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DATE: December 29, 1987

FROM: Robert Drew
Martha Beauchamp *Martha Beauchamp*

TO: Health and Environment General Committee
Research Subcommittee
Legislative and Regulatory Subcommittee
HESD Research Groups and Task Forces
HEAD Issue Groups and Task Forces

RE: 1989 Research and Regulatory Response Budget

This memorandum is to bring you up-to-date on the progress of our efforts to develop the 1989 budget for the HESD and HEAD, and to outline the next steps. Committee leadership and staff from both departments have been working steadily for three months to develop a joint, programatically-organized research budget outline.

The Process to Date

At a planning meeting the last week in October, representatives of both departments and their committees identified five program areas for 1989 research and regulatory response: air, water, waste, fuels, and hazard evaluation and communication. The issues of concern, their potential impacts, and the needs for research and regulatory response activities were identified for each of the five program areas.

In early December issue and research group chairs and staff had a two-day meeting to further refine the organization of the five programs. In particular, efforts were made to prioritize and consolidate activity areas and to identify more precisely the types of research and regulatory response information needed to address issues within each of the five program areas. Additional efforts were made to further consolidate needs within more than one program area.

Based on the 1988 budget allocations and using guidance available from the two-year planning cycle for 1989, preliminary monetary guidance figures were assigned to each activity area. This is not intended to be rigid or to stifle creativity. It will, it is hoped, discourage at an early stage, development of proposals which can't be justified on the basis of presently identified needs and priorities. It will also indicate the substantial justification necessary for proposals that exceed the guidance.

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Finally, the groups charged to develop specific research proposals for the various activity areas were identified as well as the primary anticipated user groups. It is hoped that this will ensure that planners and users have a clear and united concept of why the work is needed and what information it will provide.

These efforts and the direction of our planning were reported to HEGC and to the CORE Group (a subgroup of HEGC charged with developing a long-term strategic research program plan) at their November meetings. We intend to keep them fully informed as we proceed and to make every effort to conform this 1989 budget to the strategic plan being developed by the CORE Group.

The Budget Plan and Research Proposal Process

The attached Summaries of Activity Needs is the product of the December meeting and will serve as guidance for developing specific research and regulatory response proposals. The narrative description of the five program areas including the issues and activities associated with each was prepared for the December meeting and is the basis for the Summary papers.

It is anticipated that all the Research and Issue groups will meet in January or early February to develop specific ideas and cost estimates, to establish specific priorities and to assign people to write up the research projects. A format for preparing specific budget proposals, along with a completed example, and a series of suggestions to consider in developing proposals are attached. Research and Issue Group chairs must submit all proposals to API no later than Wednesday, February 24. We will assemble and collate the projects into the five programs and mail them to the Planning and Budget Workgroup and the Issue group chairs who will meet the afternoon of March 8 and all day March 9 to review and further refine and prioritize the overall program to ensure that it meets the identified needs. The results of this meeting will be circulated to the HEGC, CORE Group and the subcommittees. The PBW and the Issue Group chairs will meet again April 12 to approve the final package, which will then be sent to HEGC for approval at their meeting on April 28.

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The Change for 1989

This year the budget process emphasizes five program areas, prioritizes issues and activity needs within those areas and develop research and regulatory response proposals to address these needs within a comprehensive framework. Development and review of individual proposals against the backdrop of a comprehensive program should facilitate and enhance our budget planning because it will allow us to develop greater unanimity about the need for and priority of various programs and projects. It will allow related projects to be reviewed in the context of an overall program designed to address clearly articulated needs and to avoid specified adverse impacts. It should be much easier to see what will be lost if an individual project is deleted. It should also demonstrate where there are information gaps that could be filled if the program were expanded.

We welcome your comments and suggestions.

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Things to Consider in Developing Project Proposals

1. A monetary value has been assigned to each Issue Area. This figure was "guesstimated" based upon some understanding of the costs involved in conducting the regulatory or research project and the 1988 budget allocations. While Task Forces should not feel bound by these estimates, an explanation will be needed if additional funds are felt necessary. Similarly, Task Forces should not feel compelled to utilize all of the funds specified if too much money was estimated.
2. Issue Groups, Research Groups or Task Forces believing that important Activity Needs were missed, should notify their Issue/Research chair and proceed to prepare project proposals to address these. A strong justification should be prepared for these projects since they will likely be scrutinized to an even greater extent than the projects already identified.
3. We suggest that chairpersons or designated project drafters consult with those committees that have a direct interest in the outcome of the project. These are identified following the designation of the Group/Task Force with primary responsibility. Coordination and consolidation is to be encouraged wherever possible.

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1989 HEALTH AND ENVIRONMENTAL PROJECT PROPOSAL

PROGRAM/TITLE:

OBJECTIVE:

DRIVING FORCES/IMPACT:

DESCRIPTION:

POSSIBLE OUTCOMES AND CONSEQUENCES:

ESTIMATED DURATION:

ESTIMATED BUDGET:

PRIOR COSTS:

FUTURE COSTS:

SUBMITTED BY:

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SUMMARY OF ACTIVITY NEEDS
FOR THE AIR PROGRAM IN 1989

Due to the emergence of two issues which have previously received little budgetary consideration, the Air Program budget shows a significant increase. These two issues are ozone and oxygenated fuels. Because of the impact each of these issues can have on the petroleum industry, they require special consideration at this time. However, there are important ongoing air programs which merit continued funding.

The following line items are a continuation of the 1988 Air Program.

CLEAN AIR LEGISLATION/REGULATION (\$300)

To respond to the anticipated flurry of activity surrounding amending or reauthorizing the Clean Air Act \$300 is needed for consultant support in developing testimony, position papers, and for responding to new regulations such as SARA Title III air emissions, etc.

Responsible group: AQIG

AIR TOXICS REGULATION (\$350)

Regulatory Response - To respond to EPA initiative to remove chromium from process cooling towers \$50k is needed for consultant support.

Responsible group: AQIG

Research - To help plant operators prepare for compliance with Title III \$200k is needed to continue a project which evaluates air toxic models, this will include both Arctic and urban topographies; \$100k is needed to do an exposure assessment around cooling towers which contain chromium.

Responsible group: ARG/EA

OTHER NAAQS (\$100)

Regulatory/legislative Response - To respond to Congressional and/or EPA initiatives to control NO_x and SO_x under acid rain \$100k is needed for consultant support to prepare testimony, etc.

Responsible Group: AQIG

VEHICLE EMISSIONS (\$300)

Research - To develop a data base to handle the federal and state initiatives to reduce the aromatic content of gasoline

\$250 is needed to determine the influence of aromatics on benzene emissions; to find alternatives means of controlling mobile source emissions such as I&M or vehicle controls \$50 is needed for data collection.

Responsible Group: ARG

The following ozone programs are proposed in anticipation of Congressional and EPA action on ozone non-attainment and standard setting.

OZONE STANDARD REVISION (\$325)

Regulatory/legislative Response - To respond to EPA's current review of the ozone standard \$75k is needed for a critical review of all available literature on health effects of ozone exposure; \$100k is needed for consultant support on both the primary and secondary standard review; \$150k is needed for a feasibility study on the possibility of doing a larger study on the socioeconomic costs versus benefits of a lower ozone standard.

Responsible Group: Air Quality Issues Group (AQIG)

OZONE NON-ATTAINMENT (\$450)

Regulatory/legislative Response - To respond to initiatives from EPA and Congress \$200k is needed for consultant support to examine the effectiveness of current VOC control strategies; \$150k is needed for consultant support to review the way states compile their emissions inventories and the accuracy of those inventories; \$100k is needed for consultant support to examine alternatives to the current EPA method of monitoring for compliance.

Responsible Group: AQIG

Research - To improve the data base on ozone exposure \$100k is needed to establish an exposure assessment program.

Responsible Task force: Exposure Assessment & Control Group

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CPI upon the recommendation of the Ad Hoc Oxygenates Group (AHOG) provided funds from 1987 monies to CRC to undertake two projects related to the use of oxygenated blends as fuels. CPI, also at AHOG's request, asked APRAC to prepare two proposals for research on methanol. APRAC has done this and these additional projects are reflected in their anticipated budget request in addition to the usual and ongoing APRAC projects.

APRAC (\$951k)

This is the funding request anticipated from APRAC. It includes the normal APRAC list of priorities (\$620). Also included are two methanol projects, one on emissions and one on smog chamber work. (\$330)

Responsible Group: Air Research Group (ARG)

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AIR PROGRAM GUIDANCE

PRESSURES/IMPACT	\$K 1988	EST.\$K 1989
Clean Air Legislation (Subtotal) (Ozone, acid rain, air toxics)	100	200
Air Toxics (Subtotal)	225	350
Modeling		200
Section 112		150
Other NAAQS (Subtotal)		100
SO _x		50
NO _x		50
Vehicle Emissions (Subtotal)	225	350
Benzene/Gasoline		250
Alternatives Reformulation		50
Vehicle HC Reductions		50
APRAC (Subtotal)	660	620
		Subtotal 1620
ITEMS ADDED IN 1989		
Ozone Standard Revision (Subtotal)	110	325
Primary Standard		150
Secondary Standard		25
Cost/Benefit Analysis		150
Ozone Non-attainment (Subtotal)	175	550
VOC Controls		300
Emissions Inventories		50
Exposure		100
Monitoring		100
APRAC		330
		Subtotal 1205
TOTAL	1495	2825

NOTE: THE DOLLARS SHOWN FOR 1988 REFLECT HEAD AND HESD FUNDS ALLOCATED TO AIR.

1988 HEALTH AND ENVIRONMENTAL PROJECT PROPOSAL

ISSUE/TITLE:

Issue: RCRA/Waste Management
RCRA Regulatory Response and
Legislation Development

OBJECTIVE: To provide an effective response to RCRA regulations, litigation settlements, and EPA interpretations, and to develop the materials necessary to support revisions to RCRA in 1988.

DRIVING FORCES/IMPACT: RCRA Regulatory actions during 1987-88 could cost API members billions of dollars. For example, loss of land disposal could cost refining operations at least \$200 million annually. Retrofitting surface impoundments or replacement with tanks would lead to an investment of \$4-6 billion. Data gathering to influence further amendments in 1988 will also be particularly important.

DESCRIPTION: The project will provide for contractor assistance in development of comments to be submitted to the EPA in response to regulatory proposals or studies that are expected to include the following:

- o Land disposal ban rules for high-volume hazardous waste
- o Criteria for permitting of solid waste disposal facilities (impoundments)
- o Deep well injection (land disposal) of hazardous waste
- o Underground tank regulations

The development of technical support for litigation efforts may include:

- o Toxicity Leaching Characteristic Procedures (health-based) standards, groundwater model)
- o Definition of Underground Tanks
- o Regulation of wastewater treatment impoundments as hazardous facilities

Preparation of material for 1988 legislative initiatives may include:

- o Risk management information
- o Facility Management under waste bubble approach

- o Extractive industry exemptions
- o Economic justifications

POSSIBLE OUTCOMES AND CONSEQUENCES: The anticipated result of this type of activity is more reasonable, cost-effective rulemakings by the Agency. The consequences of not being able to hire a contractor to assist in this effort will be a reduced ability of API to influence the outcome of the proposed rulemaking. In addition, the ability to prepare legislative initiatives will enable API to provide needed information to interested members of Congress.

ESTIMATED DURATION: 12 months

ESTIMATED BUDGET: \$240K

PRIOR COSTS: \$200K

FUTURE COSTS: \$150K

SUBMITTED BY: M.L. Fuson

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ISSUE/TITLE: Water Management/Sediment Quality Criteria

OBJECTIVE: To develop the necessary scientific data to evaluate and respond to proposed EPA protocols for derivation of sediment criteria for toxic pollutants.

