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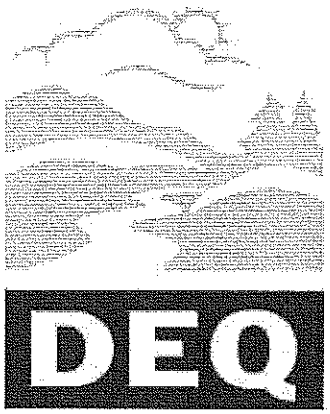
2/24/1978

OREGON
ENVIRONMENTAL QUALITY
COMMISSION MEETING
MATERIALS



State of Oregon
Department of Environmental Quality

ROBERT W. STRAUB
GOVERNOR

Environmental Quality Commission

POST OFFICE BOX 1760, PORTLAND, OREGON 97207 PHONE (503) 229-5696

POLICY STATEMENT
OF THE
OREGON ENVIRONMENTAL QUALITY COMMISSION

ADOPTED MARCH 17, 1978

The Department shall conduct experimental burning by requiring areas to be burned using into-the-wind strip lighting and back-burning techniques during the period July 1, to August 31, 1978. During such period research shall be conducted on the effect of such techniques on characteristic emissions and plume bahavior. The Department shall determine whether such techniques reduce low level smoke emissions.

If the Department finds such techniques reduce the total amount of particulate emissions and will not adversely affect air quality, it shall require the use of such techniques for burning stubble of those grasses specifically not susceptible to damage by use of such techniques.

34645 Lake Creek Drive
Brownsville, Oregon 97327

February 27, 1978

Environmental Quality Commission
Mr. Ron Summers
P. O. Box 1760
Portland, Oregon 97207

Dear Mr. Summers:

I attended the February 24, 1978, meeting of the EQC. I was in attendance from 9:00 a.m. until 4:00 p.m.

I feel that you are to be commended for being familar with the February 24 agenda, the laws of Oregon set for the EQC, and for being especially verbal urging compliance with regulations set by Oregon law to provide Field Burning Regulations for 1978.

I feel that the vote of the commission to not set those 1978 Field Burning Regulations into action and to delay on a decision was a major disaster to the implementing of the regulations by the DEQ, the many fire districts, and the hundreds of grass seed growers. All must cooperate in their varied responsibilities for 1978 yet all still remain unsure of what is expected of them this year. It is not fair and equitable treatment under the law and a humiliation to citizens who would like to see a political potatoe ended.

Uninformed and biased commission members have no place in our government. As a citizen of Oregon I must urge that we have appointments appropriate to the intelligence required to deal legally and fairly in all areas of business that I witnessed February 24.

Yours truly,

Glenna G. Matson

Glenna G. Matson

34645 Lake Creek Drive
Brownsville, Oregon 97327

February 27, 1978

Environmental Quality Commission
Commissioners Densmore, Hallick and Phinney
P. O. Box 1760
Portland, Oregon 97207

Dear Commissioners:

I attended the February 24, 1978, meeting of the EQC in Salem City Hall. I was appalled by your lack of knowledge on several items of the printed agenda. At one point your chairman had to refer you to the section where correspondence copies of a case were placed - you don"t read in advance apparently. Commissioner Summers seems familar with the agenda and with Oregon Law from which he occasionally quoted for the record.

I do not understand why you that sit on such a commission are so ill-prepared and apparently ill-informed on your responsibilities as commission members. I do not know how you could, in all good conscience, vote intelligently on matters before you. One glaring example of ignornace seemed to be a presentation by the representatives of the grass seed growers on the horrible erosion occurring in the foothills of the Cascades which have been forced into annual crops. Another glaring example of ignornace was the inability of Ms. Hallick to grasp the fact that law provides farmers of grass seeds hardship requests for irrepairable land damage (not one has ever been granted) above and beyond their acreage burning limit.

I feel the citizens need to press for intelligent appointments to commissions dealing with regulations governing personal lives and livelihoods. I was not pleased by what I heard and I hope to convey my impressions to others by sharing with them the handling of agenda items E through J of your February 24 meeting.

Yours truly,

Glenna G. Matson

Glenna G. Matson

2748 N.E. 24th Ave
Portland, Or.
2/27/78

Oregon EQC Commission
Salem, Oreg.

Gentlemen: I am glad to hear you have decided to allow the grass seed growers to burn 180,000 acres this year. I watched my father and older brother kill themselves trying to make a decent living for their families on a grain farm. Now that farmers have found an easier and more profitable way to earn a living, silly people like Mayor Gus Keller want to take that away from them. If they want cleaner air, why don't they stop cars from coming through their town, spewing poisonous carbon monoxide day and night, 365 days of the year? Do the people in Eugene walk, or ride bicycles, to work or wherever they're going? After all, grass burning lasts only a few weeks! (They could wear gas ~~mask~~ masks that long)

I can turn the hose on the outside walls of my house (white) any time of the year, and the brownish-black water that rolls down isn't caused by grass-burning.

Respectfully,
Mrs. Roy M. Fox

P.S. I would be grateful if you could bring this to the attention of EPA's Douglas Hansen - and Mayor Keller.

Carol -
(for the book")

LUVAAS, COBB, RICHARDS & FRASER, P.C.
ATTORNEYS AT LAW
P. O. BOX 10747
777 HIGH STREET
EUGENE, OREGON 97401

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503

JOHN L. LUVAAS
RALPH F. COBB
JOE B. RICHARDS
ROBERT H. FRASER
PAUL D. CLAYTON
DOUGLAS L. McCOOL
DAVID L. SHAW
DENNIS W. PERCELL
LAURA A. PARRISH

March 7, 1978

Mr. Wm. H. Young, Director
Department of Environmental Quality
P. O. Box 1760
Portland, Oregon 97207

RE: Field Burning Rules

Dear Bill:

I enclose Mr. Long's March 6 letter with attachments for inclusion in the record on the Field Burning Rules.

Very truly yours,

LUVAAS, COBB, RICHARDS & FRASER, P.C.

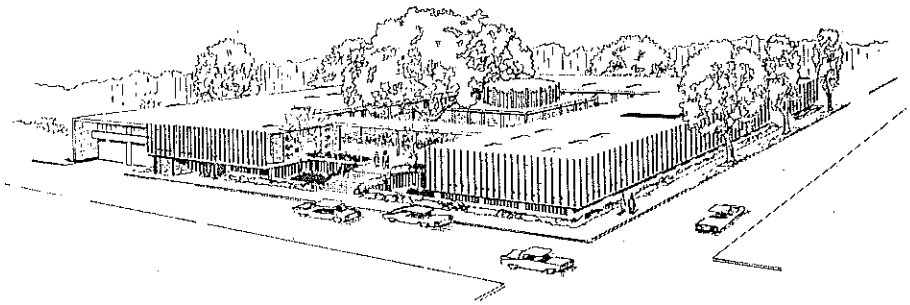
JOE B. RICHARDS

JBR:lmm

ENC

cc: Mr. Long

CITY OF EUGENE



CIVIL DEPARTMENT — 101 EAST BROADWAY, SUITE 401 — 503/687-5080
EUGENE, OREGON 97401

March 6, 1978

Members of the Environmental
Quality Commission
c/o Joe B. Richards, Chairman
777 High Street
Eugene, Oregon 97401

Re: Field Burning Rules

Dear Chairman Richards and Commission Members:

The City of Eugene submits the attached material as part of the record to be considered by the Commission in developing field burning rules for the 1978 season. Before describing the relevance of this submission we wish to share with you a few observations.

We must confess that we are confused about the role of the record in this proceeding. As you remember, there was considerable disarray regarding whether the Commission would submit a SIP revision or an interim plan to EPA resulting from the February 24th hearing. On the basis of the opinion of the Attorney General it was decided to submit an interim plan allowing the burning of 180,000 acres. As we read the Attorney General's opinion, any discretion to set a lower amount of field burning will exist only after a full scale SIP revision has been rejected. Inasmuch as a SIP revision is not underway the situation is very unclear.

Subsequent to that hearing representatives from Eugene met with the DEQ staff in an attempt to devise burning practices rules for the coming season. These negotiations have been less than successful. It was suggested, however, that Eugene should submit proposed rules on burning practices if it wished the manner of burning this summer to be different than past years' practices.

There are several difficulties which prevent us from making such suggestions at this time. First, we believe that an interim plan, to be acceptable to EPA, must contain greater parti-

culate reductions based on a lower acreage figure. Consequently, we believe that the proposed plan will be rejected. At that time the Commission will decide the contents of an alternative plan or SIP revision; and at that time Eugene may have more specific suggestions. We do not believe that the Commission should or will be restricted to the present record at that time.

Obviously, the degree of regulating burning practices will depend upon the amount of acreage to be burned. Thus we believe more severe burning practices restrictions will be needed if the full 180,000 acres is to be burned. Less restrictive measures may be called for if only 100,000 acres are to be burned.

Second, we believe that the "record" in this proceeding is for relevant factual data. Consequently, suggestions for the language of legal rules would not be precluded after the closing of the submission date. We may be able to develop suggested rules which would apply irrespective of the acreage amount. Such suggestions may be submitted in advance of your next meeting on this topic.

We understand that health effects evidence was ruled irrelevant at the February 24th meeting. In the event, however, that this record is used for decisions in the future, we are submitting the attached medical testimony. In addition, we believe that health effects is directly relevant to the issue of what practices should be employed to reduce the emissions of fine particulates from field burning.

We would have serious objections if the present record is used in the future on a different submission to EPA or if the present record is used as a basis for a present SIP revision. An acceptable SIP revision must involve massive offsets, and affected concerns should be heard. We appreciate the opportunity to testify before the Commission on February 24th and thank you for your attention.

Very truly yours,

JOHNSON, HARRANG & MERCER
CITY ATTORNEYS

Stanton F. Long

SFL:jw

Encls.

BOARD CERTIFIED
AMERICAN BOARD OF PEDIATRICS

BOARD CERTIFIED
AMERICAN BOARD OF ALLERGY AND IMMUNOLOGY,
A CONJOINT BOARD OF THE AMERICAN BOARD OF INTERNAL MEDICINE AND THE AMERICAN BOARD OF PEDIATRICS

JOHN D. MINOR, M.D., P.C.
PHYSICIAN
132 EAST BROADWAY
EUGENE, OREGON 97401
(503) 485-0316

March 2, 1978

Joe Richards
Chairman of the Environmental Control Commission
Salem, OR

Dear Mr. Richards:

I have now been in Eugene for almost four years and I have seen a double pronged effect in my patients due to the grass industry. I see the younger allergic patient in May and June with hay fever and asthma secondary to grass pollen. Because of the unique situation in the Willamette Valley where they grow grass to seed, it pollenates, one of the reasons being that it is not cut, and then blows down to this end of the valley and gets trapped between the Cascades and the coast range creating what I am sure is one the highest pollen counts in the United States. After they cut the fields, the grass pollen situation seems to die down and then they begin burning the fields in July and August. This brings out a different type of patient and this is a patient with chronic obstructive pulmonary disease either due to intrinsic asthma, emphysema, or chronic bronchitis. This type of patient is usually over forty and already has a compromised or irritable pulmonary system. There is no question in my mind, however, that these patients do get worse during the smoke season and the patients indicate that it does bother them. I have seen this year after year and it is disappointing that at the present time they are thinking of increasing the amount of fields to be burned. I would hope that if they raise the limit above 50,000 acres that the burden of proof be placed upon those that burn the fields that it is not harmful.

Thank you very much for your time and consideration.

Sincerely yours,

John D. Minor, M.D.
JDM/jas

V. C. VITUMS, M.D., P.C.
FRANK N. TURNER, M.D., P.C.
PHYSICIANS
RESPIRATORY MEDICINE
PATTERSON MEDICAL BUILDING
1180 PATTERSON STREET
EUGENE, OREGON 97401

PHONE 687-1712

March 3, 1978

Dear Sir:

My name is Vitolds Charles Vitums, M.D. I have been a specialist in Pulmonary (respiratory) Diseases in Eugene, since June of 1972.

Every year that I have been practicing my specialty I have noticed an increasing number of patients necessitating physician visits during "field burning weeks" because of respiratory symptoms. These people most commonly have underlying lung diseases such as asthma, emphysema, bronchitis, or a combination of these. Approximately one out of ten of these patients develop severe enough problems to require hospitalization, with accompanying intensive respiratory therapy. Sometimes, other complications, such as infections or heart failure result and again hospitalization and even death may ensue. In addition to the above, many more patients request their medications increased or started, via the telephone, because of increasing symptoms of breathlessness and a sense of suffocation which began during "field burning time". Finally, there are some who have to leave the area in preference to clean air on the coast, for example. However, most of these patients are not able to do this because of the illness, age, or poverty.

For the above medical reasons, field burning is a health hazard and therefore should not be continued.

Sincerely,

V.C. Vitums, M.D.

VCV/jrp

Office: 747-3359 Home: [redacted]

N. M. KUDELKO, M.D., F.A.C.A.
PHYSICIAN · ALLERGY
ISLAND PARK PROFESSIONAL CENTER
175 WEST "B" STREET
SPRINGFIELD, OREGON 97477

March 6, 1978

Joe Richards, Chairman
Environmental Quality Control Commission
Salem, Oregon

Dear Mr. Richards:

Having been in medical practice for over 25 years in the Willamette Valley and caring for patients of all ages in their specific problem dealing with the allergic disease of the respiratory system, I wish to make the following statement: Patients who suffer problems with allergic or hypersensitivity disease of the respiratory system have a most distressing and unique problem. In addition to the individuals own body constitution or threshold at any one time, his own home environment-location of home, type of heat or cooling system, trees, plants and animals present, + the total air pollutants present from day to day also play an important factor or role in the total picture of how an allergic patient will do from one time to the next.

Field burning in the summer months makes up part of this environment for these individials at that time. True, atmospheric inversions,"slash burning", wind direction, industrial pollutants, automobiles, trucks, buses, automobile & camper visitors from out of state all contribute to this problem.

Setting standards during the summer months for total suspended particulate (TSP) matter and adhering to them is the direction in my opinion to go. Field burning & its pollutants is a great factor during that time and therefore, should be controlled to certain specific standards based on their contribution to the total environmental pollutants present in the Willamette Valley.

Sincerely,

N. M. Kudelko, M.D.

N.M. Kudelko,M.D.,F.A.C.A.

NMK/gms

THE EUGENE
HOSPITAL
AND CLINIC

PHYSICIANS AND SURGEONS

1162 WILLAMETTE STREET
EUGENE, OREGON 97401

TELEPHONE 503/687-6000

March 3, 1978

Department of Environmental Quality
796 Winter Street, N. E.
Salem, Oregon 97310

Gentlemen:

For the past six years I have been active in developing testimony about the adverse health effects of air pollution and specifically field burning.

I have polled the members of the Lane County Medical Society including the specialists in internal medicine, allergy and pulmonary disease. It is their overwhelming consensus that the smoke from field burning produces harmful effects in many of their patients who have allergy or chronic lung disease. This is consistent with my own experience in the clinical practice of internal medicine. It is also consistent with a study done several years ago by some members of the society which correlated the incidence of respiratory complaints in offices with the intrusion of smoke from field burning.

Sincerely yours,

Byron U. Musa

Byron U. Musa, M. D.

vp

HESSEL, GORDON & MURDOCK
PHYSICIANS AND SURGEONS, P. C.
GENERAL THORACIC AND VASCULAR SURGERY
536 MEDICAL CENTER BLDG.
EUGENE, OREGON 97401

JULIUS H. HESSEL, M. D., F. A. C. S.
GLENN M. GORDON, M. D., F. A. C. S.
JAMES L. MURDOCK, M. D., F. A. C. S.

March 3, 1978

Joe Richards, Chairman
Environmental Quality Commission
777 High Street
P. O. Box 10747
Eugene OR 97401

Dear Mr. Richards:

I have been asked to write a letter to you again expressing my concern regarding the health aspects of field-burning as it affects the citizens of Eugene.

As you are well aware, over the past 12-15 years the city of Eugene has been very concerned about field-burning smoke which has intruded into our city during the summer burning season of the grass-seed growers. Not only is this an irritant from the standpoint of aesthetics, but it does carry with it significant health hazards.

There is substantial data to show that particles from smoke, which are extremely small, can be inhaled and carry with them other irritants from polluted air which then cause symptoms in a sensitive person. This aggravates especially persons who have asthma, emphysema, and other chronic respiratory infections.

It has been my experience that there is an increase in respiratory problems associated with smoke intrusions in the summertime.

I would strongly state that measures need to be taken to insure the maximum health of the citizens of Eugene by attempting to control all types of pollution which will affect our air-shed. As a correlary, open-field burning is one of these sources of pollution. Please do what you can to require this industry to meet standards which are acceptable.

Sincerely yours,

Glenn M. Gordon MD

GLENN M. GORDON, M.D.

GMG:eec

ROBERT V. CRIST, M.D. F.A.A.F.P.
Diplomate, American Board of Family Practice

WILLIAM C. LAWTON, M.D.
Diplomate, American Board of Family Practice

GEORGE H. HUGHES, M.D.
Diplomate, American Board of Family Practice

FAMILY MEDICINE ASSOCIATES, P.C.

Physicians and Surgeons

2460 Willamette Street • Eugene, Oregon 97405

Telephone 687-2961

The Practice of Family Medicine

March 2, 1978

Mr. Joe Richards
Chairman of the Environmental Quality Commission
Salem, OR 97310

Dear Mr. Richards:

I am a Family Practitioner and have been practicing in Eugene, Oregon since July of 1965. I am writing you concerning my observations with regard to the complaints and health of my patients during the field burning seasons of those thirteen years. I am not an expert in pulmonary diseases and I have not done any scientific study in this area. However, as a busy, active practitioner, it is quite obvious that symptoms and complaints referrable to coughing, difficulty breathing, burning of the eyes, asthma, and the like are many times increased in my patients with known lung disease during the field burning season. I have also developed a "gut level" feeling that when I look out my window and see heavier than usual field burning smoke in the air, patient complaints will increase in the subsequent few days.

In discussing this matter with patients with chronic lung disease, I have come across several patients in my practice who leave the Eugene area during the field burning season specifically because they have learned that to stay here is too uncomfortable for them.

As mentioned above, these are merely personal observations and although I cannot scientifically substantiate a direct cause and effect relationship, it is quite obvious as a Medical Practitioner in Eugene that there must be some relationship.

Thank you for your time in reading this, and I sincerely hope that it aids you in your deliberations and decisions.

Sincerely yours,

Robert V. Crist, M.D.

RVC/cp

POWELL didn't think a 60-day period for the Commission to act was realistic, since that is the entire length of the burning season.

KRAMER agreed.

0585 POWELL moved to page 12, relating to experimental burning and felt he didn't understand the wording of subsection (2). He asked if that language was clear enough to give anyone directions as to what experimental burning is to be done and how that finding is to be found.

KRAMER hoped it was clear. The intent is that experimental burning would be done to provide a minimal amount of detrimental effect to the air shed, the type mentioned in earlier testimony such as the big burn, attempting to do night burning, and other possibilities that the industry has discussed. The wording is awkward, but he felt the intent was there.

POWELL saw it as limiting the amount of experimental burning. For example, maybe the 15,000 acres that were eliminated in the second year of the phasedown of the bill, and maybe prohibiting any in this upcoming season.

KRAMER said that was incorrect.

STEVENSON said that section also bothered him, since the results can't be guaranteed because it is experimental. He felt the wording should be cleared up, because it says the results won't be worse than anticipated, and how can that be known until the experiment is concluded.

POWELL said he had a question to ask the representatives of DEQ later.

0604 POWELL questioned the $400,000 sum on page 15, subsection (4). If DEQ plans to purchase extensive monitoring equipment which has been estimated to cost around $500,000 and they use that money to purchase it with, is there any assurance to the citizens of Oregon that DEQ will continue to research solutions to the problem of open burning. Just buying the monitoring equipment would use most of that money, which has come from the growers' fees, especially if there are fewer than 195,000 acres burned because of inversions or other problems. If that does happen, there will be even less money in the program.

KRAMER said this was a limitation, not necessarily a minimum to be spent on the program.

POWELL understood that, however, the Senate Agriculture Committee was told that the Department wanted this equipment. He thought that others in the Willamette Valley should contribute to the purchase of that equipment, not just the grass seed growers, since pollutants are emitted on a daily basis. He felt this was a blank check to the Department.

KRAMER talked about the air shed study done in Portland. People made committments to get the program going, only after the money was designated by the Legislature. Funds are hard to get unless a program is already operating. Any program that is going to be done on smoke management is going to be coming from funds appropriated through this or some other manner by the Legislature. He didn't think we should expect private industry to participate or anyone else for that matter. There might be governmental funds from EPA or others to use on it.

JAMES A. REDDEN
ATTORNEY GENERAL

DN
DB

DEPARTMENT OF JUSTICE
100 State Office Building
Salem, Oregon 97310
Telephone: (503) 378-4400

February 28, 1978

William H. Young, Director
Department of Environmental Quality
P. O. Box 1760
Portland, OR 97207

Dear Mr. Young:

Enclosed is a copy of Opinion No. 7575 which has just been issued in response to your question.

Very truly yours,

James A. Redden
Attorney General

br
Enc.

JAMES A. REDDEN
ATTORNEY GENERAL

DEPARTMENT OF JUSTICE
100 State Office Building
Salem, Oregon 97310
Telephone: (503) 378-4400

February 28, 1978

No. 7575

This opinion is issued in response to a question presented by William H. Young, Director, Department of Environmental Quality.

QUESTION PRESENTED

Does the Environmental Quality Commission (EQC) now have authority to reduce the maximum total registered acres available for open field burning in 1978 below the 180,000 acres specified in ORS 468.475(2), in view of rejection by the United States Environmental Protection Agency (EPA) of a proposed amendment to Oregon's Implementation Plan under the Federal Clean Air Act, which would have allowed burning of 180,000 acres?

ANSWER GIVEN

No. The EQC has not proposed, and the EPA has not ruled out approval of, an amendment to the Implementation Plan which would combine allowable field burning of 180,000 acres with other offsetting measures within the authority of EQC and the Department of Environmental Quality, and proposals for future measures, to reduce particulate emission to allowable levels.

DISCUSSION

Before the 1977 legislative session, the laws relating

to open field burning provided for a rapid reduction in the maximum number of acres for which field burning permits could be issued, from 235,000 acres in 1975, 195,000 acres in 1976, 95,000 acres in 1977, to only 50,000 acres in 1978 and thereafter. ORS 468.475 (1975 replacement part).

Oregon is also subject to the Federal Clean Air Act, 42 USC §§1857 et. seq. and regulations adopted under it. As required by 42 USC §1857c and in accordance with the phase-out mandated by the 1975 Oregon statute, Oregon submitted an "Implementation Plan" to the United States Environmental Protection Agency (EPA) which limited 1977 and 1978 field burning to 95,000 and 50,000 acres, respectively. This plan was approved by the EPA.

After the EPA approved the Implementation Plan, Oregon Laws 1977, ch 650, §8 amended ORS 468.475 to allow the burning of a considerably greater number of acres in 1977 and 1978. ORS 468.475 now provides in part:

> "(2) Except as may be provided by rule under ORS 468.460, the maximum total registered acres allowed to be open burned pursuant to subsection (1) of this section shall be:
>
> "(a) During 1977, not more than 195,000 acres.
>
> "(b) During 1978, not more than 180,000 acres."

Subsection (3) requires the EQC to set maximum field burning acreage for 1979 and subsequent years by order,

> ". . . upon finding that open burning of such acreage will not substantially impair public health and safety and will not substantially interfere with compliance with

relevant state and federal laws regarding air quality."

Subsection (5) specifically states the legislature's intent:

> "(5) It is the intention of the Legislative Assembly that permits shall be issued for the maximum acreage specified in subsection (2) of this section unless the commission finds after hearing that other reasonable and economically feasible alternatives to the practice of annual open field burning have been developed."

The Oregon Environmental Quality Commission (EQC) subsequently issued 1977 burning permits for 195,000 acres, as authorized by ORS 468.475(2)(a), as amended. The EPA has notified the state that it will receive a Notice of Violation for 1977, and a state proposal to amend the Implementation Plan to allow burning permits in 1978 for 180,000 acres has been returned by the EPA to the state to allow it to be revised in a manner consistent with applicable law.

Unilateral amendment of Oregon's Implementation Plan and issuance of burning permits for 180,000 acres, without EPA approval, would continue the state in violation of 42 USC §1857d-1, which provides:

> "Except as otherwise provided in sections 1857c-[etc] . . . (preempting certain State regulation of moving sources) nothing in this chapter shall preclude or deny the right of any state or political subdivision thereof to adopt or enforce (1) any standard or limitation respecting emissions of air pollutants or (2) any requirement respecting control or abatement of air pollution; except that if an emission standard or limitation is in effect under an applicable implementation plan . . . such State or political subdivision may not adopt or enforce any emission standard

or limitation which is less stringent than the standard or limitation under such plan . . ." (Emphasis added).

The question arises whether the EQC has authority to reduce the maximum total registered acres available for open field burning in 1978 below the maximum 180,000 acres specified in ORS 468.475(2), to avoid continued violation of the CAA.

If the state cannot obtain EPA approval of a revised Implementation Plan which permits burning of 180,000 acres, 42 USC §1857d-1 clearly prevails, depriving the state (and the EQC) of authority to allow field burning to the extent allowed by ORS 468.475(2)(b). The mandate of ORS 468.475(5) would be nullified, as unconstitutional under the Supremacy Clause which provides:

> "This Constitution, and the Laws of the United States which shall be made in pursuance thereof; . . . shall be the supreme Law of the Land; and the Judges in every State shall be bound thereby, any Thing in the Constitution or Laws of any State to the Contrary notwithstanding." US Const art VI, cl 2.

However, the EQC has clearly not exhausted the possibilities of devising and proposing an amendment to the Oregon Implementation Plan which would comply with the mandate of ORS 468.475(5), and gain approval of the EPA.

Although we have not reviewed it, we understand the EQC's first proposal for amendment of the Implementation Plan simply substituted 180,000 acres for 50,000 acres as the allowable 1978 burn. The EPA letter rejecting this proposal, pointing out

1977 violations of the Implementation Plan, stated:

> "Thus, instead of providing control needed to meet health and welfare related standards, Oregon is now preparing to relax controls on one source of particulates (field burning) without providing increased control on other contributing sources to offset any additional air pollution from field burning." Letter, January 27, 1978, from Don DuBois, Region X Administrator EPA, to William H. Young, Director, Oregon Department of Environmental Quality.

However, the letter went on to encourage submission of a revised proposal:

> "The first option open to Oregon is to modify its proposed plan revision and to make a new submission in time for EPA review and approval. In all likelihood, this would result in a temporary one year control strategy to be supplanted by the plan revision due under the new Act on January 1, 1979. There are a number of measures that could be considered for adoption as part of an interim plan, including reduction in field burning acreage for 1978, quantified improvements in the smoke management program, and changes in emission limits applicable to other source categories. We trust this approach will receive serious consideration. However, these changes would have to be supported with analysis showing that standards will be attained and would have to be formally adopted after adequate notice and public hearing and submitted to EPA by early April in order to clear up the issue before the 1978 burning season."

The letter then proposed, as an alternative if formal revision of the plan is infeasible, a "one-year control strategy," to be adopted by agreement which would show the taking of "all reasonable measures . . . to alleviate the particulate problem in the Willamette Valley" in 1978. This would apparently amount to an agreement to allow Oregon to violate the original and

unamended Implementation Plan, if adequate particulate control is achieved. The state is cautioned that ". . . despite such an agreement, and prosecutorial discretion, a citizens' suit under the Act is not precluded."

Under either alternative "measures that could be considered" include reduction in field burning acreage for 1978, quantified improvements in the smoke management program, and changes in emission limits applicable to other source categories. But as the letter states:

> "The selection and implementation of an adequate control strategy including the determination of relative levels of control to be applied to various sources of air pollution to protect the public health and welfare, is an important state prerogative and responsibility under the Federal Clean Air Act."

We also note that the CAA and EPA are not concerned with field burning or any other type of air pollution as such, but with the result, that is with the total of particulate emissions by all sources. Thus, it should be possible to obtain approval of a revised Implementation Plan which contemplates burning of the full 180,000 acres if it includes other offsetting measures designed to reduce total particulate emissions to allowable levels.

We first examine the statutes to determine whether the EQC has authority, in the present situation, to include any reduction from 180,000 acres of allowable field burning in its revised proposal for amendment of the Implementation Plan. We conclude that it does not. ORS 468.475(5) is simply too specific.

ORS 468.475(2) does preface its language setting the acreage limitations by the words, "Except as may be provided by rule under ORS 468.460, the maximum . . . shall be:" (Emphasis added).

ORS 468.460, in turn, provides:

> "(1) In such areas of the state and for such periods of time as it considers necessary to carry out the policy of ORS 468.280, the commission by rule may prohibit, restrict or limit classes, types and extent and amount of field burning . . .
>
> "(2) In addition to but not in lieu of the provisions of ORS 468.475 and of any other rule adopted under subsection (1) of this section, the commission shall adopt rules for Multnomah, Washington, Clackamas, Marion, Polk, Yamhill, Linn, Benton and Lane Counties, which provide for a more rapid phased reduction by certain permit areas, depending on particular local air quality conditions . . . and the availability of alternative methods of field sanitation . . ."

ORS 468.280, cited in subsection (1), provides:

> "(1) In the interest of the public health and welfare of the people, it is declared to be the public policy of the State of Oregon:
>
> "(a) To restore and maintain the quality of the air resources of the state in a condition as free from air pollution as is practicable, consistent with the overall public welfare of the state. . . ."[1]

---

[1] ORS 468.455 contains still another policy statement:

> "In the interest of public health and welfare it is declared to be the public policy of the state to control, reduce and prevent air pollution caused by the practice of open field burning. Recognizing that limitation or bar of the practice at this time, without having found reasonable and economically feasible alternatives to the practice could seriously impair the public policy of the state to reduce air

These statutes give the appearance of authorizing EQC to limit field burning acreage below the amounts specified for 1977 and 1978, on the "public welfare" grounds stated therein. But if so, this sets up a sharp contradiction with ORS 468.475(5), which states that the only grounds for reduction below the acreage figures specified is the existence of "other reasonable and economically feasible alternatives to the practice of annual field burning."

If such a conflict exists, it must be resolved in favor of subsection (5), on grounds first that subsection (5) is substantially more specific, and second, that subsection (5), as it now exists, is the later enactment. The prefatory language in subsection (2) ("Except as may be provided . . .") is a holdover from the 1975 law. Subsection (5), in contrast, is in its present form a drastic change from the former language. As subsection (4) of ORS 468.475 (1975 replacement part) it formerly read:

> "It is the intention of the Legislative Assembly that permits shall be issued for the maximum acreage specified in subsection (2) . . . only if the commission finds . . .
>
> "(a) There are an insufficient number of workable [field sanitization] machines . . .
>
> "(b) There are insufficient methods available for straw utilization and disposal; and
>
> "(c) Reasonable efforts have been made to develop alternative methods . . . and such methods

1 (Continued)
pollution by smoke management and to continue to seek and encourage . . . reasonable and economically feasible alternatives . . . all consistent with ORS 468.280."

have been utilized to the maximum reasonable extent." (Emphasis added).

Substitution of the word "unless" for the words "only if" is a complete reversal of emphasis, and the only consideration in the amended subsection allowing the setting of a lower limit is the existence of reasonable and economically feasible alternatives, regardless of whether adequate effort has been made to develop alternatives.

It is reasonably clear from the language of the statutes that the legislature did not intend to allow EQC authority to lower the permissible 1978 field burning acreage on any other grounds. History of the measure's consideration in legislative committees amply supports this conclusion.

The EQC is accordingly obliged to include proposed burning of 180,000 acres in its resubmission of a revised Implementation Plan for 1978. We understand that in the coming burning season the Department of Environmental Quality will, for the first time, have monitoring facilities and a program sufficient to determine the actual contributions made by field burning and other sources to particulate air pollution in the Willamette Valley. The proposed Implementation Plan could thus well provide for use of data gathered in 1978 in setting field burning acreage limitations for 1979, in accordance with ORS 468.475(3), and in preparing the revised Implementation Plan for 1979 which is also required.

We cannot speculate as to the additional smoke management and pollution control measures offsetting the additional field

burning acreage which must be included within the Implementation Plan revision to be proposed for 1978. This is something which the department and the EQC must decide, based upon their expert knowledge and within the statutory limits of their authority. It does appear that proposals for future control measures, and even proposals to seek additional statutory authority, may be given at least some weight towards approval of a 1978 control program which may not for that year comply with all ultimate goals.

Nor can we speculate whether the EPA will approve any Implementation Plan revision which contemplates burning of 180,000 acres in 1978, in contrast to the 50,000 acre limit effective under the present plan. The point is that EQC must make every effort within its competence to achieve compliance with federal requirements and comply with the legislative mandate expressed in ORS 468.475(5).

It may ultimately prove impossible to do both. In that case the CAA will govern, and ORS 468.475(5) will be of no effect. We would then be required to consider whether ORS 468.475(5) is severable, so that EQC would have authority to set lower acreage maximums in order to comply with the CAA, or whether a special legislative session is the only alternative. This question is not before us and may never arise, so we do not reach it.

James A. Redden
Attorney General

JAR:JAR:cm

GOVERNMENTAL AFFAIRS •
PUBLIC RELATIONS •

DAVE NELSON & ASSOCIATES

2100 Lancaster Dr. N.E.
Suite 1-B
Salem, Oregon 97303
Phone (503) 585-1157

Dear Bill,

I'm forwarding these two letters to you for the field burning record.

Dave

AGRICULTURAL RESEARCH SERVICE
WESTERN REGION

OF UNITED STATES DEPARTMENT OF AGRICULTURE

Legume and Grass Seed Production Research Unit
Room 3B, Farm Crops Building
Department of Crop Science
Oregon State University
Corvallis, Oregon 97331

March 1, 1978

Environmental Quality Commission
1234 S.W. Morrison Street
Portland, Oregon 97205

Dear Commission Members:

At the request of the Oregon Seed Council, I am presenting my views concerning the impact of alternate-year burning on weed control in grass seed fields.

At the present time, open burning is the only effective method available for control of winter annual grass weeds in annual ryegrass seed fields. In recent years, I have observed a number of fields that have not been burned because of their proximity to highways or population centers, weather, or burning limitations. In those fields where there was a significant weed population, failure to burn for a single year resulted in disastrous weed populations. These observations indicate that compulsory alternate-year burning without considering weed populations of individual fields would be an unsatisfactory program.

When and if ethofumesate (Nortron) is registered for use by EPA, it may be possible to use this herbicide to control weeds in an alternate-year burning program; however, there is no indication when this herbicide might be registered for full use by EPA.

In perennial grass seed fields, many years observations and much research has shown that crop residues inactivate the soil-applied herbicides used for control of winter annual grass weeds.

Thus, annual open burning is essential for satisfactory weed control.

Sincerely,

William O Lee

William O. Lee
Research Agronomist

AGRICULTURAL RESEARCH SERVICE
WESTERN REGION

OF UNITED STATES
DEPARTMENT OF
AGRICULTURE

Legume and Grass Seed Production
Research Unit
Room 2074, Cordley Hall
Department of Botany and Plant
Pathology
Oregon State University
Corvallis, Oregon 97331

March 1, 1978

Environmental Quality Commission
1234 S.W. Morrison Street
Portland, Oregon 97205

Dear Commission Members:

The Oregon Seed Council requested that I send you our latest opinion on alternate-year burning and grass disease control. With any projected reduction of burning apparently to be shared by all growers on a percentage basis, growers will try to select fields to burn based on apparent need for weed or disease control, or contract requirements for high purity, etc. In addition, in a wet summer it will not be possible to burn some fields even when scheduled for burning. Under these circumstances, some fields will not be burned for two or more successive years allowing serious damage from disease, and the arrangement also will permit severe cross contamination between fields that will spoil present disease control. Since no chemical control or other alternative is yet available, alternate-year burning does not seem to satisfy disease control requirements in the Willamette Valley.

Sincerely,

John R. Hardison

John R. Hardison
Supervisory Research Plant Pathologist

OREGON SEED COUNCIL

2100 LANCASTER DR. N.E.
SALEM, OREGON 97303

Telephone 503 585-1157

STATEMENT ON THE ADOPTION OF PROPOSED FIELD BURNING REGULATIONS

AGENDA ITEM J OF THE DEQ MEETING FEBRUARY 24, 1978

Mr. Chairman, members of the commission, my name is David S. Nelson and I present these comments on the proposed rules on behalf of the Oregon Seed Council. There are several points that need to be a part of the record for your consideration.

1. Field burning is a necessary practice in the production of grass seed. It controls disease, weed, insects, provides a plant stimulation to increase yields, removes and disposes of a residue and reduces the hazard of wild fire.
2. We need to point out that there are no reasonable or economically feasible alternatives to annual open field burning.
3. Grass seed production is a major segment of Oregons agricultural economy and of Oregons economy.
4. Oregons grass seed production accounts for approximately 70% of the production of grass seeds in the United States.
5. Production of grass seed prevents erosion and stream sedimentation and loss of top soil.
6. Burning fields for sanitation substitutes for the future use of many tons of chemicals, if and when they are developed, thus eliminating the possibility of chemical contamination of our surface water.

Testimony of the Oregon Seed Council to the EQC concerning the proposed adoption of the proposed agricultural burning rules for 1978. The following comments and recommendations are to the rules drafted as agenda item J of the EQC meeting dated February 24, 1978.

Rules

26-005 Definitions. No recommended changes.

26-010 General Provisions. No recommended changes to the existing language.

26-011 Certified Alternative To Open Field Burning. No recommended changes.

26-012 Registration and authorization of acreage to be open BURNED. No recommended changes to the language. We would object very much to any unreasonable requirements that could be imposed in the drafting of the forms to be provided by the department. One requirement that we would consider as unreasonable would be any requirement that would necessitate renumbering all fields by the fire chiefs. The rural fire districts provide a key service in the smoke management program and are currently underfunded in providing the service and they are under staffed to be burdened with unnecessary work.

26-013 Limitation And Allocation Of Acreage To Be Open Burned.

(1) (a) (b) Since that is the current and existing law we support adoption of that language.

(2) We support the language.

(3) We would support that language and add after the language "experimental field sanitizers" add the language "approved experimental burning".

(4) We support that language.

(5) We support that general statement.

(6) We support very strongly the adoption of the pro rata share basis of allocation of acreage to be burned in 1977. There are many arguments that can be made in favor of pro rata allocation. Probably the strongest of those arguments is

that each grower must have the individual disgretion to use his available tools to minimize his losses on the fields of his choice on a year in and year out basis. There is no one in a position to make those decisions as acturately or responsibly as the individual farmer. Therefore, we strongly support (a).

(b) We equally strongly support the language in (b).

(c) We support the language.

(d) We support the language.

(e) We support the language.

(6) We support the language.

(7) Experimental Burning.

Experimental burning is provided for by statue. The purpose of experimental burning as stated in the statue is for improving by demonstration or investigation of the environmental or agronomic effects of open field burning. The statue goes on to say, experimental open burning includes but is not limited to

A. Development, demonstration or training personnel in the use of special or unusual field ignition techniques or methodologies.

B. Setting aside times, days or areas for special studies.

C. Operation of experimental mobile field sanitizers.

Statue goes on to say that the commission may allow open burning under this section of acreage for which permits have not been issued persuant to ORS 468.475 when it finds that the experimental burning

A. Can in theory reduce the adverse effects on air quality or public health form open field burning and

B. Is necessary in order to obtain information on air quality, public health or agronomic effects of experimental form of open burning.

Statue also says under paragraph 3 that the department may by rule establish fees, registration requirements and other requirements or limitations necessary to carry out the provisions of this section. The section of statue dealing with experimental

burning received considerable discussion during the development of both SB 535 which provided the basic language for HB 2196 and in HB 2196 which ultimately became part of the Oregon Statues. In all of the discussion concerning experimental burning it was never implied nor suggested that the language under (3) specifically the words OTHER REQUIREMENTS OR LIMITATIONS would authorize the commission to arbitrarily fix a maximum on the over all number of acres to be burned by experimental methods. To the contrary the legislative record of HB 2196 includes a discussion of experimental burning by Senator John Powell and Loren Kramer, Execitive Assistant to the governor. In this meeting, Mr. Kramer is discussing the provisions of HB 2196 that would be acceptable to the governor. In that conversation, Mr. Kramer responds to a question from Senator Powell and indicates that it is not the intention nor the desire of the governors office to arbitrarily limit the number of acres included under experimental burning. I've included and submitted to the commission a copy of those minutes and in fact I believe I sent a copy of that discussion to the department and members of the commission following last years discussion of the same limit on experimental burning. If you'll recall last year at the July 15th meeting of this commission I testified in opposition to the establishment of the 7500 acre limit on the grounds that the purpose of experimental burning was to find out as much as we could as quickly as we could about better ways of burning fields so as to further minimize the already small impact of open field burning on residential areas in the valley. The experimental burning programs are supposed to be authorized by the commission establishing paramiters as set forth in the statue as to what an experimental burn is suppose to accomplish. The department then following those paramiters would review each experiment on a case by case basis and determine wheather or not it met the guidelines for an experimental burn set by the commission. In practical operation the total number of acres that would

be experimentally burned in a given summer could range from as few as was burned last year (somewhere around 3500 acres) to as many as could feasible be conducted under the terms of the statue. It is our recommendation that the commission strike the arbitrary ceiling of 7500 acres on experimental burning and insert such language as the statue indicates thus setting out guidelines for approval of experimental burn on a case by case bases. We would further recommend that the commission establish a fee for those acres to be experimentally burned of $3.50 per acre so that the total fee equals the normal burning fee. We would recommend that the same fee distribution be made as under the normal field burning fee that is $1.00 for the Smoke Management Program, 20¢ an acre for the fire districts for registration of acres to be experimentally burned and $2.30 to off set cost of conducting the experiment and to evaluate the experiment.

