resulting from EPA guidelines. The closure of small plants will go largely unnoticed, since the EPA "Early Warning System" of plant closures covers plants with 250 or more employees.

Inter-Industry Effects of Plant Closures. The closure and replacement of plants are assumed to occur at a relatively constant rate over the period. The implicit assumption is that there would be little or no disruption of metal finishing services to customers, and no change in the historical supply/demand balance, product-mix, or total volume of metal finishing production work, other than normal growth.

The effects of plant closings and the changes in the structure of the industry not only have serious secondary impact on their customer group, but on the suppliers to the metal finishing industry as well. Taken as a whole, the market loss for total chemicals and materials may be only temporary, but the restructuring of the industry will result in long term changes in the type of demand and marketing patterns.

While the NBER model may be relatively satisfactory for estimating the probable magnitude of total industry abatement cost, it disregards the serious interindustry economic effects that are certain to occur if the volume of plant closures is anywhere near the projected level. Metal finishing operations, both job-shop and captive, are for the most part a continuous, integrated service function to other manufacturers, conducted on a closely coordinated customer/supplier relationship. Most importantly, it is largely a "local" type of business, with the "servicing capacity" historically tailored to the local and specific type of demands of a limited geographic area and customer group. Consequently, even the closure of one small metal finishing shop may have an immediate and serious economic effect upon the local manufacturers as a result of production slow-downs or stoppages for lack of an essential service. The shift to other suppliers of metal finishing services is not a simple matter. In most cases the manufacturer will have to go outside his local area to find

available capacity. The necessary out and back transportation of materials, parts, components, or products, and the time delay add materially to costs.

Also, considering the wide range and variety of types of metal finishing done, the more reasonably accessible outside metal finishing plants are not likely to be of a type that can meet the particular requirements and specifications needed by each manufacturer, or may not have the excess capacity to meet more than their historical local demand. Reestablishing a satisfactory, reliable, and close customer/supplier relationship may be very difficult.

It cannot be assumed that the historical supply/demand balance will be eventually reestablished by new or expanded capacity of surviving plants. If, because of abatement problems and costs, it is uneconomical or impractical to operate an existing local metal finishing operation, a similar new plant in the same market area may not be built. Expansion of reasonably nearby surviving plants cannot be relied on to provide the wide variety of metal finishing services demanded. The distinct differences between "job shop" metal finishing plants and "captive" plants, in flexibility of product mix, reserve capacity, customer diversification and economic situation, greatly complicate this problem. Not only are the generally smaller, less financially secure job shops affected more seriously by the costs of abatement and thus more likely to close, but any replacement of lost capacity by new or expanded plants would be biased toward the larger plants and captive type shops. Even in the long run, the historic structure of the metal finishing industry will be significantly altered.

Secondary Effects of Increased Metal Finishing Prices.
While the NBER report focuses on the magnitude of the cumulative costs for pollution abatement that must be passed on to consumer industries, they do not adequately present the economic consequences of such a price increase. A simple figure of cents per square foot of plating, or cost per ton of chemicals consumed, does not illustrate the economic effect and its consequences.

Although some types of metal finishing are essential and have limited or narrow substitution possibilities, many have alternatives. Under present conditions, these are

largely uneconomical or impractical, but with a significant increase in metal finishing costs and shortage of conventional metal finishing capacity, a considerable amount of substitution must be assumed. Different raw materials, product redesign, modified manufacturing processes, substitution of plastics and other materials for both coatings and final product, metallurgical changes (e.g., case hardening, nitriding for hard chrome plating) or simply getting along without some types of metal finishing (e.g., cosmetic appeal) are all viable alternatives. Any estimate of the degree to which this will take place is difficult in view of the extent and variety of metal finishing operations performed by the "industry" covered in the Lancy and NBER reports. Nevertheless, it is bound to be highly significant and affect both the structure and economics of the resulting metal finishing industry and its suppliers and customers. As with the direct interindustry effects discussed above, the magnitude of the economic consequences of this trend depends largely on the extent of metal finishing plant closures and the character of the restructured industry, as well as the magnitude of metal finishing price increases.