DRIVING FORCES/IMPACT: EPA is currently developing a modeling approach for deriving sediment criteria for toxic pollutants. The criteria will set maximum concentration levels for the pollutants in sediments and will be used in the CWA Sec. 404 dredge and fill program regulations, will be incorporated into state water quality standards and Sec. 403 ocean discharge regulations. The end result will be more stringent limitations on the discharge of some pollutants in industry effluents, possible requirements to remove contaminated sediments adjacent to industry outfalls, and additional difficulties and expense in obtaining dredge and fill permits. The costs to remove sediments and to dispose of them in approved facilities alone could run into millions of dollars per facility. For example, a chemical plant incurred costs of \$1.2 million (1986 Canadian dollars) when it was required to remove sediments to one meter depth and 1500 meters in each direction of its' outfall because of alleged sediment contamination from its discharge.

DESCRIPTION: This project will continue studies initiated in 1987 to evaluate EPA's predictive models for determining the bioavailability and interstitial concentration of sediment contaminants. Microcosms will be used to determine the behavior of selected compounds in industry effluents (two organics and one metal) found to accumulate in water/sediment environments. The sorption/desorption kinetics of these constituents will be measured using a well-characterized sediment and the results tested in the EPA models. Toxicity tests using water column and benthic infauna will also be run to test assumptions in the EPA models; i.e. 1) sediment organic carbon normalization; 2) metal partitioning; 3) bioavailability/toxicity in sediments. Other approaches will be reviewed and the most promising investigated.

POSSIBLE OUTCOMES/CONSEQUENCES: This study will provide industry with timely data to evaluate EPA's methods for deriving criteria and to respond to specific sediment criteria when proposed (late in 1988). All segments of the industry will benefit, especially Refining and Production. The results can also be used by industry to evaluate any site-specific sediment criteria and cleanup requirements and expected effects on dredge and fill permit conditions. API research has been successful in impacting EPA's effluent hazard assessment program. This project could result in imposition of less stringent criteria by EPA.

ESTIMATED DURATION: 1 YEAR

ESTIMATED BUDGET: \$80K

PRIOR COSTS: \$120K

FUTURE COSTS: CONDITIONAL ON EPA

SUBMITTED BY: P.B. DORN

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AIR PROGRAM

I. OVERVIEW

The air program involves regulatory and research activities responding to federal and state initiatives stemming from the Clean Air Act and from RCRA and SARA. The activities affect refining, marketing, transportation and production operations.

Forces driving industry actions in the air area include:

- a. Numerous states can meet neither the National Ambient Air Quality for ozone nor the carbon monoxide standard by the 1987 deadline. Thus, they are under pressure to control emissions, often at great expense to the oil industry.
- b. Health effects issues relating to air pollutants are becoming more and more dominant in the political as well as the regulatory area.
- c. Questions of exposure, health effects and measurement errors have raised new questions about compliance with the standards.
- d. There are provisions of the Clean Air Act, RCRA and SARA calling for controls on emissions of hazardous air pollutants and proposed legislation which would stringently control air toxics.
- e. Continuing national and international concern about acid precipitation with implications for further control of NOx and SOx.

Following is a brief description of the principal issues and the research/information needs for industry to properly address them.

II. OZONE

A. OZONE NONATTAINMENT

There are currently 62 cities across the country that cannot meet the current ozone standard by the end of 1987. We expect more nonattainment areas after analysis of the 1987 monitoring data has been incorporated.

Both Congress and the Environmental Protection Agency have proposed new legislation, policy statements, etc. in order to resolve the problem. The proposed Mitchell and Waxman bills, for example, contain costly measures, such as command and control legislation, mandatory emissions reductions, elimination of bubble and netting (which currently provide some flexibility in choosing controls), short compliance deadlines, and construction

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bans. State and local governments and EPA will be under considerable pressure to enact hydrocarbon control regulations, and possibly NOx controls that are costly to the oil industry. For example, the ozone standard is the driving force behind proposed reductions in the RVP levels of gasoline.

The goal of the industry is to:

- o Ensure that the most cost-effective controls are put in place, that all emission sources are considered for controls (not just major sources) and that the controls that are put in place contribute to improvements air quality.
- o Ensure that the method for determining compliance is based upon a statistical representation of ozone levels found throughout the nonattainment area.
- o That proposed controls reduce human exposure to which to in fact pose health hazards.

In order to meet these goals, States and EPA must use sophisticated air quality models, improve their emissions inventories and reexamine their measurement system. API back up data to help support these efforts will go a long way toward helping API demonstrate to the Agency and to Congress that alternatives to costly control programs are feasible and desirable.

ACTIVITIES - ONGOING (1987-88)

During most of 1987, API's major focus has been to:

- o Respond to congressional efforts to enact new Ozone control legislation; and
- o Respond to EPA's Proposed Ozone Nonattainment Policy.
- o Begin responding to state actions on Stage II and RVP.
- o Collect data on the environmental impacts of oxygenated fules.

Back-up technical data on our position has been an important part of that position. The Ozone Concentration Data Analysis, for example, has been a key element in a successfully attempt to slow down very onerous House and Senate Bills and to begin discussions on a more realistic measurement system.

Another key 1988 objective will be to press for a more realistic measurement of progress toward meeting the standard and better modeling to select controls. API will conduct research and data analysis.

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Additionally we have worked on assessing the impact the use of oxygenated fuels will have on total vehicle emissions. We are sponsoring research which will clarify the issue. We continue to work for a rational approach to the introduction of oxygenates into our fuel supply.

ACTIVITIES - LONG TERM (1989 AND BEYOND)

We expect that the 1987-88 efforts will continue. Some of the focus may shift even further onto providing support to states in efforts to limit unproductive or unnecessary HC controls.

We will need to continue to do work on characterizing vehicle emission as the pressure increases for reduced RVP and use of methanol. We have proposed that APRAC look specifically at emissions from methanol vehicles and smog chamber work at modeling based on the findings of the emissions study.

To take a very futuristic view, it may be necessary for the industry to become involved in research on the global warming trend. Scientists are developing more data indicating that this theory may become fact. The practical effect on the industry, however, is that warm temperatures cause the formation of higher ozone levels and lead the states to control more and more HC's. The three record-breaking hot summers in the 1980's, for example, (1980, 1983 and 1987) have done considerable damage to many state and local efforts to reduce ozone levels.

B. OZONE HEALTH EFFECTS

At the same time that the Nation cannot meet the current ozone standard, the EPA is considering tightening the standard. This is because some experts believe that new health studies reveal health effects at or very close to the current standard and the CAA requires a margin of safety.

Although few believe that agreement will be reached to raise the standard, there is a critical need for API to provide additional health data in order to better evaluate the findings from the recent studies.

ACTIVITIES - ONGOING (1987-88)

During 1987, Dr. Jack Hackney, under contract to API, conducted a study of exercising athletes.

During 1988, API has plans to conduct a modeling study of the actual population exposure to ozone. It is clear that EPA's reporting system overstates the amount of ozone in the ambient air. Population exposure must also be considerably less than EPA's reports would indicate. Thus, before a new standard is

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devised, we need to identify what the actual exposure is.

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ACTIVITIES - LONG TERM (1989 AND BEYOND)

In 1989 we propose to do a critical review of the existing health effects ozone literature to determine if further research is required.

III. AIR TOXICS

The accidental release of toxic materials to the atmosphere over recent years has heightened industry, government and public concern over existing control measures and prevention/response planning. SARA Title III affirms the requirement for industry to evaluate potential hazards associated with its operations and develop comprehensive emergency response plans. In addition, EPA is under pressure from Congress to regulate toxic emissions under Sec. 112 of the CAA. Also, Congress has proposed legislation which would very stringently control toxic air emissions. Development of air monitoring and control requirement under the RCRA land disposal ban provision will further affect current industry operations.

The goal of industry research in this area is to provide better tools with which to evaluate the potential problems at the plant level and accomplish the necessary planning. Toxic gas models must be evaluated and improved population exposure modeling must be pursued. Such efforts will help identify whether these chemicals pose a threat that should or should not be regulated. The potential health effects of priority air toxics such as H2s from production operations should also be studied.

ACTIVITIES - ONGOING (1987-88)

Two toxic gas models DECADIS and SLAB, were improved, made PC compatible and more usable for industry. The effects of surface roughness on dense cloud dispersion are being studied. Dense gas data sets from field experimental programs (ammonia and hydrofluoric acid) are being evaluated and interpreted in preparation for use in further improving available models.

ACTIVITIES - LONG TERM (1989 AND BEYOND)

Evaluate the performance of toxic gas models using the results of preceeding work on surface roughness and data base interpretation to determine the most accurate predictive tool for emergency response planning.

IV. OTHER NAAQS (ACID RAIN)

The NAPAP study has helped mitigate concerns about Acid

Rain's effect on vegetation and wildlife. However, NAPAP will probably not put an end to the demand for controls. Indeed a new concern has begun to emerge about the potential for human health effects from exposure to acid precipitation. Should EPA be successful in linking health effects to acid rain, there may be a whole new set of pressures from Congress and the states to establish further regulatory controls on all sources of combustion.

ACTIVITIES - ONGOING (1987-88)

API activities are primarily related to support of lobbying efforts to eliminate or mitigate new legislation.

ACTIVITIES - LONG TERM (1989 AND BEYOND)

We will continue 1987-88 activities. New health data may be needed.

V. OTHER CRITERIA POLLUTANTS

The Clean Air Act directs EPA to review and revise, if necessary, the ambient air standard of each criteria pollutant every five years, at minimum. A revised standard for particulate was recently promulgated, shifting emphasis from total suspended particulate to the small, breathable particles of 10 microns and smaller. The other criteria pollutants are in various stages of review.

API research should continue to improve plume models (SOx/NOx) used to obtain permits under the Clean Air Act in consideration of air quality attainment at the local level. Earlier API research provided some information on the impact of the PM10 standard on refiners, but full impact evaluation is needed. Since health effects data form the basis of NOx and SOx controls, this data should be examined. In the longer term, the visibility impact of SO2/particulate should be studied.

ACTIVITIES - ONGOING (1987-88)

API efforts on other criteria pollutants have been made in the context of their relationship to acid rain, and to chromium emissions from process cooling towers.

ACTIVITIES - LONG TERM (1989 AND BEYOND)

EPA review of the NOx standard should begin soon. If it appears that they wish to tighten the standard, we will need additional health data.

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VI. COORDINATING RESEARCH COUNCIL AIR POLLUTION ADVISORY COMMITTEE (CRC APRAC)

Through APRAC API joins with the automobile industry to perform joint research on topics of mutual interest in the area of vehicle/fuels air pollution. It is one of the means by which API leverages its research investment in terms of dollars, technical expertise and advanced automotive equipment. Thus, APRAC research extends and complements the API air research program.

APRAC research focuses on three areas (1) vehicle emissions, (2) atmospheric processes and (3) measurement techniques development. Vehicle emissions work over the last few years has concentrated upon such topics as particulate emissions from diesel engines, vehicle refueling emissions and emissions model development. In the atmospheric area, most of APRAC's resources were devoted to the Southern California Air Quality Study as one of a number of government and industry sponsors. That program will provide data for developing improved models for use in future air quality control strategies.

In 1988-89, APRAC must continue to participate in SCAQS. Vehicle research should advance the diesel particulates work and the vehicle modeling effort. In addition, studies on emissions from methanol fueled vehicles should be undertaken and projects on the measurement of exhaust components of these vehicles should be considered.

VII. VEHICLE EMISSIONS

API regulatory and research activities regarding vehicle emissions evolve from requirements of the Clean Air Act and direct concern for human exposure to emissions from motor vehicles.