(8) Hardship Application Provisions.

In the departments write up of the hardship application procedures the department has for the immediate preceeding year made the hardship application process meaningless. The hardship language was written by the 1975 legislature as a means of insuring that the grass seed industry would have an "out" if the then hoped for mobile field sanitizers did not prove to be an effective alternative as they were hoped to be. The legislatures response to the seed growers position was that if you do encounter the disease problems the financial problems, the insect problems that you allege will occur we will provide an out, the hardship provisions. The department has written the rules governing hardship burning in such a manner that they are not an accessible remedy. I'm informed by staff members of the department that it is the commissions attitude that to be considered an acceptable hardship an incidence wheather it be financial, disease, insect or irreperible damage must be of such magnitude that it is greater than what would normally be expected to occur if a farmer did not burn

his fields. That asumption simply eliminates hardship as a remedy for a grower no matter what his circumstances. The Silverton Hills are an example. The grass seed growers of the Silverton Hills have told the commission and the legislature that they need to maintain all of that ground in grass seed. Secondly, that they can not maintain the ground in grass seed without burning it. The only alternative for that grower is to try to grow a ceral grain. The erosion in the Silverton Hills for the last three years, this year included, is severe. The commissions contention is that erosion is the expected and normal result of not burning and requiring alternate crops and therefore it is not a hardship. Next years erosion will be more severe and yet will be the expected increase in erosion from not burning the second year. That geometrically increasing erosion will eventually leave the Silverton Hills without any top soil and yet never have crossed the so called "greater than what should be expected if you don't burn it" guideline of the commission. The same thing holds true of incidences of disease or weeds thoughout the valley. Another example might be the incidences of ergot in grass seed fields. This year if the grower did not burn his field he might have an incident of ergot of 0.1%, recognizing that 0.4% is an unmarketable crop. Next years incidence may be up to 0.6% however, following the rule that is what you would expect if you don't burn a field the grower is left without a marketable crop. Yet his is not eligible for hardship relief from the commission because of the commissions basic premise of thats what you would expect if you don't burn it. We would request that the commission completely rewrite the hardship provisions in line with the intention of the legislature that drafted the basic hardship language. Second, we ask that the commission prepare and make available a copy of a successful hardship application including documentation of the situation that lead to the approval of the application.

I am including copies of research conducted on the production of grass seed in the northwest and the role that burning plays in that production. We will be ready to help the commission develop language or programs designed to implement the field burning smoke management program.

POWELL didn't think a 60-day period for the Commission to act was realistic, since that is the entire length of the burning season.

KRAMER agreed.

0585 POWELL moved to page 12, relating to experimental burning and felt he didn't understand the wording of subsection (2). He asked if that language was clear enough to give anyone directions as to what experimental burning is to be done and how that finding is to be found.

KRAMER hoped it was clear. The intent is that experimental burning would be done to provide a minimal amount of detrimental effect to the air shed, the type mentioned in earlier testimony such as the big burn, attempting to do night burning, and other possibilities that the industry has discussed. The wording is awkward, but he felt the intent was there.

POWELL saw it as limiting the amount of experimental burning. For example, maybe the 15,000 acres that were eliminated in the second year of the phasedown of the bill, and maybe prohibiting any in this upcoming season.

KRAMER said that was incorrect.

STEVENSON said that section also bothered him, since the results can't be guaranteed because it is experimental. He felt the wording should be cleared up, because it says the results won't be worse than anticipated, and how can that be known until the experiment is concluded.

POWELL said he had a question to ask the representatives of DEQ later.

0604 POWELL questioned the $400,000 sum on page 15, subsection (4). If DEQ plans to purchase extensive monitoring equipment which has been estimated to cost around $500,000 and they use that money to purchase it with, is there any assurance to the citizens of Oregon that DEQ will continue to research solutions to the problem of open burning. Just buying the monitoring equipment would use most of that money, which has come from the growers' fees, especially if there are fewer than 195,000 acres burned because of inversions or other problems. If that does happen, there will be even less money in the program.

KRAMER said this was a limitation, not necessarily a minimum to be spent on the program.

POWELL understood that, however, the Senate Agriculture Committee was told that the Department wanted this equipment. He thought that others in the Willamette Valley should contribute to the purchase of that equipment, not just the grass seed growers, since pollutants are emitted on a daily basis. He felt this was a blank check to the Department.

KRAMER talked about the air shed study done in Portland. People made committments to get the program going, only after the money was designated by the Legislature. Funds are hard to get unless a program is already operating. Any program that is going to be done on smoke management is going to be coming from funds appropriated through this or some other manner by the Legislature. He didn't think we should expect private industry to participate or anyone else for that matter. There might be governmental funds from EPA or others to use on it.

MARION

Soil and Water Conservation District

2487 ~~XXX~~ LANCASTER DRIVE NE
SALEM, OREGON 9730~~X~~ 3

February 20, 1978

Environmental Quality Commission
1234 S. W. Morrison Street
Portland, Oregon 97205

Dear Commission Members:

At the February 20th meeting of Marion County Soil and Water Conservation District, the Board of Directors voted unanimously against further reduction of open field burning. The 1977 Legislature allowed 180,000 acres to be burned in 1978. Further reduction in acreage would cause serious erosion problems in Marion County.

We feel that open field burning is needed because the alternative cropping system seems to be an annual cropping of small grains. In many areas of Marion County this alternative has already caused extensive damage, especially on the hill soils of Eastern Marion County. This has become a source of stream pollution. We need to meet the demands set forth by Section 208 for Water Quality. The growing of perennial grass seed crops on hill ground should be a practice encouraged by everyone. More reduction in acreage burned will be detrimental to the land and the people in these critical areas.

There are many other reasons for open field burning, which I am sure you are aware. This special problem is a serious concern and we ask for your

support. We will be glad to supply additional information.

Sincerely,

John Duerst

John Duerst
Secretary-Treasurer
Marion SWCD

ROBERT W. STRAUB
GOVERNOR

DEPARTMENT OF
ENVIRONMENTAL QUALITY
MIDWEST REGION
16 OAKWAY MALL • EUGENE, OREGON • 97401 • Phone (503) 686-7601

February 7, 1978

Harold Youngberg, Ph.D.
Department of Crop Science
Oregon State University
Corvallis, OR 97331

Dear Harold:

Oregon Revised Statute (ORS) 468.475 (2)(b) provides that: "Except as may be provided by rule under ORS 468.460, the maximum total registered acreage allowed to be burned pursuant to subsection (1) of this section shall be:

(a) During 1977, not more than 195,000 acres
(b) During 1978, not more than 180,000 acres."

As provided for in the above referenced ORS 468.460 (1), the Environmental Quality Commission (EQC) may adopt rules prohibiting or restricting open field burning of grass seed or grain crops in carrying out ORS 468.280 which sets state policy with regard to air quality. The Commission has, of course, adopted such rules generally for smoke management purposes and has revised them annually, or there abouts, to respond to legislative requirements.

In addition, as provided for in ORS 468.460 (2), the EQC shall adopt rules for the Willamette Valley which provide for a more rapid phased reduction (below the specified annual limitation) by certain permit areas depending on:

a. Particular local air quality conditions,

b. Soil characteristics,

c. The extent, type or amount of open field burning of grass seed crops, and

d. The availability of alternative methods of field sanitation and straw utilization and disposal.

Finally, in ORS 468.460 (3), the Commission shall consult with Oregon State University and may consult with other agencies prior to the rule adoption of the previous paragraph.

When the adopted annual acreage limitation is less than the amount registered for open burning (as it has been every year), the Commission must consider again items a. through d. or other reasonable methods

when allocating acreage for open burning. Though not required by law, the DEQ would like to receive any input which OSU can provide regarding allocation procedure so we may, in turn, advise our Commission.

In summary we are asking OSU the following questions:

1. What advice or recommendations can OSU provide to the Commission regarding reductions of acreage by certain permit areas below the 180,000 acre authorized for 1978, taking into consideration items a. through d. listed above?

2. When registered acreage exceeds the burning limitation adopted by the Commission, what advice or recommendations can OSU provide to the Commission regarding the procedures for allocating permits? Items a. through d. should again be considered as well as date of registration, proportional share or any other reasonable method.

As I mentioned, the public hearing is scheduled for February 24, 1978. We would like to review your comments and mail them to the EQC in advance of their meeting. Also you may wish to attend the hearing should Commission have questions regarding your response.

Thanks for your help and please feel free to call if you have questions.

Sincerely,

Scott A. Freeburn
Coordinator - Field Burning Program

SAF:ckw

Crop Science Dept.
EXTENSION SERVICE

Oregon State University

(503) 754-2771
Corvallis, Oregon 97331

February 16, 1978

Scott A. Freeburn
Coordinator -- Field Burning Program
Department of Environmental Quality
16 Oakway Mall
Eugene, OR 97401

Subject: EQC hearing restricting open field burning

Dear Mr. Freeburn:

The following statement has been prepared in consultation with Drs. John Hardison, Orvid Lee, D. O. Chilcote, and Jim Kamm. It summarizes the status of alternatives to open field burning available to growers in 1978.

PLANT DISEASE CONTROL

The effectiveness and importance of fire and flame sanitation in plant disease control has been well established. Major diseases, especially ergot, blind seed disease, and grass seed nematode, are now controlled by only open field burning. The experimental chemical, Bayleton (BAY MEB 6447) has shown promise in control of diseases such as rusts, powdery mildew, and certain other leaf and stem diseases. Bayleton is not expected to control ergot and blind seed disease. Bayleton is not registered. Sodium azide has given control of ergot and blind seed disease by suppression of ascocarps, but it is not registered for this use. New chemicals are being screened continually to find materials that will control blind seed disease and ergot.

WEED CONTROL

Open field burning is still the only dependable method available for control of winter annual grass weeds in annual ryegrass seed fields. Ethofumesate (Nortron), the herbicide that has shown promise for control of weeds in annual ryegrass seed fields, was granted an emergency exemption by EPA under section 18 of FIRFA in November 1977. This emergency exemption expired Dec. 31, 1977. There is no assurance that this exemption will be renewed in 1978 or that any other type registration will be available. Thus, it can't be assumed that this herbicide will be available for widespread use in 1978. Even if another emergency exemption is granted in 1978, the use restrictions imposed by such an exemption are so stringent that use is impossible or impractical for most growers.

Weed control in perennial grass seed fields is still dependent on open field burning. While the mobile field sanitizer and complete mechanical removal of crop residues have shown some promise as alternatives to open field burning, neither practice has been fully researched and the equipment required for these practices is not generally available. Thus, there are no practical alternatives to open burning available at this time and it is concluded that weed control will be very difficult in unburned fields in the fall of 1978.

STIMULATION OF SEED PRODUCTION

Post harvest burning of perennial grass seed crop residue is important to stimulate seed yield the following season. This effect is exerted primarily through enhanced tillering in the fall giving a larger number of vigorous new shoots which subsequently have a greater degree of reproductive development. Research suggests that this is a result of residue removal allowing greater light penetration and absorption by the soil. This change in micro-climate gives warmer soil temperatures during the day and cooler temperatures during the night, thus enhancing tiller development and subsequent reproductive development. To date no other treatment other than burning accomplishes this effect.

The close-clipping and sweeping method in experimental plots gives residue removal similar to open burning. Although not as effective as burning, it does assist in maintaining higher seed yields. Raking and flail-chop removal methods are less effective. The costs and extended effects of close-clip-sweep need to be evaluated on a field basis.

INSECT CONTROL

Plant pests that use leaves, seed culms, and stems of grasses as overwintering sites are affected by field burning. Those pests that feed in the roots or crowns of grasses are not affected by burning. Insecticides that once effectively controlled plant bugs have been cancelled by the EPA because of real or potential environmental concerns. The primary control measure for the plant bugs that cause "silver top" is field burning. Research studies indicate that any reduction in field burning is likely to result in an increase in "silver top". This disease causes all or parts of the infloresence to prematurely turn white and abort seed development.

During the 1977 season severe outbreaks of March fly and wire worm occurred in grass seed fields. These infestations resulted in the destruction of grass stands. There is some indication that the severity of these outbreaks was associated with poor field sanitation in 1976.

Open field burning remains the only control for insects that infest grass seed fields and cause "silver top".

SUMMARY

There is no chemical or substitute thermal treatment available to farmers in 1978 to control ergot, blind seed disease, or seed nematode other than open field burning. Field burning remains the only available technique for control of insects that cause "silver top". Field burning is an essential practice for weed control in both annual and perennial grasses grown for seed. Without it, the maintenance of the high quality standards for purity demanded by the consumer will be difficult or impossible to attain.

To respond specifically to your questions: (1) What advice or recommendations can OSU provide to the Commission regarding reductions of acreage by certain permit areas below the 180,000 acres authorized for 1978, taking into consideration particular local air quality conditions; soil characteristics; the extent, type or amount of open field burning of grass seed crops; and the availability of alternative methods of field sanitation, straw utilization, and disposal?

The limiting nature of the soils on which many grass seed crops are grown reduce the crop choices available to farmers. Perennial grass seed crops are sod forming and provide the best soil protection of any crops that can be grown on the hill-land soils. Perennial and annual ryegrass are the most tolerant winter crops of the high water table and frequent winter flooding that occurs on many of the soils in the southern Willamette Valley. Forcing shifts from grass seed production on these soils with limited alternatives will create a severe economic hardship on farmers and create new pollution problems.

Preliminary tests of burning machines and techniques have not provided any practical means of achieving an acreage reduction in open burning. Experiments with the close-clip-sweep technique of non thermal treatment have shown promise but needed field tests have not been funded. It is not an available practice at this time.

Straw utilization research and development activities have not demonstrated any economically feasible commercial use for straw. The tonnage of straw for animal feed in 1977 has declined because of the lower price of high quality hay. The outlook for hay prices in 1978 indicates that the interest for straw as an animal feed will be even less in the coming season. Thus, the entire cost of straw removal must be borne by the seed grower and he has no method available for disposal without burning.

There is no technical basis for reducing open field burning below the 180,000 acre maximum specified in the law.

In response to question (2), when registered acreage exceeds the burning limitations adopted by the Commission, what advice or recommendations can OSU provide the Commission regarding procedures for allocating permits?

There is no information available supporting acreage allocation based on soil characteristics or grass seed species. When the registered acreage exceeds the burning limitation, the available acreage should be allocated to grass seed growers on a proportional basis so that all seed growers share the hardship equally. The decision as to which fields should remain unburned is a management decision that should be left to each individual grower based upon his judgment of the best way to minimize his losses.

Sincerely,

Harold Youngberg

Harold Youngberg
Extension Agronomist

HY/kk

PUBLIC AFFAIRS COUNSEL

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ROBERT G. DAVIS, President

TED HUGHES, Vice President

February 22, 1978

FOR THE OREGON GRASS SEED INDUSTRY

Background on Field Burning Legislation and Its Impact

The 1977 Legislature adopted a law (House Bill 2196) authorizing burning of 195,000 acres of grass seed fields in 1977, and 180,000 acres in 1978. It also provided that, beginning in 1979, the Environmental Quality Commission would set the number of acres that may be burned.

The 1975 Legislature had set the acreage level at 95,000 in 1977, and 50,000 each year thereafter. But the subsequent Legislature determined that this would cause the death of the grass seed industry in the Willamette Valley and increased the limit for two years, and left open the option of reviewing Environmental Quality Commission limitations in ensuing years.

The 1977 revision was presented to the Environmental Protection Agency as an amendment to the "State of Oregon Clean Air Act Implementation Plan" (SIP). The current plan for attaining and maintaining the National Ambient Air Quality Standards for control of total suspended particulate (TSP) in the Willamette Valley relies, in part, on limiting grass seed field burning to 50,000 acres. Region 10 of EPA has advised the Department of Environmental Quality that its proposed amendment -- increasing the level of field burning from 50,000 to 180,000 acres for 1978 -- is not acceptable without providing increased control on other contributing sources to offset any additional air pollution from field burning.

The DEQ's proposed amendment to the State Implementation Plan did not indicate any other steps that would be taken to offset any added pollution from field burning. This, in effect, called upon EPA to permit a relaxation of the SIP, which the EPA contends it is not legally empowered to permit.

A. The Law and Legislative Intent

House Bill 2196 makes two key statements in legislation authorizing continuation of field burning, and at newly specified levels. Section 4 provides, in part:

"Recognizing that limitation or bar of the practice (of field burning) at this time, without having found reasonable and economically feasible alternatives to the practice could seriously impair the public welfare, the Legislative Assembly declares it to be the public policy of the state to

reduce air pollution by smoke management and to continue to seek and encourage by research and development reasonable and economically feasible alternatives to the practice of annual open field burning, all consistent with ORS 468.280."

The Legislature also provided in Section 8, Subsection 5:

"It is the intention of the Legislative Assembly that permits shall be issued for the maximum acreage specified in subsection (2) of this section unless the commission finds after hearing that other reasonable and economically feasible alternatives to the practice of annual open field burning have been developed."

The legislative record of hearings and floor debate clearly show that the Legislature meant what it said: That permits must be issued for burning 195,000 acres in 1977 and 180,000 acres in 1978.

The implication clearly is that the Legislature has approved a certain quantity of emissions from burning of grass seed fields. No other industry or source has similar legal authority; all others are governed by administrative rule. Consequently, all strategies for attaining and maintaining the National Ambient Air Quality Standards must start with the premise that there will be 180,000 acres of field burning this year. As the EPA says, there must be a strategy for reducing total suspended particulates in the atmosphere. But Oregon law provides that this strategy may not include a reduction in field burning below 180,000 acres.

Legislative intent was made even clearer when the Assembly adopted provisions authorizing the Environmental Quality Commission to set the field burning acreage limit in years after 1978.

If the Legislature had wanted to give the commission a voice in field burning limits for 1977 and 1978, clearly it would have said so. But it did not; it gave the commission a voice beginning in 1979, and pointedly took the matter out of the commission's hands for 1977 and 1978.

B. The Role of the Environmental Protection Agency

Two sets of air quality standards have been adopted by Congress and the EPA. Primary standards are set to guard the public health. These standards provide that the total suspended particulate (TSP) load may not exceed 260 micrograms per cubic meter of air. Secondary standards, related to esthetic considerations such as visibility, provide that the TSP may not exceed 150 micrograms per cubic meter.

In a January 27, 1978, letter to William H. Young, Director of the Oregon Department of Environmental Quality, Region 10 EPA Administrator Donald P. DuBois noted that present air quality control requirements have not been enforced, "and both the primary and secondary particulate standards were exceeded at one or more sampling sites in the Eugene-Springfield area last year."

In fact, the tougher secondary standard of 150 micrograms was exceeded 27 times at Eugene-Springfield air sampling stations during 1977. But only eight of those came during the field burning season, and only on one of those dates was any field burning conducted.

The 39,000 acres burned on that day, August 23, was the largest number by far put to the flame on any day during the field burning season. Yet the micrograms of TSP were measured at only 153 -- barely over the 150-microgram esthetic standard. And this measurement was exactly matched on September 10, 1977, a day on which the DEQ says there was no field burning in the Willamette Valley.

When Eugene-Springfield reports 27 violations of the secondary standard, and field burning has occurred on only one of those days, other sources obviously are at fault.

In a telephone conversation with Robert G. Davis, government relations representative for the Oregon Seed Trade Association, just yesterday, February 21, EPA Region 10 Legal Counsel Richard Du Bey commented:

"It is unfortunate that the State of Oregon has addressed total suspended particulates only with respect to field burning."

Du Bey was asked specifically by Davis whether the EPA would reject any proposed amendment to the State Implementation Plan unless the field burning acreage were reduced. Du Bey said that this is not the case. The EPA, he said, is not interested in the methods the state uses to reach and maintain the air quality standards. The EPA is interested only in results. The state, he said, is within its rights to authorize burning of 180,000 acres. EPA will accept any control methods adopted by the state for control of air pollution, as long as the overall strategy works to meet the goals of the Clean Air Act.

In his letter to DEQ Director Young, EPA Regional Administrator DuBois made this point as well. He wrote:

"The selection and implementation of an adequate control strategy, including the determination of relative levels of control to be applied to various sources of air pollution to protect the public health and welfare, is an important State prerogative and responsibility under the Federal Clean Air Act."

DuBois went on to make a number of suggestions as to how Oregon might modify its proposed revision of the State Implementation Plan. This, he said, would in all likelihood result in a temporary, one year control strategy to be supplanted by the plan revision due under the new Act of Congress early next year. His suggestions included:

1. Reducing the field burning acreage for 1978. This, of course, is an action prohibited by the Legislature.

2. Making quantified improvements in the smoke management program. The smoke management program is continuously being refined and new burning techniques developed to reduce the suspended particulate load. Included is a plan for this year to put all growers in radio communication with state officials so they can put out field fires in the event of adverse weather changes.

3. Making changes in emission limits applicable to other source categories. Steps along this line already are being taken. DEQ Director Young has reported an informal agreement with the State Department of Forestry to sharply restrict burning of forest slash during the field burning season soon will be made formal.

The DEQ has still other avenues open. Included is a better definition of how much of the total suspended particulate load is actually attributable to field burning. The DEQ estimates that 44 pounds of TSP are emitted for each acre of grass straw burned. But this estimate could be far off.. If an average of two tons of straw per acre were left to be burned, the average emission level would be only 31.2 pounds per acre, according to research of Dr. Richard W. Boubel of Oregon State University's Engineering Experiment Station.

DuBois did not limit himself to those few suggestions, however. He said it probably would be acceptable if the state simply promised to make a good faith effort to control air pollution in 1978. His letter to Young said:

"If formal revision of the plan proves infeasible, I believe there is another possible solution to the problem. The State of Oregon may be able to develop a one-year control strategy which shows that all reasonable measures will be taken in 1978 to alleviate the particulate problem in the Willamette Valley. Such a control strategy should show dates by which the 1978 measures would be implemented and a schedule for developing the SIP revision to be submitted in early 1979. Such a control strategy would be embodied in a formal agreement between EPA and the State."

C. The Role of the Department of Environmental Quality

The Department of Environmental Quality has an obligation to uphold the law authorizing burning of 180,000 acres of grass seed fields in 1978. DEQ Director Bill Young reported on Tuesday a number of recommendations he will make to the Environmental Quality Commission that seek to reduce total suspended particulates in the Willamette Valley. He was quoted in a Salem newspaper on that same day as saying adjustments can be made in air pollution enforcement to reduce slash burning smoke and to more strictly regulate field burning while still allowing 180,000 acres to be burned.

Time constraints prevented the DEQ from taking these steps in 1977 prior to the field burning season. However, there has been and still is adequate time to develop a new strategy to accommodate federal primary and secondary air quality standards.

But as has been said before, this strategy may not include a reduction of the level of field burning authorized by the Legislature. Whatever reductions in TSP are required must be applied against the dozens of other sources of air pollution.

In addition, the DEQ must do research essential to demonstrating how much of the particulate load is actually contributed by field burning. Young himself says this is not really known at this point, and urges a significant amount of field burning this summer so that a substantially improved air quality monitoring network can produce some definitive results.

As EPA Legal Counsel Du Bey pointed out, particulates come from many more sources than field burning. In fact, field burning is only 5-7 percent of the problem but has drawn 100 percent of the attention.

In 1977, Oregon air sampling stations detected 118 violations of the secondary air quality standard throughout the state. The only violations receiving attention are those that fall during the field burning season. And yet in the Eugene-Springfield area only one violation could be remotely attributed to field burning.

During the legislative session and in appearances before the Emergency Board, the Oregon grass seed industry strongly supported efforts to finance adequate research to determine the true extent of the contribution of field burning to air quality problems. The Association still supports that effort, and commends Bill Young for putting together funding for an enlarged air sampling network.

D. The Role of the Industry

Over the last several years, growers have contributed approximately $3 million toward smoke management programs, and research into alternatives to field burning. They have cooperated and continue to cooperate with the Department of Environmental Quality, Oregon State University and others involved in these programs to accomplish three goals: Reduce the amount of emissions caused by field burning, to burn at times and places as directed by state agencies to keep smoke away from populated areas, and to find environmentally sound and economically feasible alternatives to burning.

Growers continue to involve themselves in refinement of the smoke management program, attending and presenting seminars, installing communications equipment, and engaging in "rapid lighting" experiments to find ways to move the smoke higher into the air, with fewer emissions.

Growers are obligated by law, and personally committed, to the use of all methods discovered to minimize the smoke from field burning, and to the use of reasonable and economic alternatives as they are developed.

They currently are spending considerable time and money in an effort to block the transfer from Oregon of the only Agricultural Research Service entomologist in Oregon, Dr. James Kamm. Dr. Kamm has under way a series of experiments to control, in environmentally approved ways, insect pests that attack the major grasses grown for seed. His is one of many continuing efforts designed to find means of controlling grass seed diseases and pests other than by burning.

E. Summary

1. All researchers, the Governor and the Legislature have concluded that there are no reasonable and economically feasible alternatives to field burning, and pollution from this source should be controlled by a smoke management program.

2. The Legislature has specifically determined that burning of 180,000 acres of grass seed fields must be permitted in 1978.

3. The Environmental Quality Commission may not reduce the level of field burning in 1978 below 180,000 acres.

4. The Department of Environmental Quality must file a new amendment to the Clean Air Act State Implementation Plan showing that 180,000 acres will be burned this summer, but that reductions of emissions will be effected by better controls on other sources, or develop -- as suggested by EPA -- a one-year control strategy. For the DEQ not to make a good faith effort would be to subvert the law by inaction.

5. The EPA has said specifically that a plan including provision for burning of 180,000 acres will be acceptable, providing that the overall requirements of the Clean Air Act are met.

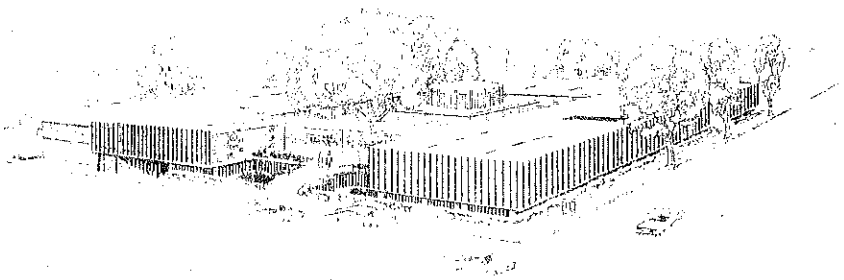
6. Additional research must be conducted to show the true impact of field burning on air quality. Responsible state officials now admit this data is not available.

7. Research also must be conducted into other sources of pollution. Field burning is very rarely associated with violations of the secondary air quality standards, and there has been no showing that field burning was the cause, or contributed significantly to, any violations.

PRELIMINARY REPORT ON THE IMPACT OF FIELD BURNING ON EUGENE'S AIR QUALITY

Prepared by:
Terry Smith

CITY OF EUGENE



OFFICE OF THE CITY MANAGER
503/687-5010

P.O. BOX 1967

EUGENE, OREGON
97401

M E M O R A N D U M

February 23, 1978

TO: Members of the Environmental Quality Commission

FROM: Terry Smith, Environmental Analyst, City of Eugene

RE: ATTACHED REPORT

Attached is a copy of the "Preliminary Technical Report on the Impact of Field Burning on Eugene's Air Quality." Due to the short time available for the preparation of the report, several appendices that were to be included with the report have not been completed (i.e., sample calculations for the regression analysis and an evaluation of the test statistics). These sections will be added to the report as time permits. Finally, as new data is evaluated, additional sections will be added to the report (i.e., the drying characteristics of Oregon grass straw). The addition of these sections will strengthen and clarify the report's conclusions.

The major conclusions of the study are:

1. The adverse health effects that have been reported to occur during the field burning season are to be expected, given the concentrations of total suspended particulate matter and oxidents in Eugene's air during that period.

2. Smoke from open burning is especially potent for causing these health effects, due to the small size and composition of the particles emitted and the chemical composition of the gaseous emissions.

3. As a result of inefficient sampling methods and inappropriate sample handling techniques, previous estimates of the contribution field burning makes to particulate concentrations in Eugene are too low.

4. Open burning emits Polycyclic Organic Matter (POM), which has been strongly implicated as a human carcinogen. The human exposure to POM caused by field burning is unknown at this time, as are the health implications of that exposure.

5. During a severe smoke intrusion into a population center, field burning pollutants by themselves may produce adverse health effects.

6. For the past three years, rice growers in the Sacramento Valley have been using straw moisture restrictions and "into-the-wind strip-lighting" to drastically reduce the emissions of particulate, total hydrocarbons, and carbon monoxide from field burning. We have found no reason to believe that these methods, as well as alternate-year burning, cannot be used successfully on grass-seed fields.

As you will note when reading this report, several technical pitfalls that have not been appreciated in the past are pointed out--the problem of collecting field-burning smoke with Hi-Vol samplers is one example. These pitfalls are not limited to Oregon, but have been duplicated in several other states. It is hoped that the identification of these problems and the compilation of data from numerous sources on the physical characteristics of field smoke will make future research on the consequences of open-field burning more productive.

TS:jm/THa1

PRELIMINARY TECHNICAL REPORT ON THE IMPACT OF FIELD BURNING ON EUGENE'S AIR QUALITY

Introduction

For many years, there has been debate on the scientific and medical aspects of field burning. Three main questions have been debated: 1) How much field burning smoke enters Eugene's air; 2) Does smoke from field burning pose a health hazard? and 3) Are there economically practical means of reducing any impact field burning might have? There has been a serious lack of data for resolving any of these three questions. Previous studies indicate that field burning had only a small impact on Eugene's air quality and it was surmised that the health effects were minimal.

New data has now been gathered on the character of the emissions from open burning, on the health effects of particulate matter, and on methods of reducing the emissions from open field burning. This information has been used to make an independent reassessment of the impact and control of Oregon grass field burning. The conclusions of this investigation are: 1) that, given the concentrations of air pollutants present in Eugene's air during the field burning season, we should expect to see the kinds of health effects that have been reported; 2) that smoke from open burning is especially potent for causing the observed health effects; 3) that the impact of smoke intrusions from open field burning is much greater than previously estimated; 4) that the concentration of pollutants in a severe smoke intrusion may pose a health risk even without pollution from other sources in the area; 5) that the impact on Eugene of field burning is about the same as slash burning; 6) that certain emissions from open burning are known carcinogens, but with uncertain impact; 7) that economical burning practices can be employed to significantly reduce the emissions of particulate, total hydrocarbons, and carbon monoxide; and 8) that the particulate emission factors used in the past for open burning underestimate actual emission rates.

Possible Health Effects from Grass Seed Field Burning

Many Eugeneans suffer adverse health effects which may be caused by smoke intrusions during the field/slash burning season. The reports of doctors, several individuals, and a few limited studies indicate that the adverse effects include aggravation of the symptoms of pre-existing lung disease, aggravation of hay fever and asthma, and accute irritation of the lungs, eyes, and nasal passages. The existing data does not, at this time, allow us to determine how severely or how many people are affected.

In general, there are two types of exposure to air pollutants--chronic or long-term exposures and accute or short-term exposures. For many pollutants, the human body can tolerate larger short-term exposures than long-term exposures. For this reason, the primary National Ambient Air Quality Standards (NAAQS) allow an annual geometric mean concentration of particulate matter of 75 micrograms-per-cubic meter (ug/m^3), while the 24-hour average can be as great at 260 ug/m^3. When these standards were issued, it was thought that they would adequately protect the public's health. To ensure that the

public's health is adequately protected and to protect against property damage, another set of more restrictive secondary standards was also issued. For the air quality of a community to meet the secondary standards, concentrations of particulate matter cannot exceed 60 ug/m^3 annual geometric mean or 150 ug/m^3 24-hour average.

Since these standards were issued, new research data has indicated that human health may not be adequately protected even by the present secondary standards. It seems that the present annual standards for total suspended particulate (TSP) matter is adequate and may even include a small safety margin. However, "best judgment" estimates by the Environmental Protection Agency Health Effects Research Group of the 24-hour TSP threshhold for health effects indicate that concentrations of 80-100 ug/m^3 cause an aggravation of symptoms in the elderly and aggravation of asthma symptoms while concentrations of 170 ug/m^3 cause accute irritation systems[1]. These conclusions are based on studies of cities where the air pollution includes sulfur dioxide as well as particulate matter. Many researchers believe that there are synergistic effects between sulfur dioxide and particulate matter which make it difficult to predict what effect these concentrations of particulate matter alone might have. For this reason, the EPA does not yet feel that it is advisable to change the present standards for suspended particulate matter. Nonetheless, the current data seems to be the best available information on the effects of particulate matter on health.

During the field-burning season, TSP concentrations regularly exceed 100 ug/m^3 24-hour average even at rural sampling sites and often exceed the 24-hour secondary standard of 150 ug/m^3. Another pollutant, photochemical oxidant, is also found in Eugene's air during the field burning season at concentrations exceeding the primary standard of 160 ug/m^3. High photochemical oxidant concentrations produce health effects similar to those caused by particulate matter as well as causing irritation of nasal passages, watering of the eyes, headaches, and increased susceptibility to respiratory infections. It is not surprising, then, that portions of the population of Eugene experience the adverse health effects that have been reported considering the concentrations of particulate matter and oxidant present in this area during the field and slash burning season.

Field and slash smoke are especially potent in producing these reported health effects. Several investigations of the particulate emissions from open burning of fuels similar to grass straw show that over 95 percent of the particulate mass is smaller than 5 micrometers (um) in diameter.[2,3,4,5] Particles smaller than 5 um are deposited deep in the lungs of humans breathing them. Open burning also releases significant amounts of gaseous and liquid hydrocarbons.[6] Some of the hydrocarbons (i.e., formaldehyde and acrolein) are strong irritants and are even more toxic when absorbed onto inert particles that can penetrate deep into the lungs. Other hydrocarbons contained in field smoke can react photochemically to produce oxidant.

The Impact of Field Burning on Particulate and Oxidant Concentrations in Eugene

Past efforts to determine how much field burning smoke enters Eugene's air have had limited success due to the lack of sufficient data. The most notable effort was the Environmental Protection Agency's "Technical Support Document on the Phasedown of Oregon's Open Field Burning" (EPA-TSD) prepared in response to Oregon's State Implementation Plan amendment of 1976. The EPA's study used two approaches to characterize the impact of field burning: An optical microscopic analysis performed by Walter C. McCrone Associates of Hi-Vol filter and slash samples collected in Eugene and Springfield, and a statistical multiple correlation analysis and multiple linear regression analysis to relate the effects of several meteorological variables and the amount of field and slash burning to measurements of air quality in Eugene and Springfield. From these analyses, EPA predicted the contribution of field and slash burning to TSP concentrations in Eugene-Springfield.

The statistical analysis predicted contributions over the three-year period examined from field and slash burning as follows: "1) field burning mean 24-hour contributions of less than 1 ug/m^3 to 4 ug/m^3 and maximum 24-hour contributions of less than 13 ug/m^3 to 43 ug/m^3; and 2) slash burning mean 24-hour contributions of less than 3 ug/m^3 to 15 ug/m^3 and maximum 24-hour contributions of less than 21 ug/m^3 to 84 ug/m^3." "The microscopic filter analysis showed that for 59 filters examined from the 1975 field burning season, an average of 8 ug/m^3 of the TSP levels was attributable to field burning. The range was from less than 1 ug/m^3 to 33 ug/m^3. A small number of filters were examined for burned wood and bark which will originate from slash burning, hog-fueled boilers, or other wood combustion sources. The average value for this category of particles was about 5 ug/m^3 (the range was from 1-15 ug/m^3)." The study concluded, "These values are well below the primary 24-hour NAAQS of 260 ug/m^3 but are significant when added to the contribution from other sources in the area."

In order to determine the reasonableness of these predictions, an estimate of the contribution a hypothetical smoke intrusion would make to TSP measurements was calculated using visibility reduction as a measure of air quality. Severe smoke intrusions that have occurred in the past have reduced visibility to 1-1.5 miles for two hours, followed by an improvement in visibility to four miles for the next three hours. Using this characterization and an emperical relationship derived by Oregon DEQ between visibility and TSP,[7] it is possible to calculate the contribution of the intrusion to measured 24-hour TSP levels. By this method, the estimated contribution is 64-83 ug/m^3. Although smoke is more efficient in reducing visibilities than typical suspended particulates, these values are far greater than the predictions in the EPA-TSD. Therefore, a re-evaluation of the EPA's statistical and microscopic analysis was necessary to determine the reason for the discrepancy.

Since both the statistical analysis and the microscopic analysis made use of Hi-Vol filter data, any weaknesses in this sampling method will affect both predictions. As stated earlier, numerous investigators of the emissions from open burning have found them to be very rich in sub-micron particles.

Carrol, et al, found that the particles in smoke from burning cereal grain straw had mass median diameters in the 0.1 um range (see Figure 1). About half of the particulate was found to be liquid or semi-fluid hydrocarbons. Most of the particles below 1 um in diameter were amorphous.

As the smoke plume ages during transport from the burning site to a receptor area, it is possible for some of these characteristics to change. Calculations[8,9] and measurements[10] show that the agglomeration rate for 0.05 to 1.0 um particles is too slow to produce a large reduction in the mass fraction of sub-micron particles in less than 12 hours. Since the evaporation rate of the volatile hydrocarbons is greatest for the large particles, the mass of particles greater than 1 um will decrease with time.[2] The loss of particles larger than 3 um by dry deposition is significant during this time period.[11] In addition, photochemical reactions in the aging smoke plume will generate new aerosol in the sub-micron size range under typical summertime conditions in a few hours. This suggests that aged smoke plumes intruding into Eugene should have a greater mass fraction of sub-micron particles than existed near the fire line.

The issue, then, is whether Hi-Vol filter samplers adequately measure the concentration of particulate matter having a mass median diameter of 0.1 um and consisting of a large portion of small liquid droplets. A review of several studies shows that Hi-Vol filters are very inefficient at collecting particles of this type.[12] Figure 2 shows that a large portion of 0.1 um particles will penetrate a glass fiber even at flow rates one-third those used in Hi-Vol filter samplers. Simple linear extrapolation of this data (see Figure 3) to flow rates used in Hi-Vol samplers suggests that penetration could be as great as 38 percent. As the fiber filter begins to accumulate particulate matter, the penetration of solid particles will begin to decrease and the penetration for liquid particles will increase. In addition, one investigator[13] has found that evaporation losses during sampling of photochemically-produced liquid aerosols can be as great as 40%. Evaporation losses will continue to occur during filter storage before analysis. Photochemically-produced aerosols are similar to the particulate hydrocarbons produced by open burning--partially-oxidized, liquid, hydrocarbon droplets. The combination of all these effects could lead to an underestimation of the mass concentration of a smoke intrusion by 25-50%.

Data from Hi-Vol filter samplers was used to derive the regression equations for predicting the impact of field burning on TSP in the statistical analysis. The inefficiency of Hi-Vol filters for collecting smoke particles will tend to mute the effect predicted for field burning. This problem is further aggravated by the small size of the particles from field burning. Since it takes one million particles 0.1 um in diameter to equal the mass of a single 10 um particle, small contributions of large particles from sources near samplers will tend to obscure the impact of field burning further. The effect of these problems is partially indicated by the amount of variability in the data that is unaccounted for by the regression equations--25 to 50%. Clearly, then, the combination of masking effects and the poor collection efficiency of Hi-Vol filters for field smoke will cause the EPA's regression analysis to significantly under-predict the impact of field smoke.