The probable extent and pattern of this trend must be examined much more closely, since it materially affects the size and type of the restructured industry and its pollution abatement costs and problems. Additionally, any significant changes or increases in substitutes or alternatives for the present metal finishing practices necessitates a reassessment of the energy and raw materials consumption picture. It is reasonable to assume that most alternatives to conventional metal finishing are presently uneconomical and a shift to them not only increases costs, but will require a greater energy consumption and demand for scarce raw materials and natural resources, such as petrochemical base materials for plastics and non-ferrous metals for special alloys that do not require conventional metal finishing.

A second effect of increased metal finishing prices that is not adequately treated so far is the probable increase in export of metal finishing jobs and import of products for which metal finishing is a major cost factor. It has been pointed out that with any significant degree of plant closings, customers and manufacturers will have to go far afield to obtain satisfactory metal finishing services and therefore use of foreign metal finishing facilities will not be as impractical as at present. Particularly for automotive demands (one of the largest metal finishing consumers), the

nearby Canadian facilities will have a competitive advantage over equally or greater distant domestic metal finishers. With both domestic prices and distance to domestic suppliers materially increasing as a result of water pollution abatement requirements, a significant amount of dependence on import of metal finishing services and final product is likely, particularly in the critical periods of 1977 and 1983 when the domestic situation is most disrupted. We believe that the cost and availability of imported services and the long-term effect of increased imports on the size and growth rate of the domestic industry are significant.

THE CHAIRMAN OF THE
COUNCIL OF ECONOMIC ADVISERS
WASHINGTON

August 4, 1975

MEMORANDUM FOR GOVERNOR RAYMOND SHAFER
Counsellor to the Vice President

FROM: Paul W. MacAvoy

SUBJECT: Industry Reports for the National Commission on Water Quality

On review of the Industry Reports on Pulp and Paper and Electroplating, three basic categories of questions were raised that should provide some direction for attempting to evaluate the NCWQ study effort.

First, specific questions were raised about how the methodology used by the contractors was implemented to derive the cost estimates that were made. These questions can, and should, be answered before the Commission issues its first report in October.

Second, there were questions raised about whether the overall study design used by the Commission was capable of fulfilling the legislative mandate given to it in PL 92-500. These are more difficult to answer definitively, but it would not be prudent to ignore them. They have political implications that will become apparent when the report is released. The final set of questions concerned the role, or lack of role, that the study effort could play in setting new environmental policy.

Both CEA and DOC seemed to agree that the economic models used in the reports they reviewed represented improvements over previous efforts. These models were developed by EPA to estimate the economic impact of the provisions in PL 92-500. But there are limits set by the models. The estimates of cost made in the respective studies depend on the "representative firm" analytical structure. Serious questions have been raised about biases that this technique can introduce into the cost estimates. It would be prudent to have someone

investigate this particular aspect of the methodology used in the reports. This could be done by comparing the estimates with those that have been made where a sampling procedure was used to generate real data on costs of meeting various rules or standards.

Another type of question raised concerns how inter-industry effects will be treated in the NCWQ reports. If the application of BPT or BAT brings about substantial changes in the way an industry such as electroplating is organized, for example, these changes will have repercussions on other industries. How will these effects be measured?

In the past EPA has attempted to estimate economy-wide effects by running macroeconomic models of the economy with and without pollution control costs. Such an effort, in this case, would not provide the needed information because the concerns that were raised center on dynamic adjustment effects and adjustment costs that macroeconomic models cannot identify.

There was also concern expressed by both CEA and DOC about the absence of environmental data -- particularly environmental data that can be associated with engineering and economic data on a regional or site-by-site basis. Without such environmental data, it is not clear that the NCWQ will be able to say that it has investigated adequately the environmental effects of the effluent limitations.

More important, without such information, the Commission's study effort will be much less useful for policy purposes. Without it one cannot see the association between different levels of control cost and improvements in water quality. Although the Commission may be attempting to ascertain the environmental effects of PL 92-500 in other studies, unless an objective procedure is developed for associating environmental effects with the industry cost data, the industry studies will be of no relevance for policy purposes.

These comments are in addition to the CEA staff comments that discuss the Pulp and Paper Reports. These are attached in memorandum form, for your future reference.