Both the federal government and state governments continue to view gasoline as a source to be further controlled in their quest to attain the National Ambient Air Standards particularly for ozone and carbon monoxide. Vehicle emissions also are being implicated with regard to human exposure to aromatics and as contributors to acid rain.

Research on vehicle emissions should include definitive evaluations of running losses and evaporative emissions under realistic vehicle operating conditions as well as an assessment of means to improve control of vehicle hydrocarbon emissions. Health oriented research on emissions should examine the effect of octane substitutes (MTBE, ethanol) and aromatics, alcohols and aldehydes.

VIII. OXYGENATED FUELS

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CRC is initiating research on oxygenated fuels. Any API work must be carefully coordinated with CRC. (Oxygenated Fuels is covered in detail under the Fuels pod.)

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TENTATIVE WASTE PROGRAM GUIDANCE

ISSUE	REGULATORY RESPONSE/RESEARCH NEEDS				
	REG. RESP/DATA GATHERING	TECHNOLOGY	MODELING	ANALYTICAL	HEALTH STANDARDS
LAND DISPOSAL BAN	X	X	X	X	
WASTE MINIMIZATION	X	X		X	
WASTE CHARACTERIZATION	X		X	X	X
PRODUCTION WASTES	X	X	X	X	X
SUBTITLE D	X			X	X
STORAGE TANKS	X	X		X	
CORRECTIVE ACTION/ REMEDIAL RESPONSE	X	X	X	X	X
	\$ 650K	\$ 750K	\$ 350K	\$ 250K	\$ 250+ K
TOTAL -	\$ 2250+				

NOTE: x's indicate that research/information needs described in the attached summary apply to the corresponding issues.

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SUMMARY OF RESEARCH REQUIRED FOR THE WASTE PROGRAM IN 1989

There are seven major issue areas of concern in the waste program reflecting both RCRA and SARA/CERCLA activities. Because many of the perceived research needs can provide information and assistance to at least two or more issue areas, the presentation which follows is organized by research/information topics rather than by the specific issues. For planning purposes, the 1989 preliminary budget guidance for the waste program area is \$2,250K. A tentative allocation of this amount by topic is shown below.

LEGISLATIVE/REGULATORY RESPONSE (\$200K)

Funds for legislative/regulatory response are needed to address specific rulemakings expected under all of the issue areas; i.e.

- Land Disposal Ban
- Waste Minimization
- Waste Characterization
- Production Wastes
- Subtitle D
- Above Ground Storage Tanks
- Corrective Action/Remedial Response (RCRA and CERCLA)

Responsible Task Forces: Waste Management and CERCLA work groups; P.W.I.G.

DATA GATHERING (\$450K)

Much of the effort under this activity will be integrated with HEAD legislative/regulatory activities rather than research projects. It includes specific information needs related to Subtitle D, storage tanks, groundwater characterization, and Production U.I.C and ancillary wastes activities. For example, EPA intends to focus on impoundments in the future and data will be needed to characterize impoundment sludges, water, and air emissions.

RESPONSIBLE Task Force(s) - Mainly HEAD RCRA/CERCLA work groups, Production's P.W.I.G., and ET's Air Emissions Task Force.

TECHNOLOGY REQUIREMENTS (\$750K)

Research is needed on innovative treatment technologies to address such areas as 1) treating petroleum wastes to meet potential requirements for BDAT, 2) waste minimization 3) pretreatment of VOCs to meet air emission standards resulting from 3004(n) of RCRA, and 4) cleaning up wastes from CERCLA sites or past solid waste disposal units at RCRA permitted facilities. Consideration should be given to

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developing comprehensive multiyear project proposals which can answer the research needs of all of these areas. The estimated budget for each year of the program should be given with emphasis on the scope of work to be carried out in 1989. Discussions should be held with the Corrective Action/Remedial Response Task Force so that proposed research will address the specific needs of that group.

Responsible Task Force - Waste Treatment (ET)

Research is needed on both state of the art and innovative technologies for cleaning up petroleum contaminated soils and groundwater in response to petroleum product leaks and spills and also for corrective action/remedial response requirements arising from RCRA and CERCLA. Again, consideration should be given to developing comprehensive multiyear projects which in addition to addressing constituents such as BTX should include constituents such as oxygenates, heavy metals, PNAs etc. With regards to the soil cleanup portion of the program, coordination of research with the Waste Treatment Task Force may be desirable since past and future refinery waste treatment technology research conducted by that group may be applicable to contaminated soils.

To ensure that the specific needs of the issue groups are met, discussions should be held with HEAD's Corrective Action/Remedial Response Task Force and the Storage Tank Task Force.

Responsible Task Force - Groundwater Technical T.F. (ET)

ANALYTICAL/MONITORING (\$250K)

Research on methods for chemical analysis of wastes, including soils and groundwater, benefits all of the identified pressure/impact areas and should be continued. In addition, there is a need to evaluate new waste characteristic procedures developed by EPA such as the anticipated air toxicity characteristic, and revised TCLPs for oily wastes and for surface impoundments. Research is also needed on improving sampling procedures for wastes, contaminated soils, and groundwater and to justify the use of a limited list of analytes for groundwater analysis at CERCLA and RCRA remedial action sites. Discussions should be held with the Corrective Action/Remedial Response Task Force.

Responsible Task Force - Environmental Monitoring; Groundwater Technical (ET)

MODELING (\$350K)

There is an increased need for research to evaluate and improve models being used by EPA and the states for a variety of regulatory programs. These include scenarios for waste characteristic tests, U.I.C., land treatment demonstrations, RCRA air emission regulations, and corrective action/remedial response. The types of models vary but emphasis should be on fate and transport models for contaminants in soil and groundwater. In addition to research on the models themselves, research is needed to improve the databases used for specific factors in the models and to validate models. The identification of data base projects should be coordinated with the Groundwater Technical task force.

Consideration should be also given to whether research is needed on source emissions models or dispersion models for atmospheric transport of constituents from area sources such as land farms or surface impoundments. The Air Emissions T.F. should discuss this with the Air Research Group's Air Modeling Task Force to see if that groups research could provide the needed information.

Modeling and data base research should address both short-term and long-term needs of the industry and should be packaged as comprehensive projects showing activities over several years where feasible.

Responsible Task force - Land & Groundwater Modeling T.F.; Groundwater Technical T.F.; Air Emissions Task Force (ET).

HEALTH BASED CLEANUP STANDARDS (\$250K)

Drinking water standards (MCLGs and MCLs) will be established over the next few years for a large number of compounds, mainly organics but some metals, many of which are present in petroleum wastes and products. Consideration must be given to evaluating the data gaps for each constituent of interest and developing, if feasible, the needed data. In addition, the feasibility of conducting toxicology research (mechanisms etc.) which would be helpful in affecting the risk assessment procedures used by EPA to set drinking water standards should also be considered.

Responsible Research Group - Toxicology with input from RCRA and Water Management Issue Group members.

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WASTE MANAGEMENT PROGRAM

I. Overview

The proper management of industrial waste and the upgrading of currently operating management facilities is an issue of major attention in the eyes of the public and regulatory agencies. Amendments to RCRA in 1984 call for government initiatives that promise to significantly increase the scope and detailed requirements of the already stringent waste management regulations. Specifically, the Amendments contain provisions that discourage land disposal (which by statute includes land treatment), expand the universe of hazardous wastes thru new listings and toxicity testing procedures, regulate underground storage tanks, specify waste minimization considerations, and provide for extensive cleanup of past solid waste disposal facilities. Of particular concern is the fact that in a number of cases the Amendments also changed the overall regulatory framework--if EPA fails to take action within a specified time frame, automatic sanctions are imposed on the regulated community.

The other major statute dealing with waste management is CERCLA, as amended by SARA (Superfund), which provides for liability, compensation, cleanup and response when hazardous substances are released into the environment. The primary emphasis to date has involved groundwater and soil contamination and appropriate remedies for cleanup. Activities involving releases to air are likely to become a greater concern over the next few years.

From a cost-impact standpoint the most important waste-related issue facing the industry over the next few years is the potential regulation of exploration and production wastes. Although EPA's draft report to Congress mandated by the statute suggests that E&P wastes should not be designated as hazardous (potential capital cost had been estimated at \$40 billion), the extent of regulation under other programs is uncertain.

Key pressures/driving forces which influence the current and future response and research programs include:

- o Potential for increased regulation of production wastes
- o Expansion of the hazardous waste universe through broader procedural definitions -- overly conservative health standards and inadequate models, unrealistic mismanagement scenarios, analytical methods

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- o Restrictions on land disposal without regard to potential harm
- o Potential strengthening of the overall waste management program thru amendments to RCRA or CERCLA or the development of state Superfunds
- o More stringent groundwater cleanup requirements, possibly thru comprehensive federal legislation

A more detailed summary of the major issue areas with associated pressures and short/long term activities follows.

II. Land Disposal Ban

Pressures/Driving Forces

The 1984 RCRA Amendments contain a provision which instructs EPA how and when to make specific determinations governing the management of selected categories of hazardous waste. Congress specifies that EPA prohibit the land disposal of specific wastes according to a specified timetable or establish treatment standards for such wastes prior to land disposal. Because the statutory definition of land disposal includes land treatment, EPA action relative to the industry's hazardous wastes could result in federal prohibiting of its continued use unless some variance is provided.

The statutory provision to gain an exception from the Land Ban focuses on two options: a 'no migration' petition or meeting the treatment performance standards set forth as Best Demonstrated Available Technology (BDAT). The present direction which EPA is taking may result in an interpretation that "no migration" means zero movement of a molecule of any hazardous constituent, including movement to the air, while BDAT will be based on extremely stringent technology standards, principally driven by incineration.

A separate and different provision in RCRA instructs EPA to expand the universe of hazardous waste by making new waste listings and identifications. The wastes which become hazardous will also be subject to the above prohibitions, thereby exacerbating the negative impact to the industry of the Land Disposal Ban.

Activities - Ongoing (1987-88)

From a regulatory response perspective, API is continuing to monitor, review, and maintain contact with appropriate EPA personnel to gain advance information relative to each rule-making on the Land Disposal Ban.

API is also gathering and assembling pertinent data regarding volumes of wastes generated and land treated,

compiling analyses relative to biodegradation rates and specific models, and continuing to address and quantitate air emissions from land treatment units.

Further, extensive efforts are continuing in lobbying activity on the Hill to provide data and arguments on the agency's rulemakings before they are promulgated.

In considering BDAT, API is continuing to evaluate other effective treatment technologies to compare with incineration in an attempt to affect the Agency's performance standards.

Activities - Long-Term (1989 and Beyond)

Continued evaluation of waste treatment technologies will be needed to assist in response to EPA's development of BDAT levels.

It will also be important to develop data on air emissions from land disposal units more broadly than only land treatment units to address upcoming regulatory activity for landfills and surface impoundments.

III. Waste Characterization

Pressures/Driving Forces

There is an overriding concern on the part of Congress and various environmental groups that EPA is either over/under regulating wastes as hazardous. To allay these concerns, Congress mandated, that EPA improve the existing methods for characterizing wastes as hazardous as well as revisit those wastes which the agency had previously determined to be hazardous. Under this instruction, EPA is focusing on a broad listing of primary sludges in the petroleum refining industry as hazardous, while simultaneously developing more accurate disposal scenarios and analytical and modeling tools with which to analyze and determine the 'hazardousness' of wastes. During the next several years EPA intends to promulgate tests dealing with surface impoundments, other refinery wastes, radioactive waste, and air emissions from hazardous wastes. Clearly, the impact to the industry may be enormous, and cover all operations.