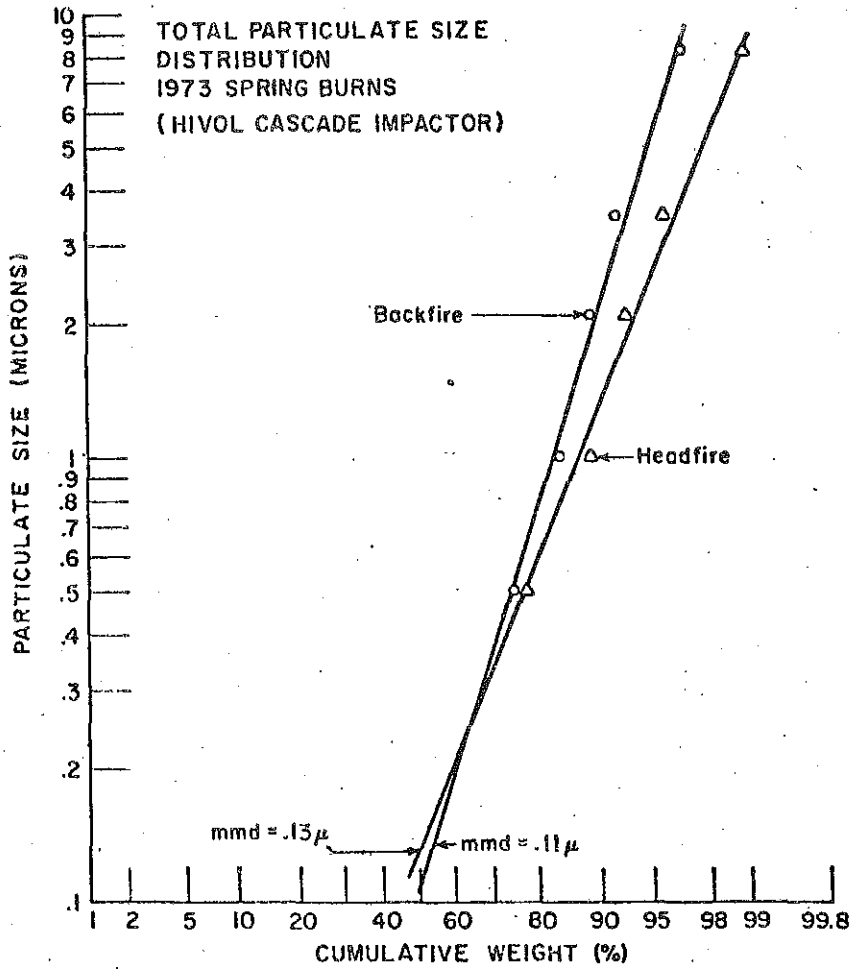


Figure 1 Particulate Size Distribution, Head and Backfires (ref. 2)

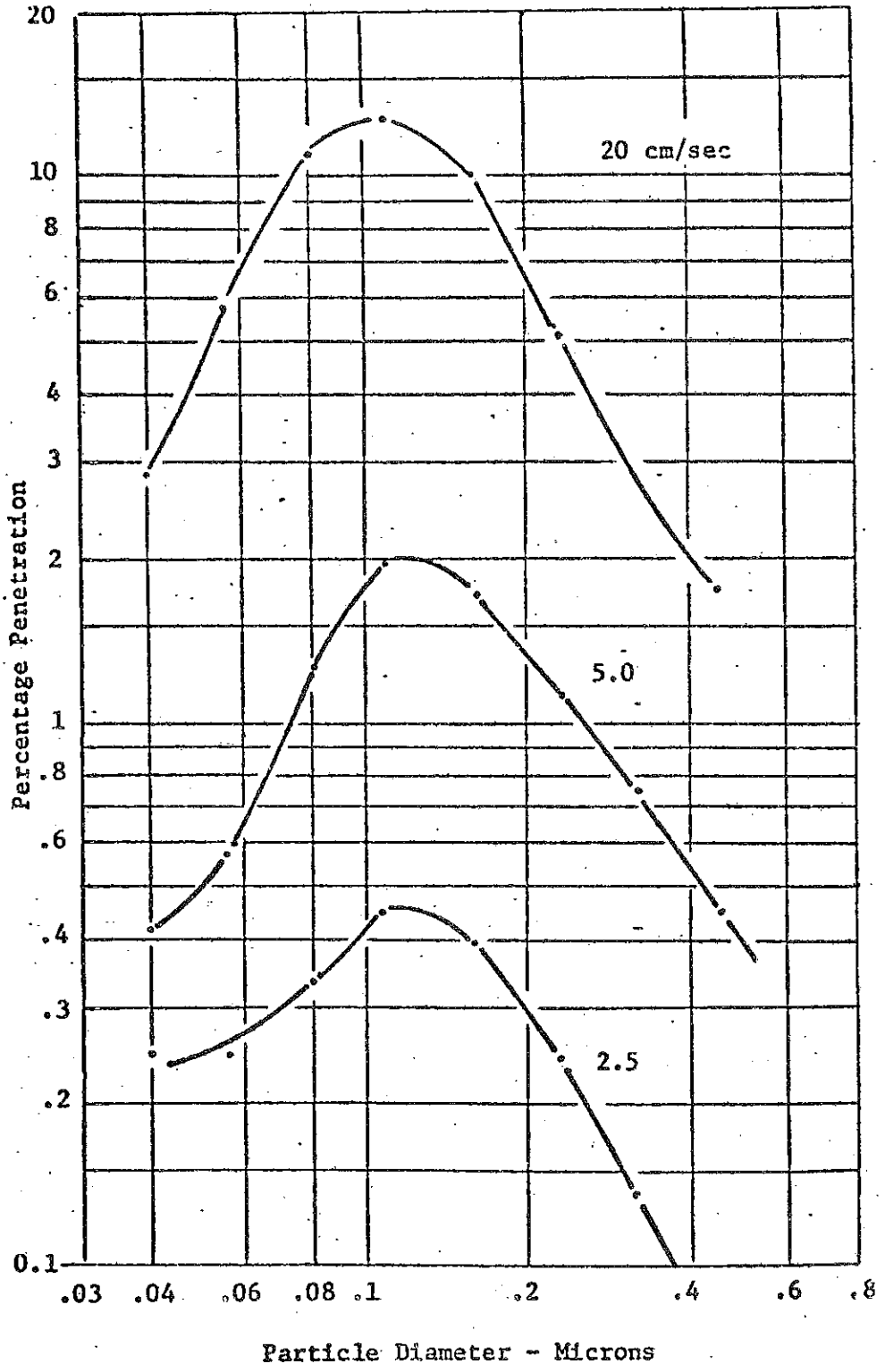


Figure 2 PENETRATION v PARTICLE SIZE FOR SODIUM CHLORIDE (ref. 12)

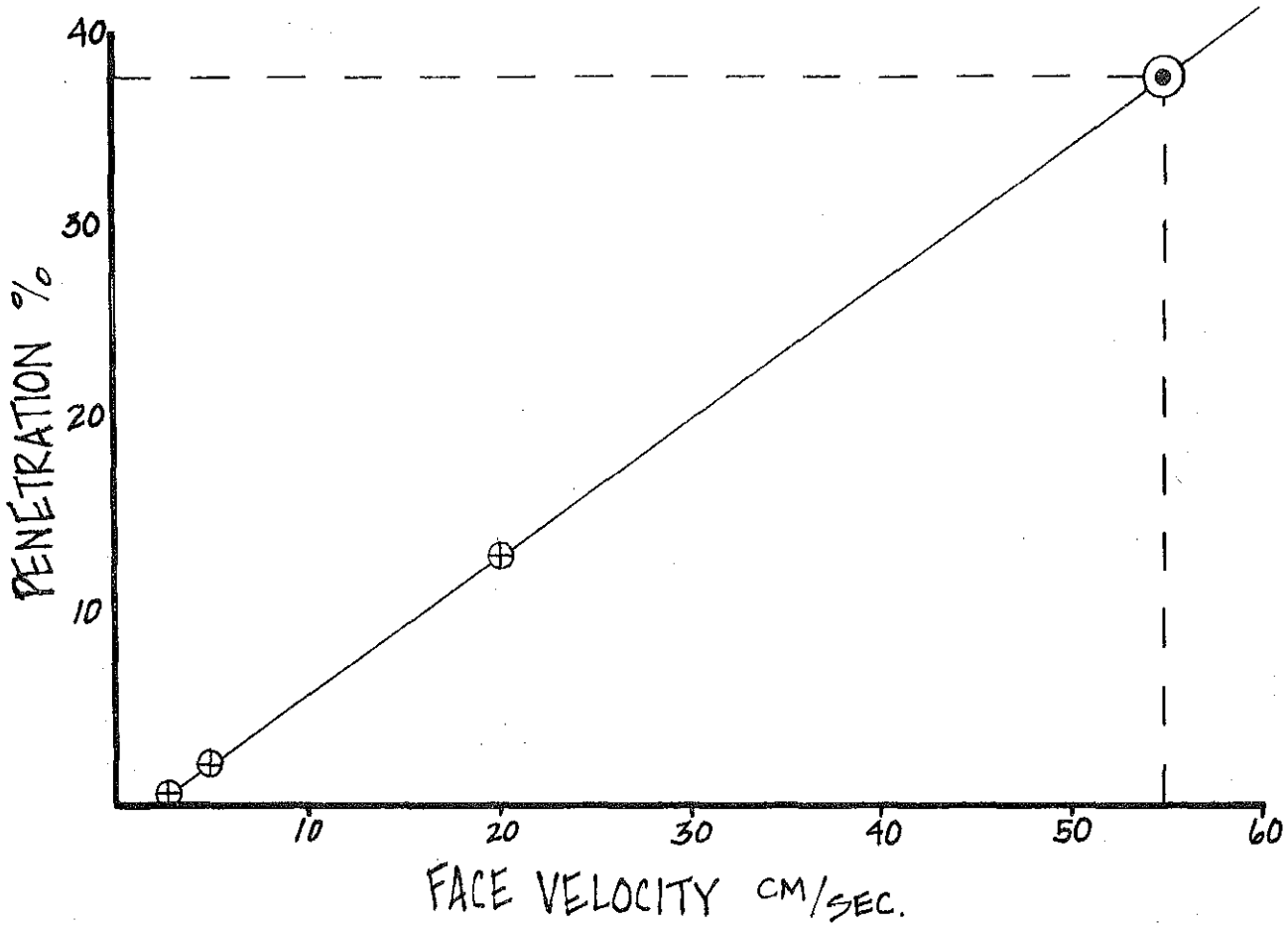


Figure 3. Extrapolation of data from figure 2 to estimate the maximun penetration of particulate through glass fiber filters for the flow rate used in Hi-Vol samplers (55cm/sec)

Another instrument used to monitor air quality is the nephelometer which continuously monitors the amount of light scattered by suspended particulates in the air. The intensity of the scattered light, usually referred to as B_{scat}, is proportional to, among other parameters, the concentration of particulate in the 0.1 to 0.7 um size range.[14] So long as the particulate concentration in this narrow size range varies with total particulate concentrations, it is possible to use a semi-empirical equation to calculate TSP from nephelometer readings.

There are two advantages to this approach. One, the nephelometer makes its measurements without significantly disturbing the particles suspended in the air. It therefore can measure liquid as well as solid particles and does not suffer from the collection inefficiencies of the Hi-Vol filter samples. Two, B_{scat} is sensitive to sub-micron particles while Hi-Vol measurements are most sensitive to the large size range. The main disadvantage is that B_{scat} is sensitive to changes in the size distribution and optical properties of the particulate, so that changes in B_{scat} can be produced by factors other than changes in TSP concentration. Some of this interference can be removed by using data from the area where the nephelometer is to be used for developing the semi-empirical equation for calculating TSP from B_{scat}. This procedure was used here.[15]

As a part of the statistical work for the EPA-TSD, a regression analysis was performed using B_{scat} measured at Eugene and Springfield and visibility measured at the Eugene Airport as the dependent air quality variables. The analysis was not completed, however, because there are no federal standards for B_{scat} or visibility. In an attempt to overcome the limitations described above for the Hi-Vol data, we completed the B_{scat} and visibility analysis and calculated the estimated impact of field and slash burning on TSP concentrations.

The predicted concentrations from field and slash burnings are as follows: 1) field burning--mean 24-hour contributions of less than 3 ug/m^3 to 16 ug/m^3 and maximum 24-hour contributions of less than 21 ug/m^3 to 99 ug/m^3; and 2) slash burning--mean 24-hour contributions of less than 4 ug/m^3 to 20 ug/m^3 and maximum 24-hour contributions of less than 35 ug/m^3 to 120 ug/m^3. The contributions to visibility reductions are as follows: 1) field burning--mean daily reductions of less than 0.6 miles to 2 miles and maximum daily visibilty reductions of 3 miles to 14 miles; and 2) slash burning--mean daily visibility reductions of less than 0.2 miles to 2 miles and maximum daily reductions of less than 1 mile to 13 miles.

The microscopic analysis done for the EPA of Hi-Vol filters also underestimates the impact of field burning due to the losses of sub-micron and liquid particles from Hi-Vol filters as described earlier. Despite these losses, a large amount of sub-micron smoke particles should still be present on the filter and detectable by the optical microscope. Yet, the microscopist reported that there was little (less than 5%) particle mass in the sub-micron range on these filters.[16] Through investigation and private communication[17] with the McCrone Associates' microscopist, this author has determined that the sample removal and preparation techniques used were inappropriate for analyzing field and slash smoke particles.

The analyst prepared slides for examination from strips cut from the glass fiber filters and shipped to McCrone Associates. The storage and shipping methods and length of time before the samples were prepared for analysis are unknown. Particles were removed from the filters for analysis, using two techniques: 1) the particle "cake" was first scraped off the filter surface onto a clean glass microscope slide and fixed with a cover glass and 1.66 refractive index mounting oil; and 2) an attempt was made to remove particles embedded in the fiberglass filter by taking a sticky drop of Aroclor 5442 resin on a needle and rolling it along the filter surface. Embedded particles, as well as glass fibers, which adhere to the drop were dispersed onto a glass slide that was heated to 80-90°C., covered with a cover glass, and allowed to cool.

As is now known, field burning emissions contain a large portion of particles smaller than 0.1 um. About half of the particulate are hydrocarbons with a wide range of compositions and melting and boiling points. Most of the particles larger than 1.3 micrometers are crystaline or structured in some way and are presumed to be nonvolatile hydrocarbons [mainly $C_xH_yx(x>>y)$], silica, other soil minerals, and ash.[18] Unfortunately, both the mounting mediums used by McCrone Associates are solvents for some hydrocarbons--especially the aromatics. Some of the hydrocarbon particles will melt or boil at 80°C. Finally, an optical microscopy cannot detect particles smaller than 0.2 to 0.3 um in diameter. The sum effect of particle losses during air sampling, filter shipment, and sample handling and preparation is the removal of most of the particulate emitted from field burning and slash burning.

The particles most likely to survive this gauntlet are the non-volatile hydrocarbons and mineral matter that are mostly larger than 1 um. The particles identified by McCrone Associates' microscopist were of exactly this type. Using size distribution data from several of the references, it is possible to roughly estimate what portion of the total contribution of field burning particulate was actually visible to the microscopist. This amounts to using the microscopically-identified field burning particles as a crude tracer.

Even with perfect sampling and preparation methods, only a third of the particulate emitted from field burning would be visible with the optical microscope. If we assume the worst, that all the sub-micron particles were lost, then the microscopist would only have seen one-eighth of the total mass contributed by field smoke. By a most conservative analysis, then, the estimated contribution of field and slash smoke realistically could be multiplied by a factor of 3 to give: 1) the mean 24-hour contribution of field burning for TSP concentrations may be 24 ug/m^3 and the maximum 24-hour contribution may be 99 ug/m^3; 2) slash burning may contribute an average of 15 ug/m^3 and a maximum of 45 ug/m^3 for a 24-hour average.

A summary of the estimates of the impact of field and slash burning on TSP concentrations and visibility for the three years examined by the EPA and re-evaluated in this study is contained in Table 1. Although the data is not precise, significant conclusions can be drawn: 1) the three different

Table 1

Summary of estimated contributions of field and slash burning emissions to TSP concentrations and visibility reductions during the field burning season of 1974 - 76.

Investigation and method of analysis	Mean Contribution		Maximum Contribution	
	FIELD BURNING	SLASH BURNING	FIELD BURNING	SLASH BURNING
EPA - Regression analysis using TSP	1-4 ug/m^3	3-15 ug/m^3	13-43 ug/m^3	21-84 ug/m^3
Original miscroscopic analysis of filters	8 ug/m^3	5 ug/m^3	33 ug/m^3	15 ug/m^3
Impact of smoke intrusion calculated from visibility reduction			64-83 ug/m^3	
Regression analysis using B_{scat}	3-16 ug/m^3	4-20 ug/m^3	21-99 ug/m^3	35-120 ug/m^3
Re-evaluation of miscroscopic analysis of filters	24 ug/m^3	15 ug/m^3	99 ug/m^3	45 ug/m^3
Regression analysis using visibility reduction	.6-2 miles	.2-2 miles	3-14 miles	1-13 miles

methods used to estimate the contribution of field and slash burning particulate to TSP concentrations have produced similar results; 2) the previous estimates have significantly under-estimated the impact of field burning while the impact of slash burning may have been slightly over-estimated; 3) emissions from field burning make a significant contribution to violations of NAAQS for TSP in the Eugene airshed; 4) field burning alone may produce short-term TSP concentrations large enough to pose a health hazard.

The Potential Impact of Field and Slash Burning on Photochemical Oxidant and Carbon Monoxide Concentrations in Eugene

It is well known that open burning of agricultural and forest fuels releases a variety of gaseous hydrocarbons, carbon monoxide, and oxides of nitrogen.[2,19,20,21,22] Boubel, et al, and Darley, et al, proved that large portions of the hydrocarbons emitted from open burning are photochemically reactive. Darley is presently (1978) conducting experiments to accurately determine emission factors for each of the reactive hydrocarbons from a wide range of agricultural and forest fuels. In the presence of nitrogen oxides, reactive hydrocarbons exposed to sunlight potentially can react to form oxidants (mainly ozone), irritant hydrocarbons, and liquid aerosols (the main constituents of L.A. smog). The formation of ozone has been demonstrated in forest and slash fire plumes, but the mechanism of this reaction has not been determined.

Available data does not allow the exact determination of the impact of field burning on oxidant and carbon monoxide concentrations in the Eugene AQMA. Since field burning makes a substantial contribution of particulate to Eugene's airshed, it may also contribute to high oxidant concentrations. The data contained in Table 2 shows that field and slash burning in the three south valley counties--Lane, Linn, and Benton--are major sources of total and reactive gaseous hydrocarbons and carbon monoxide as compared to the other major source of these pollutants--the automobile.[23] The emissions of these two sources cannot be compared with auto emissions because the large heat release during an open burn will, under proper conditions, loft a portion of the emissions to high altitudes while auto emissions are less buoyant and more likely to remain near ground level. One attempt to assess the contribution of field and slash burning to high oxidant concentrations in the Willamette Valley was unsuccessful due to instrumentation problems.[24] This study did show that high oxidant concentrations are widespread, that emissions of oxidant or its precursors from urban centers can lead to high oxidant concentrations in other areas due to long-range transport, and that a valley-wide strategy will probably be necessary for effective control of oxidant. Many other factors are unclear concerning the production and control of oxidants. This uncertainty has lead the EPA to re-examine oxidant control policies and their underlying scientific basis.[25]

Emissions of Polycyclic Organic Matter from Field and Slash Burning

Particulate polycyclic organic matter (POM) is emitted from virtually every combustion source,[26] including open burning. Several members of this

Table 2

The emissions of carbon monoxide and gaseous and reactive hydrocarbons in the three south valley counties - Lane, Linn and Benton for the third quater of 1977.

SOURCE	EMISSIONS IN TONS		
	Olifens and Ethene	Total Hydrocarbons	Carbon Menoxide
Mobile Sources	1669	7585	54,791
Field Burning	1150	2730	22,989
Slash Burning	Emissions unknown	9538	50,867

Table 3 Comparison of seed yields for annual burning, alternate year burning and mechanical removal (expressed as a per cent of annual burning for four grass species over a 3-year period) - (ref. 28)

Species	Annual Burning	Alternate Year Burning[1]	Mechanical Removal
Creeping Red Fescue	100	88	78
Orchardgrass	100	98	84
Merion Bluegrass	100	95	69
Perennial Ryegrass*	100	86	65

[1]A mechanical removal operation was performed in the alternate year so that the treatment began and ended with burning of the residue.

* In this instance, only 2 years were involved.

class of heavy hydrocarbons have been strongly implicated as human carcinogens. Benzo(a)pyrene (BaP) is one example. Field[27] and forest fires have been conclusively shown to emit BaP, and these are probably the two largest sources of these compounds in Oregon. The exact amount of these pollutants released from rye grass burning is unknown. In addition, there is little data on ground-level concentrations of BaP in Oregon air.

One attempt has been made to estimate the possible human exposure and risk from BaP emissions from agricultural open burning.[18] For this calculation, it was assumed that a small field was burned with a fuel load of three tons/acre with moderately unfavorable dispersion conditions. The predicted maximum ground-level concentration was 20% of the estimated maximum safe concentration. That there is uncertainty involved in this calculation and in our knowledge of the actual carcinogenic potential of POM emissions must be considered along with the fact that very large quantities of rye grass straw are burned. While we do not wish to be alarmist, the large uncertainty in our knowledge and the potentially serious risk involved indicates an urgent need to measure the POM exposure produced by smoke intrusions from field and slash burning. Some data on ambient BaP concentrations in Eugene may be available from EPA that could be used to further evaluate this question.

Methods of Reducing the Effect of Field Burning on Eugene Air Quality

The foregoing analysis of the contribution field burning makes to TSP concentrations in Eugene was made for the 1974, 1975, and 1976 burning seasons when the smoke management program was in effect and the acreage burned was limited to 220,000, 186,000, and 166,000 acres, respectively. In the short run, at least, four alterations of current practices can be used to further reduce field burning emissions--additional acreage limitations, the use of alternate-year burning of some crops, and two simple changes in burning practices.

Research at Oregon State University[28] has shown that some grass seed crops will suffer only a small reduction in yield (under 5%) if they are burned every other year instead of every year. To minimize yield losses, mechanical removal of the straw must be used during the non-burning year. (The costs of straw removal range from $17 to $30 per acre.[29]) The results of this type of treatment on some perennials are summarized in Table 3. Ironically, these yield reductions are actually less than are produced by late season burning every year (see Table 4). The possibility of increased disease and insect pests has not been assessed, but some increase could be expected. The results of widespread use of this practice and the effect on other grass varieties is not known. The cost of straw removal ranges from $17 to $30 per acre.[27]

Researchers in California have examined the effect of atmospheric conditions and residue and fire management techniques on emissions from open burning of cereal grain straw.[30] Moisture content of the straw and stubble was found to be the most significant factor influencing particulate, gaseous hydrocarbons, and carbon monoxide emissions. The drier the straw, the lower the emissions--see Figures 4, 5, and 6).

Table 4 Mean seed yield of four grass species where post-harvest residue was burned early August versus late October (ref. 28)

Species	Burned early	Burned late
Chewings Fescue	920	648
Highland Bentgrass	459	299
Orchardgrass	1113	946
Bluegrass	1182	1044
Mean	918	734

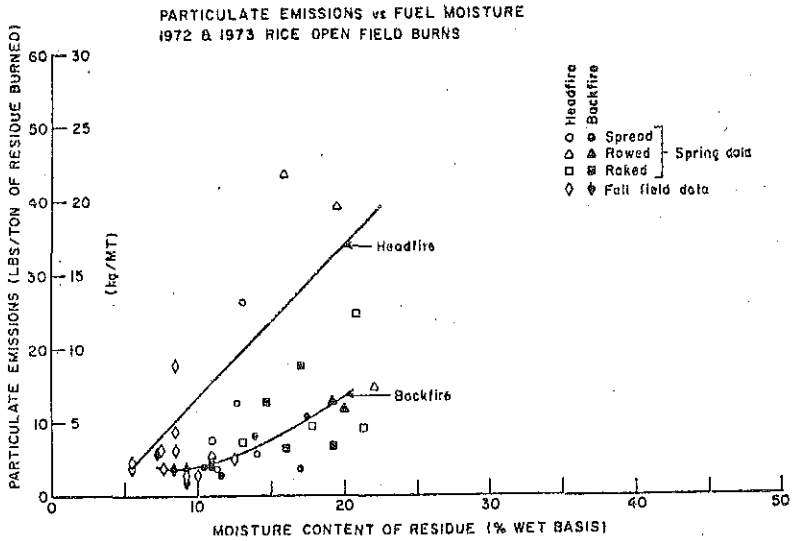


Figure 4 (ref. 30)

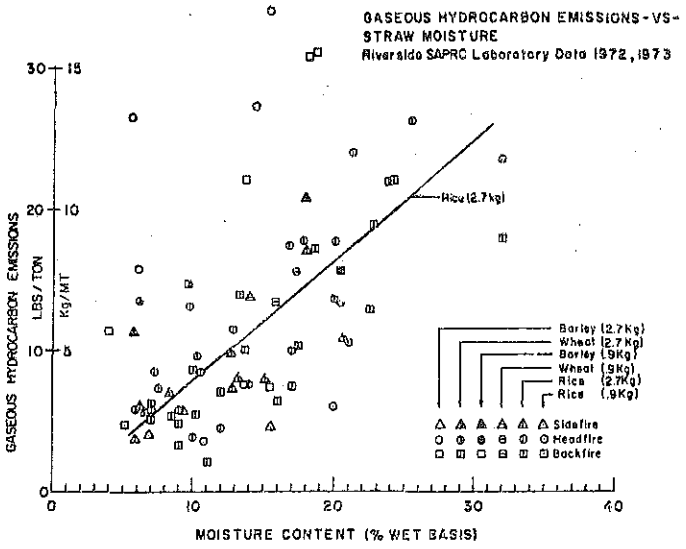


Figure 5
(ref. 30)

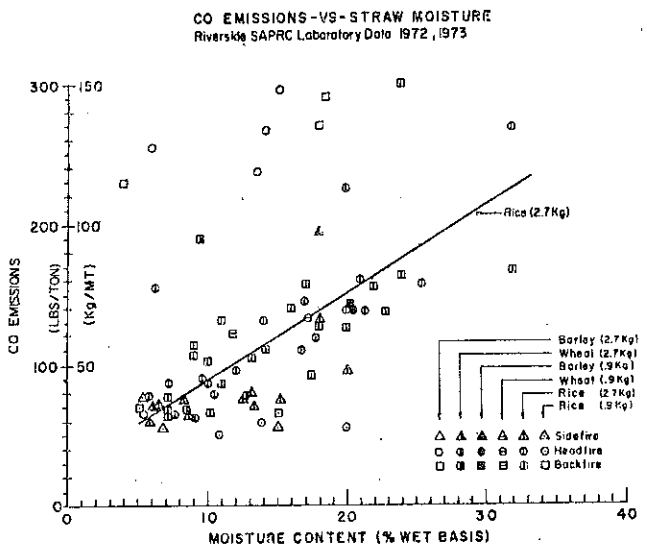


Figure 6
(ref. 30)

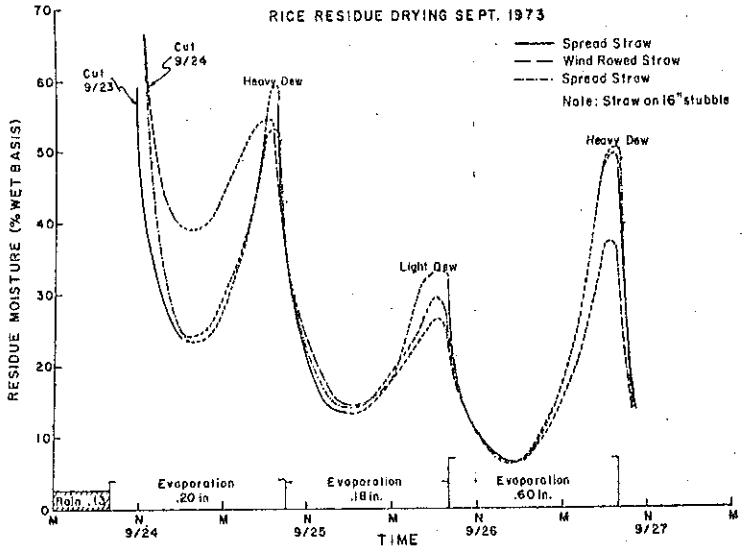


Figure 7 (ref. 30)

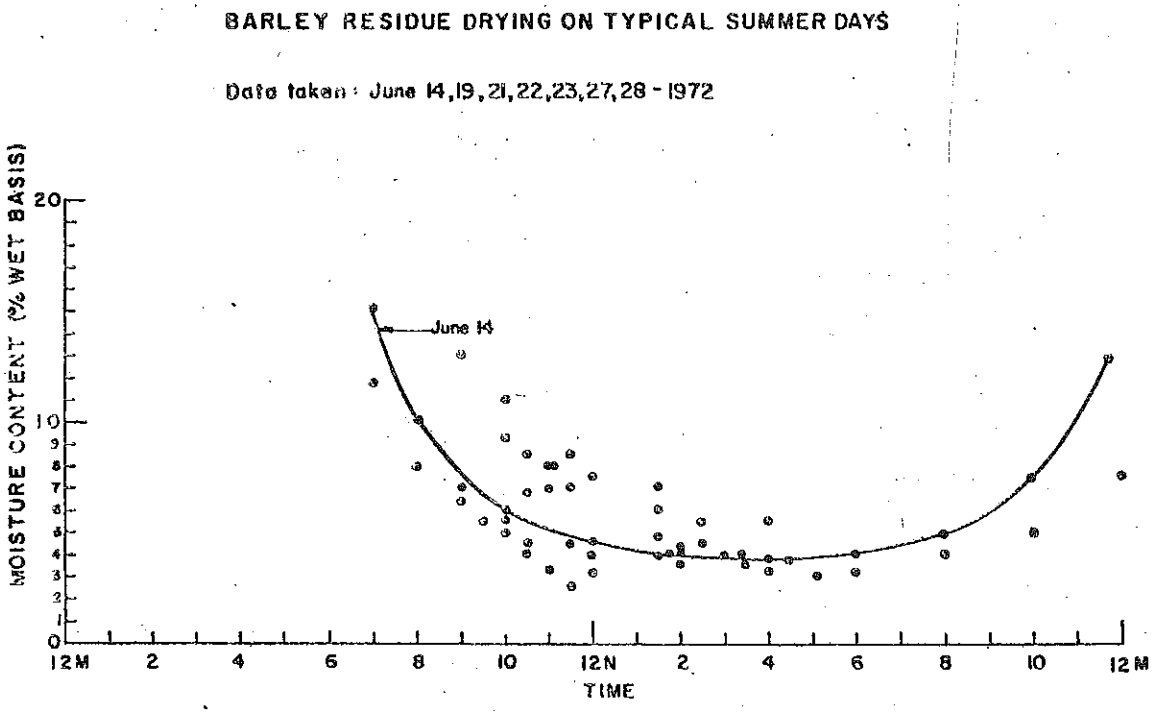


Figure 8 Barley Residue Drying on a Typical Summer Day
(ref. 30)

Several factors affect the moisture content and drying characteristics of straw. The most important of these factors are amount of sunlight reaching the straw, the average relative humidity and temperature, the daily minimum and maximum humidity, wind speed, the amount of rainfall and dew, and the straw loading and management methods. The normal practice for grass seed crops of spreading the straw after combining promotes drying of the straw and should be continued.

The experiments with cereal straw have shown that two or three days of clear weather are required for the straw to dry to an acceptably low moisture content after a rain or harvest. (See Figure 7). A strong diurnal variation in moisture content also has been found. Although a field may have dried to an acceptably low moisture content on one day, it may not be dry enough to burn until 11:00 or 12:00 the following day (see Figure 8). Even on summer nights, with little or no dew, the residue was found to absorb moisture because of increased relative humidity and may reach 15 percent moisture content. It is important to note that straw moisture will reach equilibrium with atmospheric conditions rapidly (see Figure 9) during clear, dry weather, but will take days to reach equilibrium without solar radiation even at substantial air velocities.

Several methods for determining straw moisture were investigated in California. The "crackle test" commonly used in hay bailing operations has been found useful. A handful of straw is gathered and bent sharply; if the straw makes a crackling or popping noise, it has dried to less than 10-12% moisture content. A "shush" sound, or no sound at all, means the straw has not dried to 10-12% moisture content. Uneven straw loading and drying requires that several representative samples must be taken to determine if the whole field has dried sufficiently.

Another test has been developed for use in rice field burning: When relative humidity in the field is 50% or less on succeeding clear days, then straw moisture should be 10% or less. Clumps of straw or heavy straw loading also should be checked to see if they are much damper than the general field conditions. If even 10% of the straw feels wet to the touch, a burn would produce twice as much particulate emissions as it would if no wet clumps were present.

The moisture content variations of grass seed straw must be measured to determine if the pattern found for rice straw holds for grass straw. The straw moisture measurements taken during field sanitizer trials by Youngberg[31] may provide adequate data for this evaluation. If grass straw does behave similarly, then two changes in burning practices can be implemented: 1) disallow burning until a field has passed the "crackle test" after harvest or a rain; 2) and only allow burning to begin at the time of day that a relative humidity of 50% or less has been predicted. Although these procedures may cause difficulty during an unusually rainy summer, Figure 10 shows the emissions reductions that can be achieved.

Burning fields against the wind with a backfire, instead of with the wind in the traditional headfire, will also lower emissions at least of particulate.

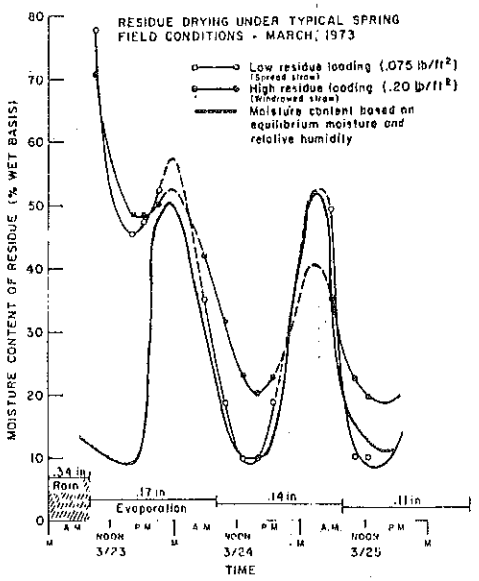


Figure 9 (ref. 30)

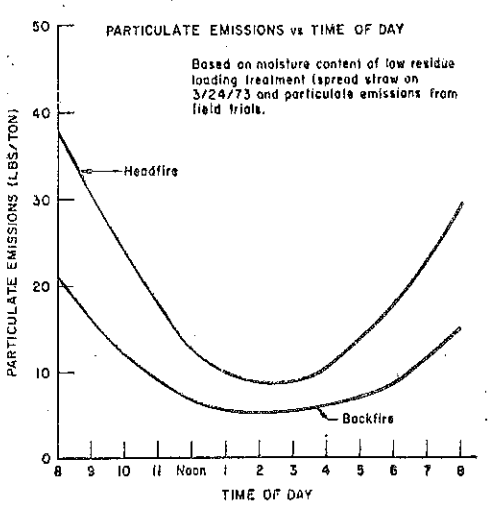


Figure 10 (ref. 30)

Table 5. — Benzo(a) pyrene (BaP) and total suspended particulate matter (TSP) from flaming and smoldering phases of burning pine needles 1/

Fire phase and fuel loading (pounds per square foot)	Emissions	
	Benzo(a)pyrene	Total suspended particulate matter
	ng/g 2/	Pounds per ton 3/
Flaming:		
Light (0.1)	33	14
Medium (0.3)	17	17
Heavy (0.5)	36	40
Smoldering:		
Light (0.1)	100	59
Medium (0.3)	55	143
Heavy (0.5)	140	192

1/ Fuel moisture content for all fires ranged from 18 to 27 percent.
2/ Nanograms of benzo(a)pyrene per gram of fuel burned. A nanogram is 0.000000001 gram.
3/ Pounds of total suspended particulate matter per ton of fuel burned.
(ref. 30)

Table 6

Benzo(a) pyrene (BaP) and total suspended particulate matter (TSP) from burning pine needles 1/

Type of fire and fuel loading (pounds per square foot)	Emissions	
	Benzo(a)pyrene	Total suspended particulate matter
	ng/g 2/	Pounds per ton 3/
Backing:		
Light (0.1)	3,500	22
Medium (0.3)	560	8
Heavy (0.5)	240	5
Heading:		
Light (0.1)	38	22
Medium (0.3)	40	88
Heavy (0.5)	100	129

1/ Fuel moisture content for all fires ranged from 18 to 27 percent.
2/ Nanograms of benzo(a)pyrene per gram of fuel burned. A nanogram is 0.000000001 gram.
3/ Pounds of total suspended particulate matter per ton of fuel burned.
(ref. 3)

The emissions of gaseous hydrocarbons and carbon monoxide may also be reduced, but the large variability in the experimental data made it impossible for researchers to be certain that such a reduction really occurred.

It is hypothesized that backfiring reduces particulate emissions in two ways. A backfire moves slowly (1 m/sec.) across a field, while a headfire moves more rapidly (15 m/sec.). The flame of a headfire is not in contact with the straw for very long and leaves much partially-burned, smoldering straw in its wake. The particulate emissions from the smoldering phase have been shown to be several times that of the active fire zone. (See Table 5). In grassfields, this smoldering can continue for several minutes to several hours after the flame has passed. The slow-moving backfire results in longer flame-fuel contact, more complete combustion of the straw, and therefore leaves little smoldering straw behind. A second factor may also reduce emissions in a backfire. The fuel directly ahead of the active fire zone is heated and much volatile matter is boiled off. In a headfire, the wind carries part of this volatile material away from the flame, but in a backfire, the wind carries more of the volatiles into the flame where they are burned.

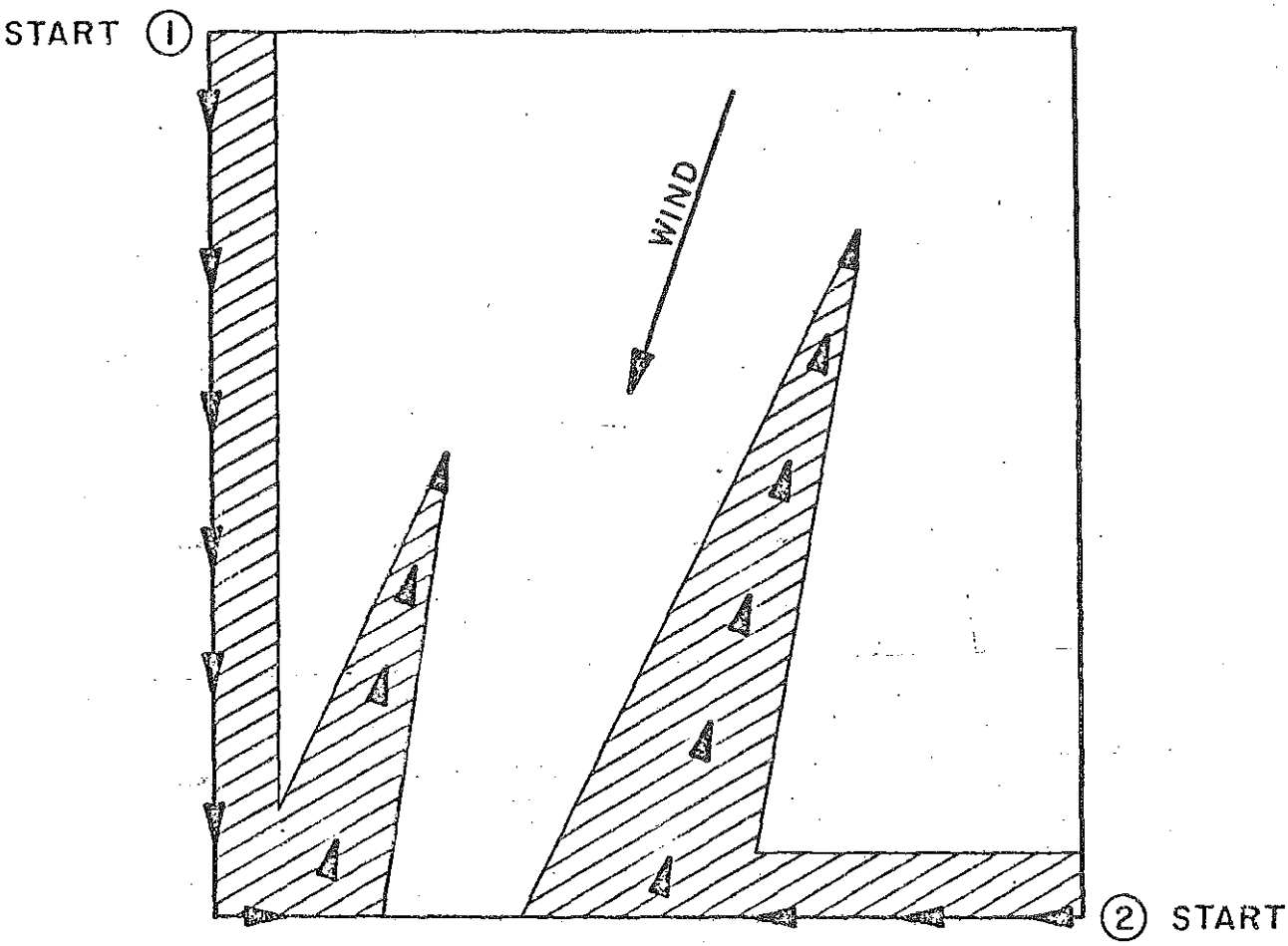
Backfiring achieves its greatest reductions at high moisture content, but reduces particulate emissions by over 50% for moisture contents between 10 and 25%. These results are statistically significant at the 99% confidence level.