Attachments

UNITED STATES GOVERNMENT

Memorandum

TO : Paul MacAvoy

DATE: July 28, 1975

FROM : Allan Pulsipher

SUBJECT: Pulp and Paper Industries Study for the National Commission on Water Quality

I have read the file given to you on the pulp and paper industries. Joe Kalt has read the NBER report on the "Economic Impact" of the 1972 amendments on these industries. These studies represent a culmination, and in some respects a "perfection," of a methodology developed by EPA to develop the Effluent Guidelines called for by the 1972 amendments.

Although serious data problems remain, at least the reports on this industry are conceptually consistent. The conceptual and analytical mistakes that marred many of EPA's "Effluent Guidelines" studies have been avoided and corrected. The NBER study on the "Economic Impact" of the regulations even exhibits some analytical inventiveness in showing how the EPA developed methodology should be employed. In short, what the contractors evidentally were told to do, they seem to have done fairly well.

If one accepts this conclusion, however, two important questions remain.

1. Do the reports respond adequately to the legislative directions in PL 92-500?

2. Are the reports useful for evaluating and, if necessary, redirecting environmental policy?

Neither of these questions can be answered affirmatively and confidently on the basis of the sample provided by the pulp and paper reports.

Sec. 315(a) of PL 92-500 established "a National Study Commission which shall make a full and complete investigation of all of the technological aspects of achieving, and all aspects of the total economic, social, and environmental effects of achieving or not achieving the effluent limitations and goals set for 1983..." The Commission organized in response to this section has decided to include an investigation of the 1977 goals in its effort as well.

The study effort, as represented by the file furnished by Governor Shafer, has two major parts. The first is an engineering study[1/] of the pollution control technology available to the pulp and paper industries -- primarily aimed at finding out whether it would be capable of reducing effluents to the levels required by the Act, and how much this would cost the industry. The second part of the study effort is an economic study[2/] which attempts to translate the costs estimates derived in the engineering study into a "direct" effect on the industry -- i.e., how many plants of what type will close -- and an "indirect" effect -- i.e., what the short-run and long-run effects will be on prices, production, and employment in the industry.

1/ Capabilities and Costs of Technology Associated with the Achievement of the Requirements and Goals of the Federal Water Pollution Control Act Amendments of 1972 for the Pulp and Paper Industry, Hazen and Sawyer, 1975.

2/ The Economic Impact of the Federal Water Pollution Control Act Amendments of 1972 on the Pulp and Paper Industry, National Bureau of Economic Research, 1975.

Although I am not qualified to evaluate the comprehensiveness or accuracy of the technological judgments made in the engineering study, the file of comments on the first draft of the study do not evidence anymore objections or "outrage" than is typical in exercises of this sort. The more cogent criticisms seem to have been responded to in the final report.

The principal problem I have with the engineering report, per se, is its use of a "representative mill" to estimate aggregate costs for each "industry sub-category." The discussion of this is on pp. 141-143 and I call your attention to it. The defense of the procedure on the basis that the estimates are "in good accord with values presented by others," I find unpersuasive because the other studies employed the same sort of "representative mill" device to make their cost estimates. I am not able to evaluate the fundamental argument for this procedure -- that cost and time constraints simply preclude a more complete data gathering effort -- but, since I expect that this "representative plant" technique will be used in other reports to the Commission, a careful comparative, statistical analysis and investigation of the technique ought to be performed by the Commission.

There were no reviewer comments on NBER's economic study in the file. Both Joe Kalt and I read the report and we both agree it is better conceptualized and done than other efforts we have seen. However, the report is heavily dependent upon the data generated by the engineering report and the theoretical part of the analysis is much more complete than the empirical implementation of it. In general, however, the theoretical part of the economic report provides a good outline that could be used as a basis for evaluating other reports done for the Commission.

This still leaves the two more fundamental questions posed earlier. Do the reports respond to the legislation? Are they useful for policy purposes?

The Commission must be designing and implementing other studies to respond to PL 92-500's requirement to study "all aspects of the total economic, social, and environmental effects of achieving or not achieving" the standards set in the Act. Information contained in the reports in the file contain only economic cost data -- largely on an aggregated nationwide data. The only environmental data presented are broad, aggregate estimates of likely reductions in pollutant volumes that are curde arithmentic calculations of the broadest "rule of thumb" type. (See pp. 317 to 319 in the Hazen and Sawyer engineering report.)