Activities - Ongoing (1987-88)

API is communicating its position relative to the analytical and modeling issues to EPA, and has been successful in delaying the promulgation of the toxicity characteristic test and the leach procedure associated with it because of technical shortcomings. In the interim, API is continuing research which will assist EPA in its model development and is working with the Agency in assessing and improving the

existing toxicity characteristic test procedure for oily waste.

API is also gathering data and information from member companies which will assist in characterizing surface impoundments. This is primarily to narrow EPA's focus given that the estimated cost to bring all the surface impoundments into the RCRA program is estimated to be in the billions-of-dollars-range.

Activities - Long-Term (1989 and Beyond)

Research is needed to assist API in recommending modifications to, or develop other, models for particular disposal scenarios to predict the fate and transport of oily wastes in groundwater and soil. API should also continue research on evaluation/development of analytical methods, sampling procedures, and appropriate hazardous waste characteristic tests and provide such input to EPA.

API needs to develop additional data on wastewater surface impoundments and the constituents therein to address EPA rules and recommend changes or alternatives to the agency's intent to render these impoundments as hazardous. Further, API will need to participate in developing coalitions to prevent unnecessary and over burdensome regulations.

IV. Corrective Action/Remedial Response

Pressures/Driving Forces

In an attempt to reduce the number of future CERCLA sites, and to address the present superfund site cleanups, EPA is actively executing its authorities under both the RCRA and SARA statutes to assess, investigate, and prescribe clean-up remedies. Moreover, a number of existing state and local legislative initiatives require clean-up and corrective action at appropriate waste sites. New Jersey state law includes provisions which require clean up prior to sale/lease of property with approval and permitting in the jurisdiction of the state agency. Proposition 65 in the state of California requires labeling, extensive testing, and possible prohibition on disposal for a variety of chemicals, and other states are considering similar legislation. The obvious economic and liability issues for the industry are enormous and of great concern.

EPA is crafting Corrective Action regulations which will dovetail with the regulatory framework of RCRA, whereby all facilities applying for a RCRA permit must undertake Corrective Action. The agency has also published numerous guidance documents in the interim, which focus on general EPA policy and the execution and technical contents of facility

assessments and investigations. These documents exist for both RCRA and CERCLA and include descriptions of clean-up standards and appropriate levels. The agency is driving the RCRA and CERCLA programs closer together which is forcing industry action much quicker and at increased cost.

Current "permanent" remedies under CERCLA have increased the cost of a typical site cleanup significantly, and long term liability costs of monitoring and containing hazardous wastes on-site may pressure companies into more expensive permanent solutions. Interpretation of the "joint and several" clause also will influence cleanup technology.

Activities - Ongoing (1987-88)

API is participating in EPA's corrective action round-table forums to present the industry's perspective. API will review and comment on the various guidance documents and is compiling analyses of the different approaches prescribed in RCRA contrasted with those under CERCLA. This effort will assist in assessing whether EPA should indeed be bringing the two together, and if not, help to explain appropriate differences.

The status and content of state Superfund programs is being evaluated to assist member companies in responding to new initiatives and tax pressures.

API is also evaluating remedial response cost and technology by summarizing EPA site Records of Decision (RODs). Many of these were initiated prior to the Congressional directives in SARA which prefer long-term, permanent solutions, rather than temporary mitigation.

The EPA National Contingency Plan (NCP) is scheduled to be released for comment late this year. Major items to be reviewed include mixed funding directions, alternate concentrations limits use; de minimus settlements, appropriate and relevant requirements, and other issues that EPA Regions must implement.

Activities - Long-Term (1989 and Beyond)

API should continue its research on the scope of groundwater and soil contamination, detection and clean-up methods, and fate and transport mechanisms of oily waste and products. Evaluation, modification, and development of models for fate and transport of contaminants in soil and groundwater will also be important. These efforts will assist in site evaluations and help to offer remedial recommendations with scientific evidence of their effectiveness. Further, these areas of investigation will assist in the development of what is the appropriate level for clean-up and what criteria influence these levels.

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Continuation of the review of EPA Records of Decisions will be instrumental in assisting member companies with site specific data to negotiate settlements that are considered reasonable by the Agency.

SARA/CERCLA reauthorization legislative activities will begin, based upon the success and changing perceptions of EPA's administration of the existing law. Issues ranging from municipal site eligibility, required technologies, Agency discretion (flexibility) and taxation will all be open to modification in ways that could be inequitable or harmful to the petroleum industry.

V. Waste Minimization

Pressures/Driving Forces

There are at present, several Federal, State and local legislative initiatives which are recommending either a new regulatory program for waste minimization, or a federal clearinghouse to provide guidance to the states. Further, there have been two reports submitted to Congress with conflicting recommendations, one from the Office of Technology Assessment (OTA) and the other from EPA. The former identifies a need for active regulation of waste minimization and is premised on OTA's conclusion that industry is not doing all it can to successfully reduce the quantity of waste. The latter identifies no need for further regulation but focuses on the need for further data to fairly evaluate the issue.

The existing National Policy is to minimize the volume and toxicity of waste generated in the country. Current regulations include a requirement for certification by generators that a waste minimization program is in place. A key concern for API and its members relates to the definition of waste minimization which some would like to limit to source reduction rather than including recycling and treatment.

Activities - Ongoing (1987-88)

API is actively holding and participating in workshops and seminars to include industry views in any policy developments. Studies to more accurately define waste quantities and minimization technologies are planned for 1988.

Activities - Long-Term (1989-Beyond)

EPA has stressed that failure of industry to actively follow this issue and provide positive input could lead to rigid legislative mandates for waste reduction. To avoid such mandated programs, API will need to continue its efforts relative to technologies for reducing waste volume and toxicity and increase its educational program to be sure that

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the entire industry is informed.

VI. Storage Tanks

Pressures/Driving Forces

Under the current RCRA program, underground storage tanks containing hazardous substances and petroleum products are regulated. In response to environmental interest, Congress has also introduced several bills to regulate above ground storage tanks. Additionally, individual states have introduced several legislative initiatives to regulate all storage tanks. Such broad regulatory application could have severe impacts on all sectors of the industry and could severely hamper how products are presently handled and stored.

EPA is also looking to regulate storage tanks from a CERCLA perspective, principally driven by the existing Reportable Quantities requirement, as well as the Corrective Action/Remediation requirements for these tanks. In addition, the interest being given to alternative fuels may directly affect any legislative and/or regulatory action taken for storage tanks.

All of these initiatives are primarily focusing on ground water and soil contamination, remediation, and enforcement.

Activities - Ongoing (1987-88)

API has been extremely active in following the agency's underground tank proposals and has had a major impact on the initial proposals. Response to revised rulemakings, as well as the final rule, will continue in 1988. Additionally, new data gathering efforts and studies associated with above ground tanks are planned.

Activities - Long-Term (1989-Beyond)

It will be important for API to maintain its position that current industry practices are acceptable and provide data to support the effectiveness of those practices. Updating of some of the existing documents and new studies to show the lack of environmental harm from storage tanks may be needed.

VII. Subtitle 'D'

Pressures/Driving Forces

The provision of RCRA which governs non-hazardous wastes is Subtitle "D", which is primarily administered by the states. There is evidence and a growing concern that leachate

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from this non-hazardous waste poses as great a threat to human health and the environment, and therefore should be regulated as stringently, as hazardous waste. Much of the activity relative to creation of more stringent regulations stems from several law suits where drinking water contaminated, and leukemia deaths were attributed to the contamination.

EPA is presently evaluating which industries and/or industry sectors have the largest number of Subtitle 'D' facilities. The agency's preliminary draft report ranks the petroleum industry as second, behind municipalities. The largest segment of the industry currently regulated by such Subtitle 'D' programs is production, specifically produced water and drilling fluids.

Moreover, many member companies are concerned with unfair settlements at several superfund sites where municipalities are the major contributor to the problem, yet industry is viewed as the party which can afford the clean-up. That is, numerous Subtitle D facilities have been placed on the NPL and concern is growing as to who will pay to clean these municipal sites.

Activities - Ongoing (1987-88)

API has been tracking activity within the agency relative to Subtitle D reports. More importantly, API is monitoring the activity in Congress regarding the reauthorization of RCRA in either 1988 or 1989. It is clear that Subtitle D will be a key component of any further legislative initiatives.

Activities - Long-Term (1989 and Beyond)

Depending on legislative action during 1988-89, it may become important for the industry to develop suggested Subtitle D standards for its operations - these hopefully would recognize the difference in hazardousness when compared to many Subtitle C wastes as well as municipal wastes.

VIII. Production Waste

Pressures/Driving Forces

There exists in RCRA a special timeframe for EPA to evaluate production wastes from the petroleum industry and report to Congress on the need for regulation. After many delays and finally court action, EPA's study was initiated, and a draft report has recently been completed. API's primary concern was that EPA might determine that wastes associated with E&P operations are hazardous and therefore subject to compliance with the Subtitle C requirements for hazardous waste. The cost impact associated with this action was estimated at approximately \$40 billion. Although the

recently released draft EPA report indicates that E&P wastes will not be considered hazardous, the extent of alternative regulation is uncertain.

Activities - Ongoing (1987-88)

API undertook a parallel study to be prepared to support/refute the agency's findings based on analytical and technical arguments. API is planning to track the hearings, both state and federal, regarding this issue, and has submitted extensive comments on the Draft report transmitted to Congress in October 1987. Input to EPA relative to state UIC program effectiveness is also planned.

Activities - Long-Term (1989 and Beyond)

The initial indication that produced water and drilling fluids may not be subject to Subtitle C regulations does not mean that other Agency activity regarding Subtitle D or the UIC program will not be a significant problem. As such, API will need to evaluate several components of the UIC program such as fate and transport modeling, well location and standards, existing state programs and their effectiveness.

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FUELS PROGRAM GUIDANCE

PRESSURES/IMPACT	\$K 1988	EST. \$K 1989
Motor Gasoline	1282	1240
Oxygenates	--	165
Benzene	425	500
Fuels Other Than Gasoline	---	140
Total	1727	2045

Note: The dollars shown for 1988 reflect HESD and HEAD funds allocated to fuels.

The 1988 estimated funds include the following for HEAD regulatory response: \$500 K - Benzene; \$40 K - Oxygenates; \$40 K - Gasoline.

The breakdown of research required for each pressure/impact is shown on the following pages, attached.

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SUMMARY OF 1989 ACTIVITY NEEDS
FUELS PROGRAM

MOTOR GASOLINE (\$1240 K)

Gasoline environmental health effects issues continue to be a major concern to API members. These issues often are the catalyst for regulatory programs, as for example, EPA's automotive refueling rulemaking. The focus of IARC on gasoline may provide additional driving forces for other regulatory agencies.

Regulatory Response - An estimated \$40 K is needed to respond to anticipated regulatory initiatives at the federal level, and increasingly in state arenas. Specific areas of concern include limits on RVP and refueling emissions, and efforts to reduce or control gasoline aromatic content. These funds will be used to provide technical consultant support.

Responsible Task Force - Interdepartmental Committee on Motor Gasoline (ICMG)

Research - The large epidemiology study of gasoline distribution workers (OH-38D) is expected to be completed in 1988. Although the result will not be available until then, additional follow-up epidemiology research is likely to be needed, especially if certain cancer sites are shown to be elevated. Approximately \$450 K is anticipated to be required for this effort. An additional \$200 K is anticipated to be required in 1990. A constant dollar support to CIIT of \$250 K/year to investigate the mechanism of the carcinogenic effects of gasoline is requested from 1988 through 1990. This program will provide additional information on the mechanism of kidney damage in male rats following hydrocarbon exposure. Recognizing that the link between the nephrotoxic effect and the renal carcinogenic effects of gasoline needs to be more firmly established, \$500 K is sought to initiate the IBP-145 F "light ends" chronic study. This entails exposing laboratory animals to gasoline vapors representative of those generated during the automotive refueling process.