There are several disadvantages to simple backfiring. Its slow speed increases field burning labor costs. The slow heat-release rate produces a less buoyant smoke plume that is more subject to fumigation by high surface winds. The actual importance of this last problem is hard to evaluate in comparison to headfiring. Smoke from a smoldering headfired field has little buoyancy also, and this phenomenon has not been considered by any investigator.

The slow speed and low-plume buoyancy of backfiring can be improved by increasing the length of the fire line for a given field size. This is accomplished using "into-the-wind strip lighting" of the field. Figure 11 illustrates an aerial view of a field being lighted with this technique. The additional length of fire line increases the heat release rate and improves plume rise. Limited data indicates that this modification increases particulate emissions slightly over simple backfiring.

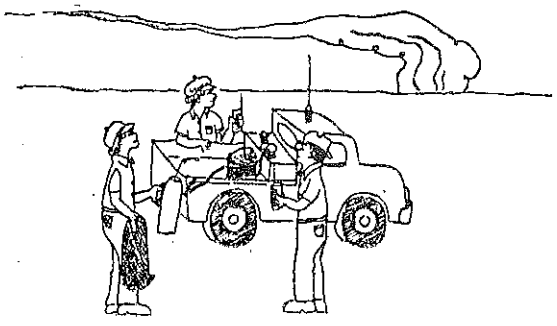
Another problem with backfiring is possible increases in BaP emissions. Some preliminary experiments with fine forest fuels have shown that backfires in high moisture fuels produce more BaP than headfires (see Table 6). These experiments used fuel loadings in the range encountered in grass fields (0.18 lbs./ft^2). Careful measurements of BaP emissions will have to be made under actual field conditions to determine if this increase is large enough to be of concern.

The California Air Resources Board and rice growers now have been using backfiring and moisture content restrictions for three years. Burning rules require that the straw dry to 12% before burning, and that all fall rice



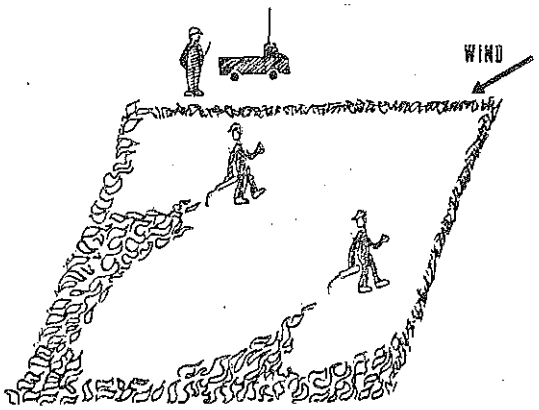
LIGHTING PATTERN FOR INTO-THE-WIND-STRIPLIGHT
(TWO MEN LIGHTING FIELD)

Figure 11 (ref. 30)



For the safety of your crew and your neighbors check your burning equipment and plans before firing a field.

Figure 12



Field entry spaces should be ignited as illustrated above.

Figure 13

field burning use the "into-the-wind strip lighting" technique. The Air Resources Board evaluated these rules in 1976[32] and is preparing another more comprehensive evaluation for November 1978.[33] The 1976 evaluation showed an overall decrease in the average number of smoky days, but was unable to determine if this was the result of the new straw management techniques or better than average weather conditions.

In any case, much practical experience has been gained. The low-intensity flame of a backfire has poorer fire propagation potential than a headfire. Higher fuel loadings and lower straw moisture are required for propagation of a backfire. Since straw loadings are generally higher in grass seed fields than in cereal grain fields, the higher fuel loading requirement for backfiring should be met in most cases. The lower residue moisture content requirement should pose no problem either. If a backfire will not stay lighted because of high straw moisture, the residue is too wet to burn by any method and the field should be given more time to dry.

A personnel safety scheme is essential when using the "into-the-wind strip lighting" method. If a person lighting a fire through the field were immobilized (i.e., by a broken leg, heart attack, seizure, etc.), he would be subject to further injury by the oncoming fire. Personnel for this work should be selected for good health to minimize the potential for accidents. A buddy system or special supervision with an all-purpose vehicle with water tank and pump have also been used. It may be possible to use the winch and cable, rapid ignition technique, developed by grass seed farmers, to develop an into-the-wind strip light fire. Figures 12 and 13 are illustrations from a California Rice Research Board pamphlet produced to educate growers and field crews about the safe use of the strip lighting method.

When into-the-wind strip lighting is used, normal variations in wind direction will cause approximately 20-30% of the area of a field to be burned with a headfire-type burn. With light and variable surface winds, it is often difficult to determine the wind directions. In this case, the prevailing wind direction should be used to decide which side of the field should be lighted first.

Maximum flame temperatures in a backfire or into-the-wind strip light are about the same as, or lower than, the temperatures encountered in a headfire when burning spread straw. (Temperatures in backfired windrowed are much higher than headfires). The flame temperature remains high for a longer period of time in a backfire. Potentially, this could destroy some plants in perennial grass varieties. The mobile field sanitizer produces even higer flame temperatures than backfires. One way to assess the possible detrimental effects of backfires on perennial grasses is to compare the soil temperature profile taken during studies of these two methods. The effect of the sanitizer on perennials is fairly well known.

The Under-Estimation of the Particulate Emissions Factors for Agricultural and Forest Open Burning

The emission factors measured for each of the pollutants released during open burning are used in a number of important ways--in emissions inventories

compiled for each airshed, in the development of strategies to reduce air pollution, and in dispersion modeling studies, to predict the contribution each pollution source makes to air pollution at any given location. Errors in these emission factors will affect all of these processes.

For example, an effort is being made to use a dispersion model called LIRAQ to more accurately calculate the contribution of field burning to the degradation of air quality in the Willamette Valley. Both the validation and prediction processes for this model make use of emission factor data. Errors in the emission factors will result in inaccurate impact predictions.

The method often used for measuring the particulate emissions for field burning uses a Hi-Vol filter sampler and a CO_2 monitor mounted 10 feet above the burning field. Carbon dioxide concentrations greater than 0.1% are used to indicate the presence of emissions from the burning straw. By operating the Hi-Vol sampler during the time of high CO_2 concentrations, particulate emissions from the active fire zone only are sampled. This is done to prevent interference from non-burning sources of particulate. The amount of CO_2 measured is also used to determine the rate of fuel consumption for calculating the final particulate emission factor.

As has already been shown, the Hi-Vol filter sampler does not efficiently collect field burning particulate. This methodology is even worse for sampling emissions from open burning. Since the sampler is collecting the high temperature air coming from the active fire zone, some of the compounds released will still be gaseous in the vicinity of the sampler, but will later condense to form suspended particulate as the smoke plume cools further. Since only the particulate emissions from the active fire zoned are sampled, the larger quantity of particulate released from the smoldering part of the field are not collected. (The measured advantage of backfiring over headfiring in reducing particulate emissions would be even greater if the ignitions from the smoldering phase behind a headfire were included in the measurements). All these factors lead to the conclusion that the particulate emission factors that have been determined for field burning are far too low.

Experimental confirmation for this conclusion can be found. In the Odell study of emissions from the field sanitizer,[34] and EPA Method-5 particulate sampling train was used. Despite many problems in the study, one fact stands out: As much as 40-percent of the total particulate catch was found in the condensation traps behind the glass fiber filter. During his burning tower experiments, Darley found that a portion of the particulate emissions passed through a glass fiber filter.[30] Finally, researchers at the University of Washington performed airborne studies of particle emissions from prescribed forest burns. The instruments used do not rely on filtration, but instead make in-situ measurements of particle size and concentration. These measurements found that particulate emissions were far higher (470%) than previously determined.

Obviously, an accurate, standard sampling method needs to be developed. The standard method would have to include a condensation trap. A real-time particle concentration monitor could be used instead of the CO_2 monitor to determine the presence of field smoke at the sampling head. This would allow sampling of both the flaming and smoldering phase of the field without interference from background particulate. Until an accurate sampling method exists and new particulate emissions factors are determined, calculations and predictions made with the old emissions factors should be used with caution.

TS:ml/PW25a9

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TS:ng/PW25a14

TESTIMONY OF THE OREGON ENVIRONMENTAL COUNCIL BEFORE THE ENVIRONMENTAL QUALITY COMMISSION, AGENDA ITEM J (FIELD BURNING RULES) FEBRUARY 24, 1978

During the 1977 Legislature, OEC reiterated its concern for clean air and urged a three-prong attack on pollution: no increase in acreage for grass seed growers from the amount actually burned in 1976, plus curbs on slash burning and auto emissions.

What we saw was a series of compromises that the United States Environmental Protection Agency now acknowledges have not done the job: we are not meeting clean air standards now and we have not developed an acceptable plan to achieve those standards by the 1982 deadline.

We recognize the Environmental Quality Commission's choices are limited: there are no funds to implement an automobile inspection program in the Eugene and Springfield metropolitan area; no specific legislation has been passed to strengthen DEQ's control of slash burning. What we saw in the 1977 Legislature was a lot of buck-passing from the grass growers to the slash burners to the auto drivers, each one saying that they were not creating any air quality problems -- if that is true, why does EPA say we have not complied with clean air standards?

Recommendations: Given the fact that air quality in the lower Willamette Valley is not acceptable, Oregon Environmental Council believes the Federal government has preemptive power over state statutes through the Oregon Clean Air Implementation Plan. There is no question that Oregon is obligated under that plan to reduce field burning in order to live up to our commitments. We therefore support EPA's recommendation of 50,000 acres which would put Oregon into compliance with the Clean Air Act.

Further, we consider it mandatory that EQC use whatever authority it has to curb all sources of air pollution during the 1978 field burning season to offset the effects of field burning which, by law, they are forced to allow. We consider it incumbant upon DEQ to go back to the 1979 legislature and point out that we have failed to meet Federal standards under the 1977 Oregon law. As an emergency measure, a curb on all industries in the affected area is essential in 1978 to offset the effects of field burning if necessary, and to assure Oregonians their basic right to breathable air; in the long run, the State of Oregon must face up to its obligations to control pollution from whatever source and to deal with industry impartially in terms of getting the largest number of jobs with the least amount of environmental damage.

AGENDA ITEM J
Field Burning Rules

Finally, it is imperative that we maintain the best possible smoke management program with radio communication and that research be continued to document the effects of various sources and methods of control in the hopes that we can ultimately arrive at a solution all parties can live with.

In summary, OEC recommends (1) adopting the EPA recommended 50,000 acres, (2) making provision for mitigating offsets by curbing emissions from other sources during the 1978 field burning season, and (3) continuing research toward better solutions to the problem than are now available. We urge that the Environmental Quality Commission continue to seek improvements in the Oregon law in order to enable us to meet federal standards for clean air. Should Oregon fail, we fully expect the Federal government to move in with controls which may be far less palatable to Oregonians than the measures we have proposed.

OREGON ENVIRONMENTAL COUNCIL

2637 SW Water Avenue
Portland, Oregon 97201

222-1963

Submitted to:

Environmental Quality Commission
Salem, Oregon

February 24, 1978

BJS LW:alh

THE LEAGUE OF WOMEN VOTERS OF OREGON
494 STATE STREET - SUITE 216
SALEM, OREGON 97301
581-5722

February 24, 1978
To: Environmental Quality Commission
Re: 1978 Field Burning Rules and Acreage Limitations

I am Janet Calvert and I am speaking to you for the League of Women Voters of Oregon and Central Lane County.

As you know, the League has long supported air pollution abatement and consequently, a solution to the problem of field burning. We hope that in your deliberations today you will consider the effect of field burning on the entire air shed and on the economic viability of other industries in the Willamette Valley. Many of these businesses have spent considerable effort and money to reduce their air emissions. We are told that forestry officials voluntarily cease slash burning upon the request of the Department of Environmental Quality when meteorlogical conditions or intrusions of other pollutants warrant even though their smoke management program may not require it.

Although we strongly support these attempts to achieve better air quality, we question the fairness and validity of allowing one industry to pollute at the expense of others. The loss of production in other industries in the Willamette Valley may very likely be the result of such inequality when federal clean air standards are taken into consideration.

In conclusion, we hope that our presence at this hearing expresses our continuing concern about this issue. Thank you.

Annabel Kitzhaber, Pres.
LWV of Oregon
1892 W. 34th Ave.
Eugene, Oregon 97405

Janet Calvert, Pres.
LWV of Central Lane County
1062 Woodside Drive
Eugene, Oregon 97401

The Cascade Foothills Grass
Seed Growers Association
P.O. Box 74
Stayton OR
(503) 769-3274

To whom it may concern:

This booklet has been assembled to illustrate the effects of soil erosion during a winter of average rainfall in the Cascade foothills area of Marion County, Oregon. This erosion is occurring on farmland which traditionally produced perennial turf grass seed, but has been converted to other crops due to reduced acreage of allowable field burning. Annual tillage associated with these alternative crops breaks down the soil structure, thus inducing erosion. All scenes were photographed during January and February 1978.

February, 1978

Introduction

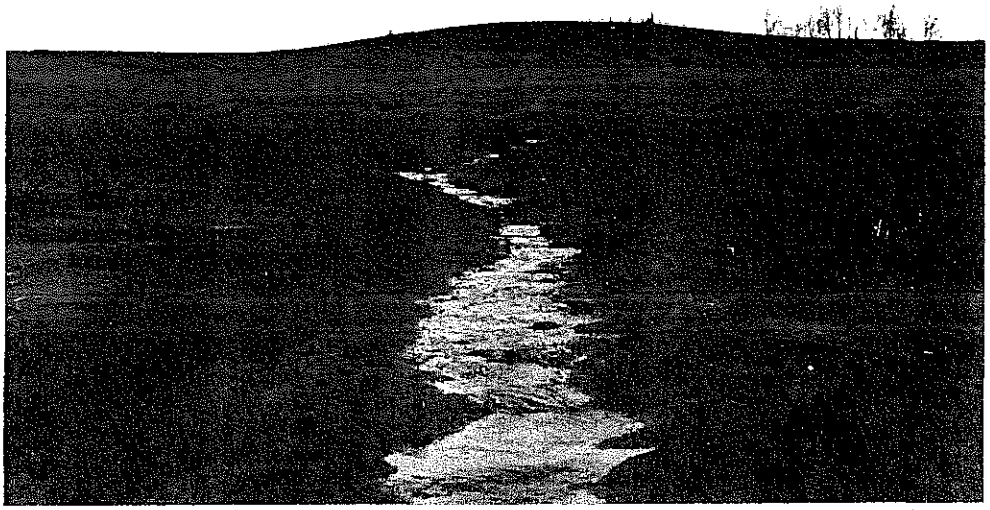
The grass seed industry in the Cascade Foothills of Marion County began in the 1930's with the commercial acceptance of native Highland bentgrass as a turf grass and the introduction of fine fescues. These grasses experienced dramatic acreage increases during the 1940's and 50's.

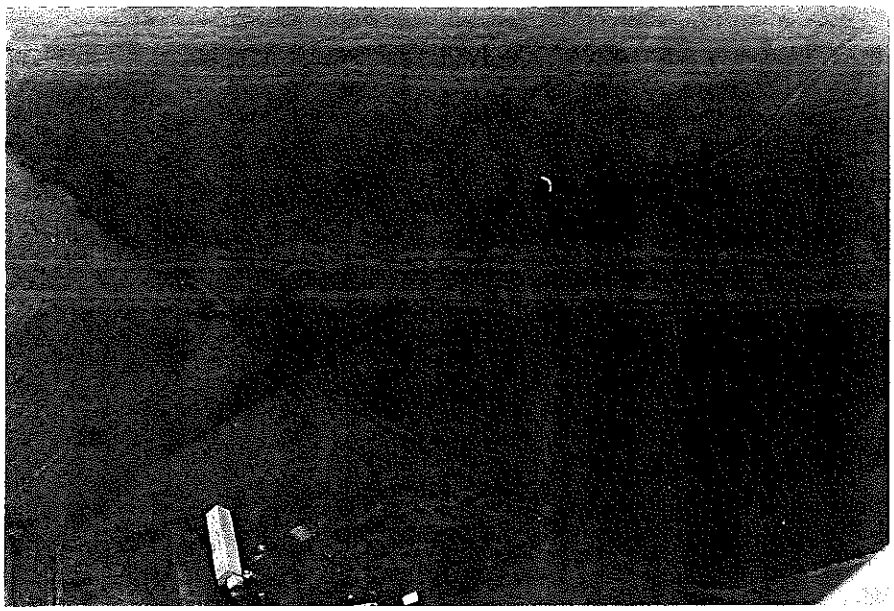
The hill land converted to grass seed production had previously produced grains, chiefly wheat and oats, since pioneer settlement of the area some 70 years earlier. Continued annual tillage associated with grain production had depleted the primarily clay loam soils and eroded the shallow topsoil. Grass seed production then became not only an economic savior to the area's grain farmers experiencing declining yields, but also a soil preservation and conservation vehicle. As seed yields increased with heavier application of commercial fertilizers residue volume also increased. Unless removed, residue retarded plant growth and provided an environment for disease, insects, and rodents.

Research by Dr. John Hardison, USDA plant pathologist at OSU, confirmed that field burning controlled blind seed disease, nematode and several other grass diseases. By 1950 open burning was a universal cultural practice among grass seed growers. Further evidence suggests that field burning provides additional benefits, including (1) increased yields through reduced sod-binding, plant growth stimulation, and improved fertilizer efficiency, and (2) improved weed control through actual thermal damage to weed seeds and plants, and increased effectiveness of herbicides.

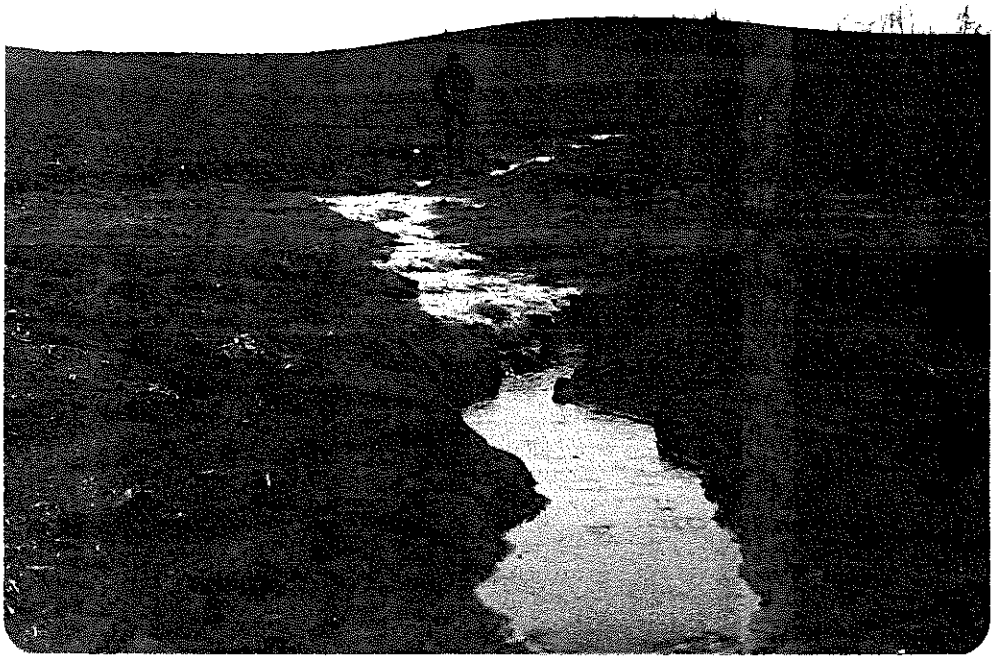
Prior to 1970, some 280,000 acres of grass seed crops were burned annually in the Willamette Valley harvest. This total included some 35,000 acres in the Cascade Foothills, virtually all on land succeptible to erosion with slopes of 3% to 40%. Since 1970, state legislation has gradually reduced the allowable acreage to be burned, resulting in the conversion of grass seed acreage to other crops, notably wheat. Thus the hill land of the Cascade Foothills is partially reverting to its original use which depleted the soil nutrients and eroded the topsoil. Although nutrients are now replaced by utilizing commercial fertilizers and lime, the latter problem still exists. This photographic essay portrays a portion of the erosion occurring during the 1977-78 rainy season.

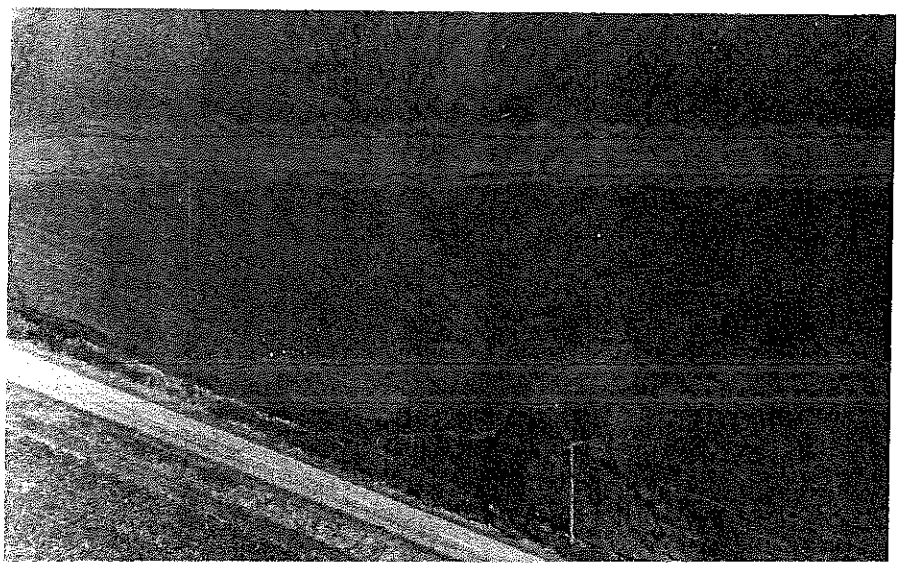
Clay loam soils such as those occurring predominately in the Cascade Foothills grass seed production area are characterized by shallow topsoils (4 to 10 inches) and red clay subsoils which, although classified as moderately well-drained, still restrict percolation during periods of medium to heavy rainfall. Thus surface runoff is a common occurrance during an average rainy winter.

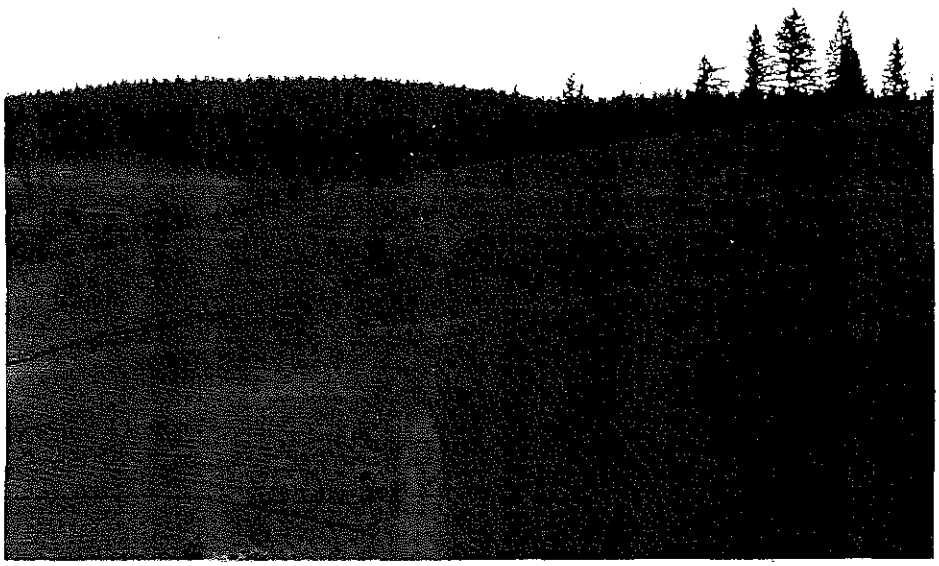


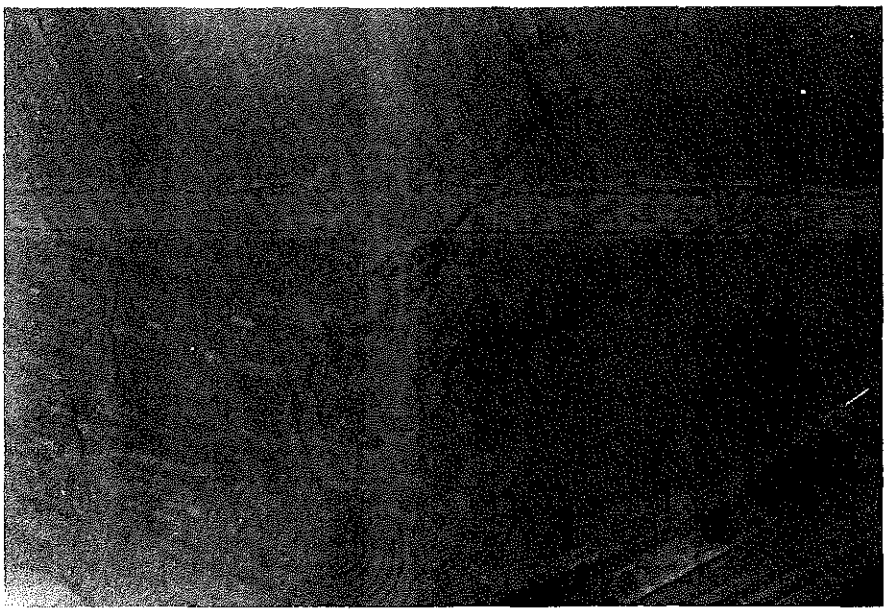


Soil which has grown any type of turf grass for more than one year develops an extensive network of roots and general buildup of organic matter which stabilizes the soil structure. When the grass crop is removed, even after one year of tillage, sufficient organic matter remains to stabilize the soil and prevent erosion during surface runoff.

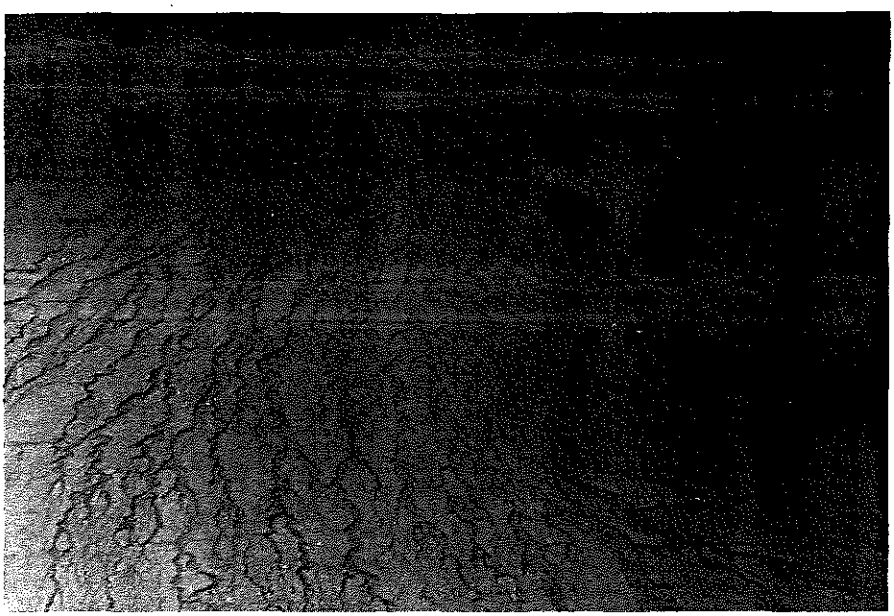




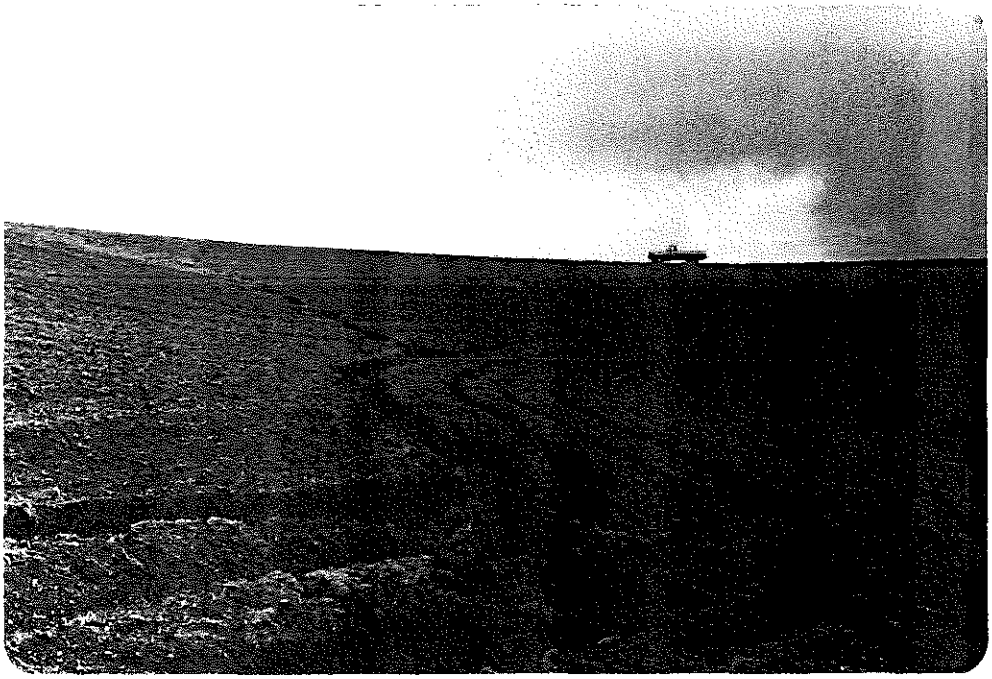


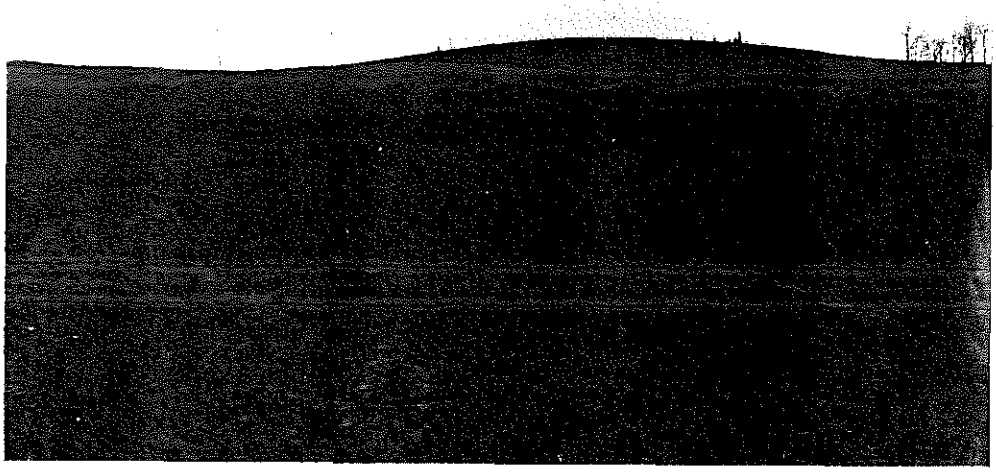


During the normal sequence practiced in grass seed production, when a stand is plowed, fallowed, or planted to grain for one year, then replanted to grass, little or no erosion should occur. Since grass seed acreage has been reduced due to field burning regulations, however, approximately one-fourth (8,000 - 10,000 acres) of the land in the Cascade Foothills devoted to grass seed prior to 1970 has now been tilled two or more consecutive years, while growing alternative crops of an annual nature. Such continuous tillage results in a complete breakdown of sod and reduction of organic matter, subjecting the land to severe soil erosion once again.

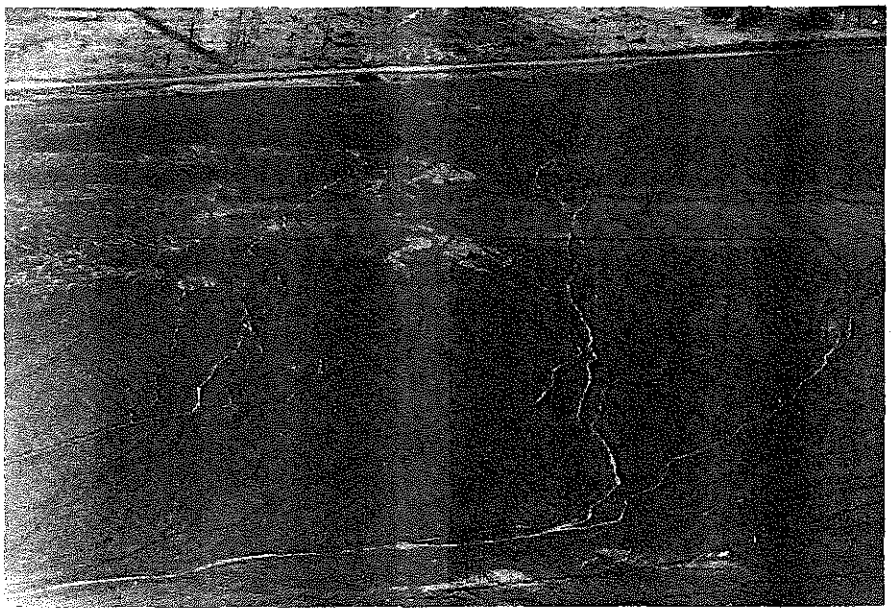


Top photo shows field near Silverton in which 55 Tons of topsoil per acre was lost due to erosion, as measured by a Soil Conservation authority.

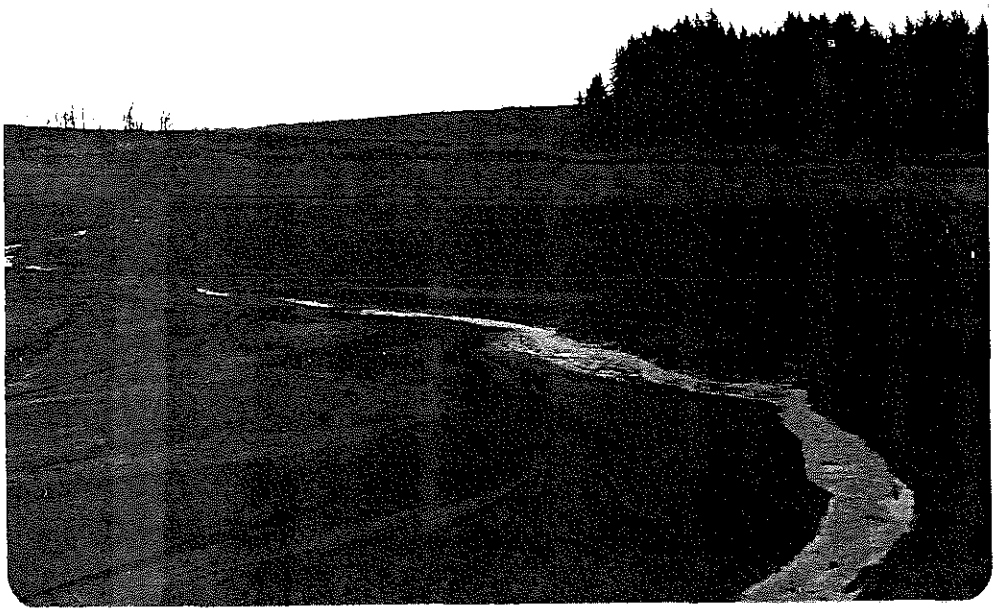


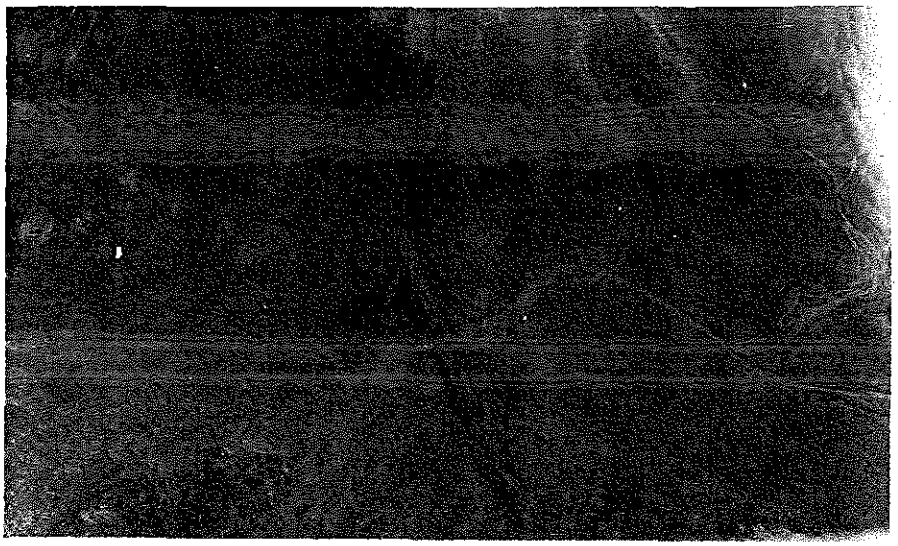


These photos illustrate the inability of most hill soils to absorb and percolate heavy rainfall.

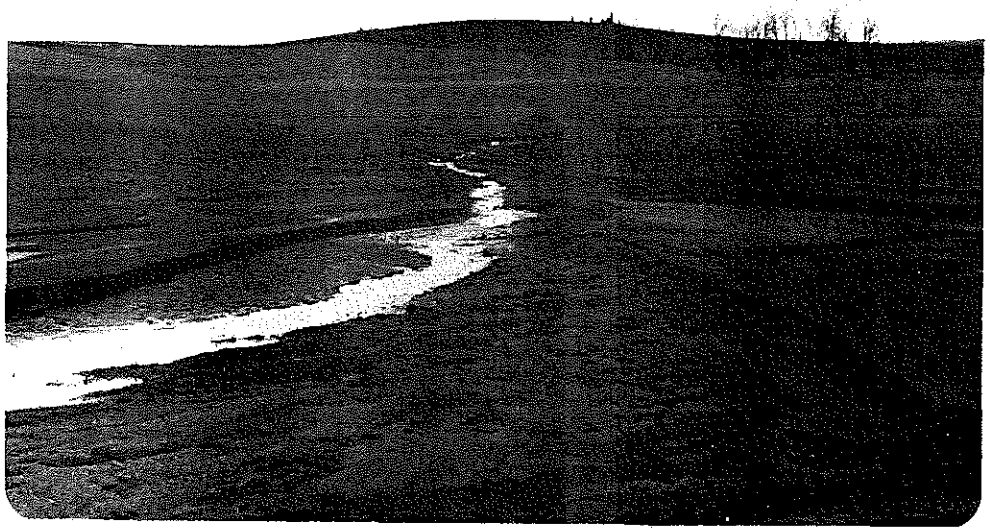


Muddy-colored water is clearly carrying topsoil into nearest stream, causing pollution of a non-point source which will be regulated under EPA guidelines by 1982.