This information would not enable one to begin to analyze the environmental consequences of achieving or not achieving the goals set in the legislation -- let alone the associated benefits. Some mills may be discharging effluents into waters that are so heavily polluted by "non-point" sources that even a 100 percent reduction in effluents by all industries (or point sources) would not have any discernible consequences on water quality. Conversely mills in isolated locations may be the only source polluting an otherwise pure river. Hence, a 70 percent reduction might be more than adequate to reduce effluents to completely safe levels. Such information may be available or derivable from the contractor's basic data collection, but it is not in the report and it will be needed for the Commission to satisfy the requirement in PL 92-500.

Similarly, without such information the reports are of limited use for evaluating or improving current policy. The ultimate conclusion of the two reports is an estimate of the relative increase in the price of the industry's output, and the nature of time path by which the higher price will be reached. In isolation, such an estimate is of limited use. It must be placed in a broader context for policymaking purposes. As it stands it can only be evaluated subjectively.

I have attached Joe Kalt's memorandum on the NBER study.

Attachment

UNITED STATES GOVERNMENT

Memorandum

(: Allan Pulsipher DATE: July 25, 1975

OM : Joe Kalt

JECT: NBER report on "The Economic Impact of the Federal Water Pollution Control Act Amendments of 1972 on the Pulp and Paper Industry."

This study is supposed to analyze the impact of the 1972 Amendments to the FWPCA on the pulp and paper industry. All things considered (e.g., the scarcity of data, methodological and estimation problems, etc.), the report is about as good as can be expected and is probably the best study that the government has commissioned so far on the effects of its environmental controls.

Based upon an examination of the institutional and technological factors in the pulp and paper market, the study estimates the capital (i.e., fixed), operating, and maintenance costs associated with meeting the 1977, 1983 and 1985 standards. Unlike most other studies which have estimated "clean up" costs on the basis of one or two "representative" plants, this study attempts to derive "representative" costs for each individual plant. Moreover, a significant improvement in this report relative to previous studies is its realization that firms may be able to adjust their basic production process and product characteristics in a way which reduces abatement costs. Most previous studies have taken processes and products as givens and estimated abatement costs on the basis of "best available" end-of-line technology. It is interesting that although the study reports abatement cost estimates for the cases of process and product adjustment, the National Commission on Water Quality required that the costs which were factored into the analysis of the impact on the industry's prices, output, and profitability be the abatement costs incurred in the absence of any process or product adjustments.

The study's basic cost data are taken from the companion report by Hazen and Sawyer, Inc., and are apparently based on fairly comprehensive information. One possible problem with the cost data is that the user cost of capital which is relevant for firms' decisions to invest in abatement equipment is taken to be greater than the long run average rate of return in the industry (presumably the competitive rate) because "few managers can justify marginal capital investments which reap the average return." This last statement is not explained. The study reports different abatement cost estimates and justifies using the lowest cost scenarios for much of the impact analysis on the grounds that managers are rational and will minimize costs. This last bit of economic reasoning is a great improvement over previous studies.

Once the total, average, and incremental abatement costs are predicted, the analysis turns to the impact of these costs on pulp and paper producers. Fortunately no attempt is made to quantify any macro "ripple" effects -- the quality of such analysis in previous studies has been atrocious. The economic methodology of the impact analysis is fairly good. Not only is there a rarely-seen understanding of the roles of supply and demand elasticities, but there is also a discussion of the substitution elasticities associated with pollution-causing inputs.

An econometric model with four "sectors" (demand, supply, investment, and capacity) is used to quantify impacts. The demand equations have both price and income arguments. The supply (marginal cost) curve is estimated as some function of capacity utilization. Investment is treated as a function of the difference between desired and actual capital stocks. Capacity is a function of lagged values of capacity and investment. The results of the model are not unreasonable: the price and profit impacts, for example, are larger in the short run and taper off toward an equilibrium after adjustment to the Act is accomplished. It is slightly disturbing, however, that the prices of pulp and paper are assumed to rise by 4 percent in the long run because it is found that the fixed costs of a new plant rise by 4 percent under the Act.

For the purposes of benefit-cost analysis, this study, by itself, is of little value, since there is no attempt to quantify the incremental value of the economic good "cleaner water" which is produced by the pulp and paper industry. It would be nice to know, for the purposes of policy, what people receive in return for their expenditures.