Responsible Task Forces -

OH - 38D: Epidemiology

Mechanism of Carcinogenic Effects of Gasoline Components:

Toxicology

Light Ends Chronic Study: Toxicology

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OXYGENATES (\$165 K)

Regulatory Response - A response effort is anticipated for federal and state initiatives that could mandate the use of oxygenated fuels. A modest budget of \$40 K is allocated to provide technical support for response efforts.

Responsible Task Force - Interdepartmental Committee on Motor Gasoline (ICMG)

Research - Three research areas have been identified. The first would examine the potential carcinogenic risks associated with the addition of ethanol to motor gasoline (gasohol). The methodology of EPA, Cancer Assessment Group (CAG) will be used (\$25 K). The second area would entail predicting the prevalence of serious poisonings and deaths arising from ingesting of M85 fuel, using available data on emergency room poisons from gasoline. This project would also be \$25 K. The final project (\$75 K) would entail generating quantitative estimates of methanol dose from dermal exposure - this probably being a major route of entry.

Responsible Task Forces -

Risk Characterization of Gasohol: Interdepartmental Committee on Motor Gasoline

Risk Characterization of Gasoline/Methanol: Occupational and Community Medicine

Dermal Absorption of Methanol: Toxicology

BENZENE (\$500 K)

Regulatory Response - An estimated \$200 K is needed in 1989 and in 1990 to respond to EPA remand of the Section 112 benzene standards. EPA plans to reissue the benzene standards as a result of the recent Vinyl Chloride decision. Focus of the response effort is to develop recommendations to EPA on new risk assessment techniques, and alternative means to establish safety and acceptable risk levels. This effort would also set precedence for other statutes including RCRA, and CWA. Information developed would be useful for legislative initiatives such as CERCLA/SARA reauthorization in the early 1990's.

Responsible Task Force - Benzene Issues Group

Research - Two research areas have been identified. The first would be a continuation of the CIIT benzene program for \$250 K in 1989 and 1990. The CIIT benzene research is investigating the mechanism of benzene induced leukemia, pharmacokinetics (i.e. absorption, distribution, metabolism

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and excretion of benzene in the body), and dose-response relationships. This research is viewed as a key aspect in efforts to prove that benzene exposure and leukemia are not linearly related, but have a non-linear relationship and a potential threshold of response. A second project would conclude in 1989 (\$50 K) investigating the benzene content in common foods. This effort seeks to establish that significant contributions to benzene in the body stem from food ingestion, putting into perspective the significance of low ambient benzene exposures from the atmosphere. (Benzene formation in exhaust emissions is listed under Air Issues).

Responsible Task Forces -

CIIT Benzene Research and Benzene in Food: Toxicology Committee

Influence of Fuel Aromatics on Benzene Emissions: Gasoline Vehicle Emissions Task Force

FUELS OTHER THAN GASOLINE AND OXYGENATES (\$140 K)

Regulatory Response - This effort would primarily address regulatory efforts to reduce sulfur and aromatic content in diesel fuel, as well as efforts to replace diesel fuel fleets with methanol. A modest budget of \$40 K is allocated for technical support.

Responsible Task Force - Interdepartmental Committee on Motor Gasoline

Research - In light of the examination by IARC in March of 1988 of several petroleum fuels (jet fuel, diesel fuel and fuel oil) for evidence of carcinogenicity, this project would assess the potential for human exposure to these products. The intent of the project would be to examine the literature to determine the disposition of these products in terms of the number of people potentially exposed, as well as the pattern and magnitude of exposure. (\$100 K)

Responsible task force - Exposure Assessment and Control.

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FUELS PROGRAM - MOTOR GASOLINE

OVERVIEW OF MOTOR GASOLINE ACTIVITIES

SHORT-TERM

In the near term, states will be under pressure to implement Stage II controls even if the onboard refueling canister is finalized. States may want to take the initiative for controlling refueling vapors to insure credit toward attainment of the ozone standard. Stage II costs are approximately \$21,000 for 9 nozzle station. Similarly, for Reid vapor pressure controls. States may move to enact control measures that are on a faster track (that is more steep) than EPA currently proposes in an effort to demonstrate "reasonable" progress toward ozone attainment. RVP cost estimates are \$1.5 billion for steep cuts of the like proposed in EPA's Phase II program. (That is, 9.0 RVP in Class C areas and proportional reductions in A & B).

LONG-TERM

Continued interest in the Baucus Amendment is expected. This amendment calls for a study of human exposures and health effects from aromatic hydrocarbons in gasoline and restricts the aromatic content of gasoline to 35% by weight. Continued concern about potential health effects from gasoline exposure are expected to remain.

PRESSURE/TRIGGERS

The pressures are twofold:

- (1) Continuing inability of areas to meet Clean Air Act's ozone standard. As a result, interest is expected to continue in reducing evaporative emissions through RVP reductions and refueling emissions through Stage II in selected areas.
- (2) Potential concern over health effects of gasoline, especially those possibly associated with the aromatic content of motor gasoline. Health effect concerns (not including benzene-related issues) are described in detail below:

EPA has taken the position that as many as 67 cancer deaths annually may result from exposure to gasoline vapors during automotive refueling. This estimate is based on the results of API's PS-6 laboratory study in which there was an excess of kidney tumors in male rats following exposure to wholly vaporized gasoline. EPA also views the epidemiology evidence as "suggestive of increased

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cancer incidence." The above is a secondary rationale for the agency's proposal to control gasoline vapors emitted during refueling.

In the Spring of 1988, IARC will examine crude oil, gasoline, and several middle distillate fuels for evidence of carcinogenicity. The results of these evaluations will be published in an IARC monograph several months later. While the exact denomination of these petroleum substances as potential carcinogens is speculative, it is possible that several of these important products will be classified as human cancer risks. The following year, IARC will evaluate solvents, including several of a petroleum nature.

Studies in Oklahoma have implicated refinery work experience and presumptive exposure to stoddard solvent among dry cleaner workers as risk factors for kidney cancer. While the scientific merit of these studies has been seriously questioned, the similarity of stoddard's solvent to the heavier ends of motor gasoline may lead some to question whether exposure to these complex mixtures presents a carcinogenic risk to humans.

Classification of some of these types of petroleum products as potential human carcinogens or implicating them as associated with increased chronic health risks will initiate increased regulatory pressure to control exposure or perhaps re-formulate these products to lower perceived cancer risks.

SHORT-TERM NEEDS

API needs to continue to update its cost and lead-time estimates for Stage II installation as information on Stage II implementation becomes available from experience in areas like New York and New Jersey and any other potential target for Stage II controls. More state specific information will be required on Stage II costs and impacts. Similarly for RVP, should States move on their own to restrict RVP beyond EPA's proposal, State specific impact information will be needed. The goal of both of these uses will be to limit the proliferation of Stage II controls, encourage federal preemption of refueling emissions as the most cost-effective approach, and limit magnitude of RVP restrictions by arguing for cost-effectiveness of ASTM standards and expanded evaporative canisters.

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LONG-TERM NEEDS

Industry should begin to assess impact of any restrictions of aromatics. It should also begin to amass health effects review information to provide as needed and if necessary critique scientific/technical material as it is generated.

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HAZARD COMMUNICATION AND EVALUATION BUDGET GUIDANCE

PRESSURES/IMPACT	\$K	EST. \$K
	1988	1989

Refinery Streams Program	180	350
Worker Notification	---	25
IARC Activities and Regulatory/ Legislative Response (inc. TSCA and Title III)	100	100
Neurologic Effects from Solvent Exposure	25	75
HESD Research Support	240	240
Guidance for Emissions Inventory	---	100
Public Outreach Program	---	100
Biological Indices	<u>---</u>	<u>25</u>
TOTAL	545	1015

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SUMMARY OF 1989 ACTIVITY NEEDS

HAZARD COMMUNICATION AND EVALUATION PROGRAM

GENERIC REFINERY STREAMS PROGRAM (350K, 5 yr program)

In 1987, HEGC charged the TSCA Issues Group with developing a program to minimize the impact of EPA TSCA Section 4 test rule on the petroleum industry. An ad hoc Workgroup recommended that API expand its voluntary research program aimed at materials that: 1) are of interest to the industry and 2) where test data had a likelihood of mitigating TSCA Section 4 test rules. \$180k was authorized in 1988 to begin the research program. It is envisioned that this would be at least a five year research program. The emphasis will be on selection and implementation of those materials most likely to provide necessary regulatory and safety applicability.

Responsible Task Force - Toxicology Research Group with input from the TSCA Issues Group

WORKER NOTIFICATION (25K)

Passage of federal legislation to designate and notify populations at risk of contracting occupationally-related disease is expected in 1988. API will need to respond to regulatory rulemakings relating to the passage of any legislation in this area - the bulk of which will likely be in 1989. This will require extensive industry data regarding occupational illnesses.

Responsible Task Force - Hazard Communication and Labelling Issue Group.

IARC ACTIVITIES and REGULATORY/LEGISLATIVE RESPONSE (100K)

In 1988 and 1989, IARC will evaluate and classify fuels and other petroleum substances and processes. This project would entail continued participation in the IARC review process as well as preparing and responding to any regulatory repercussions which may result from IARC's classification. In addition, numerous activities in 1989 will necessitate participating in regulatory and legislative proceedings directed at recordkeeping/reporting, health/environmental effects testing under TSCA, Superfund, Title III and other pending legislation, e.g. groundwater.

Specific examples include:

- 1) EPA will continue to issue TSCA Section 4 test rules which may impact the petroleum industry;
- 2) Testing requirements may result from the activities of ATSDR;

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- 3) Revisions and continued reporting requirements under TSCA and SARA Title III are expected.
- 4) Legislation pending in the U.S. Congress, would require extensive toxicological testing of fuel additives and lubricants.

Responsible Task Force - TSCA Issues Group with input from the Toxicology Subcommittee

NEUROLOGIC EFFECTS FROM SOLVENT EXPOSURE (75K)

The Neurobehavioral Task Force plans to complete in 1988 (1) a critical review of the neurobehavioral health effects literature and (2) planning for a workshop on solvent related neurobehavioral health effects. Hosting of the workshop may require a reprogramming request for additional funds in 1988. Anticipated needs in 1989 include contracting for services to perform a feasibility study, concentrating on the needs of the petroleum industry, to determine the appropriate population(s) for epidemiological study and the appropriate clinical neurobehavioral/neurotoxic endpoints to measure for signs of toxicity. Any resulting proposal will require long range strategic planning and the expenditure of considerable resources.

Responsible Committee - Occupational and Community Medicine Group with input from the Epidemiology Group and the TSCA Issues Group.

HESD RESEARCH SUPPORT - (240K)

A number of support services, not funded from individual research project budgets, are necessary to maintain a high quality research program. These include (1) research material storage and archiving, (2) consultant support for short-term services of scientific experts and (3) information services support to help prepare reports and papers for publication and dissemination.

Responsibility - David Disbennett

GUIDANCE FOR EMISSIONS INVENTORY - (100k, 3 yr program)

SARA Title III requires reporting of emissions into all environmental media (i.e., air water and soil). The industry has recognized the importance of improving the method by which companies estimate their emissions. The ability to readily, and cost-effectively model emissions will enhance the industry ability to comply with the regulation.

Responsible Task Force - Title III with input from Superfund Coordination and Reauthorization Group.