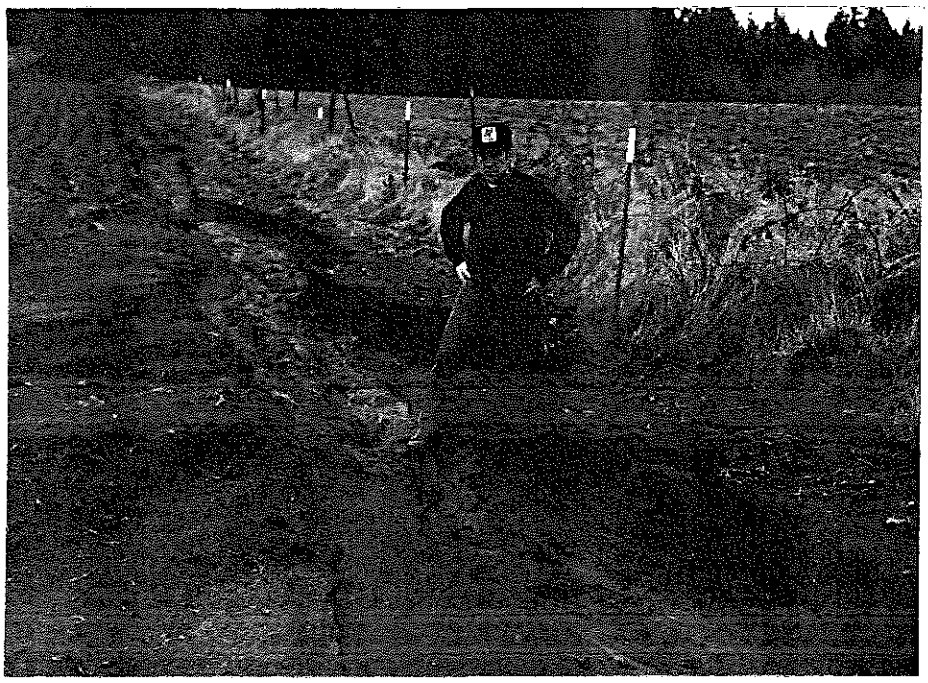


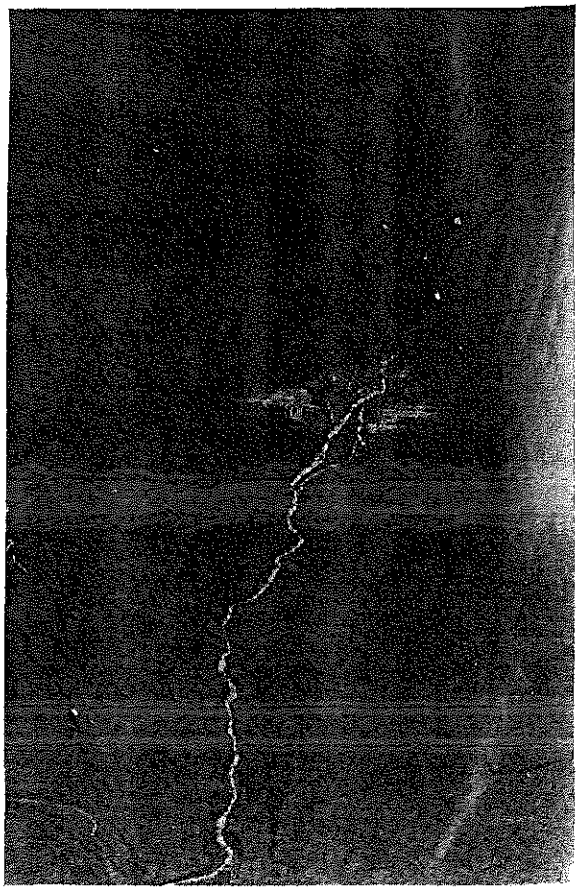


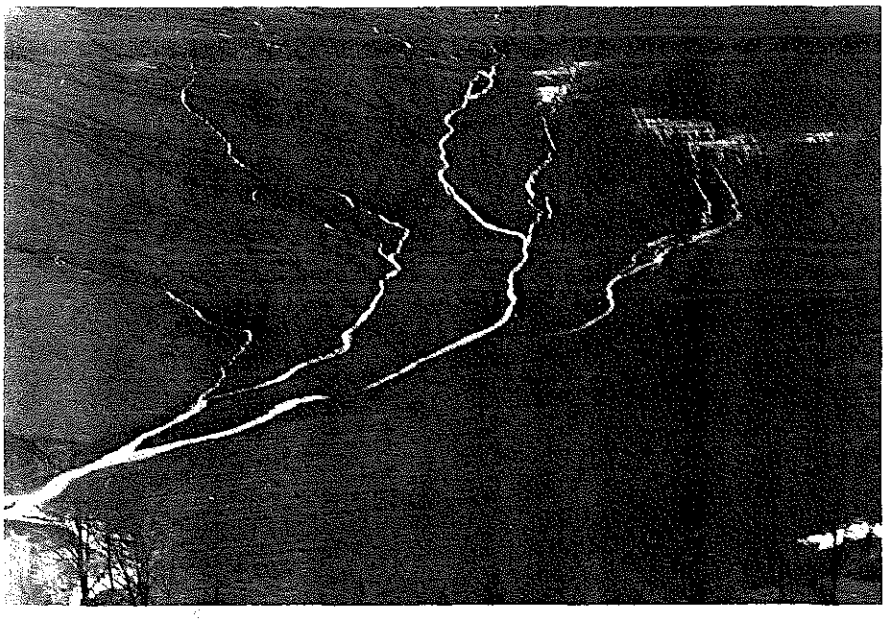
The tilled land pictured has a slope of 0 - 3%, yet is eroded by runoff from hills above.



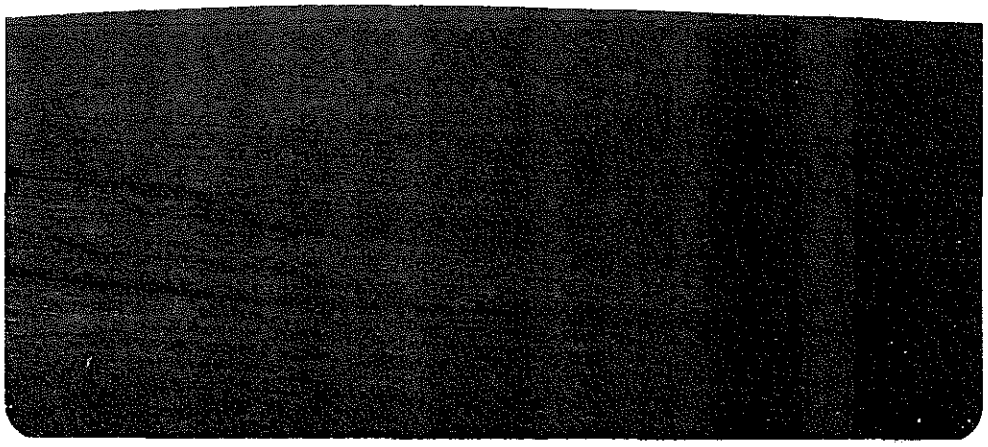
Shallow nature of topsoil (4 - 10 inches on most areas of Cascade Foothills) precludes building drainage or diversion ditches. Heavy rainfall will erode any recently-tilled topsoil. Adequate systems of permanent (sodded) ditches would preclude economical field operations.

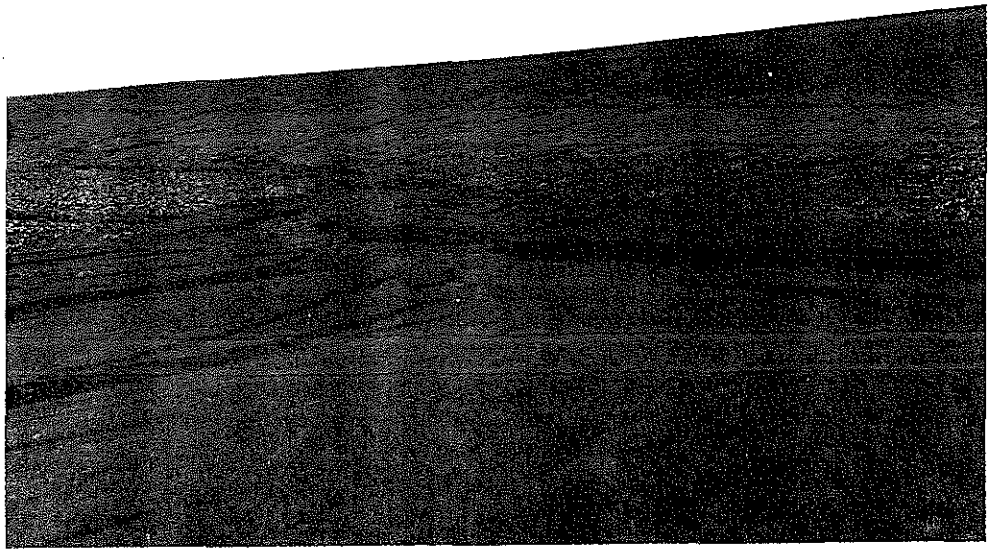


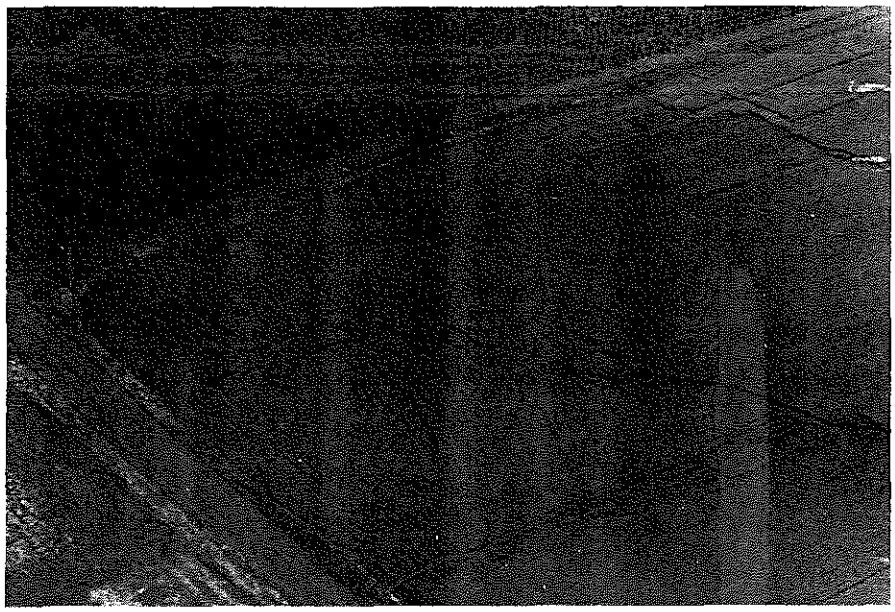




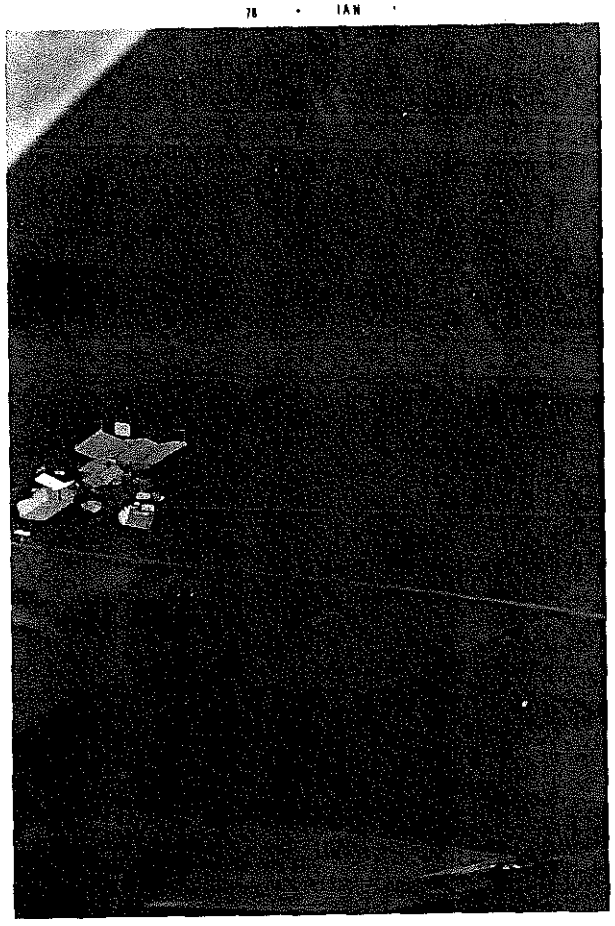
Top photo pictures erosion loss of 55 tons of topsoil per acre.





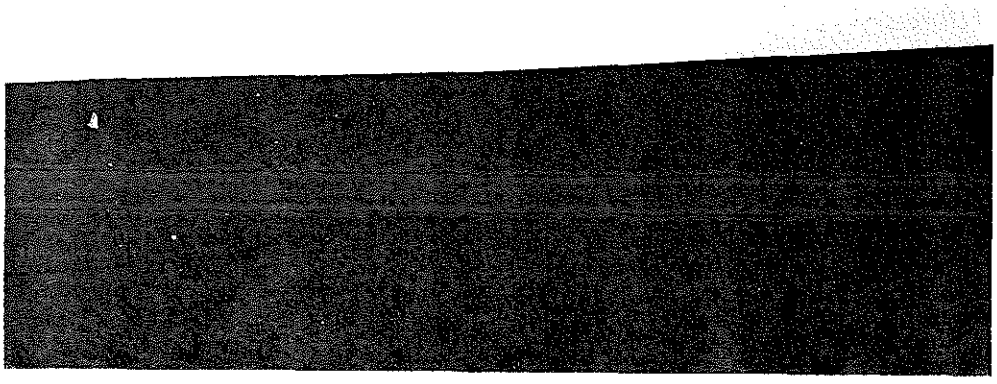


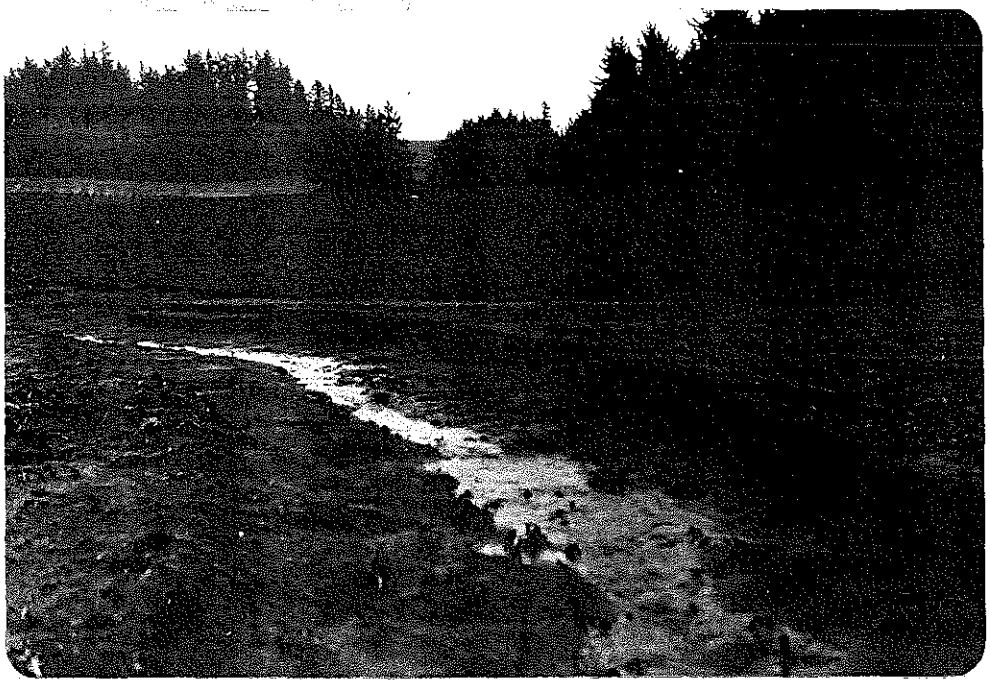
Photos on these pages follow erosion from origin on 5 - 10% slope within Christmas tree plantation down to and across highway (mud was bladed from blacktop) to level land (1 - 3% slope) along stream. Adjacent grass seed turf did not contribute runoff.



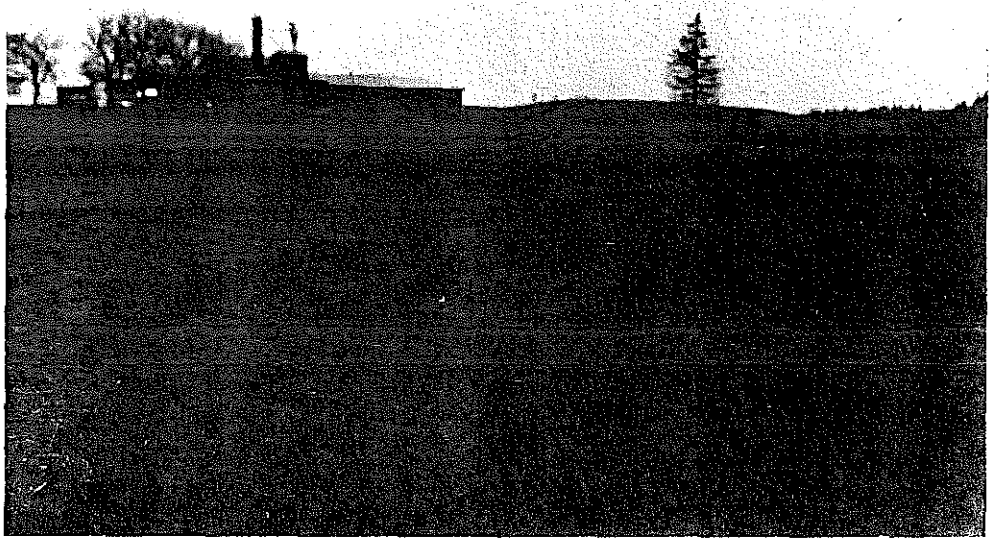
Contour tillage, while effective under light to medium rainfall conditions, fails to hold soil under occasional heavy rains, such as one inch in 8 hours or two inches in 24 hours.

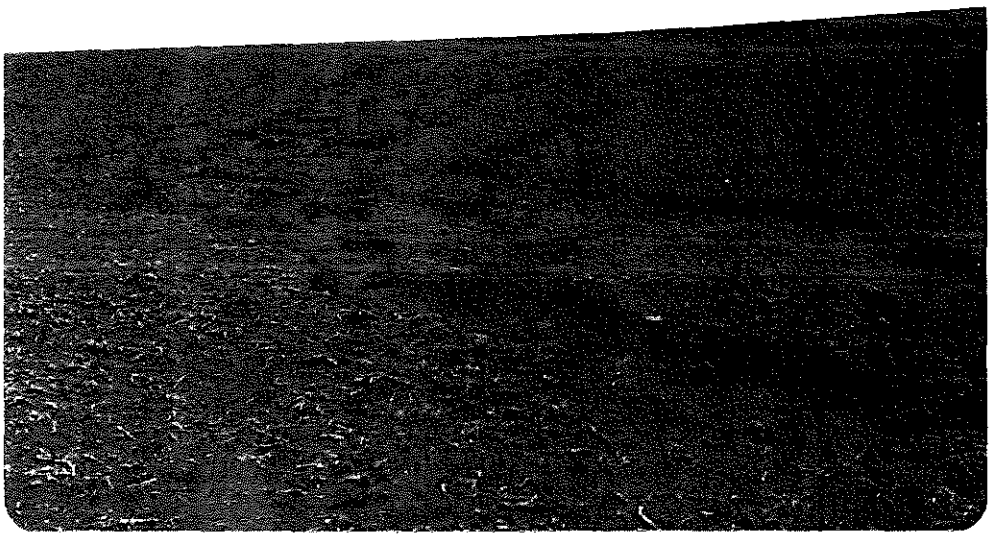
Although Salem records average annual rainfall of 38 to 40 inches at an elevation of 200 feet above sea level, the Cascade Foothills grass seed production area lies between 500 and 1800 feet above sea level and measures 60 to 85 inches annual rainfall.



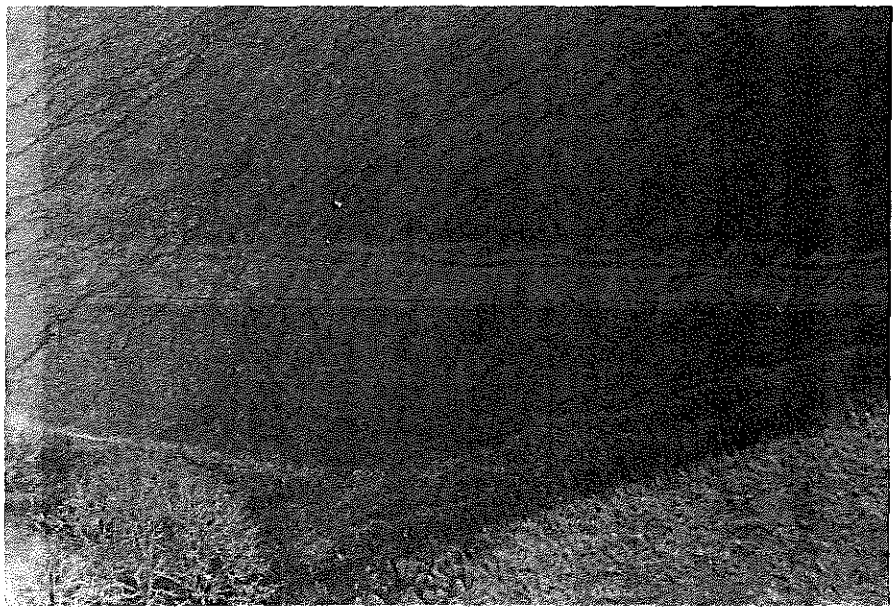


These photos illustrate erosion extending the entire depth of shallow topsoil.



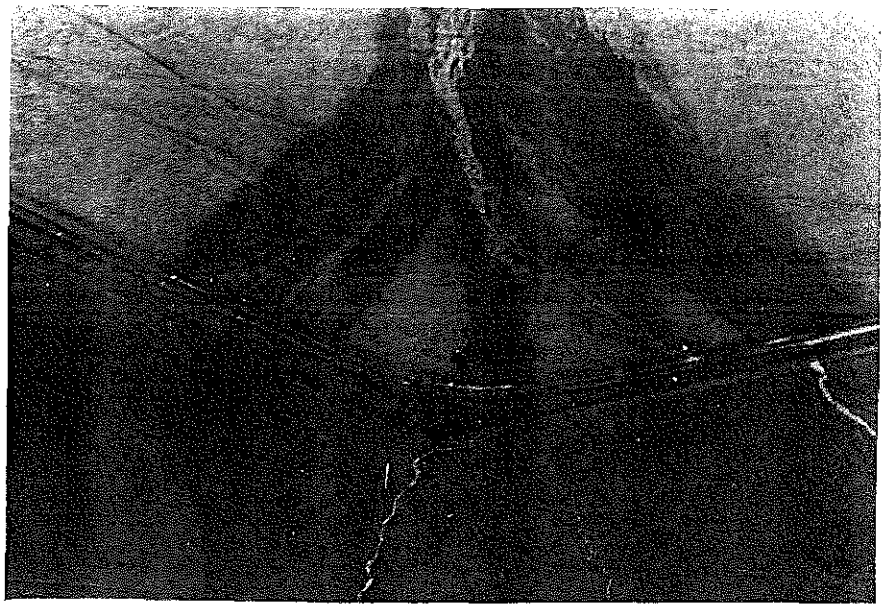


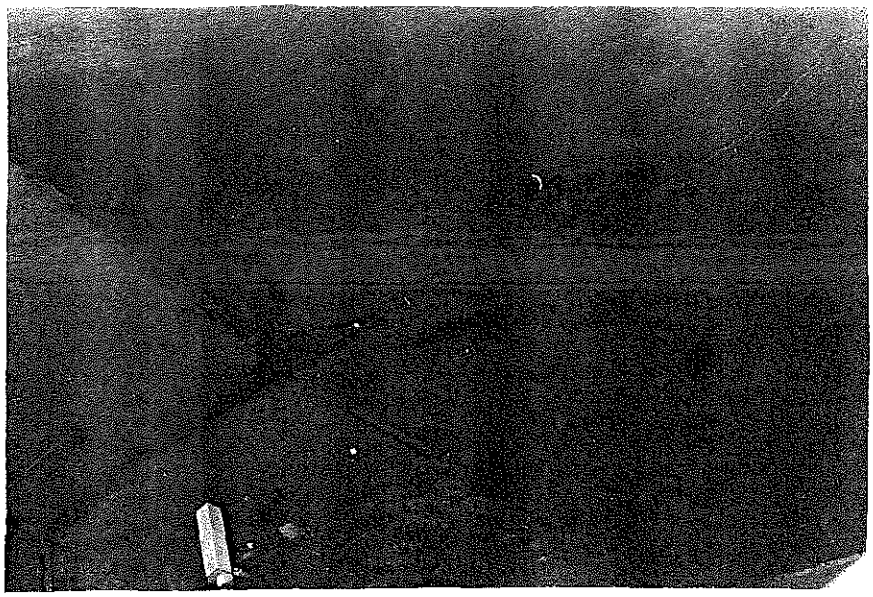
Top photo illustrates field which lost 86 tons of top-soil per acre, according to Soil Conservation Service measurements.

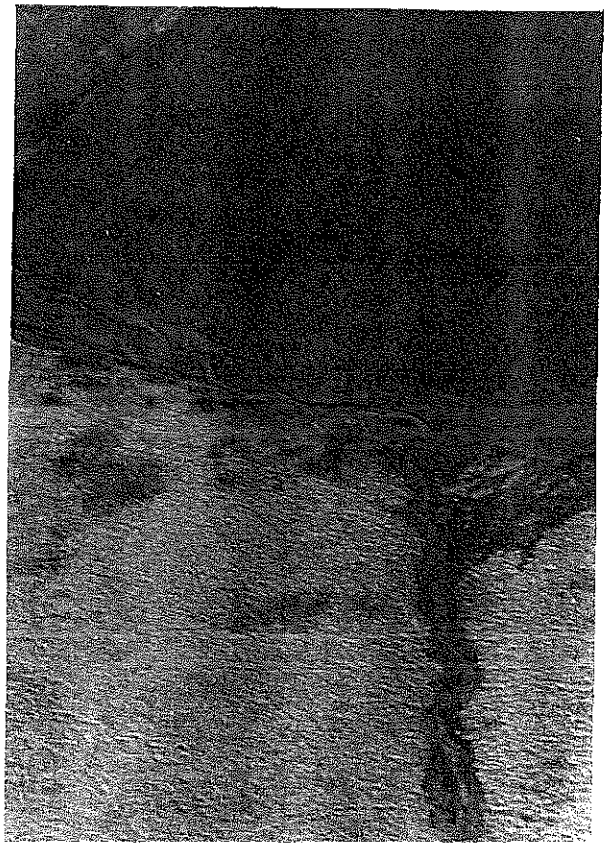


In this case pasture turf prevented or reduced stream pollution by retaining eroded topsoil, although pasture is temporarily damaged.

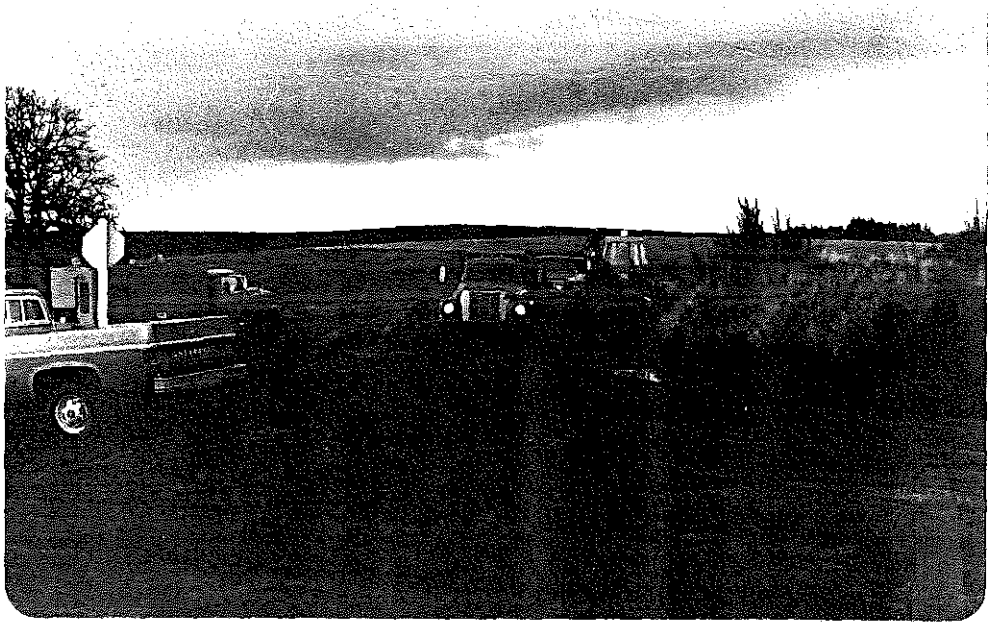
While pasture turf conserves soil as well as grass seed turf, economics of cattle raising and local climate preclude expansion of this industry in the Willamette Valley, while coyotes have all but decimated the local sheep industry. Moreover, present and future stream-pollution regulations negate possible increased concentrations of livestock.

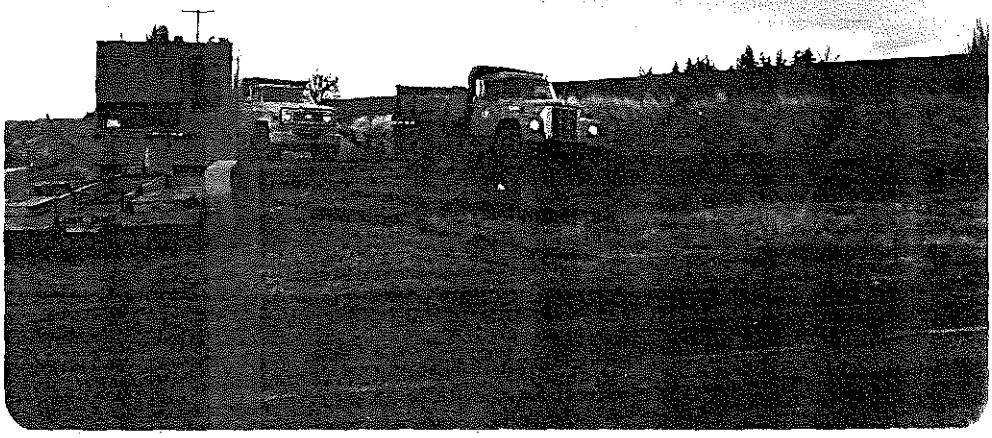


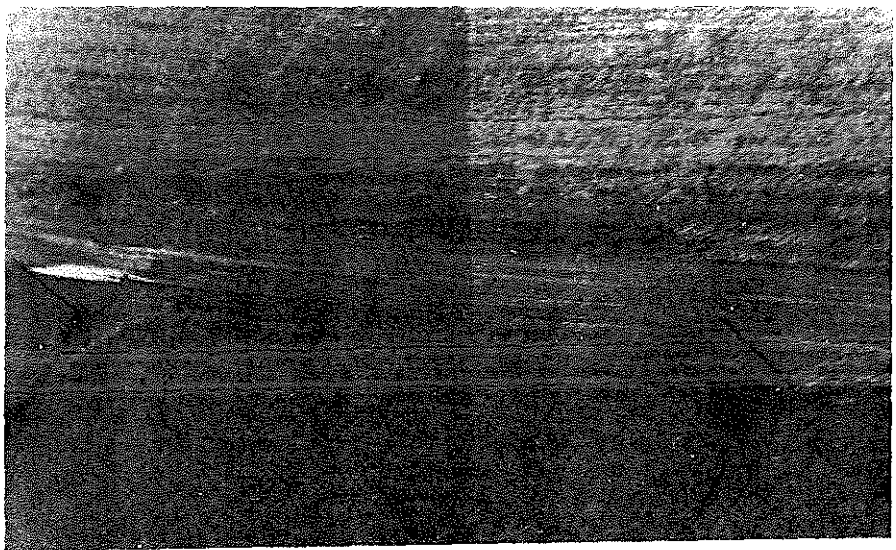


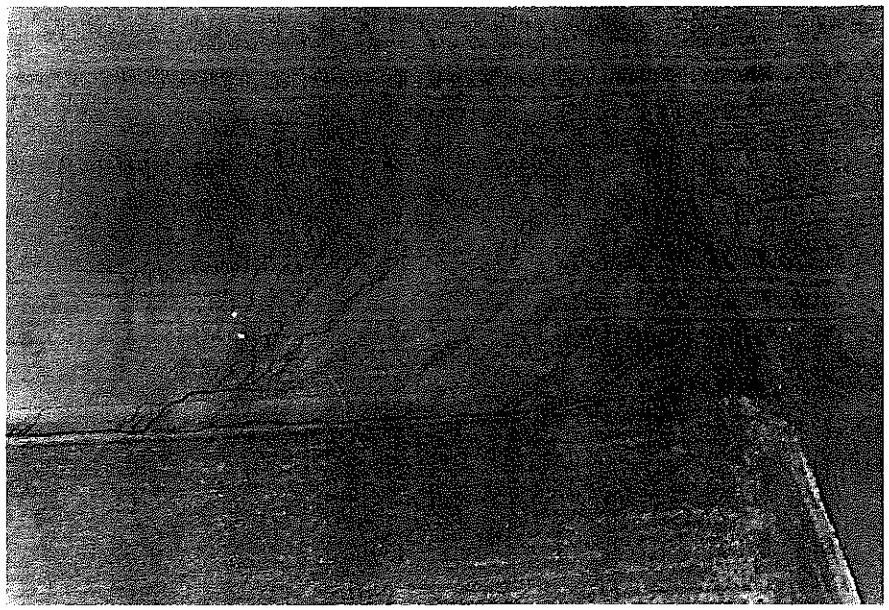


In some cases, eroded topsoil accumulated on roadway, necessitating costly removal by county road maintenance crews.

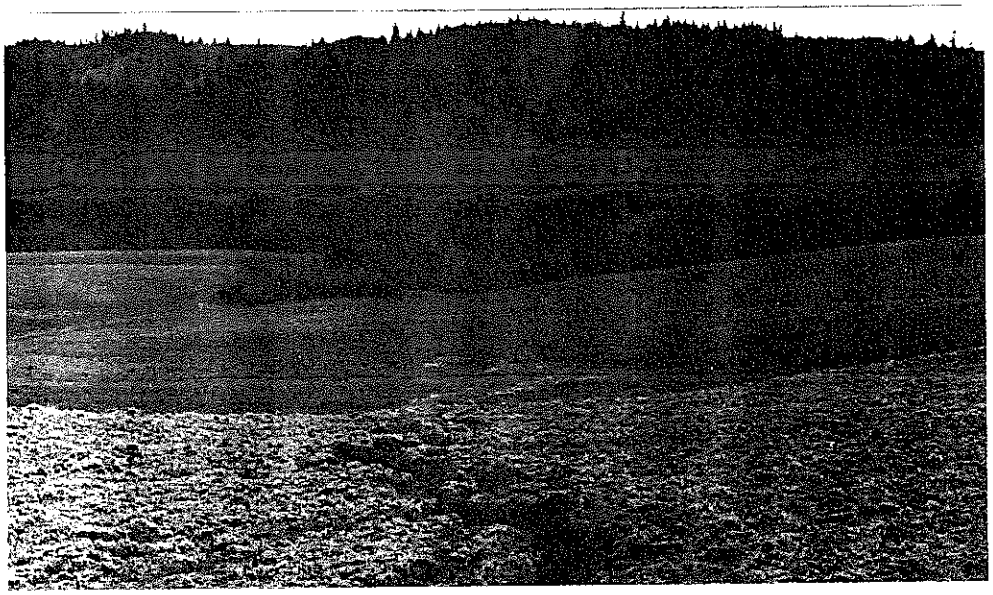




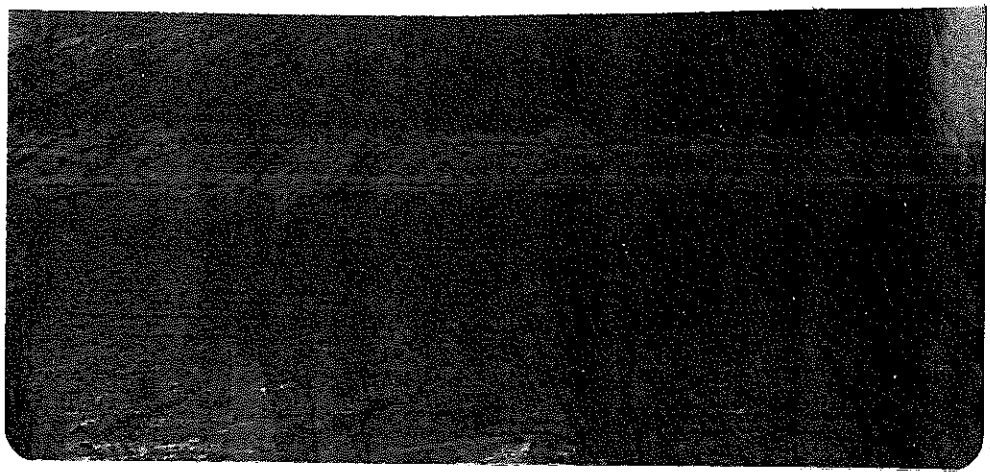


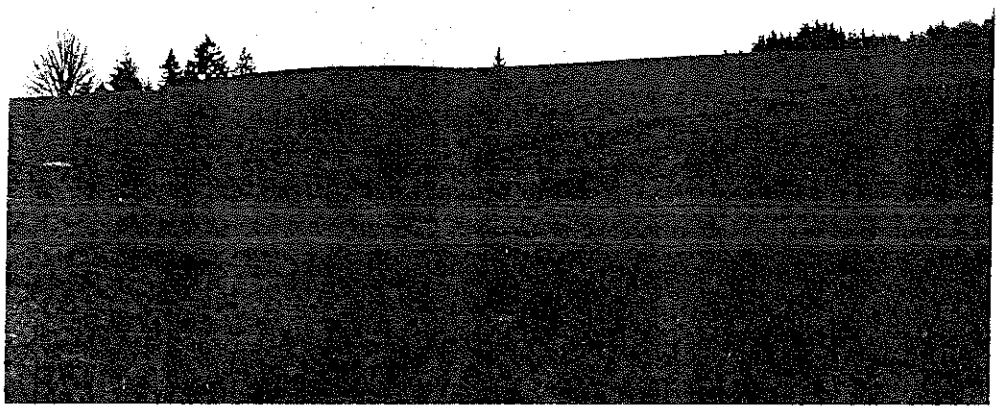


Although grass turf reduces surface runoff, adjacent tilled land erodes during heavy rainfall.



Upper and middle photos show fields eroded even after grain crop was established, due to continuous annual cropping. Soil Conservation Service measurements indicated 26 tons of topsoil per acre was lost from field in top photo.





ROBERT W. STRAUB
GOVERNOR

Department of Environmental Quality

XXXXSWXMORRISONXSTREETXPORTLANDXOREGONX97205X Telephone (503) 229- 5395
P. O. Box 1760, Portland, Oregon 97207

MEMORANDUM

To: Environmental Quality Commission Date: February 14, 1978

From: Director

Subject: Procedures for Processing Applications for Preliminary Certification for Tax Credit

Background

The Department believes that the purpose for requiring Preliminary Certification, prior to construction of projects that may be eligible for tax credit, is to avoid the following undesirable situations:

1. Million dollar solutions to "two-bit" pollution problems.

2. Construction of facilities, based upon the expectation of tax credit, which are not eligible for tax credit.

3. Trying to determine what condition a company was trying to solve after the facility has been constructed, without knowing what the initial conditions were like.

4. Applications for tax credit for hundreds of minor changes in production facilities where we have no way of knowing why the changes were made.

Therefore, the Department should attempt to: (1) reach agreement with the applicant, before construction, on what facilities would be eligible for tax credit; and (2) ensure that the facility proposed represents a reasonable solution (cost effective and practical) to the pollution problem involved.

Presently, the Department is not consistently applying procedural review of applications for Preliminary Certification to achieve these purposes. In many cases Preliminary Certification is granted for entire projects without either sorting out those portions that are not eligible for tax credit, or even determining whether a substantial purpose of the project is for pollution control.

Thus the issue is, if we are going to implement the Preliminary Certification portion of the tax credit statutes to achieve the purposes delineated above, what procedures should be implemented to ensure that they are consistently applied both in Headquarters and Region Offices.

Discussion

New procedures for processing Preliminary Certification requests should be developed by the Department which clearly spells out the purposes for this requirement.

The procedures would generally operate as described below. Upon receipt of an application and supporting documentation (e.g., plans and specifications), it is reviewed to determine if the entire facility is clearly eligible for tax credit. If so, then Preliminary Certification is immediately issued. If not, a written request will be made to the applicant to identify those portions of the facility it believes are eligible for tax credit and to provide any supporting documentation necessary.

If, upon receipt of this information, the staff agrees with the applicant then Preliminary Certification will immediately be issued. If the staff disagrees with the applicant on any portion of the facility it believes is eligible for tax credit, a conference with the applicant will be initiated to attempt to resolve differences. Where disagreements are resolved, the applicant will submit a written request for any appropriate changes in its application, whereupon Preliminary Certification will immediately be issued. Where agreement cannot be reached, a staff report will be prepared for the Commission requesting denial of Preliminary Certification for those portions of the facility the staff does not believe are eligible for tax credit.