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PUBLIC OUTREACH PROGRAM - (100k, 5 yr program)

During 1988 and 1989, there will undoubtedly be tremendous public scrutiny of the industry. It is likely that:

- o IARC will classify various petroleum substances as possible human carcinogens,
- o ATSDR will issue to local and state organizations Toxicological Profiles , which will summarize in layman's terms the risk from exposure to chemical substances
- o Companies will identify for local and state commissions whether they have substances presumed to be hazardous on site and the quantity of these released to the environment.

The amassing and release of all this information will cause greater scrutiny of the industry. This project envisions a comprehensive public outreach program which should serve to minimize the public pressure. It will be important during this turbulent time to educate the public on the importance of petroleum products and the jobs created by the industry. API can serve a valuable role in disseminating information and preparing information for distribution to its members, and local and state councils.

Responsible Committee/Task Force - Hazard Communication and Labelling Task Force with input from TSCA Issues Group.

BIOLOGICAL INDICES - \$25K

ATSDR is exploring biological means of confirming exposure to chemical substances. These biomonitoring methods would be used for example, to determine whether individuals living near Superfund sites had been exposed to substances at the site. It is possible that biomonitoring will play an important role in conducting Superfund health assessments. This project would serve to review the state of science on biomonitoring and constructively comment on efforts by EPA and/or ATSDR to use this technology.

Responsible Task Force - Occupational Medicine

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BUDGET PROGRAM OVERVIEW

HAZARD COMMUNICATION AND EVALUATION PROGRAM

The Hazard Communication and Evaluation Budget Program consists of issues relating to international, federal and state activities aimed at the collection, dissemination, and evaluation of health effects related information. These issues primarily emanate out of TSCA, OSHA, CERCLA, and the Emergency, Planning and Community Right-To-Know Act of 1986 otherwise known as Title III.

To date, much of the impact of TSCA has related to the generation and submission of data. This includes requirements to generate health and environmental effects test data (TSCA Section 4) as well as the submission of production and exposure information (TSCA Section 8). The implementation of EPA's TSCA authorities has been fraught with difficulties particularly when directed to the petroleum industry.

The pace of TSCA regulatory proceedings is expected to increase. Recent reports from EPA suggest an interest in using TSCA to address issues that might typically emanate from other statutes. An example is EPA's plans to regulate under TSCA the use of hexavalent chromium in comfort cooling towers as opposed to the Clean Air Act.

In addition to TSCA needs, requirements to test are being driven by non-TSCA influences. The new SARA 110 provisions could lead to costly testing and greater scrutiny on substances of interest. In addition, mandated testing provisions are getting included in new proposed legislation. Of particular concern are provisions in amendments to the Clean Air Act that would require health testing of fuel additives and all lubricants within five years of enactment. If passed, no fuel additive or lubricant could be marketed without adequate health testing after that deadline.

Communicating the risks from exposure to hazardous substances is fast becoming a critical objective for the petroleum industry. Growing public concern over risks from exposure to hazardous substances in both the workplace and the community has brought an onslaught of legislative and regulatory right-to-know (RTK) requirements aimed at all companies using or producing potentially hazardous chemicals. The implementation of these laws, such as Title III, and the invocation of their pursuant regulatory obligations will further stimulate public awareness and concern in the years ahead. It is precisely this heightened public interest that necessitates the updating of existing risk management and communication programs for virtually every sector of the oil industry.

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The following issue areas are expected to drive API's activities as they relate to Hazard Communication and Evaluation.

HEALTH EFFECTS REVIEW OF PETROLEUM MATERIALS, INCLUDING IARC

In 1988 and 1989, the International Agency for Research on Cancer (IARC) will evaluate and classify major petroleum industry products including crude oil, gasoline, kerosine, diesel fuel, home heating oil, bunker oil and vehicle emissions. Other materials such as solvents and middle distillates will also be examined. The implications of an IARC classification can be dramatic given that IARC's classification of carcinogens are used by federal and state agencies as the basis for regulation. For example, the OSHA Hazard Communication Standard requires companies to classify as carcinogens compounds found by IARC to be probable carcinogens.

While the intense attention devoted to the neurotoxic potential of solvents appears to have abated somewhat, there exists a level of concern that heavy exposure of solvents, including those of a petroleum nature, presents a neurotoxic risk to those exposed. For example in 1985, the National Institute for Occupational Safety and Health (NIOSH) cited "sustained changes in personality or mood" and "impaired intellectual function" as having been shown in epidemiology studies of workers chronically exposed to solvents. Other studies, including a recent study of refinery workers in Europe, have implicated solvents as a risk factor in the development of kidney disease.

The combination of classifying petroleum products or processes as carcinogenic and implicating them as possible factors in human disease increases the potential for further regulation or restriction. In the worst of all possible scenarios, one could speculate that the federal government would dictate the formulae for various products.

Activities 1987-1988: Participate to the extent possible in government efforts to classify the health hazards associated with petroleum materials, particularly the upcoming IARC review. API's objective should be to assure that petroleum-related substances are properly characterized. In the case of IARC, this will entail ensuring that IARC has access to all current relevant information and making certain that API representatives participating in the IARC review process are adequately briefed.

Activities 1989 and beyond: Efforts should be made to plan for any repercussions which may result from IARC classifying petroleum substances as probable carcinogens. Even more importantly, an effort will be needed to assist member companies with the hazard communication/risk perception outfall of any adverse classification. In addition to cancer risk, there will be a continuing need to track and participate in the non-cancer health effects issues relating to petroleum substances, e.g. solvents.

RECORD KEEPING AND REPORTING REQUIREMENTS

New demands for release of sensitive information is expected in 1988. Much of this information will be released not only to EPA but the States, local communities and the public at large. Two notable examples are EPA's Comprehensive Assessment Information Rule (CAIR) and the implementation of Title III of SARA also known as the Emergency Planning and Community Right-To-Know Act of 1986.

CAIR - In early 1988, EPA plans to finalize its CAIR rule which will require manufacturers and processors to complete portions of a 100 page questionnaire on the manufacture, processing, exposure, disposal and use of a substance. Much of the information sought by CAIR is generally considered to be confidential business information. As proposed, the rule could require the generation of costly information without much anticipated benefit to improving health and safety. API's comments on the CAIR proposal took issue with EPA's authority to require the generation of new information using TSCA Section 8.

Title III - Reporting under Title III will begin in 1988. Companies must report to the local community the identity of hazardous substances stored on site, and notify the community if there is a release of a listed hazardous material exceeding its reportable quantity and a report describing emissions. How to deal with the impact of reporting XXX million tons/year of a substance is still unknown, and must be handled. The hazard communication "primer" is one step in addressing the situation. It is anticipated that there will be considerable community pressure once this information is released. This pressure may be in the form of more regulations to limit toxic pollutant releases and greater demand for community participation in industry operations.

ACTIVITIES 1987-1987: API will continue to track and participate in EPA's rulemaking proceedings under TSCA and Title III in an effort to limit the extent of unnecessary information requests. As rules are finalized, we will need to assess their impact on the industry. As data are collected and disseminated there will be a continuing need to assure that such information is properly characterized by the federal and state governments as well as understood by the public at large. API is developing a general manual on risk perception and risk communication. In addition, efforts are underway to provide a framework for characterizing the risk from benzene exposure (See description under Fuels). We will need to consider again whether to devise improved modeling and estimating emissions and measurement techniques.

Activities 1989 and beyond: There will likely be new proposed reporting requirements in the coming year. API should consider participating in rulemaking proceedings that may impact the industry. There will also be a continuing need to improve and increase efforts in hazard communication and evaluation to ensure

that any data collected and disseminated is correctly interpreted.

MANDATED TESTING AND TOXICOLOGICAL PROFILES

EPA is increasingly using its authority to require testing. The cost of TSCA mandated testing may approach \$4 million dollars per compound. The justification for this testing is no longer limited to supporting TSCA decisions. During 1987, EPA proposed a test rule on 73 substances to support the RCRA program. The use of TSCA to support other EPA program office is expected to increase.

The new requirements of SARA 110 have the potential to significantly add to requirements to generate new toxicological information. Over the next several years, the Agency for Toxic Substances Disease Registry (ATSDR) will issue Toxicological Profiles on over 275 substances, several of which will be of interest to the petroleum industry. The Profiles are to summarize and interpret available toxicological and epidemiologic information, in order to ascertain significant human exposure levels and, where appropriate, identify toxicological testing needed in instances where there is inadequate information. EPA is currently planning a TSCA Section 4 procedural rule on the use of TSCA to support the testing provisions in SARA 110.

Efforts by the government to mandate testing can lead to increased scrutiny on petroleum substances, diversion of industry resources to areas not considered to be of priority concern, and the generation of data not relevant to human risk assessment. Legislation pending in the U.S. Congress would require, if passed, extensive toxicological testing of fuel additives and lubricants.

Over the last year, API's has gained considerable experience in administering the C9 Aromatic Hydrocarbon test program. The Institute is currently exploring the management of the anticipated commercial hexane test program. This program will be financially underwritten by the commercial hexane producing companies.

In order to limit EPA's efforts to mandate testing of petroleum substances, API developed a generic streams testing program. Substances are being selected for testing if they are of importance to the industry and where test data may be valuable in averting a test rule. The initial focus is on petroleum streams that are also used as solvents.

Activities 1987-1988: The C9 test program will continue to play a major part of API's activities through 1988. Research funds are budgeted to conduct the testing mandated by EPA. In addition to meeting the regulatory deadlines, efforts will be needed to ensure EPA acceptance and proper interpretation of these studies. In addition, API will continue to track and participate in

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rulemaking proceedings under TSCA and CERCLA/SARA that may impact the industry.

In 1988, the generic streams testing program should begin. \$200,000 was budgeted for the initial phase of research. The focus of the testing is on substances and end-points that are of interest to API and tests which have a likelihood of influencing future ITC and EPA scrutiny of petroleum substances.

Activities 1989 - API will need to continue its efforts to limit mandated testing on the industry and work to ensure that any testing that is required is meaningful. New toxicological and epidemiologic information on petroleum related substances is expected in the next several years. Much of this information will be the result of EPA mandated testing under TSCA Section 4, e.g., cyclohexane, C9 aromatic hydrocarbon fraction, cumene, cresols. Continued focus on API's voluntary generic streams test program will be desired.

HEALTH ASSESSMENTS

The 1986 Superfund Amendments requires ATSDR to conduct health assessments for each facility on the Superfund National Priorities List. Health assessments are to include preliminary assessments of the 1) potential risk to human health posed by sites 2) existence of potential pathways of human exposure, 3) comparison of expected human exposure levels to the health effects associated with identified hazardous substances, and 4) comparison of existing morbidity and mortality data on diseases that may be associated with the observed levels of exposure.

Activities 1987-1988: To date, API has had minimal input in the health assessment process. We plan to comment on ATSDR's notice describing the scope and content of Superfund health assessments. API's objective is to ensure that health assessment pertaining to petroleum substances are properly conducted. Adverse assessments could lead to expensive clean up programs and increased liability directed at potentially responsible companies.

Activities 1989: API will continue to monitor and participate in health assessments on an as needed basis.

EXPANSION OF OSHA HAZARD COMMUNICATION RULE

In late August 1987, the Occupational Safety and Health Administration (OSHA) expanded the Hazard Communication Standard (HCS) to include virtually all aspects of the petroleum industry including transportation, production, marketing, and exploration -- in addition to refining to which the original standard applied. In essence, the new rule requires all employers to establish comprehensive hazard communication programs to inform and train their employees regarding the hazards of substances to which they are exposed or potentially exposed in their workplaces.

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Activities 1987-1988: It is possible that, in the near future, the HCS may be amended to reflect public comment and litigation pertaining to the promulgation of this final rule. API will continue to monitor these actions and participate in proceedings, when appropriate. Currently, API is developing a primer on risk communication, designed to aid plant managers in addressing public inquiries regarding worker and community exposure to hazardous substances.