To further ensure consistency on the substantive issue of what types of facilities are eligible for tax credit, the Air, Water and Solid Waste Divisions will prepare guidance, for the use of Department staff, which categorizes facility types into three groups: clearly eligible for tax credit; clearly ineligible for tax credit, and eligibility to be determined based upon supporting documentation and discussion. This guidance can generally be developed from the history of facilities already approved or denied for tax credit. As new types of facilities are approved or denied for tax credit they can be added to the list.

As applications are received for new types of facilities not listed in the guidance documents, Region staff will consult with Headquarters staff, prior to approval or recommendation of denial, to assure uniformity of approach. Management Services Division will be responsible for coordinating the guidance between Air, Water and Solid Waste programs.

Recommendation

The Commission should approve the stated purposes for the Preliminary Certification program and direct the staff to prepare new procedures, as outlined in this report, to achieve these purposes.

Bill

WILLIAM H. YOUNG

MJD:cs

ROBERT W. STRAUB
GOVERNOR

Environmental Quality Commission

POST OFFICE BOX 1760, PORTLAND, OREGON 97207 PHONE (503) 229-5696

MEMORANDUM

To: Environmental Quality Commission

From: Director

Subject: Future Activities in the Medford/Ashland AQMA

Much interest has been expressed in future air quality activities which will involve the Medford/Ashland AQMA. Adoption of the proposed particulate strategy is just a start in developing a complete program to attain and maintain compliance with all Federal and State air quality standards. Following is a list of such activities and the dates by which those activities are projected to be completed:

Future Control Strategy Activities

Particulate Summary

February 1978	Adopt Particulate Control Strategy (effective thru 1985)
May 1978	Obtain Source Compliance Schedules
May 1978	Adopt Emergency Reduction Plans for Air Pollution Episodes
May 1978-Jan.1985	Addition to the strategy may be adopted based on new information and need to accommodate greater than projected growth and need to replace existing strategies which may become non-viable.
Jan. 1982	Complete all control installations required by strategy
Jan. 1985*	Adopt long term maintenance strategy

*Note ongoing efforts to improve data bases including special studies on slash burning, road dust and home heating will provide better information on area source and background impacts so that level of confidence in the new strategy effectiveness will be maximized.

CO & HC Summary

Jan. 1979	Adopt work plan for development of transportation control strategy.
	Adopt reasonable available control technology rules for stationary sources.
July 1982	Adopt complete transportation control strategy
December 1987	Complete strategy

1. The adoption of particulate control rules, as now drafted, would require the development of compliance schedules within 3 months of adoption. Control equipment would be installed on industrial sources until January 1, 1982. An arrangement will be made with local fire permit issuing agencies to control open burning.

2. A program must be established by January 1, 1979 outlining the process which will be used to develop control strategies for carbon monoxide (CO) and photochemical oxidants (POx). A requirement for all reasonably available control technology must be in effect by January 1, 1979.

   In connection with this, a lead agency which will coordinate the air quality planning for CO and POx must be designated by the Governor by April 1, 1978. It appears now that this agency will be Jackson County. A division of responsibilities for different aspects of the planning will be made. It is anticipated that the Department will be responsible for performing some of this work.

3. The Department will be performing a study of the air quality impact in the Willamette Valley from field and slash burning from May, 1978 to March 1979. Part of that study will be efforts to use chemical tracer and chemical element balance techniques to allow identification of slash burning impact on Willamette Valley Total Suspended Particulate concentrations. If successful, these techniques would most likely be applicable to the Medford/Ashland AQMA.

4. The Environmental Protection Agency, at the request of the states of Oregon and Washington, has begun a comprehensive study of existing information on slash and other forestry burning. The study will include subjects such as existing practices, emission characteristics, air quality impact and methods for its reduction and alternative methods for disposal. The study will be completed by June, 1978.

5. The legislative Joint Interim Task Force on Forest Slash Utilization made several recommendations. The State Department of Forestry and the DEQ have met to coordinate the response to the recommendations and their implementation. The next such meeting will occur on March 3, 1978. The product of these efforts should be a reduction of the air quality impact of slash burning.

6. Chemical element and particle size analyses of some Total Suspended Particulate (TSP) samples have been made in the past and will be made in the future. These will aid in better identification of the relative effects of various source categories on TSP concentrations and help track the effects of control strategies. Results from the Portland Data Base Improvement Project and the Field Burning Monitoring effort should be very useful to better identifying source impacts in the Medford area.

7. Research work done recently on road dust emissions will be applied to the Medford/Ashland AQMA. This is a source category which has only recently been recognized as being significant. Much work on characterizing emissions and investigating and evaluating control techniques has been done lately.

8. Particle identification by microscopy will continue for some samples. Although this method is restricted to use on only particles larger than about 2 microns, it is a well accepted technique for identifying that portion of the sample. In the Medford/Ashland AQMA about 50% of the sample consists of particles greater than 2 microns in diameter.

9. Monitors for both nitrogen oxides and non-methane hydrocarbons have been installed in Medford. Measurements of these pollutants are necessary in order to use the technique recommended by the Environmental Protection Agency for determining the reduction of these two pollutants which is necessary to achieve the photochemical oxidant standard.

10. An Ambient Particulate Monitor (APM) is being evaluated at this time in Medford. This sampler gives almost continuous readings of total suspended particulate concentrations, rather than the 24 hour averages given by the high volume samplers now used. However, the APM will have to demonstrate adequate correlation to the high volume sampler before its results can be accepted.

11. A study of carbon monoxide concentrations at six sites in Medford and one site in Ashland is presently underway. The study duration will be one month. The purpose is to determine how concentrations in commercial and residential areas compare to those measured at the Brophy Building during periods of atmospheric stagnation. This information will be useful when developing transportation control strategies.

12. A survey of photochemical oxidant concentrations at several sites throughout the AQMA will be performed this summer during the peak oxidant season. This information will be useful in developing control strategies for photochemical oxidants. It will also be used to ensure that the present monitoring site is located at or near the area of peak photochemical oxidant concentrations.

ROBERT W. STRAUB
GOVERNOR

Environmental Quality Commission

POST OFFICE BOX 1760, PORTLAND, OREGON 97207 PHONE (503) 229-5696

MEMORANDUM

To: Environmental Quality Commission

From: Director

Subject: Veneer Dryer Control in Proposed Medford/Ashland AQMA Rules

The purpose of this memorandum is to provide the Commission with more information about the proposed rule for veneer dryers.

Requirement

The proposed rule for veneer dryers requires that the existing statewide rule be met, with the condition that any control equipment installed to meet the rule be able to be upgraded to match the effectiveness already demonstrated by two control systems. These systems are a wet scrubber in series with a fiber bed mist eliminator and a catalytic afterburner operated at about 600°F.

Justification

The requirement that this source category install only readily upgradable control equipment is felt necessary to keep a viable and maybe the only option open for further control which may be needed in the very near future to provide offsets or substitute for the failure of other strategies. The reductions attributed to wood particle dryers and/or charcoal furnaces may not be fully achieved. In this case, reduction in emissions from some other source category will have to be increased in order to ensure that ambient air quality standards for particulate are met. Upgrading the veneer dryer control systems would be unquestionably more practicable than tightening the emission limitations for any of the other source categories.

Similar actions have been taken by the Department and the Commission in the past. The Portland General Electric power generating facility at Boardman was required to be designed to be able to burn garbage and install a sulfur dioxide scrubber. The rules for aluminum plants and kraft pulp mills both require that they meet more restrictive emission limits by specific future dates. Providing the additional control on veneer dryers would be as effective from an air quality impact standpoint as controlling all other wood cyclones with baghouses, or prohibiting wood space heating or even controlling the particleboard dryers to the degree specified in the proposed rules.

Performance of Existing Systems

Many air pollution control systems have been applied to veneer dryers over the past several years in Oregon in attempts to comply with rules which were in effect at that time. These rules were more restrictive than the statewide rules now in effect. Two systems reached a high level of control and are now referenced, in the proposed rule. A short description of each system follows:

Wet Scrubber In Series with A Fiber Bed Mist Eliminator: This system was developed by Georgia-Pacific Corporation and has been used at their Prairie Road plant in Eugene. Development started in 1972. It consists of water sprays in the duct prior to high efficiency cyclones. These are followed by a packed tower filled with Pall rings. The system ends with a Brinks fiber bed mist eliminator unit. Also included in the system is a separator to remove the collected material from the water.

Test results show the system to have achieved a collection efficiency of 91 percent.

The two veneer dryers which were controlled by this system were originally heated with natural gas. However, they have been converted to wood firing. The system can operate without any significant operational problems on gas fired dryers. The mist eliminator was removed after five months operation on a wood firing system. It is the Department's understanding that the mist eliminator was removed from the system because it was beginning to experience some operational problems and its use was not actually required to assure compliance with existing rules. However, it has not been demonstrated that the problems encountered would be insurmountable in continuous service. It should be noted that some periodic servicing of mist eliminators must be expected as evidenced by the unit installed at Boise Cascade in Salem.

Catalytic Afterburner: This system is marketed by Coe Manufacturing Company and has been installed at the Lebanon plant of U. S. Plywood. Development work on this system started in 1972. Test results show that the system has achieved a collection efficiency of 86 percent at a temperature of 600°F. There are no significant operational problems with this system.

Alternatives

The alternative which industry has suggested is to require that control equipment be upgradable, but to not specify any specific level of effectiveness. This would leave open the possibility of installing control equipment which is only slightly upgradable. Specifically, the Burley scrubber is a low pressure drop, economical system which is now widely used in areas outside AQMAs to meet the statewide opacity limits. Its efficiency may be upgraded slightly but it is extremely doubtful they could reach levels achieved by the two other units discussed unless a mist eliminator is installed. We are aware of investigations underway to determine if a Burley scrubber can be equipped with a fiber bed mist eliminator.

Summary

Additional reduction in particulate emissions will be needed if the wood particle dryer or charcoal furnace rule cannot practically be met. Certain collection systems exist for veneer dryers which have significantly higher collection efficiencies than that which will be required to meet the proposed AQMA opacity limits. These systems can be installed to meet the opacity limits and later upgraded to a much higher particulate collection efficiency, if needed. Maintaining such flexibility is considered highly desirable given the real possibility that some of the proposed control strategies may not be implementable and other strategies will have to be substituted.

WILLIAM H. YOUNG

DMBaker/kz

TIMBER PRODUCTS CO.

POST OFFICE BOX 1669
MEDFORD, OREGON 97501
PHONE 503/773-6681

FEBRUARY 22, 1978

ENVIRONMENTAL QUALITY COMMISSION
P.O. BOX 1760
PORTLAND, OREGON 97207

ATTEN: MR. JOE RICHARDS
CHAIRMAN

SUBJECT:
SPECIFIC AIR POLLUTION CONTROL
RULES FOR MEDFORD - ASHLAND
AIR QUALITY MAINTENANCE AREA

DEAR MR. RICHARD:

MR. RICHARDS AND MEMBERS OF THE ENVIRONMENTAL QUALITY COMMISSION, I AM WRITING IN CONCERN OF A NUMBER OF THINGS SET FORTH IN THE GUIDE LINES OR CONTROL RULES FOR THE MEDFORD - ASHLAND AIR QUALITY MAINTENANCE WHICH WILL BE PRESENTED TO THE COMMISSION FOR ADOPTION AT YOUR FEBRUARY 24, 1978 MEETING

VENEER DRYERS - SECTION 340-30-020 . THE WORDING AS I READ IT, IS THAT WE MUST INSTALL EMMISSION CONTROL EQUIPMENT THAT THE SAME AS BEING INSTALLED IN THE REST OF STATE BUT THIS EQUIPMENT MUST HAVE CAPABILITIES OF INCREASING EFFICIENCY 85% IF AND WHEN THE DEPARTMENT OF ENVIRONMENTAL QUALITY FEELS THERE SHOULD BE FURTHER CONTROL. I HAVE PLACED ORDERS FOR CONTROL EQUIPMENT FOR OUR GRANTS PASS PLANT WHICH WILL PUT OUR DRYERS THERE IN COMPLIANCE WITH STATE STANDARDS, AND IN CHECKING WITH THE SUPPLIER ON THIS 85% REQUIREMENT HE WOULD NOT PUT HIS EQUIPMENT ON OUR MEDFORD PLANT UNDER THESE CONDITIONS BECAUSE HE FELT THAT IT WOULD BE UNABLE TO MEET THE 85% REQUIRMENT. NO VENDERS WILL TALK TO ME ON THIS CONTROL EQUIPMENT WITH THE 85% CLAUSE IN IT. ANY VENDER THAT I PLACE A ORDER WITH MUST GIVE ME A GUARANTEE THAT THE EQUIPMENT WILL MEET REQUIRMENT OR I DO NOT PAY FOR IT. WE HAVE HAD TOO MANY SAD EXPERIENCES IN THE PAST WITH EQUIPMENT THAT WAS PUT IN THAT DIDN'T MEET STATE STANDARD ON EMMISSIONS WOOD,

PARTICLEBOARD DRYERS AT HARDBOARD AND PARTICLEBOARD PLANT SECTION 340-30-030.

THIS SECTION IS OF THE MOST CONCERN TO OUR MEDFORD PLANT AND I'M SURE IT IS TO THE OTHER TWO PLANTS IN THE ROGUE VALLEY. AT THE PRESENT TIME WE HAVE WET SCRUBBERS ON OUR PARTICLEBOARD DRYERS AND FROM ALL INFORMATION I CAN GATHER FROM A NUMBER OF VENDERS, THE WET SCRUBBER IS THE BEST KNOWN TECHNOLOGY TO REMOVE PARTICULATE FROM PARTICLEBOARD DRYERS. THE DEPARTMENT OF ENVIRONMENTAL QUALITY MAKES THE STATEMENT THAT THEY ASSUME THAT A ELECTRISTACTIC PRECIPITATOR WILL DO A BETTER JOB OF REMOVING PARTICULATE THAN THE WET SCRUBBERS. THEY ARE BASING

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THEIR ASSUMPTION ON THE OPERATION OF THE PRICIPITATOR IN OTHER INDUSTRIES SUCH AS FOUNDRIES OR ALUMINUM PRODUCTION PLANTS. THERE HAS NEVER BEEN A ELECTRISTATIC PRECIPITATOR TRIED IN THE WOOD INDUSTRY. IN A PARTICLE-BOARD OPERATION WE LIVE IN THE CONSTANT FEAR THAT A SPARK WILL ENTER THE AIRSTREAM CARRYING WOOD PARTICLES THUS CAUSING AN EXPLOSION SUCH AS THE ANDERSON CALIFORNIA INCIDENT LAST YEAR WHICH TOOK A NUMBER OF LIVES.

IT IS COMMON KNOWLEDGE THAT A ELECTRISTATIC PRECIPITATOR IS CON-STANTLY ARCHING DUE TO THE ELECTRIC CHARGED PLATES, THUS A POTENTIAL EXPLOSION HAZARD. WE FEEL THAT THE ELECTRICSTATIC PRECIPITATOR IS NOT THE SAFE AND SAME EQUIPMENT TO BE INSTALLED ON PARTICLEBOARD DRYERS. SINCE THE MEDFORD - ASHLAND AIR QUALITY COMMITTEE RECOMMENDATION WAS SUBMITTED TO THE D.E.Q. AND WAS ADOPTED VERBATEM I HAVE CONTACTED A NUMBER OF VENDERS AND ALSO PROFESSORS THAT HAD BEEN WORKING UNDER A GRANT FROM E.P.A. AND THE ANSWERS I GOT WAS NOT SATISFACTORY TO JUSTIFY THE ENVESTMENT OF A ELECTRICSTATIC PERCIPITATOR. THE MOST TRUTHFUL ANSWER I GOT WAS FROM AMERICAN AIR FILTER WHO IS THE PIONEER IN PRODUCTION OF PRICIPITATORS AND THEIR STATEMENT WAS THAT IT WOULD NOT BE ECONOMICALLY FEASABLE TO BUILD A WET ELECTROCSTATIC PRECIPITATOR THAT WOULD OPERATE THE WAY IT SHOULD TO REMOVE THE PARTICULATE AND HYDROCARBONS TO MEET REGULATIONS. THEIR ROUGH ESTIMAT OF COST OF A PRICIPITATOR TO MEET MY NEEDS WHICH IS TO TAKE CARE OF 65,000 CFM FROM MY DRYERS INSTALLED WOULD BE IN THE AREA OF 1,000,000.00 AND I THINK THAT IF WE ARE REQUIRED TO SPEND THIS KIND OF MONEY ON DRYER CONTROL ONLY IS MY BELIEF THAT OUR PARTICLEBOARD PLANT WOULD BE SHUT DOWN.

THE OTHER ITEM IS THE COMPLIANCE SCHEDULE SECTION 340-30-045.

IN THIS SECTION IT REQUIRES THAT A COMPLIANCE SCHEDULE BE SUBMITTED NOT LATER THAN JUNE 1, 1978. THERE IS PARTS OF THE REGULATIONS THAT A COMPLIANCE SCHEDULE CAN BE APPLIED. HOWEVER ON THE PARTICLEBOARD DRYER I CAN SEE NO WAY THAT A COMPLIANCE SCHEDULE CAN BE SET FORTH. EVEN THE DIRECTOR OF DEPARTMENT OF ENVIRONMENTAL STATES THAT A PILOT PLANT WILL HAVE TO BE SET UP TO SEE IF IT IS FEASABLE BOTH IN PARTICULATE REMOVAL AND ECONOMICALLY TO OBTAIN THE PROPOSED LEVELS, AS YOU ALL KNOW SETTING UP A PILOT PLANT OR MODEL, WHICH SHOULD BE FULL SCALE TO OBTAIN THE TRUE ANSWER, IT TAKES BOTH TIME AND CONSIDERABLE AMOUNT OF MONEY. THE D.E.Q. IS ASKING THREE PLANTS TO STAND THIS EXPENSE OF SETTING UP A MODEL FOR TESTING. AS IT STANDS THIS MODEL COULD FAIL AT OUR EXPENSE OR IF IT SHOULD BE SUCCESSFULL THERE IS NO DOUBT IN MY MIND THAT IT WILL BECOME A STATE STANDARD IN ALL PARTICLEBOARD PLANTS AND FIBRE BOARD PLANTS IN THE STATE OF OREGON. IF THIS PILOT MODEL CONSEPT IS GOING TO BE REQUIRED THEN I SEE NO THER ALTERNATIVE THAN OF APPLYING FOR A STATE OR GOVERNMENT GRANT TO COVER THE EXPENSE OF THIS MODEL. IT IS ON THESE BASES THAT I CAN NOT SEE ANY WAY WE CAN SET A COMPLIANCE SCHEDULE BY JUNE1, 1978 FOR THE PARTICLEBOARD PLANT, DUE TO THE FACT

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THAT ONCE A COMPLIANCE SCHEDULE IS SUBMITTED IT BECOMES A ADDENDUM TO YOUR OPERATING PERMIT AND MUST BE COMPLIED WITH OR BE SUBJECT TO A FINE CONTINUOUS MONITORING.

SECTION 340-30-50.

THIS IS ANOTHER AREA OF QUESTION AS FAR AS THE PARTICLEBOARD DRYERS ARE CONCERNED. WE HAVE MONITORING EQUIPMENT ON OUR BOILER AND I CAN SEE HOW WE CAN INSTITUTE A MONITORING PROGRAM ON THE PLYWOOD DRYERS. I HAVE YET TO FIND A INSTRUMENT SUPPLIER THAT CAN SUPPLY AND MONITORING SYSTEM FOR A PARTICLEBOARD DRYER ON A CONTINUOUS BASES. TO GET A TRUE TEST ON A PARTICLEBOARD DRYER IT TAKES FROM THREE TO FOUR HOURS EACH DRYER.

IT IS MY FEELING AND I'M SURE I CAN SPEAK FOR THE OTHER PARTICLE-BOARD AND FIBRE BOARD PLANTS IN THE AREA THAT MORE TIME AND STUDY BE SET FORTH ON PARTICLEBOARD DRYER EMMISSIONS AND THAT ENGINEERS AND PROFESSORS WITH EXPERIENCE ON ELECTROSTATIC PRECIPITATORS BE CONTACTED AND SET FORTH SOME GOOD BASIC GROUND RULES FOR THE USE OF THIS EQUIP-MENT IN THE WOOD INDUSTRY. WE OF THE INDUSTRY MOST HAVE PROOF OF THE EQUIPMENTS CAPABILITY JUST AS YOU OR I MUST HAVE PROOF OF PERFORMANCE BEFORE WE PURCHASE A CAR.

WE STAND FORTH TO ASSIST OR MEET WITH THE DEPARTMENT OF ENVIRON-MENTAL QUALITY AT THEIR REQUEST. IN FACT WE WOULD LIKE TO BE INVITED TO SOME OF THE RESEARCH ON THESE SUBJECTS.

Wm. Coffendaffer

PLANT ENGINEER
TIMBER PRODUCTS CO.

TESTIMONY OF THE OREGON ENVIRONMENTAL COUNCIL
BEFORE THE ENVIRONMENTAL QUALITY COMMISSION ON
AGENDA ITEM K (GATX OIL STORAGE TERMINAL)

FEBRUARY 24, 1978

My name is John Dudrey, and I am here today representing the Oregon Environmental Council. We have reviewed the Department of Environmental Quality Staff Report on the proposed GATX crude oil transfer facility at Port Westward, near Clatskanie, Oregon. We believe this report leaves sufficient questions unaddressed to require the preparation of an Environmental Impact Statement prior to issuance of any permits.

The GATX proposal is an example of the steady, unrelenting encroachment of major economic ventures on the State of Oregon. Although the GATX operation may be preferred over refineries and other types of petroleum processing industries, the presence in the Pacific Northwest of such a terminal may ultimately give justification to and spearhead the way for less desirable elements of the petroleum industry. (The proposed AMAX plant at Warrenton in 1973-74 appeared to involve a single aluminum producing facility; but there were subtle aspects to that development such as various support and ancillary industries that would have eventually been "needed" by AMAX in the Astoria area in order to function.) Does the establishment of this seemingly harmless, low impact operation indicate plans for future development? Is the GATX proposal a "toe in the door" operation?

Rail transport may be a better alternative to pipeline delivery inasmuch as pipelines would involve considerably more large-scale impacts to construct. Railroad right-of-way already exists; however, increased rail traffic and switching operations would be experienced in the GATX area. The impacts of increased noise levels should be thoroughly analyzed. This analysis should include discussion of methods and structures that could be used to minimize noise impacts. Much more information on the local community will be needed to complete this analysis.

We appreciate the concerns of local citizens whose sleep would be disturbed by excessive rail traffic at night in the GATX terminal area. We hope the interests of those with relatively little political and economic power -- individuals in communities who will be directly affected by environmental and health impacts produced by the GATX operation -- will be protected.

We believe there is a serious problem with railway transportation in the possibility of spillage. The report does not substantiate the conclusion that a rail traffic spill would not be significant (Page 17, Recommendation 1). Under certain conditions, as outlined in the report, the opposite could be true. Until a risk analysis is performed, the potential impact of a rail mishap is unknown.

We take issue with DEQ's first recommendation that tanker and rail traffic will have insignificant environmental impact, and that if the project were environmentally detrimental DEQ would not have the authority to withhold permits. In matters where economic pressures force possible "tradeoffs" we believe that DEQ must judge the possible degradation and insure that Oregon's environmental quality will not be sacrificed or surrendered.

The GATX Report by the Department of Environmental Quality lacks the substance for making sound decisions that will protect the public's future health and welfare. The authors of the report admit that their investigation of this matter was "cursory", and that "more detailed investigation may be desirable." Indeed, a more thorough study is necessary for this proposal. GATX and participating railroad companies should be required to provide a thorough risk analysis for a train derailment and potential spills. GATX should be required to provide a similar analysis for a larger tanker spill. Under alternatives, the use of GATX's Portland facilities should be examined. Supporting or ancillary industrial development should be discussed, as well as mitigating measure for noise and traffic impacts in the area of the proposed terminal.

OEC believes a full Environmental Impact Statement should be prepared before permits are issued for this proposed project. A full EIS appears to be the only method for a thorough investigation into potential impacts of this facility. We appreciate the opportunity to appear before you, and hope our recommendation will be considered. Thank you.

Oregon Environmental Council
2637 SW Water Avenue
Portland, Oregon 97201

222-1963

Presented to:

Environmental Quality Commission
Salem, Oregon

February 24, 1978

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ZJW, AQC

SHELL OIL COMPANY

TWO SHELL PLAZA
P. O. BOX 2099
HOUSTON, TEXAS 77001

February 13, 1978

Mr. William H. Young
Director - Department of
Environmental Quality
State of Oregon
P. O. Box 1760
Portland, Oregon 97207

Dear Mr. Young:

Your Notice of Public Hearing dated January 20, 1978 solicited written comment by February 10 on the proposed Crude Oil Tanker Rules dated January 11, 1978 which deal with control of air contaminant emissions from crude oil tankers.

This letter contains Shell Oil's comments on the proposed regulations.

SHELL OIL'S BUSINESS INVOLVEMENT

Shell Oil does not transport crude oil up the Columbia River but does wish to retain the option of utilizing the ship repair facilities at Portland for both crude and product vessels. Therefore, we suggest that any of the proposed or future regulations issued in connection with the crude oil terminal at Port Westward should specifically exempt vessels bound for Oregon's existing ship repair facilities for the sole purpose of obtaining repairs to the vessels.

INERT GAS BLANKETING DOES NOT PURGE THE CARGO COMPARTMENTS

Your January 11 memorandum to the Environmental Quality Commission states on page 2 under Evaluation - HC, "Or the tankers could inert the cargo tanks, which also expels 100% of the HC vapor". We believe that the word "purge" should be substituted for inert in the quoted statement since inert gas blanketing of the cargo compartments does not displace hydrocarbons into the atmosphere.

THE COAST GUARD IS RESPONSIBLE FOR TANKER SAFETY

Despite Shell Oil's non-involvement with crude oil transportation to Oregon ports, we urge that the staff of the Department of Environmental Quality consult with the appropriate Coast Guard Commander prior to adopting any regulation affecting tanker safety. As an example of the complexity of this subject, we attach a copy of Captain H. W. Parker's comments to the South Coast Air Quality Management District in California in connection with SCAQMD's proposed rule 1116.

We would appreciate receiving copies of any revised versions of your proposed rule and copies of any final rule, should a final rule be adopted.

Very truly yours,

Capt. P. M. Overschie
Manager, Marine Operations

K

MEMORANDUM

To: Environmental Quality Commission
Director, Bill Young

From: Jim Swenson

Date: February 23, 1978

Subject: Columbia County Briefing on GATX Oil Transfer Depot, February 22, 1978, Clatskanie, Oregon.

Columbia County Commissioners sponsored a briefing for the public on the proposed GATX Oil Transfer Depot at the Clatskanie City Hall, Wednesday evening, February 22. Participating in the presentation were the following individuals County Commission Chairman Robert Hunt, Richard Van Mell (GATX), Dick Brogan (GATX), Dick Nichols (DEQ), and Pete Bosserman (DEQ). Also available were representatives from Burlington Northern Railroad to answer questions.

After a presentation on the proposal by GATX representatives and a report on the proposed permits by DEQ representatives, public comment was invited from the audience of approximately 56 people. The comments are summarized below in the following categories: concerns (questions expressing neither pro nor con attitudes), arguments in favor of, and arguments against.

Concerns

Increased rail traffic will cause additional noise to the residents along the rail line between Clatskanie and Portland.

Rail traffic through the cities of St. Helens and Ranier will cause additional automobile disruption in those cities.

New employees for the project may be brought in from the outside instead of hired locally.

Arguments in Opposition

This project is just another increment of industrial intrusion into the county. Concern is that no one is keeping track of the increments and their cumulative results. (Pete Bosserman, DEQ, pointed out that DEQ is keeping track of increments of air pollution under the federal Prevention of Significant Deterioration rule.

A 10% increase in tanker traffic is significant. Any spill as a result of a tanker accident would have disastrous consequences in Young's Bay. Young's Bay was characterized an an important estuary supporting aquatic life which serves

as food for fish which live in the Columbia River. Human error will eventually cause a major spill which would affect a $60 million/year fishing industry. Many people who live on the lower Columbia River earn their livelihood by fishing. (Dick Nichols, DEQ, emphasized that a full environmental impact statement could help make a determination for some of these unknown issues.)

The GATX proposal is just a foot in the door for more industrial expansion in the area. "Once the industry is there expansion will be easier; and there will be additional risks for oil spills."

The DEQ has not considered the environmental impacts due to a one year period of construction (vehicle traffic, noise, pollution).

Consideration of other alternatives such as a pipeline was urged.

Concerns about the stability of the rail bed between Portland and Pasco were expressed.

The state was criticized for allowing this kind of industry to enter the state when we should be looking toward the future by looking for industries that utilize people's waste and industries which are small scale and locally operated.

"We can't keep fooling around with unpredictables."

Arguments in Support

Keith Roberts, Western Environmental Services, stated that his oil spill clean-up company has contracts with Burlington Northern and GATX. He supported the proposal and indicated that his company was in a high state of preparedness to clean up any oil spills. He agreed, however, a major spill at the bar would cause much shoreline damage, but could be cleaned up.

The tax base of the county will be supported by this project with a minimum of additional demands on services.

This industry is putting up the dollars to create jobs and energy resources, and should be welcome in the community.

Burlington Northern stated the rail bed is in good shape, and construction of special tank cars increases the structural integrity, reducing chances of a spill from the rail cars.

Those in attendance at this meeting were informed of the EQC hearing on the matter at their February 24 meeting, and were invited to attend.

Also attached are letters which the Department has received expressing support and opposition for the proposed facility.

JS:mef

West Coast Shipping Company

1052 West Sixth Street, P.O. Box 4258
Los Angeles, California 90051

February 10, 1978

E. S. Mealins
Assistant General Manager
(213) 486-7268

TWX 910-321-3853
Telex 691387
Cable: Westcoast Los Angeles

Department of Environmental Quality
P. O. Box 1760
Portland, Oregon 97207

P.D.P. 2/15/78

Attention: Mr. Peter B. Bosserman
Associate Engineer
Air Quality Division

ADDITION TO DIVISION 22
CRUDE OIL TANKERS PROPOSED RULE

Dear Mr. Bosserman:

Please find enclosed our comments concerning the new air quality regulations which will affect crude oil tankers operating within the State of Oregon.

Very truly yours,

WEST COAST SHIPPING COMPANY

E. S. Mealins
Assistant General Manager

ESM:sa
Enc.

ADDITION TO DIVISION 22

CRUDE OIL TANKERS

COMMENTS:

Fuel Oil Sulfur Content - 340-22-080 -

The limiting of sulfur content in fuel oil to 1.75% by weight is an unusually stringent restriction for crude oil tankers.

A census made by vessel bunker supply companies has indicated that the average sulfur content in fuel oil available in the world's bunkering ports is about 3.2% by weight. In order for vessels to comply with the 1.75% by weight limitation, additional and sometimes virtually impossible bunkerings will be required in order to obtain the lower sulfur fuel oil. This will also impose an excessive economic burden on vessel owners because of the high cost of this type of bunker fuel.

Tanker Ballasting - 340-22-085 -

This regulation implies that crude oil tankers, even when under way in waters within the jurisdiction of Oregon, cannot take on unsegregated ballast in excess of 25% of their deadweight.

This limitation will seriously impair the safety, maneuverability and sea-keeping ability of vessels proceeding in the waters of the State. While vessels may be able to proceed to leave berths when they are moored in normal circumstances, with unsegregated ballast of only 25% of deadweight, it is routinely necessary that vessels continue taking on ballast to a greater extent dependent on the existing weather conditions and even to adjust ballast in the ship in order to optimize the vessel trim. During winter it would be virtually impossible for a crude oil carrier in ballast only to safely transit the Columbia River Bar with only 25% of deadweight aboard in unsegregated ballast.

We note that these four additions specifically address "crude oil tankers" and therefore will not apply to vessels which specifically do not meet the definition of "crude oil tankers."

2/10/78

DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

MAILING ADDRESS:
Officer in Charge
Marine Inspection
U.S. Coast Guard
6767 N. Basin Avenue
Portland, OR 97217

16711/5941.2
14 February 1978

P.B.B. 2/16

Mr. Peter B. Bosserman
Associate Engineer
Air Quality Division
P.O. Box 1760
Portland, OR 97207

Dear Mr. Bosserman:

The following comments are offered in reply to your letter of January 23, 1978, concerning proposed tanker regulations.

Proposed rule 340-22-085 setting ballast tonnage limitations: Certain vessels are required by Title 33, Code of Federal Regulations, Subpart 157.09 to have segregated ballast capability. These vessels should not be subject to limitation of ballast, as routine ballasting would not cause vapors to be expelled from the cargo tanks. These vessels should be specifically exempted from the rule as proposed. The limitation of 25 percent of deadweight tonnage for unsegregated ballast ships could be unrealistic as some vessels may require more ballast to assure optimum conditions for safe navigation.

Concerning proposed rules 340-22-090 prohibiting use of inert gas systems, Title 46 CFR, Subpart 32-53 requires certain vessels to have installed and to operate cargo tank inerting systems. A state rule prohibiting use of such systems could conflict with that regulation. The intent of the Federal Regulation is, of course, intended to minimize the possibility of explosions originating in cargo tanks. This is a very real safety factor and should not be negated.

If I may be of any further assistance to you, please feel free to call on me.

Sincerely,

J. M. DUKE
Captain, U.S. Coast Guard
Officer in Charge
Marine Inspection

JFK

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED
FEB 16 1978
file 05-2569
AIR QUALITY CONTROL

PBB
info & comment

OREGON ENVIRONMENTAL COUNCIL

2637 S W WATER AVENUE, PORTLAND, OREGON 97201 / PHONE 503/222-1963

February 7, 1978

The Honorable Robert Straub
State Capitol
Salem, Oregon 97310

Dear Bob:

We have recently reviewed the GATX proposal for an oil transfer facility at Port Westward and think it is of such magnitude and impact that a Federal Environmental Impact Statement is needed. The DEQ Staff evaluation itself rasies many questions which are unanswered except by reference to needed detailed studies.

We ask you to restate your support for an EIS and hold in abeyance any DEQ/EQC action on NPDES or Air Discharge Permits until completion of the Federal review process which is likely to bring in substantial new information.

Sincerely,

Larry Williams
Executvie Director

LW:alh

cc: Department of Environmental Quality
Army Corps of Engineers, Portland District
Division of State Lands

P.O. Box 1094
Clatskanie, Oregon 97016

February 1, 1978

Dept. of Environmental Quality
P.O. Box 1760
Portland, Oregon 97207

I would like to oppose the location of a crude oil terminal at Port Westward for the following reasons:

① There has already been a noticeable stink in Clatskanie when oil is unloaded at the Beaver Generating station. (I don't know if anyone thought to complain to you about it.) Obviously, unloading more oil means making more stink, which is a serious loss for those of us who live here. A small town in the woods shouldn't smell that bad.

② So far we have been very lucky that tankers have not broken up going across the Columbia River bar or in the river itself. More tanker traffic means more chances of spills on the coast, along the river beaches, in the salmon streams, and the bird nesting grounds. Spill containment booms and such devices are not going to help at all in the rough surf or very much in the river where, at normal winter temperatures, the oil can solidify, sink, and be dragged off in unpredictable directions.

③ If the Port Westward site must be developed, it could be put to much better uses than an oil unloading facility. I know big money & politicians are favoring oil, but that does not meet any local needs — only creates local pollution problems. We are a poor county with high unemployment. Any manufacturing facility would employ more people permanently and be a more appropriate use of that prime industrial location.

We don't need oil fumes, spills and lonely tank farms. We need clean air, unpolluted waterways, and acceptable industries.

Thank you very much for your consideration of this opinion.

Yours sincerely,

Kathleen E. Abbott

January 29, 1978

Gentleman:

We would like to be counted [illegible], in favor of the GATX Beaver Terminal.

We believe in trying to preserve the environment as much as anyone.

However, the good of the majority should be the consideration, should it not? and the good for the most, far outweighs the bad, does it not?

We can't condemn this matter because there is so much good.

Yours, Harvey & Louise Clemenson

MR. & MRS. HARVEY CLEMENSON
RT. 1 BOX 405-B
CLATSKANIE, OREGON 97016

CLATSKANIE JAN 30 PM 1978 97016

Post Card

RECEIVED JAN 31 1978

OFFICE OF ENVIRONMENTAL QUALITY

USA 9c

Dept. of Environmental Qual.

P.O. Box 1760

Portland, Oregon

97207

February 8, 1978

55 Fisher Lane
St. Helens, Ore.97051

Dept. of Environmental Quality
P.O. Box 1760
Portland, Ore.

re: Crude Oil Terminal at Port Westward

Gentlemen:

I'm strongly against it! I'm very concerned about the spill potential of oil tankers on ~~xxx~~ the Columbia River. I'm even more concerned about the numerous & ~~xxxxxxxx~~ lengthy oil trains that will cut the town of St. Helens in half. This town is growing and will probably be another Beaverton within five to ten years. The train track goes right smack through the middle of town.

The significant increase in train traffic as a result of this oil terminal will drastically lower St. Helens liveability, in my opinion. The blocking of main traffic arteries by lengthy trains would be serious. The fire dept. is on one side of the tracks and half the town is on the other side. Also, the increased noise level which extends ¼mile on each side of the tracks would be intolarable with heavy train traffic.

I hope you will consider these factors in your decision on this oil terminal.

A Concerned Citizen,

Jim Freeman

Jim Freeman

STATEMENT OF THE WESTERN OIL & GAS ASSOCIATION

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE

STATE OF OREGON

SALEM, OREGON

FEBRUARY 24, 1978

Re: Proposed Regulations For Controlling Air Contaminant Emissions From Crude Oil Tankers

I am Bob Wrede. I am appearing on behalf of the Western Oil & Gas Association, which is composed of the bulk of the producers, refiners, and marketers of petroleum products in the western United States. Needless to say, regulations such as those currently under consideration by this Commission would have a substantial impact on a vital aspect of the petroleum industry.

Our association supports responsible environmental regulations. By responsible regulations, we mean regulations which demonstrably contribute to achieving a reasonable balance between both socio-economic and environmental needs. We oppose the adoption of the regulations currently before you because we do not believe that adequate consideration has been given to: 1. the environmental benefits which might be gained by their adoption; 2. the socio-economic costs of such regulations; or 3. the operational problems these regulations would create.

In the first place, the memorandum proposing these regulations[1/] contains nothing to show that these regulations are necessary to the attainment and maintenance of applicable ambient air quality standards or to prevent significant deterioration of air quality in the state of Oregon. Unfortunately, a number of the assertions made in the memorandum are without basis in fact. For example, with respect to the provision limiting the sulfur content of fuel to be burned in crude oil tankers the memorandum states, "Ports in California are limiting the % sulfur in fuel oil burned by vessels. The most stringent rule is the Port of Ventura's, which limits vessels to fuel oil of about 0.5% sulfur." This statement is simply untrue. There is no regulation anywhere in California, of which we are aware, which limits the percentage of sulfur in fuel oil which may be burned by vessels visiting ports in that state. Ventura has no such rule and is not currently actively considering any such rule.

Nor does the memorandum indicate current ambient levels of sulfur oxides in the vicinity of Port Westward or the probable air quality impacts of either the assumed emissions of sulfur oxides from tankers visiting the proposed GATX terminal or the probable beneficial impacts, if any there may be, from limiting those emissions in the fashion proposed. Nor has any consideration been given to the cost of complying with such

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1/ Memo re Agenda Item K, January 26, 1978, EQC Meeting Crude Oil Tanker Rules - Authorization for Public Hearing, Department of Environmental Quality, January 11, 1978.

regulations other than observing that, "Some tankers have several fuel oil tanks, one of which can be dedicated to low sulfur fuel oil . . . ." This obviously implies that other tankers do not have this capability, a fact which would necessitate costly vessel modifications and, as I will discuss later, a fact which raises serious legal problems regarding the authority of any state to regulate instruments of interstate commerce and international trade, or to interfere with the Coast Guard regulation of navigation.

Similarly, the memorandum contains no technical justification for the imposition of limitations on ballasting and inerting crude oil tankers. No indication is given of the current ambient levels of hydrocarbons, or the impact which these regulations might be expected to have on those levels. The sole justification set forth in the memorandum for imposing these requirements is based on the supposition that hydrocarbons emitted as a result of possible ballasting or inerting operations at the terminal, combined with oxides of nitrogen from tankers and trains serving the terminal, and the nearby PGE Beaver turbine power plant, " . . . could drift down wind, be acted upon by sunlight, and cause photochemical oxidant standards to be exceeded." This supposition, however, is unsupported by either data or scientific analysis. The fact is that hydrocarbons, in and of themselves, are not generally considered harmful. It is only in combination with oxides of nitrogen, in the presence of sunlight, that they can--under the

proper circumstances--form photochemical oxidants, sometimes referred to as smog. This process is such a highly complex one that in some cases decreases in the so called precursors, that no reactive hydrocarbons and oxides of nitrogen, may have no effect whatever on the formation of smog and can even increase its formation. Until the environmental implications of the proposed regulations and the cost of complying with them are more fully understood, we do not believe they should be adopted by this Commission.

As I have already suggested, the proposed regulations also pose a significant legal problem. As the Department of Environmental Quality's supporting memorandum observes, both ballasting and inerting are regulated by the Coast Guard. This regulation is an exercise of the Constitutional power of the federal government to regulate navigation. Further, tankers are instruments of interstate commerce and international trade, topics which are also Constitutionally regulated by the federal government.

Because the federal government is charged with regulating, and in fact regulates, both the operation and design of tankers, serious doubts exist as to the power of any state to impose requirements which could conflict with federal regulation in the field.

Without going into boring detail, the supremacy clause of our federal Constitution[2/] provides that, in any case

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2/ U.S. Constitution, Article VI, § 2.

where there is a discernible conflict between federal law and just about anything a state does, federal law prevails. Since the Coast Guard already regulates the design and operation of tankers, it is highly doubtful that a state may regulate in a fashion affecting either tanker design, such as a provision necessitating the addition of extra fuel tanks or that a state may regulate tanker operations, such as the proposed requirement that only 25% ballast be allowed in crude tankers within the jurisdiction of the state of Oregon.

To illustrate, the application of this principle in a case now pending before the United States Supreme Court, a United States District Court found that the federal Ports and Waterways Safety Act[3/] preempted the state of Washington from regulating oil tankers operating in the Puget Sound. Arco v. Evans, U.S. Dist. Ct., W.D. Wash., No. 75-648 (Sept. 1976), probable jurisdiction noted, 97 S.Ct. 1172 (1977). The District Court held:

> "The purpose of the original tank vessel act, and of Title II of PWSA was to establish a uniform set of regulations govrerning the types of ships permitted within coastal waters of the United States and the conditions under which they would be permitted to operate. Balkanization of regulatory authority over this most interstate, even international of transportation systems is foreclosed by the national policy embodied in the PWSA."[4/]

3/ 46 U.S.C.A. § 391a.

4/ Memorandum Opinion at p. 3.

By adopting the Ports and Waterways Safety Act Congress expressed a clear intent that uniformity be assured by reserving to the federal government all power to control the design, construction, maintenance and operation of tankers. We believe that principle casts grave doubts on the validity of the regulations before you today.

There are other troublesome ramifications with respect to state efforts to regulate in fields expressly reserved to the federal government by the Constitution, such as treaty preemption, the exclusivity of federal authority over foreign affairs, and the federal power to regulate interstate commerce. Rather than discussing each of those topics in my oral presentation, I have for each of you a copy of a presentation made on behalf of the Western Oil & Gas Association before the California Air Resources Board during the course of their consideration of similar rules for the South Coast Air Basin which goes into those topics in some depth. I commend it to those who wish to delve into these problems in greater detail.

Suffice it to say that our federal system is designed to prevent undue state interference with matters which require a national perspective. It is difficult to imagine a field of regulation in which the national interest in uniformity is greater than the transporting of crude oil in interstate and international commerce. For this reason the federal government has cooperated with the international community by participat-

ing in what is known as the Intergovernmental Maritime Consultative Organization, a body charged, among other things, with promulgating uniform international environmental regulations. Also, it has given the Coast Guard the responsibility of controlling the design, construction, maintenance, and operation of vessels carrying crude oil to protect the country's interests in both safety and preservation of the environment. The answer is clear. International, national and state interests can be best served by uniform regulation. Unilateral state action simply cannot cope with the magnitude of the problem and therefore must give way.

Thirdly, the regulations are operationally unsound. The low sulfur fuel rule presents technical problems the elimination of which may necessitate expensive vessel modifications requiring Coastal Guard approval. The portion of the rule limiting ballasting is unwise. Each vessel has its own stability and manuevering characteristics. These characteristics must be matched to the local weather conditions in order to determine the amount of ballast the vessel requires for safe navigation. Any rule limiting the amount of ballast a vessel may take could result in an unsafe situation. Finally, we believe there is some confusion regarding inert gas systems. Under normal conditions, vessels will not emit more pollutants than vessels without such systems.

Please understand that our comments are being offered with a constructive purpose. The issues involved are

exceedingly complex. It is this complexity which we believe demands careful justification for any attempts to regulate in this field. Because neither environmental nor legal justification for the proposed regulations has yet been established, we respectfully submit that they should not be adopted at this time.

Thank you for your patient attention. I would be pleased to answer any questions you may have regarding my comments to the best of my ability.

PUBLIC HEARING OF

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

RE

PROPOSED LIGHTERING RULES FOR

THE SOUTH COAST AIR BASIN

January 6, 1978

PRESENTATION OF

WESTERN OIL AND GAS ASSOCIATION

I

PRELIMINARY

The Western Oil and Gas Association ("WOGA") is firmly committed to two principles which are fundamental to rational regulation for the purpose of environmental protection. First, rules and regulations must be based on valid evidence. This includes evidence establishing the authority of the agency involved, that proposed regulations will have a demonstrable beneficial effect on the environment, and that compliance with proposed regulations is technologically and economically feasible. The second closely related principle is that interested parties should be given a full and fair opportunity for review and commentary regarding the asserted basis for the proposed rules and regulations. Indeed, due process of the law requires that bodies like the South Coast Air Quality Management District ("SCAQMD") strictly adhere to these principles.

Today SCAQMD considers whether to enact the "Model Rule" for lightering prepared and distributed by the California Air Resources Board ("ARB"). Does this mean that SCAQMD is merely following CARB's instruction to adopt the "Model Rule" and is not exercising any independent judgment? If not, what is the basis for the action being considered? These questions have arisen because of the manner in which the "Model Rule" comes before the District.

Prior to November 21, 1977, industry was in receipt of two rules governing lightering operations proposed for

adoption by the South Coast Air Basin. One was distributed by the ARB staff and the other by the SCAQMD Staff. On November 16, 1977, WOGA representatives met with members of the SCAQMD staff at a workshop to discuss the District's rule. Conversations at that workshop and informal subsequent contacts revealed that the SCAQMD staff apparently purported to rely on evidence other than that published by the ARB in support of its rule. A public hearing for consideration of the District's proposed rule was scheduled for December 2, 1977.

On November 21, 1977, the ARB conducted a public hearing on its proposed lightering regulation for SCAQMD. At that hearing WOGA, the Coast Guard, and others offered extensive oral and written presentations conclusively demonstrating that the proposed rule exceeded the authority of the State of California and that the evidence was wholly insufficient to establish either a rational relation between the rule and improved air quality or the feasibility of compliance. Copies of the written presentations of WOGA, Dames and Moore (meteorology report) and the Coast Guard to the ARB on November 21, 1977, are attached as Appendices A, B, and C. Rather than adopt its proposed lightering rule for SCAQMD, the ARB approved it as a "Model Rule" to be forwarded to the District.

The ARB left no doubt about its desire for SCAQMD to adopt the "Model Rule" or its functional equivalent. The Board directed its executive officer to report in January, 1978, what if any action had been taken by SCAQMD and other coastal districts to enact lightering rules. The ARB further

indicated that if SCAQMD does not act promptly to do so, the ARB would impose the "Model Rule" for lightering on the District.

Soon after the ARB's hearing on November 21, 1977, WOGA was advised by the SCAQMD staff that the December 2, 1977, public hearing of the District was to be postponed until today. WOGA was also informally advised that, with one minor procedural change, the District would consider adoption of the ARB's "Model Rule" for lightering based on work done by the ARB's staff.

WOGA can certainly appreciate the difficult position in which the ARB has placed the District with the "Model Rule" procedure. However, this does not alter the responsibility of SCAQMD to critically evaluate just what it is being asked to do. As with any valid regulation, the proposed "Model" lightering regulation can only be adopted if SCAQMD has authority and independently determines that there is evidentiary support for the regulations. The only evidence purporting to support the "Model Rule" of which WOGA is aware is that offered by the ARB at its hearing on November 21, 1977. Any reliance on this evidence is wholly unwarranted. This was conclusively demonstrated by WOGA, the Coast Guard and others that presented commentary at the November 21st hearing. If there is any other evidence which is to be considered in connection with these regulations, we are entitled to be so advised and afforded a fair opportunity for review and presentation of commentary.

The written statements of WOGA and the Coast Guard are attached. Rather than repeat these statements in their entirety, we will merely highlight them. That is more than

sufficient to reveal why adoption of the ARB "Model Rule" is inappropriate.

II

THE ARB'S ADMINISTRATIVE RECORD RE LIGHTERING "MODEL RULE": MAJOR DEFICIENCIES

A. Lack of Authority.

Regulation of tankers engaged in interstate and international trade must be uniform. Several well established constitutional principles guarantee such uniformity.

In 1972 Congress preempted that field by amending the Port and Waterways Safety Act ("PWSA") to require promulgation by the Coast Guard of comprehensive regulations governing the design, construction, maintenance, and operation of tankers. 46 U.S.C. § 391a (See Appendix A at p. 4-6.) Both WOGA and the Coast Guard advised the ARB that a federal court had already ruled that those amendments to PWSA are preemptive and that its decision is now being reviewed by the United States Supreme Court. Ray v. Atlantic Richfield, U.S. Dist. Ct., W.D. Wash. (Sept. 1976), probable jurisdiction noted, 97 S.Ct. 1172 (1977). (See Appendix A at p. 5-6 and Appendix C at p. 12.) Furthermore, the lightering regulations would impermissibly conflict with the International Convention for the Safety of Life at Sea (Appendix A at p. 6-9). The United States is a signatory to this convention and its provisions may not be impaired by unilateral state regulation of tankers.

In addition to the federal government's preemption of

tanker regulation, there is another closely related reason which precludes unilateral state action. State regulation of tankers has international implications and therefore intrudes into the field of foreign affairs which the United States Constitution reserves exclusively to the federal government. (See Appendix A at p. 10-13 and Appendix C at p. 13.) Moreover, as respects domestic tankers the Commerce Clause prohibits state regulation because of the overriding need for uniformity. (Appendix A at p. 13-14.) Differing regulation of tankers by the several coastal states would unduly burden interstate commerce in violation of the federal constitution.

The "Model Rule" for lightering also denies due process because it would involve extraterritorial application of California's laws. (See Appendix A at p. 15-17.) As the Coast Guard pointed out, adoption of the lightering regulations proposed by the ARB would constitute an "assertion of authority to regulate the activity of vessels outside the 3-mile limit of the State's waters. . . ." (Appendix C at p. 12.)

The administrative record relating to California's authority to adopt the "Model Rule" now being considered for adoption by the District established that such action is prohibited by multiple federal constitutional principles. Those legal deficiencies apparent in the ARB's administrative record are not the only patent problems with the basis for the Board's approval of the "Model Rule."

B. Lack of Air Quality Impact.

The record upon which the ARB "Model Rule" is based

does not include valid scientific evidence establishing that offshore lightering operations have any demonstrable impact on the quality of the ambient air within the South Coast Air Basin. Demonstration of an adverse impact requires valid scientific data establishing two facts. The first is that emissions associated with offshore lightering are transported into the South Coast Air Basin. The other fact is that, if transported into the Basin, such emissions would have an adverse effect.

With respect to the "transport" issue, the record includes a meteorological analysis by the ARB Staff which is wholly inadequate to prove that offshore lightering emissions are transported into the South Coast Air Basin. The inadequacy of the ARB's meteorological work was discussed at length in a report prepared by Dames and Moore working in consultation with Professor Morton G. Wurtele of the U.C.L.A. Department of Atmospheric Sciences. As previously mentioned, that report is included as Appendix B hereto. To briefly summarize, Dames and Moore concluded along with Professor Wurtele that:

> (1) The ARB Staff failed to apply techniques accepted by the meteorology profession to analyze the transport of emissions associated with offshore lightering; and
>
> (2) The ARB Staff reached conclusions not supported by the data upon which it relied.

The Coast Guard similarly concluded that until proper transport analysis has been done, the lack of "hard scientific emission

data" would leave the proposed regulations subject to challenge with respect to their necessity. (See Appendix C at p. 8-10.)

While the "transport" meteorology data in the ARB's record was wholly insufficient, the photochemistry data was non-existent. Only by photochemical analysis can it be determined whether any hydrocarbon emissions associated with lightering operations would have an adverse effect on air quality if transported into the South Coast Air Basin. The Dames and Moore-Wurtele study points out that such analysis would require complex photochemical modeling. (Appendix B at p. 16-18.) No such photochemical analysis was even attempted to support the ARB's "Model Rule." This deficiency was acknowledged by the ARB Staff at the hearing on November 21.

Thus, as is set forth in the Dames and Moore-Wurtele Report (Appendix B), there is no valid scientific evidence demonstrating that adoption of the lightering operations now under consideration would be beneficial in terms of air quality. Neither is there evidence that what is proposed is technologically feasible.

C. Infeasibility of Compliance.

Both WOGA and the Coast Guard testified at some length about technological problems associated with both long and short term compliance with the ARB's lightering regulations. The "Model Rule" would require installation of operative vapor recovery systems on lightering vessels by July 1, 1980. The Coast Guard informed the ARB that after conducting extensive testing programs to investigate the safety of vessel vapor

recovery systems, the Coast Guard does not expect an acceptable system to be available in less than "three to five years." (See Appendix C at p. 2-6.) Nonetheless, the "Model Rule" requires "final compliance by July 1, 1980." [Proposed Rule 1116(f)(2)(D)]. Moreover, prior to June 1, 1979 vessel owners must "negotiate and sign initial contracts for construction. . . ." [Proposed Rule 1116(f)(2)(B)]. Clearly, one cannot sign contracts in June of 1979 for an approved system which the Coast Guard states will be approved for installation at the earliest in 1980 and possibly not until 1982. Obviously such timing requirements are wholly unreasonable.

Neither does the record indicate that short term operational requirements in the "Model Rule" are free from difficulties. WOGA testified that it was uncertain whether lightering operations could be conducted in exposed waters off the Coast of California on a routine basis and explained how uncertainty in this area could raise serious questions about the economic feasibility of lightering because of the potential disruption of refinery supply deliveries. (See Appendix A at p. 25-26.) The Coast Guard also warned that moving operations to the south could have international implications. (See Appendix C at p. 6.)

With respect to the operational alternative of tank washing and gas freeing in conjunction with short loading, WOGA explained about possible undesirable by-products associated with such procedures. (See Appendix A at p. 27.) The Coast Guard expressed similar concerns on that point and also com-

mented on an additional safety concern about increases in tank washing operations. (See Appendix C at p. 7.)

While several other technological problems were raised in the record before the ARB, we will dispense with discussing them in the interest of time. Suffice it to say that, as with legal and air quality impact issues, the ARB record on technological feasibility is altogether deficient to justify adoption of the proposed "Model Rule" for lightering.

III

CONCLUSION

There is one thing about which WOGA is quite certain. Adoption of the ARB's "Model Rule" for lightering by SCAQMD is inappropriate. Clearly, enactment of the lightering regulations cannot be justified on the basis of the ARB's approval of the "Model Rule." Neither can the "Model Rule" now be adopted in reliance on other evidence about which WOGA has had no fair opportunity to comment.

WOGA therefore respectfully urges the District not to abdicate its responsibility by adopting the "Model Rule" merely because instructed to do so by the ARB. Rather, we urge the District to independently evaluate the evidence, as is its charge. We are confident that such an objective evaluation will convince you that:

(1) Neither the ARB nor the SCAQMD has authority to unilaterally regulate lightering operations as proposed;

(2) Adoption of the proposed "Model Rule" is not justified by scientific data;

(3) Compliance with the proposed "Model Rule" is not technologically feasible; and as a result

(4) The "Model Rule" should not be adopted.

APPENDIX A

PUBLIC HEARING OF

CALIFORNIA AIR RESOURCES BOARD

RE

PROPOSED LIGHTERING RULES FOR

THE SOUTH COAST AIR BASIN

November 21, 1977

PRESENTATION OF

WESTERN OIL AND GAS ASSOCIATION

PRELIMINARY

The members of the Western Oil and Gas Association (WOGA) endeavor to meet the energy demands of the Western United States in a way consistent with the need to protect both the environment and the safety of their employees. It is the policy of the WOGA members to work cooperatively with the Air Resources Board and all other governmental agencies within their respective areas of jurisdiction. We also expect competing regulatory agencies to work cooperatively with each other to avoid duplicitous or even conflicting regulation of the same activity. Indeed, this is what the law requires.

The importation of crude oil into Southern California is by its very nature international in scope. The crude oil comes from diverse locations throughout the world. The tankers used are of both American and foreign registry. These vessels call not only at Southern California ports but at ports throughout the world. In recognition of the international nature of the ocean carriage of crude oil, the maritime nations of the international community have vigorously opposed unilateral regulation of tankers. Congress has acknowledged this concern and has carefully sought to avoid conflict by patterning its regulations to accord with international agreements. It is clear that conflict between competing state, national, and

international interests would not be in the public interest and can be avoided only by uniform regulation. In our judgment, both legally and practically, the overriding need for uniformity precludes unilateral state action which would result from adoption of the proposed lightering regulations.

Our belief in the paramount need for uniformity is not the only concern we have with the proposed lightering regulations. Enforcement of those regulations with respect to lightering in the lee of San Clemente Island involves extraterritorial application of California's laws. Neither the ARB nor any other arm of the state government has the power to regulate the conduct of lightering operations outside the state's boundaries.

Wholly aside from our conviction that unilateral state regulation of tankers engaged in lightering is inappropriate, we are troubled by the action now being considered by the Board. The first prerequisite of responsible regulation is a valid data base demonstrating a need for regulation. The underlying premise for the proposed lightering regulations is that the emissions to be regulated have an adverse environmental impact. This has not been demonstrated. The assumption in the Staff Report, which we challenge, is that organic vapor emissions from the San Clemente lightering area are transported on shore into San Diego County and the South Coast Air Basin. This fails to establish an adverse impact. Hydrocarbons alone are relatively innocuous and are

significant only as a precursor to the formation of oxidant. No attempt has been made to determine the resultant onshore concentration of hydrocarbons, let alone the increase in oxidant formation. As to the latter, it would be necessary to first determine the increase in reactive hydrocarbon concentrations along with onshore and transit NO_x concentrations before photochemical reactivity could be predicted. In short, the most that has been indicated is a predicted increase in hydrocarbons, not oxidant, and even the predicted hydrocarbon increase is not theoretically sound. We do not wish to appear unduly critical, but we know of no other way to emphasize the absolutely essential need for sound data.

We have a similar difficulty with the analysis of the SO_x emissions. No attempts have been made to quantify resultant onshore concentrations. Moreover, the greatest impact is presumed to be in San Diego County which, according to the Staff Report, has not had any reported violations of either the State SO_2 or sulfate standards, even while lightering operations have been conducted. In short, no cause and effect relation has been shown.

The feasibility of compliance is also a very major concern. Safe transportation of crude oil in vessels has been assured by adherence to rigid design specifications and operating procedures. This has involved cooperative efforts of the maritime industry, the Intergovernmental Maritime

Consultative Organization ("IMCO") and the United States Coast Guard which has exclusive regulatory jurisdiction over the safety of vessels in U.S. waters. We understand that the Coast Guard has taken the position that there is not a vessel vapor recovery system which has met its safety requirements. Likewise, the WOGA members do not know of such a system.

There are also some extremely difficult questions raised by the proposed regulations from an operational point of view for which there are no clear answers. Finally, we have several basic questions about whether the proposed regulations can be adopted at this or any subsequent hearing in a manner consistent with prescribed statutory procedures. Each of the matters outlined in this preliminary statement will be amplified in the balance of our presentation, beginning with the exclusion of state regulation of tankers.

THE NEED FOR UNIFORMITY: THE EXCLUSION OF STATE ACTION

Statutory Preemption.

In 1972 the Congress added Title II to the Port and Waterways Safety Act (46 U.S.C.A. § 391a) ("PWSA"). As amended PWSA provides for the promulgation and enforcement of "comprehensive" rules governing the design, construction, maintenance, and operation of both domestic and foreign oil

tankers. 46 U.S.C.A. 391a(1). The Congressional desire for establishment of comprehensive regulations expressed in the section quoted above is also repeated throughout the legislative history of the statute. Senate Report at 2767, 2769, and 2780. The "comprehensive approach" (see Senate Report at 2773) taken by Congress to prevent pollution from oil tankers demonstrates an intent to fully occupy the field. Only by fully occupying the field can the federal government prevent the various states from adopting conflicting regulations governing tankers engaged in interstate commerce.

Thus, in a textual discussion preceding the presentation of proposed rules implementing the PWSA, the Coast Guard declared in 1975 that "pollution regulations for all U.S. seagoing tank ships should be uniform, irrespective of the trade in which they are engaged." 40 Fed. Reg. 48280.

In a case now pending before the United States Supreme Court, a United States District Court found that the PWSA preempted the State of Washington from regulating oil tankers operating in the Puget Sound. Arco v. Evans, U.S. Dist. Ct., W.D. Wash., No. 75-648 (Sept. 1976), probable jurisdiction noted, 97 S.Ct. 1172 (1977). The District Court held:

> "The purpose of the original tank vessel act, and of Title II of PWSA was to establish a uniform set of regulations governing the types of ships permitted within coastal waters of the

> United States and the conditions under which they would be permitted to operate. Balkanization of regulatory authority over this most interstate, even international of transportation systems is foreclosed by the national policy embodied in the PWSA."
>
> Memorandum Opinion at p. 3.

The addition of Section (e) to the proposed regulations providing that the rule is not to be construed to "require any act or omission that would be in violation of any regulation or other requirement of the United States Coast Guard" does not assure uniformity. All it does is state the patently obvious proposition that the regulations are invalid to the extent they purport to conflict with federal laws. Neither Section (e) nor any other portion of the proposed rule prevents conflicts with rules or regulations adopted by other states. By adopting the PWSA Congress expressed a clear intention that uniformity be assured by reserving to the federal government all power to control the design, construction, maintenance and operation of tankers.

The conclusion that unilateral state action to regulate tankers has been excluded is demonstrated by several additional and equally compelling reasons.

Treaty Preemption.

In adopting the PWSA, Congress recognized the need for uniform regulations regarding the design, construction, maintenance, and operation of tankers. In so doing, it

recognized that as a practical matter it was not possible to distinguish between regulation for environmental purposes and regulation for any other reason. Legally, both state and federal courts have recognized that a state may not "attempt to exercise jurisdiction if to do so would violate an international treaty." Shoei Kako Co. v. Superior Court, 33 Cal.App.3d 808, 818-19 (1973). See also, De Tenorio v. Morgan, 510 F.2d 92, 95 (5th Cir. 1975); Fouke Company v. Mandel, 386 F.Supp. 1341, 1354-55 (D. Md. 1974).

The United States on August 2, 1962, agreed to the International Convention For The Safety Of Life At Sea (hereinafter "SOLAS"), which took effect on May 26, 1965. See, Colinvaux, British Shipping Laws, Vol. 8, 125, 129 (1973). SOLAS establishes specific standards for ship construction for the purpose of protecting human life at sea. See, Colinvaux, supra at p. 133. However, this does not mean that California can avoid a prohibited conflict with SOLAS by merely labeling its regulation as "environmental" related rather than "safety" related.

Both the Departments of State and Transportation brought this point clearly home to Congress in connection with its consideration of the PWSA. The State Department explained:

> "It must be kept in mind that standards of ship construction are set forth in the Safety of Life at Sea Convention of 1960 to which the United States is a party. These

> measures are intended of course to ensure the safety of human life and are not intended to comprehend environmental protection. Nevertheless, many of the human safety measures as a practical matter operate to protect the environment as well. The converse could be equally true of many environmental safety measures, that is, there would be incidental human safety benefits. Consequently, and in view of the mixed nature of most construction standards, great difficulty would be encountered in the promulgation of environmental safety measures as to which there would clearly be no conflict with regard to our obligations under SOLAS 1960. It is not possible to give a generalized answer as to what kinds of construction standards would not impact upon our SOLAS obligations. Each standard would have to be weighed separately on the basis of effect. Merely labelling a measure as one devoted to environmental protection would not resolve the issue."
>
> 1972 U.S. Code Cong. & Adm. News, 2804.

The State Department's opinion that environmental regulations affecting vessel construction would conflict with SOLAS was joined by the Department of Transportation which advised:

> "When one compares the enumerated topics for which the Tank Vessel Act authorizes regulatory activity [46 U.S.C.A. § 391a(2)] against the specifics of the SOLAS Convention, it becomes clear that in some topical areas, particularly those relating to vessel and equipment design and construction, a distinction between environmental requirements and intrinsic safety requirements cannot fairly be made in a manner which permits unilateral implementation of the former without derogation of the international scheme as to the latter."
>
> 1972 U.S. Code Cong. & Adm. News, 2807, 2808.

It is, of course, true that the federal government has sole and exclusive authority for negotiation and enforcement of international agreements and treaties. Foreign affairs and international relations could logically be handled no differently.

The language of Section (e) of the proposed regulations appears to have been drafted to avoid conflicts with SOLAS. That section provides in relevant part that nothing in the Rule should be construed to "prevent any act or omission that is necessary to secure the safety of the tanker or other vessel or for saving life at sea." We have serious doubts that this rather obtuse provision does in fact assure that the rules will not conflict with SOLAS. Indeed, the remainder of Section (e) empowering the Executive Officer to review applications for exemptions conflicts with the express terms of SOLAS. In effect what the regulation provides is that the Executive Officer shall interpret the treaty and decide what it permits. Not only is such action by a state official contrary to general constitutional principles, it also conflicts with Regulation 6 under SOLAS. Regulation 6 provides that vessel licensing responsibilities under SOLAS shall be carried out only by "officers of the country in which the ship is registered, provided that the Government may entrust the inspection and survey either to surveyors nominated for that purpose or to organi-

zations recognized by it." See Colinvaux, supra, at 139. Any further responsibility to enforce SOLAS in the United States lies solely with the Coast Guard.

The express conflict between the proposed lightering regulations and the International Convention for the Safety of Life at Sea highlights the extent to which regulation of oil tankers necessarily involves foreign relations. The inherent constitutional problem resulting from the Board's attempt to regulate in this area is our next subject for discussion.

Foreign Affairs: The Exclusivity Of Federal Authority.

A well established constitutional principle to which both federal and state courts have adhered throughout our history is that the conduct of foreign affairs is exclusively a federal function. See, e.g., United States v. Pink, 315 U.S. 203, 232 (1942); Bethlehem Steel Corp. v. Board of Commissioners, 276 Cal.App.2d 221, 225 (1969). That principle was recently summarized by a California court noting that, "[g]overnmental power over foreign affairs is not distributed, it is vested exclusively in the national government." R. E. Spriggs Co. v. Adolph Coors Co., 37 Cal.App.3d 653, 657 n.3 (1974). It necessarily follows, therefore, that "the external powers of the United States are to be exercised without regard to state laws or policies."

United States v. Belmont, 301 U.S. 324, 331 (1937). In short, the national interest "imperatively requires that federal power in the field affecting foreign relations be left entirely free from local interference." Hines v. Davidowitz, 312 U.S. 52, 63 (1941); Bethlehem Steel Corp., supra, 276 Cal.App.2d at 229.

The legislative history of the 1972 amendments to the PWSA leaves no room for doubt that unilateral regulation of tankers has grave international implications. When Congress considered the advisibility of regulating tankers at the federal level, it was warned by the Departments of State and Transportation that such action could "cause international problems." Senate Report No. 92-724, 1972 U.S. Code Cong. & Adm. News (hereinafter "Senate Report") at 2768. Governmental concerns of Belgium, Denmark, Finland, the Federal Republic of Germany, Greece, Italy, Japan, the Netherlands, Norway, Spain, Sweden, and the United Kingdom were also communicated to Congress by way of a joint statement which included the following warning:

> "The above Governments firmly believe, and have understood the U.S. Government to believe, that regulations concerning the construction of ships should be agreed internationally. They fear that if the U.S. as a major trading and shipping nation were to develop unilateral standards for ship construction, other countries might follow suit. The result

would be to seriously complicate ship operations and thus inhibit the free flow of trade."

1972 U.S. Code Cong. & Adm. News at 2800.

The serious international implications of unilateral action in this area have also been acknowledged by both Congress and the Coast Guard. Congress included in its 1972 amendments to the Port and Waterways Safety Act a deferral provision [46 U.S.C.A. § 391a(7)] to allow time for multilateral action which would avoid the need for the unilateral imposition of standards by the United States. (Senate Report at 2788.) The hoped-for international action was taken in 1973 when the Intergovernmental Maritime Consultative Organization (IMCO) agreed upon the International Convention for the Prevention of Pollution from Ships. See, Churchill and Nordquist, New Directions in the Law of the Sea, Documents Vol. IV, p. 345 et seq. (1975). The Coast Guard has since proposed regulations to be promulgated under the Port and Waterways Safety Act which are consistent with that Convention. The Coast Guard decided "that the Convention, although not perfect, did establish a reasonable and environmentally effective set of standards on which regulations for tank vessel construction could be based." 40 Fed. Reg. 48280. The Coast Guard further declared:

"World shipping and trade in petroleum are international in scope, with only a small portion of the U.S. supply of

> petroleum being transported in ships of American registry. Therefore, ship source pollution problems are best attacked in an international context with unilateral [federal] action reserved for those circumstances when international solutions are impossible or inappropriate."
>
> Id.

Because of the inherent international implications of tanker regulation, both logically and legally state action is excluded. Solutions must be sought in the first instance at an international level. Such international agreements are a function solely of the federal government. Likewise, if unilateral action is necessary, the decision rests solely with the federal government free from any state interference. However, even were one to ignore the international implications of unilateral state action, the conclusion of state exclusion would not vary.

Interstate Commerce: The Predominant National Interest.

The overriding national interest in uniform regulation of vessels transporting crude oil is not limited only to transactions involving international commerce. Similarly the national interest requires that vessels engaged in interstate commerce not be subjected to conflicting or inconsistent regulations imposed by the various states. See California v. Zook, 336 U.S. 725, 728 (1949); Kelly v. Washington, 302 U.S. 1, 9 (1937).

To briefly summarize, our federal system is designed to assure that state police powers are sufficiently limited to prevent state interference with matters which require a national perspective. It is difficult to imagine a field of regulation in which the national interest in uniformity is greater than the transporting of crude oil in interstate and international commerce. For this reason the federal government has cooperated with the international community by participating in IMCO. Also, it has given the Coast Guard the responsibility of controlling the design, construction, maintenance, and operation of vessels carrying crude oil to protect the country's interests in both safety and preservation of the environment. The answer is clear. International, national and state interests can be best served by uniform regulation. Unilateral state action simply cannot cope with the magnitude of the problem and therefore must give way.

Because of its obvious significance, we have concentrated first on the uniformity issue. Closely related to the need for uniformity in this area is the geographic limitation of the state's regulatory authority. It is that limitation that we next consider.

TERRITORIAL LIMITATION OF REGULATORY AUTHORITY

The proposed regulations purport to regulate vessels engaged in lightering operations in waters outside California's geographic boundaries which extend only three miles off the coast. 43 U.S.C. § 1312. By the terms of the proposed regulations, a British tanker originating its voyage in Indonesia which lightered in the lee of San Clemente Island prior to unloading its cargo in Mexico might be arrested on the high seas. This interpretation is not only compelled by the terms of the proposed regulations; it is also confirmed by the notice of hearing dated October 19, 1977. That notice includes the following statements:

> "The requirements in the proposed rules may be enforced indirectly by action taken when lighters enter Southern California ports or harbors, or alternatively, the requirements may be enforced directly anywhere in Southern California Coastal Waters as such waters are defined in the rules. In either case, the rules would apply to all lighters engaged in lightering operations in Southern California Coastal Waters."

The example of the British tanker above and the excerpt from the notice again emphasize the impermissible direct impact of the proposed regulations on international relations. However, also patent is that the proposed regulations purport to regulate conduct occurring outside California's boundaries.

Long ago the United States Supreme Court recognized the fundamental proposition that "[L]aws have no force of themselves beyond the jurisdiction of the state which enacts them, and can have extraterritorial effect only by the comity of other states." Huntington v. Attrill, 146 U.S. 657, 13 Sup. Ct. 224, 228 (1892). The law of California is the same: "[T]he laws and courts of a state can only affect persons and things within their jurisdiction." Richards v. Blaisdell, 12 Cal.App. 101, 105 (1909). The passage of time has not eroded this basic proposition of both federal and state law. See Bigelow v. Virginia, 421 U.S. 809, 822-25 (1975); Archibald v. Cinerama Hawaii Hotels, Inc., 73 Cal.App.3d 152, 159 (1977).

The limitation on the extraterritorial application of state laws is a corollary to the exclusive authority of the federal government in areas where interstate and international interests predominate. When California joined the union, it gave up whatever right it may have had to regulate activities beyond its boundaries. This was established in the United States Supreme Court case of Georgia v. Tennessee Copper Co., 206 U.S. 230, 27 S.Ct. 618, 619 (1906). Although decided in 1906, the Tennessee Copper case continues to be the controlling authority in cases involving extraterritorial pollution. Illinois v. City of Milwaukee, Wisconsin, 406 U.S. 101, 104 (1972); Texas v. Pankey, 441 F.2d 236, 240 (10th Cir. 1971). The proposition established by the

Tennessee Copper case and its progeny is nothing more than common sense. Pollution crossing international and state boundaries cannot be unilaterally regulated by state action. Federal and/or multilateral international solutions must be sought.

Our analysis of the need for uniformity and the extraterritorial operation of the proposed lightering regulations has related to this Board's jurisdiction. Setting aside for the moment the impropriety of any state action in this area, we now turn to several other problem areas.

THE NEED FOR VALID DATA: ITS ABSENCE HERE

The asserted justification for the regulations proposed here is the professed need to prevent an adverse environmental impact. Such an adverse impact cannot be assumed but it must be demonstrated with sound scientific data. We do not believe there should be any serious dispute about this fundamental proposition.

Simply stated, two things must be established to warrant the proposed regulatory action. These are: (1) that the regulated emissions are transported on shore; and (2) that the emissions which arrive on shore detrimentally effect air quality. The Staff Report ineffectively addresses

only the first of these requirements and is deficient for that reason alone. Moreover, we believe it is clear that the Staff's conclusion that offshore emissions are transported into San Diego County and the South Coast Air Basin from 60 miles at sea is not sound.

Meteorological Analysis.

Implicit in the Staff's support of the proposed lightering regulations are two technological conclusions, both of which are critical to the asserted need to regulate emissions from tankers lightering in the lee of San Clemente Island. The first conclusion is that emissions in the offshore lightering area are transported into either or both the South Coast and the San Diego Air Basins. The other conclusion is that lightering emissions which are presumed to enter those air basins have a significant adverse effect on air quality.

Those conclusions and supporting meteorological work of the Staff has been reviewed by the independent consulting firm of Dames and Moore, working in consultation with Professor Morton Wurtele of the U.C.L.A. Meteorology Department. The comments of Dames and Moore as well as Dr. Wurtele about the Staff's meteorological work are submitted along with this WOGA presentation. The Dames and Moore-Wurtele Report demonstrates that the conclusions drawn

by the Staff with respect to the effect of lightering emissions on the ambient air over land in Southern California are unsubstantiated.

Both the meteorological analysis of offshore conditions and the mathematical modeling of the photochemical impact of various substances on air quality are enormously complex areas of scientific endeavor. In the limited time allowed for comment all that could be undertaken has been a preliminary commentary about the nature of the ARB Staff's analysis. The report of Dames and Moore written in association with Professor Wurtele speaks for itself. For that reason we believe that there is no need to restate the specific, technological explanations therein for why the evidence now before this Board is wholly inadequate to support adoption of the proposed lightering regulations. Instead, we will only briefly highlight the major conclusions of Dames and Moore and Professor Wurtele.

Sections 2.2 and 2.3 of the Dames and Moore-Wurtele Report establishes that the Staff failed to apply techniques accepted by the meteorology profession to analyze the question of whether lightering emissions in the lee of San Clemente Island are, in fact, transported onshore in either San Diego or the South Coast Air Basin. Neither the Staff's calculation of a "Mean Trajectory Pattern--Summer" nor its use of Pasquill's diffusion equations are in accord-

ance with accepted scientific practices. To the contrary, both of those aspects of the Staff's transport analysis are completely invalid to demonstrate that the offshore lightering emissions are in fact transported into Southern California Air Basins in significant quantities.

The comments by Dames and Moore and Dr. Wurtele also relate to the Staff's failure to point out the limitations of the meteorology data upon which it relies. No mention is included in the Staff report or meteorology memorandum of how incomplete the data is for the use made of it by the Staff. The discussion in Section 2.1.2. of the Dames and Moore-Wurtele Report demonstrates how sparse the Staff's meteorology data truly is and also how unsuited it is for use to evaluate the extent to which the lightering emissions are transported onshore. Plate 3 in the detailed commentary about the Staff's meteorology analysis graphically illustrates the absence of data to support the Staff's transport conclusions. What this Plate demonstrates is the lack of any basis for predicting streamlines in the area between San Clemente and the coast line. The Staff report nonetheless bases its conclusions on nothing more than a guess about these streamlines.

Dames and Moore and Dr. Wurtele also critically comment on the complete absence of photochemical analysis by the ARB Staff. As Dames and Moore-Wurtele pointed out, the

omission of photochemical analysis is highly critical because valid assessments of the impact of emissions on air quality are dependent on complex mathematical modeling. No responsible finding with respect to the effect of lightering emissions on air quality can be made prior to development of a reliable model of the sort described in Section 2.4.1. of the report written by Dames and Moore in association with Professor Wurtele.

This general review of the comments of Dames and Moore and Professor Wurtele demonstrates that the proposed lightering rules are unsupported by reliable scientific evidence. In our view, the ongoing research funded by the ARB (which totals more than $550,000.00) acknowledges that adequate data relating to offshore emissions simply does not exist. Otherwise the ongoing research would be unnecessary. Presently, it cannot be known what data those studies will produce or what, if any, regulatory action they may justify. However, we do believe that the ARB's financial commitment to them strongly indicates that the Board is, in fact, well aware of the absence of reliable scientific evidence about the effect of lightering emissions on the quality of the ambient air in Southern California.

The basic prerequisite for responsible regulation is a valid scientific data base. For this reason adoption of the proposed lightering regulations would be wholly inappropriate.

OPERATIONAL IMPLICATIONS

Compliance with the proposed regulations is presently impossible without drastic modifications in current lightering procedures. The only way in which compliance could be achieved without drastically changing current operations would be installation of vapor recovery systems. Vapor recovery is not at this time a viable alternative.

Vessel Vapor Recovery: The State Of The Art.

At the present time vapor recovery equipment cannot be used in marine operations because no vapor recovery system has been developed which meets the safety requirements of industry and the Coast Guard. The absence of any reliable vapor recovery system is not the result of disinterest or neglect by either government or industry. In 1975 EPA proposed that vapor recovery systems be utilized during dock-side loading of gasoline in the Houston-Galveston area. It should be noted that dock-side vapor recovery presents fewer difficulties than vapor recovery during lightering. A self-contained system is required to control offshore emissions. In contrast, dockside emissions can be transferred ashore to existing facilities for treatment and disposal. Nonetheless the efforts of industry and government failed to produce a safe, efficient, and reliable vapor recovery system for use in Houston-Galveston loading operations.

After extensive studies of the feasibility of using vapor recovery in those operations were completed, EPA concluded that further attempts to mandate the use of vapor recovery in marine operations would have to be postponed until the Coast Guard and the marine industry could develop the technology necessary to insure that vapor recovery could be safely accomplished.

Efforts to develop an acceptable vapor recovery system for use in marine operations involving the carriage of petroleum continue. To date four general approaches to vapor recovery have been investigated. These are condensation, adsorption, absorption, and incineration. Some of these approaches have been used in some chemical and liquified natural gas operations in which the risks are greatly reduced because the vapors involved are well outside the explosive range. None of these vapor recovery systems has been demonstrated to be safe for use on vessels engaged in lightering operations. With respect to lightering operations another possibility is the use of a balance system in which vapors would be transferred to the mother ship for disposal or recovery at a later time. We do not know if this type of system is technically feasible or could be made safe for use with explosive range vapors. However, it is our present understanding that the Coast Guard will not permit the installation of any vapor recovery system on vessels engaged in lightering operations.

It must be clearly understood that vapor recovery in marine operations would necessarily involve the operation of very complex systems in a hostile environment with the risk of failure creating a hazardous situation. Every vapor recovery alternative investigated to date requires the collection and distribution of vapors from one or more tanks and therefore inherently includes the threat of multiple, catastrophic explosions should any source of ignition come into contact with vapors within the explosive range. Thus there is a need to keep vapors outside the explosive range.