Activities 1989: The revised HCS requires employers to develop and implement employee training programs regarding the potential hazards of chemicals, respective precautionary measures and emergency procedures, and the labeling and MSDS systems employed on-site. It is likely that API will play a key role in the development of these programs throughout the industry. Hazard communication is expected to become an exceedingly crucial and involving endeavor of the industry throughout the next decade.

FEDERAL LEGISLATIVE ACTIVITY REQUIRING NOTIFICATION OF POPULATIONS AT RISK OF DISEASE.

Notifying workers who are at increased or high risk of occupational disease has become a major labor issue in Congress this year. On October 15, 1987, the High Risk Occupational Disease Notification and Prevention Act of 1987 (H.R. 162), introduced by Rep. Gaydos (D-PA), passed the House by a narrow vote of 225-186. A similar bill introduced by Senator Metzenbaum, S. 79, is expected to reach the Senate floor early next year.

If enacted, this legislation will be quite troublesome for the industry. Briefly, these bills would establish a federal entity to designate and notify "populations at risk" of contracting occupationally-related disease. Such designation could be based on the extrapolated results on as little as one scientific study. Further, the bills would mandate that employers indefinitely provide and pay for medical monitoring and testing to such employees determined to be at risk. Employers also would be required to permanently transfer, at no salary and benefits loss, any employee for whom a medical determination has been made that it is necessary to transfer him or her to either a less hazardous position or one with no hazardous exposure. In short, such legislation would result in unwarranted costs to the industry.

Activities 1987-1988: API has been monitoring this legislation and has joined the Coalition to defeat H.R. 162 headed by the National Association of Manufacturers. Additionally, API has publicly supported the Henry/Jeffords substitute bill, which was defeated in the House on October 14, 1987 by vote of 191-234. API will continue to work closely with this Coalition in the coming year. During 1988, it is imperative that API become active in addressing the issue from the Senate side of the house. The disaffection of numerous chemical companies to support the Gaydos-Metzenbaum bills must be taken under advisement and

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efforts to defeat the legislation continued.

Activities 1989: Risk Perception/Risk Communication/Risk Management, will be vital issues during the 1988-89-90 time frame. If we are unsuccessful in our attempts to manage the process, we will be subjected to heavy regulation and even heavier distain from the public-at-large. API's role in this area must be acknowledged and implemented,. The formation of coalitions with other organizations to work the issues correctly is also necessary. Given the expected enactment of federal worker notification legislation next year, it is likely that API will be heavily involved in subsequent regulatory rulemakings.

STATE LEGISLATIVE RIGHT-TO-KNOW ACTIVITIES

In recent years, state legislative activity in the area of right-to-know has increased significantly. Because SARA Title III does not preempt state law, there has been considerable industry concern that further enactment of state laws could result in more regulatory obligations -- many of which undoubtedly will be duplicative and therefore unnecessary.

Activities 1987-1988: API will continue to track right-to-know activities in the states and will increase its efforts to lobby against those state requirements which could result in duplicative regulatory burdens on the industry.

Activities 1989: There likely will be more state regulatory obligations imposed on the industry in the area of right-to-know, and with them, even greater public concern. API will need to ensure that its communication programs address those concerns raised as a result of state requirements -- not simply federal regulations.

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WATER PROGRAM GUIDANCE (PRELIMINARY)

ISSUES	\$K 1988	EST.\$K 1989
Groundwater Legislation	75	150
Effluent Guidelines		
Production	380	400-725
Refining	0	400
Marketing	0	150
Surface Water Toxics	155	275-325
Safe Drinking Water Act	0	75
Natural Resource Damage Assessment	0	35-50
Oil Spill Mitigation	0	25-50
TOTALS	610	1450-1850

Note: The dollars shown for 1988 reflect HESD and HEAD funds allocated to water. (All 1988 groundwater research is allocated to the waste program.)

The 1989 estimated funds include the following for HEAD regulatory response: \$75K Groundwater Legislation; \$100K Refinery Guidelines; \$75K Surface Water Toxics; and \$75K for Safe Drinking Water Act.

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SUMMARY OF RESEARCH REQUIRED FOR THE WATER PROGRAM IN 1989

GROUNDWATER LEGISLATION (\$150K)

Regulatory Response - To respond to regulatory initiatives expected as a result of groundwater legislation anticipated in 1988, an estimated \$75K is required for consultant support.

Responsible Task Force - Water Legislation (WMIG)

Research - Facilities are being required to develop contingency plans for groundwater protection, similar to the plans required under the Spill Prevention Control and Countermeasure (SPCC) plans under Sec. 311 of the CWA. A research project is needed to develop generic guidance for operators to use in constructing the groundwater protection plan. It is envisioned that the generic plan will provide a starting point for industry affairs; (i.e. refining, production, marketing) to develop recommended practices for their facilities. Estimated cost - \$75K.

Responsible Task Force - Groundwater Technical with input from the CERCLA Remedial Response Task Force.

EFFLUENT GUIDELINES (\$950 - 1275)

Production (Research only)

To respond to EPA's development of offshore and coastal subcategory guidelines for E&P activities, an estimated \$200K is needed to complete the produced water bioassay and additive toxicity of drilling mud projects initiated in 1987-88. In addition research is needed on the fate and effects of E&P discharges into coastal waters. This would be a two year project with estimated costs of \$200K in 1989 and \$100K in 1990. Other research which has been proposed includes a project on the development of a solid phase bioassay protocol for drilling muds (\$125K) and a study of the environmental effects of oil-contaminated cuttings (a three year project; \$200K in 1989, 100K in 1990 and 150K in 1991.) The timeliness of this research should be reassessed in light of EPA's schedule for promulgation of offshore guidelines. The need for additional research to address coastal and onshore issues should be considered and should be discussed with appropriate Production Dept. groups.

Total estimated costs - \$400K - 725K

Responsible task force - Drilling Muds and Produced Water with input from appropriate subgroups of the Subcommittee on General Permits Coordination.

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Refining

Regulatory response - An estimated \$100K is needed for engineering and statistical consultants to assist API in providing input to and critiques of EPA efforts to develop revised refinery guidelines.

Responsible task force - Permits and Enforcement (WMIG)

Research - Approximately \$100K is needed to analyze selected split samples from the ten refineries where EPA expects to conduct wastewater characterization studies in 1989. In addition, research on the effect of flow reduction on mass discharge of pollutants and the applicability and costs of techniques for flow reduction (water recycle/reuse) is needed at an estimated funding level of \$200K.

Responsible task forces - Environmental Monitoring (ET) and Permits and Enforcement (WMIG)

Marketing (Research only)

An estimated \$150K is needed to continue the study initiated late in 1987 on technologies for removing organics and metals from marketing terminal wastewaters.

Responsible task force - Marketing Terminal Effluent T.F.
with input from E.T.

SURFACE WATER TOXICS (\$275 - 325)

Regulatory Response - An estimated \$50K is needed for consultant support for critiques of water quality criteria and (304) bioassay methods.

Research - An estimated \$100K is needed to continue the sediment criteria research initiated in 1987. Additional studies in the area of evaluating aquatic bioassays proposed for use in determining chronic effects of effluents is also needed and should address not only refining's needs but Production's as well; i.e. facilities in state coastal waters and onshore. (\$125K)

Responsible Task Force - (EBC) Biomonitoring Research T.F.
with input from CEC. **ADDITIONAL FUNDS SHOULD BE SOUGHT FROM OTHER GROUPS HAVING AN INTEREST IN THESE AREAS SUCH AS CMA AND EPRI.**

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Consideration should also be given to initiating research to evaluate selected short-term tests proposed by EPA for assessing the human health effects of effluents. A level of effort of about \$50K could be used to assimilate available literature on the use of the tests for effluents and to evaluate one or two of the tests on refinery effluents.

Responsible task force - Toxicology Research Group with input from the Biomonitoring Research task force.

SAFE DRINKING WATER ACT (\$75K)

Regulatory response - Funds of \$75K are needed to retain consultants to review and critique drinking water standards (MCLGs) proposed for compounds of interest to the petroleum industry.

Responsible task force - Safe Drinking Water Task Force (WMIG)

Research - A project to address data needs for certain compounds is being proposed under the waste program.

NATURAL RESOURCE DAMAGE ASSESSMENT (\$35 - 50K)

Research - A number of areas of research have been suggested by the NRDA task force of HEAD. Because the working group judged this area to be of lower priority than those listed above, estimated funds of only \$35 - 50K were allocated to this area. In addition, however, some regulatory response funds may be needed.

Responsible task force - The NRDA task force should decide which project should go forward for 1989.

OIL SPILL MITIGATION (\$25-50)

Research - The HESD Spill Response and Effects task force has suggested a number of research projects for 1989. Because this area was judged to be a lesser priority than the first four pressures/impacts, funds of only \$25-50K were allocated to this area.

Responsible task force - The Spill Response task force should decide which project should go forward.

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WATER PROGRAM

I. Overview

The water program encompasses activities and research responding to selected water legislative initiatives such as comprehensive groundwater legislation and selected EPA and state initiatives arising under the Clean Water Act (CWA), the Safe Drinking Water Act (SDWA), Natural Resource Damage Assessment under CERCLA and the CWA, and issues relating to offshore leasing for oil and gas exploration and production. These efforts benefit refining, marketing, production, transportation, and exploration.

The pressures/driving forces believed to pose the most significant economic impact over the next several years, and therefore requiring substantial research and regulatory activity, are:

- o Potential requirements and standards/criteria resulting from a new federal comprehensive groundwater statute, including potential "industry pay" provisions for health effects based research on groundwater contaminants.
- o Potential requirements to install costly control technology or change operations resulting from EPA's development of technology-based effluent guidelines and limitations for refineries, oil and gas exploration and production, and marketing and pipeline terminals.
- o Additional control costs which will be imposed on numerous industry facilities (refineries, possibly terminals and some production platforms) as a result of EPA's implementation of the surface water toxics control program as mandated by Sec. 304(1) of the amended Clean Water Act.
- o Proliferation of MCLs/MCLGs for contaminants in drinking water resulting in costly technology-based compliance.
- o Additional control costs resulting from potential stringent land-use restrictions and controls imposed on industrial facilities by Safe Drinking Water Act aquifer protection programs.

Other driving forces which impact the industry are:

- o Assessments for damages to resources resulting from Natural Resource Damage Assessment Regulations issued under CERCLA/SARA and the CWA;
- o Cleanup and liability costs for oil spills to surface waters imposed by Sec. 311 of the CWA;

- o Impediments to offshore leasing for oil and gas exploration created by concern over the effects of seismic activities.

Following is a brief summary of the specific pressures/driving forces including a discussion of the short-term and long-term research and regulatory activities believed to be necessary to mitigate the impacts.

II. Federal Comprehensive Groundwater Legislation

The 100th Congress is actively pursuing groundwater legislative initiatives. The House of Representatives is close to passing, without controversy, a compromise version of two research-based bills (HR 791 and HR 2253), which would divide groundwater research authority and technical expertise and responsibilities between the USGS and EPA.

In the U.S. Senate, "The Groundwater Protection Act," S 20, would establish a framework for a state groundwater management regime with federal guidance. EPA would be responsible for developing criteria for 150 groundwater contaminants over a three year period, with states responding with numerical standards based on the criteria. Additional provisions set out requirements for the development of state groundwater management programs. S 20 has been referred to the Senate Environment and Public Works Subcommittee on Water Resources, Transportation and Infrastructure.

The Senate research-based bill, "The Groundwater Research Act of 1987," was introduced both as an individual bill (S 1105) and as an amendment to S 20. Differing significantly from the House compromise bill, S 1105 would authorize a national program of groundwater research with the intention to expand and coordinate groundwater programs at EPA, the Department of Agriculture, and the USGS. Section 104 of S 1105 is of particular concern to the industry because it provides for research of the health effects of groundwater contaminants with the costs of such research paid by the manufacturers. As attached to S 20, S 1105 has also been referred to Senate Environment and Public Works.

Activities - Ongoing (1987-88)

API has been closely monitoring the activities in the 100th Congress in relation to these groundwater initiatives and has subsequently developed a policy position against any federal comprehensive groundwater legislation while emphasizing state primacy in groundwater management. It appears that it would be in the best interest of API to testify during the first scheduled hearing in 1988. Development of such testimony is currently underway.

In consideration of the referral of both Senate bills to Senate Environment and Public Works (a committee less than receptive to industry's concerns), a decision has been made within API to work with Senate Energy and Commerce staff to seek joint referral of the more favorable House research bill, HR 791, when passed. Eventually, this could force a compromise research bill and alleviate API concerns over S 1105 standing alone or as attached to S 20.

Finally, regulatory response must continue to include the tracking of California's progress with Prop 65, and involvement with API state councils to assist, where necessary, with response if similar initiatives emerge.

III. Effluent Guidelines and Limitations/General Permits

A. Production

Best Available Technology (BAT) and Best Conventional Technology (BCT) guidelines and New Source Performance Standards (NSPS) for discharges of muds and cuttings from offshore oil and gas facilities are due to be promulgated in 1989. Development of guidelines and standards for offshore produced water and for produced water, muds and cuttings discharges from coastal E&P facilities is underway and a proposal is expected in late 1989. Other discharges, e.g. deck drainage, will be addressed in later rulemakings.

It is less clear however, when EPA will revisit the issues of onshore E&P discharges. There are existing BPT guidelines which require "zero discharge" of produced water and muds and cuttings to surface waters for most onshore facilities. As a result most facilities reinject produced water and dispose of muds and cuttings into pits. Wells producing less than 10 barrels per day fall under the "stripper" subcategory for which guidelines were never promulgated. Also, some wells in western states fall under the "beneficial use" subcategory which allows discharges of produced water to surface waters.

However as a result of EPA's conclusions on the Production waste study conducted under RCRA, EPA may reassess the need for further regulation of reinjection wells for produced water under the SDWA's underground injection control program. In addition, the disposal of drilling muds may be subject to Best Management Practices (BMPs) under the CWA. With regards to the stripper wells, operators in the Appalachian region have petitioned for establishment of a new subcategory. And lastly, the state of Wyoming has recently become concerned over produced water discharges to surface waters authorized by the "beneficial use" guidelines and may move to impose treatment requirements.

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Activities - Ongoing (1987-88)

The goals of API's research and regulatory activities in the production area should be to develop information to eliminate EPA's proposed requirement for mandatory reinjection of produced waters in shallow waters, eliminate the need for routine bioassays on all discharges, (or at least obtain reasonable cost-effective tests), show that further controls on BCT parameters are not warranted. In addition, EPA and state efforts regarding onshore discharges will be monitored and input provided as needed.

Activities - Long-Term (1989 and Beyond)

Ongoing laboratory studies evaluating bioassay protocols for drilling muds and produced waters should be continued in 1989. Consideration should be given to initiating a long-term program to assess the fate and effects of coastal discharges on wetlands and estuarine areas. Additional research may be needed to respond to onshore issues as they develop. (Ongoing work regarding underground injection wells being carried out under the Production Waste study is expected to continue and will apply to any EPA efforts under the SDWA to regulate produced water injection wells.)

B. Refining

EPA has reopened the existing refinery guidelines with the intent of proposing revised BAT, BCT and NSPS guidelines in 1991. EPA plans to analyze refinery wastewaters not only for regulated parameters and priority pollutants, but for many other toxic pollutants which appear on RCRA and CERCLA hazardous substances lists (totals 416 components). They will also look at the possibility of requiring some inplant or source controls for pollutants within the refinery, as well as best management practices.

Activities - Ongoing (1987-88)

Substantial interaction between appropriate API groups and EPA is already being planned over the next several years. Beginning immediately, it will be necessary to understand what statutory authority EPA has in requiring upstream data collection and in establishing BMP requirements. Research efforts will be needed to address issues such as achievable industry flow reduction, wastewater characterization for pollutants not previously considered, and available and cost-effective additional treatment technology/source reductions.

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Activities - Long-Term (1989 and Beyond)

API must continue to monitor and provide input to EPA's development of refinery BAT requirements as guidelines are continuously revisited by the EPA pursuant to the statutory mandate of section 301(d) of the CWA. Long-term research on innovative technologies beginning now, could aid in the 1996 guideline reviews.

C. Marketing

Effluent limitations for marketing and pipeline terminals are set by the states or EPA regions using best professional judgement. However, there is a possibility as a result of the CWA Amendments of 1987, that EPA will move to develop national guidelines for these secondary industries in the next few years. Most terminals have only oil and water separation equipment since, until recently, the main contaminant of concern was free oil and grease. Although terminal wastewaters are generally low volume, they can be heavily contaminated with soluble hydrocarbons, oxygenates, and some metals.

Activities - Ongoing (1987-88) and Long-Term (1989 and Beyond)

Continued research is needed to identify and evaluate cost-effective management practices and control technologies to remove the soluble organics and metals from these wastewaters.

IV. Surface Water Toxics Control Program

Sec. 304(1) of the CWA requires the states to develop a list of surface waters that do not meet water quality standards for toxic and other pollutants, to identify the point source discharges causing the impacts, and to develop control strategies through the NPDES permit program for each point source. This mandate involves subissues such as the validity of EPA criteria for individual toxic pollutants, appropriate use designations for state waters, bioassay testing of effluents and the relationship of the results to instream affects among others. The first round of activity will be between now and the end of 1989, however EPA has indicated that this will be a continuing program.

Activities - Ongoing (1987-88) and Long-Term (1989 and Beyond)

The goals of API activities and research in this area are to ensure, as far as possible, that the controls and NPDES monitoring requirements eventually imposed on industry

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facilities are not unreasonable and are fully necessary to improve the quality of receiving waters. The ongoing work in evaluating EPA's aquatic bioassay protocols, and the investigation of sediment toxicity and EPA's efforts to develop criteria for toxics in sediments should be continued. Research may also be needed to evaluate procedures for carrying out toxicity reduction assessments. Additionally, API should monitor any EPA or state efforts to impose screening bioassay tests or fish model carcinogenicity tests for evaluating human health hazards of effluents and be ready to initiate the appropriate research.

V. Proliferation of Maximum Contaminant Levels, MCLs and Maximum Contaminant Level Goals, MCLGs

The Safe Drinking Water Act of 1974 required EPA to establish National Primary Drinking Water Standards as a means to provide for the safety of the public water systems. The Amendments of 1986 require EPA to promulgate enforceable national primary drinking water standards (MCLs) within three years, for 83 contaminants including volatile organics, organic chemicals, inorganics, microbials, turbidity, and radionuclides. In addition, EPA must establish standards for an additional 25 contaminants, with a priority on CERCLA and FIFRA substances, beginning in 1988 and therefore at three year intervals.

The basis for these standards are the MCLGs, or levels known to have no adverse human health effects. The actual primary standards are to be set at the MCLs, which must be as close to the goal as possible considering technology, treatment techniques, and cost. To date eight such standards have been promulgated by EPA and the agency plans to propose an additional 40 by early 1988.

Activities - Ongoing (1987-88) and Long Term (1989 and Beyond)

EPA believes that all groundwater sources which may contribute to a drinking water supply must meet national primary drinking water standards. The petroleum industry is impacted greatly as these standards become final, either by implementing technology to meet the standards, or by being forced later by EPA to cleanup to the standard. Therefore, API continues to closely monitor the promulgation of standards for those contaminants of concern to the industry and respond with comments when appropriate. Review of the health basis for such constituents will be needed in 1988 and beyond.

VI. Drinking Water Programs

The 1986 Amendments to the Safe Drinking Water Act, established the first nationwide program to protect groundwater resources used for public water supplies by

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mandating the establishment of state programs to protect wellhead areas (the Wellhead Protection Program, WHP), through the establishment of a demonstration assistance program for states or local entities to protect sole or principal source aquifers (Sole Source Aquifer Program, SSA), and through the establishment of the Critical Aquifer Protection Area, as defined as an area located within an EPA approved SSA or an area for which a groundwater quality protection plan under Section 208 of the CWA has been approved by EPA.

All three programs will inevitably restrict industry's production, refining, and marketing operations by imposing land-use restrictions or controls as program designations are made by individual states and approved by EPA.

Activities - Ongoing (1987-88) and Long Term (1989 and Beyond)

EPA has released very general guidance documents for implementing the WHP and SSA Programs. Because of the generic nature of the guidance documents, API had no substantive concerns at that time. However, API's regulatory activities will now include input at the state council level through a well organized orientation and "alert" effort. By making the state councils aware of potential pitfalls in EPA program guidance documents, if not tailored properly to the specific needs of the state, the knowledge can be utilized by the local councils in their own lobbying efforts at the state level, and the resultant impacts on the industry may be less restrictive than anticipated.

(State Underground Injection Control Programs (UIC) are affected by provisions of the Safe Drinking Water Act. Particular concerns with Class V wells are discussed above under Section III.)

VII. Natural Resource Damage Assessment

Regulations for assessing damages to natural resources; i.e. land, fish, wildlife, air, water, groundwater etc. controlled by the U.S. or a state, have been promulgated under CERCLA and are to be reviewed and revised every two years. Procedures have been finalized for conducting both simplified (Type A) and complex (Type B) assessments; the Type B rule is under litigation by state and environmental groups and API has intervened. These regulations have the potential to impose significant costs on companies when spills of petroleum or hazardous substances occur.

Activities - Ongoing (1987-88)

Industry believes that the Type A procedure is preferable in many situations and would like to see it broadened to include spills to freshwaters (it currently only applies to

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marine waters). Research to determine the overall effects and examine damages that have been assessed for freshwater oil spills, and to analyze the toxicological database used in the procedure is needed to provide input to Type A revisions expected within the next two years. The "acceptance" criteria and the "categories of injury" for biological resources in the Type B procedure are questionable, and need to be critically evaluated in 1989 to provide input to DOI prior to the 1990 review of this rule.

Activities - Long-Term (1989 and Beyond)

Other activities which would be helpful include evaluation of the long-term impacts of oil on biological resources and review of the administrative, procedural and technical problems associated with the NRDA regulations.

VIII. Oil Spill Prevention and Mitigation

Substantial API efforts have been expended in the past on issues relating to oil spill prevention, mitigation, and the fate/effects of dispersed vs. untreated oil. Such research has been and continues to be of great assistance in lease sales. The program relating to the effectiveness and impacts of dispersants has been successful in gaining not only acceptance but advocacy of their use by EPA and the Coast Guard; although some states are still reluctant. Dispersant use is an important issue because it has the potential to reduce substantially any injuries to natural resources, and consequent damages assessed to the industry.

Activities - Ongoing

Activity in the oil spill/dispersant area should be maintained, and some research (with co-funding sought from by EPA or MMS) supported. The objectives of the program would include improved contingency planning, faster and more effective response to major oil spills, and wider acceptance of dispersants as a first-line response tool to mitigate the environmental effects of spills and their cost to industry and the public.

IX. Impediments to Offshore Leasing

Offshore leasing regulatory and policy issues are handled by Exploration, however technical assistance, based on past oil spill research is provided as needed. With the current concerns on impact of seismic activities on fisheries, efforts should be made to monitor and provide input to the relevant research of other groups such as the Minerals Management Service.