Much of the complexity and potential for hazard associated with vapor recovery systems relates to procedures for keeping vapors outside the explosive range. In theory it can be done either by enriching vapors or using inert gases. The problem is that either of these two options, used in conjunction with marine vapor recovery systems, necessitates the use of complex, sensitive control and monitoring equipment which may not be completely reliable when operated in a severe environment. Failure of the equipment could allow vapors to enter the explosive range and threaten the lives of seamen. Parenthetically, the vapor recovery reduction ultimately required is 95 percent. The justification for this required efficiency is stated to be onshore experience (S. Rpt. p. 62). As explained above, self-contained vessel systems are by their nature

considerably more complex. Predicating the performance standard on this basis is unwarranted, particularly where the onshore performance standard is an extrapolation from claimed efficiency of relatively simple service station systems.

Compliance: The Imponderables.

In short, vapor recovery is simply not a viable option for complying with the proposed regulations. Absent vapor recovery, there is no way to comply with the proposed regulations without moving at least part of the operations far outside "Southern California Coastal Waters."

No one to our knowledge has ever attempted to conduct ongoing lightering operations offshore California in totally unprotected waters. Once operations are moved from the leeward side of San Clemente, both VLCC's and lightering vessels would be exposed to the direct effects of wind and sea forces. Two vessels can be kept together in the open sea to transfer cargo only when offshore wind and sea conditions permit. Because of the lack of operating experience with lighters in the open sea off the California coast, we simply do not know whether open sea lightering in this area is feasible on a routine basis.

Economical feasibility is also a concern. Generally wind and sea conditions to the west and northwest are more severe. To be economically feasible, there would have to be a predictable "window" when operations could be conducted. That is, the ability to predict significant periods of favorable weather is an economic necessity. Supply and refinery requirements are dependent upon reliable transportation schedules. Operations, both supply and refinery, of the magnitude involved cannot be made dependent upon unknown variables.

As can be seen, the economic analysis does not merely involve the cost of fuel to operate further out to sea, although this is no minor item itself. Supply and refining are the predominate economic considerations. All this comes back to being able to predict whether and during what periods lightering could be conducted in the open sea. And this, we simply cannot answer.

The remaining operational alternative is to move half of the operation beyond California Coast Waters. In our judgment the Staff has failed to demonstrate the desirability of coupling tank washing and gas-freeing outside the defined "Coastal Waters" with short loading of lighters. These operations have undesirable by-products and should not be mandated in the absence of reliable data. A by-product of tank cleaning is oily water slops which must be disposed of

in an environmentally acceptable manner. A by-product of short loading, which is integral to this alternative, is a net increase in total hydrocarbon emissions. A net increase has been established; its magnitude is being studied. Implicit in a decision to mandate increased emissions further at sea is the acknowledgement that there is a point beyond which offshore emissions cannot be rationally deemed to be a cause for concern. The Staff concedes this point at page 74 of its report wherein it asserts that "emissions occurring outside Southern California Coastal Waters will not, on the average, be transported into southern California."

This Staff comment illustrates the absolute necessity for valid scientific data. For what is here lacking is any evidence that greater emissions beyond an arbitrary line are more acceptable than lower emissions some distance nearer shore. Where is the evidence that emissions 50, 40, 15 or less miles offshore have an adverse impact onshore? The answer is that there is no such evidence. Or, stated another way, the first prerequisite is valid scientific data demonstrating an onshore impact from current operations. Such data is totally lacking here.

Another operational problem which would be created by adoption of the proposed regulation involves the requirement in Section (d)(4) that lightering vessels have installed by July 1, 1978, sealed monitoring equipment "which shall

detect and record the date, time, and duration of any operation other than cargo loading within Southern California State Waters or Southern California Coastal Waters that would result in the release into the atmosphere of organic vapors from the vessel's cargo tanks." The Staff Report indicates that most of the required sealed monitoring equipment would consist of flow sensors connected to recording devices. The problem with requiring such equipment on vessels transporting crude oil is that they are not intrinsically safe. The flow sensors which the Staff presumably envisioned being used on vessels are thermally operated with heat being introduced into vent lines by electrical currents. Such an introduction of heat and electricity into the system raises serious safety questions. Flow sensors have never been successfully installed on a vessel because they have neither been certified as safe nor approved for use by the Coast Guard. We believe that State action to require the use of such unproven equipment in connection with the shipment of hazardous cargoes is inappropriate.

It should also be noted that compliance with the low sulfur requirements in Section (b) of the proposed rules by January 1, 1978, would cause immediate operational difficulties for most refineries. Low sulfur fuel which is presently produced at most refineries has qualities differing significantly from those of normal bunker fuels. Low sulfur

and high sulfur fuels which are now available for use have different densities, viscosities, and other properties. The two types of fuels should not be comingled because burners are not adjusted to handle mixtures of fuels. The use of low sulfur fuels during lightering operations thus requires one of two changes, both of which take considerable time. New low sulfur fuel having properties suitable for present marine use would require refining modifications and special bunkering facilities for that fuel. Those actions require careful advance planning. The other strategy for compliance would be to modify vessels to permit use of fuels now available. That would also require substantial advance planning to allow for such things as installation of redundant piping, isolation values, and reservation of separate fuel tanks. We believe a January 1, 1978, compliance date for the use of low sulfur fuels is therefore unrealistic.

We also want to comment on the overbreadth of several definitions in the proposed rules. As we read the rules, any vessel which acts as a lighter at any time or place is treated as a "lighter" from that time forward. Such a broad definition is unwarranted. Obviously, the definition should be limited to lighters which are subject to the jurisdiction of the SCAQMD. Also, we believe that the definition of a "vessel" for purposes of the rules should be narrowed to exclude barges or other vessels which

are used only for storage rather than for transport of crude oil. Such containers are not logically related to the operations which the proposed regulations are intended to govern.

PROCEDURAL MATTERS

The foregoing discussion demonstrates the technologically complex and economically significant nature of the conduct which the Board proposes to regulate. Certainly it is not a subject matter that is suitable for hasty regulatory action. WOGA has pointed this out to CARB in a letter dated September 23, 1977, and has requested at least sixty days to prepare comments to lightering rules. That request was denied, notwithstanding the requirements of Resolution 64 of the California State Senate. That Resolution directs that the ARB is to make staff reports supporting regulatory action available not less than thirty days prior to the hearing at which rules are to be adopted. Although the Staff Report for the proposed lightering regulations bears the date October 21, 1977, it was not in fact made available to WOGA representatives until October 25, 1977.

Another procedural defect arises under the Lewis Air Quality Management Act (Health and Safety Code Sections 40400 et seq.). By adopting that statute the Legislature

established a moratorium on the adoption by the ARB of new rules for the South Coast Air Basin until December 31, 1977, or some time prior to that date when comprehensive new rules and regulations reflecting best available control technology are adopted by SCAQMD. (H & S § 40440.)

Next, this hearing was noticed under an inapplicable section of the Health and Safety Act. H & S Section 41504, under which this hearing was noticed has been superseded, as respects SCAQMD, by H & S Section 40451, adopted as part of the Lewis Air Quality Management Act.

Even if not inapplicable, action under Section 41504 is appropriate only after a prior noticed hearing has been held during which the Board made a finding under Section 41502 of the Health and Safety Code that the local district has failed to act reasonably to perform its statutory duties. When read together, Sections 41502 and 41504 require two separate hearings -- one for evaluation of the conduct of local authorities and another for consideration of proposed regulations. By proposing to combine those two required hearings today, the Board fails to conform to the procedures that would be mandatory if Section 41504 did in fact authorize rulemaking within the South Coast Air Basin.

Neither has the ARB followed prescribed statutory procedures for adoption of the proposed rule for the San Diego Air Pollution Control District. Again no separate

hearing has been held as required under Health and Safety Code Section 41502 to review the reasonableness of the actions taken by that District to achieve and maintain air quality standards. The coercive procedure suggested by the ARB's staff providing that the "Model Rule" will automatically become effective in 60 days if the local district fails to adopt an identical or similar rule illustrates the extent to which the Board is usurping the function of local officials. Such usurpation is inconsistent with the dual regulatory scheme established in the Health and Safety Code. Finally, granting to the Executive Officer the authority to review a rule adopted by the San Diego Air Pollution Control District to determine whether it is "acceptable" constitutes an improper delegation of a function which can be performed, if at all, only by the Board.

APPENDIX B

INITIAL REVIEW AND COMMENTS CALIFORNIA ARB's METEOROLOGICAL ASSESSMENT PROPOSED RULES CONTROLLING EMISSIONS FROM LIGHTERING OPERATIONS FOR WESTERN OIL AND GAS ASSOCIATION

DAMES & MOORE JOB NUMBER 02390-019-01
SANTA BARBARA, CALIFORNIA
NOVEMBER 18, 1977

November 18, 1977

Western Oil and Gas Association
609 South Grand Avenue
Los Angeles, California 90017

Gentlemen:

Review and Comments
California ARB's Meteorological
Assessment
Proposed Rules Controlling
Emissions from Lightering Operations
For Western Oil and Gas Association

Transmitted with this letter is the subject report. These studies were authorized by the Western Oil and Gas Association (WOGA) during October, 1977. The services were provided as Dames & Moore Job Number 02390-019-01.

The work was conducted by Dr. Bruce A. Wales of Dames & Moore in consultation with Mr. Morton G. Wurtele, Department of Atmospheric Sciences, University of California, Los Angeles.

It has been a pleasure to serve you. Should you have any questions, please contact us.

Sincerely,

DAMES & MOORE

Bruce A. Wales
Associate

BAW:jkm

Enclosure

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LIST OF PLATES

1.0 INTRODUCTION

The California Air Resources Board (CARB) is considering adoption of rules controlling the emissions associated with petroleum lightering operations in southern California coastal waters. Specifically, the rules contain provisions limiting the sulfur content of stack gas emissions and the release of ullage vapors from lighters operating in offshore waters east and south of San Clemente and Santa Catalina Islands, respectively. This area is shown in relation to the mainland on Plate 1.

The stated justification for the proposed rules is the assertion that emissions from the subject lightering operations prevent the achievement and maintenance of the State ambient air quality standards for oxidant and sulfates in the South Coast and San Diego Air Basins. Implicit in the above is the demonstration of adverse impact upon ambient sulfate and oxidant concentrations in the air basins. CARB's impact assessment consists of engineering studies describing lightering emissions and a meteorology study stating that the emitted pollutants are transported to the mainland.

Dames & Moore was retained by the Western Oil and Gas Association to review and comment upon the meteorology study described above. Specifically, we have studied pages 23-31 and Appendix B of the Staff Report (Attachment 1), and briefly reviewed other sections of the Report to familiarize ourselves with the situation. Dames & Moore was privileged to work in consultation with Dr. Morton Wurtele, Department of Atmospheric Sciences, University of California, Los Angeles, in the course of this investigation. In view of the limited time available to us for this study, the following preliminary comments are offered below.

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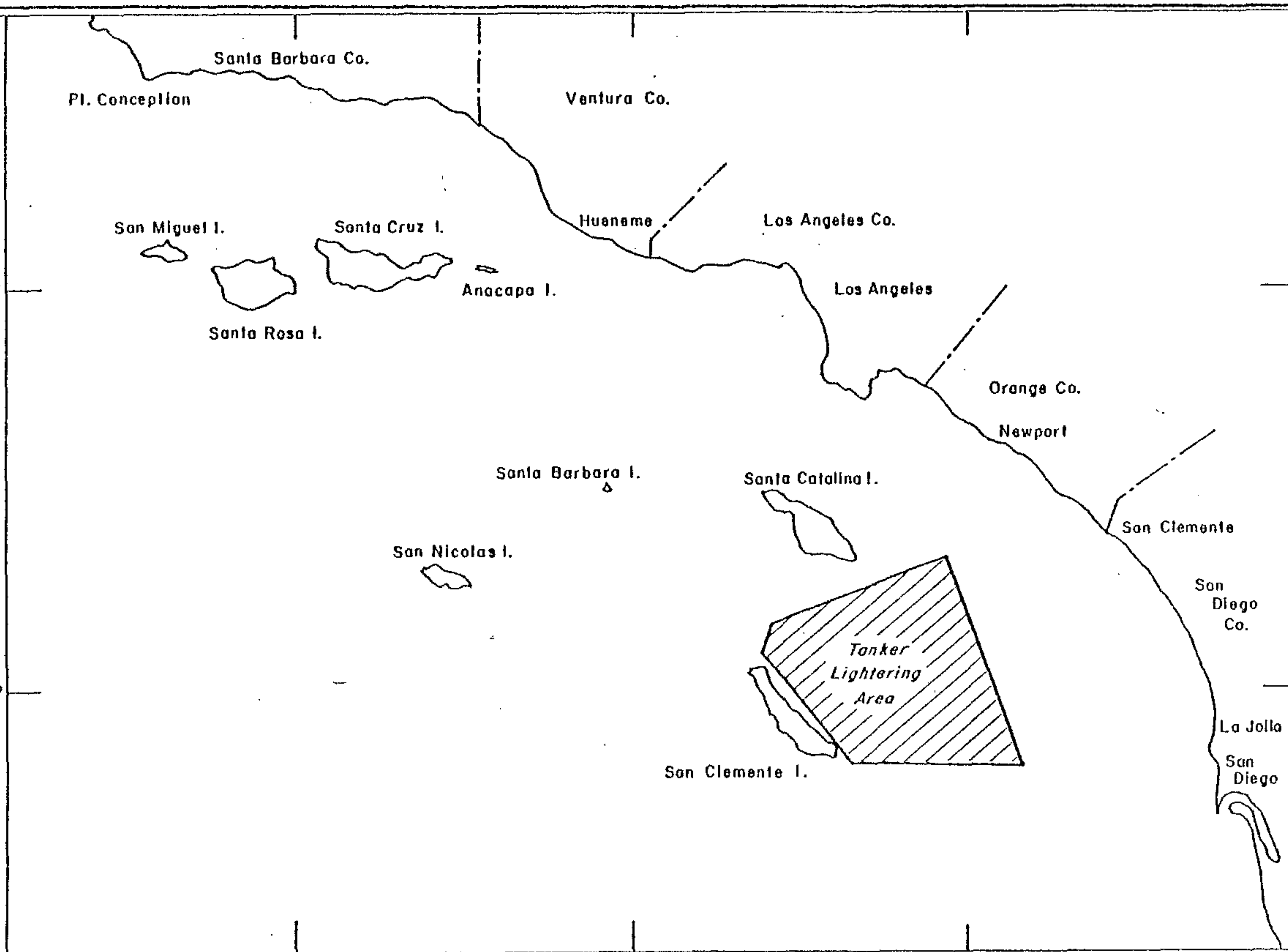

Reference: Overschie, 1977

DAMES & MOORE

COAST OF SOUTHERN CALIFORNIA SHOWING TANKER LIGHTERING AREA

2.0 REVIEW AND COMMENTS

2.1 General Comments

2.1.1 Deficient Scope

The stated objectives of the Meteorology Memorandum are to determine the likelihood of offshore emissions reaching shore and the boundaries of the source areas. The methods employed to "help" answer these questions involve the development of mean trajectory patterns and an examination of wind frequency data. The conclusions concerning transport over coastal waters are given followed by a "discussion" of dispersion conditions (Appendix B). These studies (and associated emissions studies) are the sole basis given for the "need to control" the lightering emissions (pages 2 and 24, Staff Report). Nowhere does the Staff Report state that oxidant or sulfate concentrations onshore are adversely affected. The only place in the CARB documents where this is stated explicitly is in the Public Notice, which appears to be inconsistent with the rest of the Report.

The point to be made from the above is that the Meteorology Memorandum deals only with transport. In "discussing" dispersion, there is no attempt to quantify statements pertaining to "concentration estimates downwind from an emission point" (page 2, Appendix B). No quantitative connection is made between, say, a quantity of hydrocarbons or sulfur dioxide emitted during a certain time period of lightering operation and the incremental concentrations of oxidant or sulfate at any given point downwind, onshore or otherwise. It is recognized by CARB and others that oxidant and sulfates are formed by chemical reactions in the atmosphere. CARB has not only neglected to quantitatively consider the dispersion of the emissions, but also

has failed to consider the atmospheric chemistry of pollutants known to be reactive. Thus, two of the three basic atmospheric processes influencing the emissions have been neglected in CARB's work. Therefore, it must be concluded that the work is grossly deficient in scope.

It follows from the above that if there are not estimates of incremental change in oxidant and sulfate concentrations onshore, there can be no assessment of the probability that either pollutant concentration level will be exceeded on any given day, whether that day is classified by season, flow pattern, or in any other way. The failure of the Staff Report to address these points renders it useless for the purpose of demonstrating adverse impact.

2.1.2 Poor Data Base

The Memorandum makes little mention of either the quantity or quality of the wind data used in the analyses. Indeed, with regard to Chart 1, the statement that it is "based on about 230,000 wind observations made by trained personnel" disguises the fact that the island observations, so critical for this study, are by no means comparable to mainland stations.

The low number and low relative density of data points offshore on islands in contrast to the mainland is readily apparent on Chart 1 (Appendix B). As to the quality of island station data, we consider the two most important data points, San Clemente and Santa Catalina. The reference cited by the Memorandum, U.S. Weather Bureau Technical Paper No. 54, also uses the island winds for its streamline analysis, and provides relevant information concerning the observations at each station. The information for San Clemente is as follows (page 84):

Period of record: Aug 1940--Jan 1941
Nov 1943--Mar 1945

Remarks: Author's evaluation of Navy SOMAR report. Records very markedly biased to eight main directions.

As described, the San Clemente record consists of less than two years of observations of uncertain quality. Acknowledging that CARB may have had available for its analysis a longer period of record, we know nothing pertaining to the limitations of that record because CARB has not followed the accepted scientific procedure of giving relevant information pertaining to observations at each station.

The consequences of not providing relevant information pertaining to the observations are readily apparent for Santa Catalina Island. For example, the information in Weather Bureau Technical Paper No. 54 is as follows.

Period of record analyzed: 1951-53

Remarks: Based on Summary (Job No. 9859) prepared by NWRC. Not a 24-hour station. Observations taken 0400 to 1600-1800...Records biased to eight main directions.

This station (which has recently changed its call letters confusingly from SXC to AVX, formerly the call letters for Avalon) is the Santa Catalina airport, situated at about 1600 feet elevation on one of the most exposed sites on the Island. It is interesting that the resultant wind indicated on Chart 1 of the Memorandum is westnorthwest at only 3 miles per hour. This suggests either that the flow pattern at that altitude is not

the same as that at the surface, that perhaps the San Clemente wind is not representative, or that the flow pattern is more complex than the streamlines of Chart 1 indicate.

The limitation of the observing times at Santa Catalina is also critical. Even at present, the wind reports are not taken on a 24-hour basis. The omission of the nighttime hours will tend to bias the wind direction strongly to west, and in this light the very low mean speed recorded is especially significant.

Aside from the quality of the observations on the islands per se, their remains the question as to how well observations made on islands represent the air flow over the open ocean surfaces at various distances from the island. Deflection of flow and local eddies are expected to occur in the vicinity of such obstructions. The magnitude and extent of such effects depend primarily on the height, size, form, and orientation of the island in relation to the wind. Wind observations on the islands themselves may be significantly influenced by local terrain. The point to be made here is that if the winds at San Clemente and Santa Catalina are called into question, so are the two southernmost streamlines on Chart 1, as well as the shaded area, and ultimately, the findings of the Memorandum itself.

The above remarks are not made in a spirit of perfectionism; it is understood that observations are imperfect and that one must work with them. However, it should be emphasized that Chart 1 depends <u>critically</u> on certain very few observations, that these are subject to question as not being representative even of the resultant wind field, and that small alterations in these few winds could make large differences in the analyzed flow-streamlines.

In general, land wind observations, inclusive of the islands, are based on thousands of observations, more usually ten's of thousands of observations in the case of the mainland. The ship observations used in Charts 2-5 involve only hundreds of observations, in some cases considerably less (Naval Weather Service Command, 1971). In general, these observations are obtained from moving ships and often are estimations rather than measurements made with instruments. Thus, they represent a very small data base with several inherent limitations. The Memorandum in general fails to report limitations of this kind.

2.2 Comments on Transport Analysis

2.2.1 Overview

In attempting to demonstrate transport from the offshore lightering area to the mainland coast, two wind fields based on separate techniques are presented in the Meteorology Memorandum. Chart 1 shows streamlines drawn to resultant winds and Charts 2-5 show prevailing winds. Neither of these techniques are appropriate to represent paths along which polluted air parcels move when the winds are unsteady. As indicated by a reference cited in the Memorandum (Weather Bureau Technical Paper No. 54), the wind field between the islands and mainland, to the extent that it is known, varies significantly on a daily basis. The streamlines and prevailing winds on Charts 1-5 obscure these essential details, and do not adequately represent the offshore wind field. Therefore, it must be concluded that CARB's conclusions pertaining to transport from the lightering area to the coast are unsubstantiated. Moreover, the data on which Charts 2-5 are based are inconsistent with statements in the Memorandum concerning transport of pollution into the South Coast Air Basin. The above comments are elaborated in the Sections that follow.

2.2.2 Chart 1 - Mean Trajectory Pattern - Summer

The techniques employed in the Memorandum for the calculation of the "Mean Trajectory Pattern--Summer" are theoretically unsound. There are a number of reasons why this is so. Chart 1 is a resultant wind vector chart based entirely upon coastal and island observations. A resultant or vector-averaged wind may give an entirely false picture of the flow fields characterizing an area. For example, the technique is reduced to absurdity in an instance in which a station reports 50 per cent north winds

of 20 knots and 50 percent south winds of 20 knots. In this case the resultant wind is zero, although the station never reported a calm. Another example might be that of a station reporting 50 percent northwest winds of 20 knots and 50 percent southwest winds of 20 knots. Here the resultant would be a west wind of 14 knots, although the station never reported a west wind. Obviously, the greater the variability, the less representative the resultant wind.

Given the wind field represented by the arrows in Chart 1, the streamlines drawn to this field are to a considerable extent arbitrary. This is particularly true in regard to the very crucial area to the east of San Clemente Island. Because of the absence of observations to the west and south of San Clemente, the drawing of the two southernmost streamlines in Chart 1 depend critically on the reliability of the wind reports on that Island. The two nearest wind reports are San Nicholas Island and Santa Catalina Island, with northwest and westnorthwest resultant winds, respectively. If the resultant wind at San Clemente had been northwest, a very different streamline pattern would have been drawn, and consequently a different shaded area. It is probable that the new chart would not support the conclusions drawn in the text of the Memorandum. Thus, the representativeness of the island winds is a matter of critical importance.

The analysts of Chart 1 did not accept <u>all</u> islands' winds as representative. For example, San Miguel and Santa Rosa report slightly inconsistent winds, which produce a meaningless blip in the streamlines. The northnorthwest wind on Santa Cruz Island violates the general direction of the streamlines in that area, and the anllyst has indicated by a dotted streamline that he believes, probably correctly, that the Santa Cruz wind

is to an important extent dominated by topography, favoring a northerly over a westerly flow, and tending to channel the wind across the isthmus. However, the analyst has carefully drawn for the westsouthwest wind on San Clemente Island. A westsouthwest wind on the northern portion of this island is highly suspect given the surrounding data points and synoptic controls. Terrain could be producing a localized wind with a south component during periods of northwest winds. The point is that a different interpretation of the streamlines at this location is possible, and that a different conclusion could be drawn, within the bounds of accepted practice.

2.2.3 Charts 2-5 - Prevailing Airflow Regime, Summer

The "prevailing" wind direction at a station is, as the Memorandum states, the most frequently reported wind direction. The speed associated with this wind direction is usually (as in this case) defined as the mean speed of all winds with that particular direction. As with resultant winds, prevailing winds will be representative of the wind flow at any particular time to the extent that the frequency of the prevailing direction is high. This is by no means the situation in the areas in question in Charts 2 to 5. There is a definite pattern in the reported frequencies. In the westernmost part of the area the winds form part of the large-scale flow around the Pacific High pressure cell; this is a very steady pattern, as evidenced by the wind frequencies of 60 percent or greater. Eastward, the reported frequencies drop into the range of 30 percent, and are primarily from the west. The northwest winds are only slightly less frequent than the west ones. For example, in Area 39 (San Clemente and the ocean to the east of the Island), for July the frequency of northwest winds is about 30 percent as opposed to 39 percent for west winds, and in September the corresponding figures are 32

and 35 percent (Naval Weather Service Command, 1971).

There is a further point to be made. If, say, two stations report prevailing west winds of 30 percent frequency, it does not follow that 30 percent of the time the two winds are both blowing from the west. It is theoretically possible that at no time are the winds simultaneously from the west; in order to interpret the two prevailing winds as part of an areal pattern when the frequencies are low, a correlation of their directions over time would be necessary. This is another difficulty in interpreting the prevailing wind chart when the frequencies are not high.

2.2.4 Streakline Analysis

The points made above are relatively obvious. A deficiency of the Memorandum that is less familiar to non-specialists in meteorology is presented now. The streamline chart is, or is supposed to be, a representation of the wind field at a given time. For purposes of pollution estimates, the important concepts are those of the trajectories and streaklines. The trajectory is the path followed by a given particle through time. The streakline is the line composed of all particles that have traversed a given point during the time period under consideration. When dealing with an emissions source, the streakline is the most meaningful and important graphical representation. If the wind field is steady, all three of these sets of lines -- streamlines, trajectories, and streaklines -- coincide. It is the premise of the Memorandum that the wind fields, represented by the resultant winds and the prevailing winds, are steady, that is, unchanging in time. We have seen that this is not the case. When the wind field is not steady, the trajectories and streaklines may form highly distorted patterns, looking very different from the stream-

lines at any given time, and it is not in general possible to "eyeball" them from a set of streamline charts; rather, they must be constructed according to accepted techniques.

Realizing that these concepts are unfamiliar to non-specialists, we have constructed an idealized example. In this example, the wind field turns from west to south to east to north to west again during one period, say 24 hours. Thus, the frequency of occurrence of winds with westerly components is 50 percent and the frequency of occurrence of winds between northwest and southwest is 25 percent. The resultant wind field is, of course, a calm. A stationary source begins emission at zero hours, when the wind is west, and continues emitting for 24 hours. The streaklines associated with this emission source are shown in Plate 2. At each of the four selected times (6, 12, 18, and 24 hours after emission begins), the diagram is to be thought of as a picture of the plume or smoke trail, as it would be visualized by an observer looking down from a plane directly above the source, assuming zero diffusion. The wind field, always with straight streamlines and uniform speed, but turning continuously counterclockwise in time, is represented by arrows at three-hour intervals. If the wind fields are mentally correlated with the plume, it can be seen how the plume is bent into a circular shape, although the streamlines at any given moment are always straight lines.

This simple example is not intended to represent the situation over the offshore area. What is learned from this example is that when the wind field varies significantly during a given period, it is not possible to trace emissions from an emissions source by looking at a single streamline chart. This raises the question of the period of variability shown in Charts 1 through 5. All charts are for the summertime. It is well-recognized that in the

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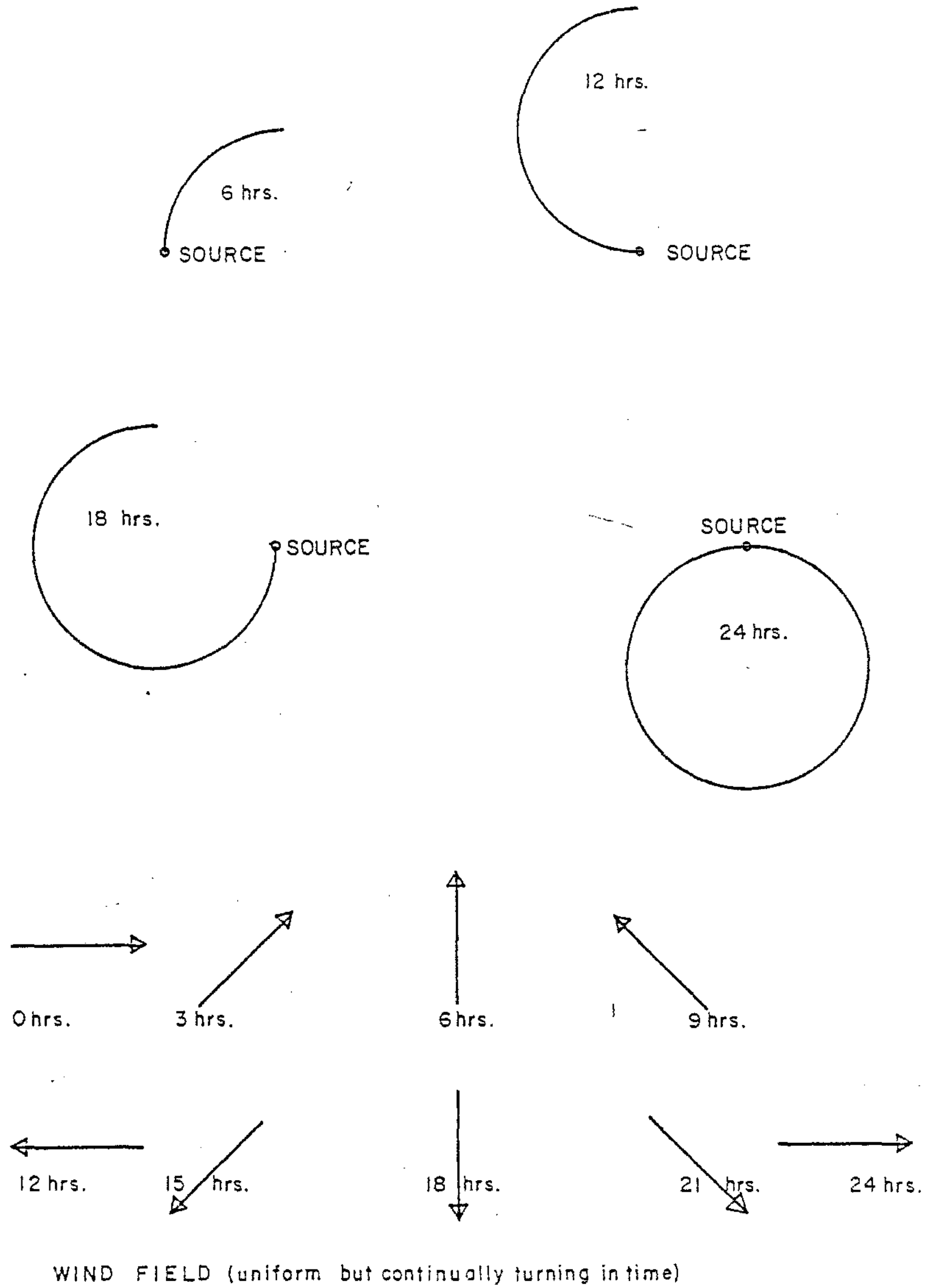

EMISSION PLUMES (STREAKLINES) AT SELECTED TIMES IN A ROTATING WIND FIELD

DAMES & MOORE

coastal area during summertime, a strong diurnal (that is, daily) variability dominates the flow patterns. The coastal stations typically have westerly winds during the daytime sea breeze hours and easterly winds during the nighttime land breeze hours. This fact tends to be obscured by the Memorandum, but is very evident in the prevailing wind streamline charts of Weather Bureau Technical Paper No. 54, which are by time of day. The chart for July 0000-0005 PST (Figure 4, page 9) shows this offshore flow pattern clearly (Plate 3). It should be noted that this feature of flow pattern exists in all seasons of the year (Figures 6, 8, and 10; DeMarrais et al., 1965).

If the wind field varies, it must be known <u>at all times</u> in order to calculate trajectory, streakline, and diffusion patterns for concentration estimation. When the typical diurnal variation is considered, it is evident that the winds are <u>not</u> known in the required detail, because they are not known over the offshore region. Chart 1 of the Memorandum, as we have pointed out, was based on island winds. Charts 2 through 5 are based on frequencies during the months in question, unstratified by time of day. The daytime streamlines of Technical Paper No. 54 (for example, Figure 3 for July) agree with those of Chart 1 in the area under consideration, and they are subject to the same criticism we have made of that Chart. However, in Figures 4, 6, 8, and 10 of the Technical Paper, the entire area between Santa Catalina Island, San Clemente Island and the South Coast is left blank, indicating that data were not available, and that the authors would not take the professional risk of estimating the streamline fields for this time of day (Plate 3). In our opinion, Plate 3 represents a realistic assessment of the available information on this topic.

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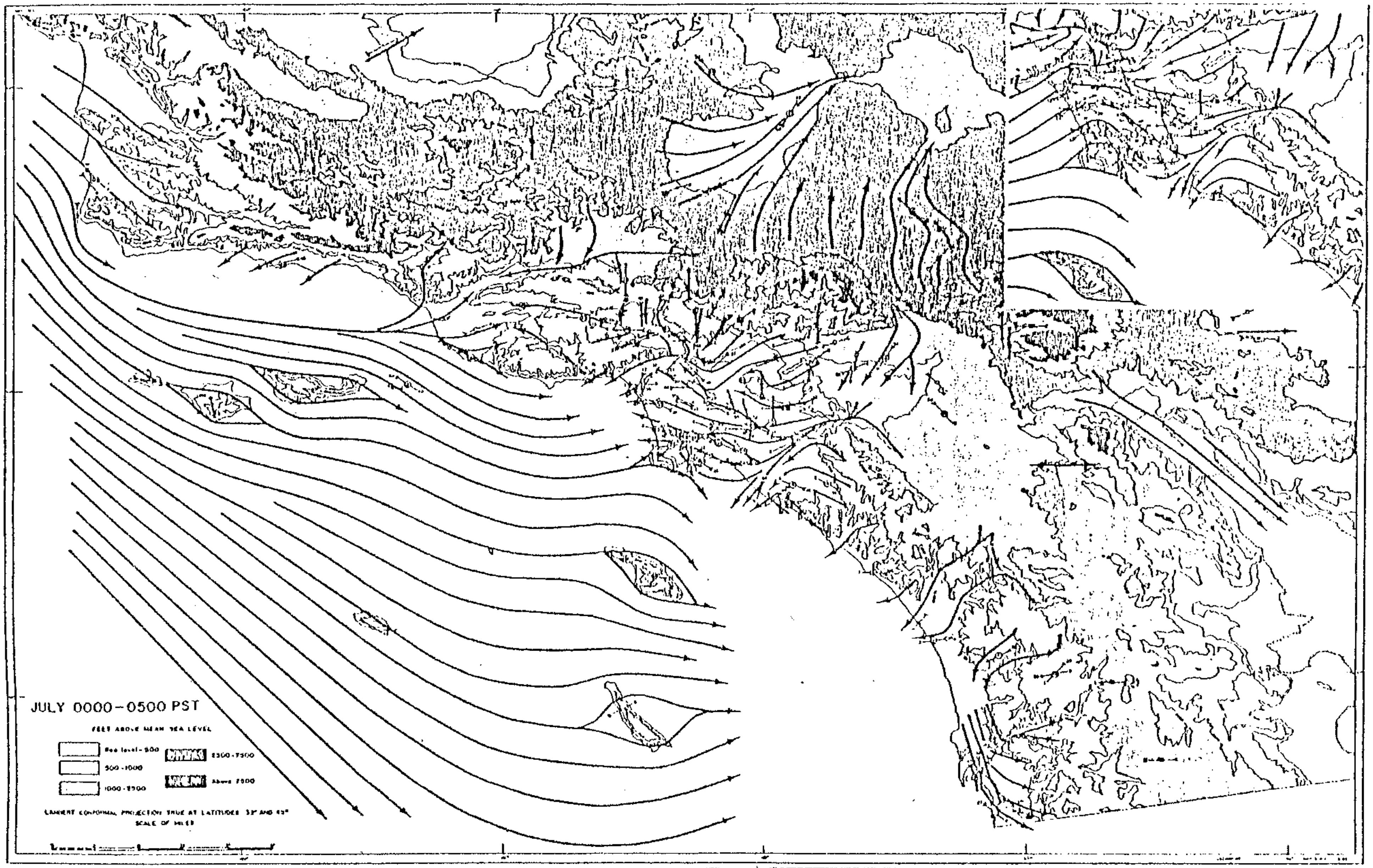

Reference: DeMarrais, *et al.*, 1965

NIGHTTIME STREAMLINE CHART FOR JULY (0000-0500 PST)

DAMES & MOORE

2.2.5 Transport into South Coast Air Basin

The Memorandum states that, on the average in summer, pollutant emissions will be transported from offshore areas, including the San Clemente area, into the San Diego Air Basin. Charts 1-5 are offered in support of this statement. These Charts show west winds. Additionally, the Memorandum states that the next most frequent flow is more southerly. "It (southerly flow) occurs about 24% of the time during July-September and tends to transport pollutants from the tanker lightering area into the South Coast Air Basin" (page 1, Appendix B).

Scrutiny of the source on which Charts 2-5 are based indicates that the "next most frequent winds" are from the northwest, not south (Naval Weather Service Command, 1971). Further, winds from the south appear to have very small frequencies in summer in this area, being so small as to be difficult to read from the wind roses. Reconciliation of these discrepencies in CARB's information is prerequisite to establishing anything pertaining to transport from the lightering area into the South Coast Air Basin.

2.3 Comments on Dispersion Considerations

In the Memorandum, Pasquill's diffusion equations are used to estimate the extent of the lateral spread of emissions as they arrive at the Coast. Given a travel distance of about 60 miles, the plume was estimated to extend about 6 miles to either side of the axis of flow. This exercise appears to be invalid for at least two reasons.

In the first place, Pasquill's formulas are essentially based on the simple Gaussian dispersion model, modified by such considerations as atmospheric static stability, inversions, etc. These modifications do not in any way alter the dependence of the Gaussian model on certain fundamental assumptions concerning the state of the medium in which the dispersion is occurring. The model presumes a flow field constant in both space and time, which carries the plume in a straight line, about which dispersion takes place. If a shearing flow or deformation field is present or if the wind is turning with time, the entire concept of a Gaussian plume is inapplicable.

It is remarkable that the Memorandum should attempt to apply Pasquill-type formulas over a distance of 100 kilometers, when the wind field, to the extent that it is known at all, is known to exhibit a strong diurnal variation. Further, it would appear elementary that diffusion is highly sensitive to the wind between source and observation point. When the winds over the entire area between lightering and coastline are known only climatologically, and when the direction of maximum frequency represents only 30 percent of the observations, it would seem wise to follow the lead of the authors of Technical Paper No. 54 and simply leave the area blank, admitting lack of sufficient data. The Memorandum's use of prevailing winds for its calculations is invalid, and

no conclusion based on such reasoning can be accepted as established.

The treatment of the lightering operation as a stationary point source for emissions is a second error associated with the use of the dispersion model in the Memorandum. The typical lightering process involves ships in motion, at a speed of two, three, or even more knots. Over the 24 or so hours of the operation, therefore, the ships move over distances of the order of tens of miles. The one quantitative estimate provided in the Memorandum, that the pollution plume will have a width of twelve miles upon arrival at the coastline, is obviously grossly in error, even if one were to accept the premises criticized in the previous paragraph.

In the Memorandum, Chart 1 is used to estimate "transport", and Charts 2-5 are used to estimate "dispersion" at least in terms of providing the widths of the pollutant plume onshore. As indicated above, neither estimate can be taken as an adequate application of accepted techniques under the circumstances. However, it is inconsistent in itself to use different wind fields for these two estimates.

2.4 Required Information

In Section 2.1.1, the Staff Report was criticized as being grossly deficient in scope for the purpose of establishing adverse onshore air quality impacts associated with offshore lightering operations. In this Section, a brief discussion of the data that would be required and the analytical approaches that would have to be taken by CARB to make a reliable impact assessment is presented. A detailed work plan is obviously beyond the scope of this report. As in the case of our previous comments, the information presented below is of a preliminary nature.

2.4.1 Analytical Approach

The processes that affect the concentrations of air pollutants emitted from a source can be grouped into three general categories:

- Transport of emitted pollutants and their derivatives by wind
- Dispersion of the above substances
- Formation and depletion of pollutants by chemical reactions

A variety of state-of-art models that incorporate features to account for the above processes are in existence. One or a combination of these may be appropriate conceptually for this particular application. If not, such a model would have to be developed.

In assessing the suitability of models for this particular application, both the characteristics of the slowly moving emissions

sources and the characteristics of the atmosphere over the ocean and mainland would have to be considered. In any event, the model would have to be tested and the levels of confidence for its predictions established.

2.4.2 Required Data

The spatial and temporal variations of the stack gas and ullage vapor emissions associated with the slowly moving sources within the lightering area would have to be quantified. The chemical composition of the ullage vapor emissions would also have to be determined. The above data could be developed largely from the results of studies of ullage vapor emissions conducted by Chevron Research Company (1977) under the sponsorship of WOGA. In extending the impact analysis to the mainland, the emissions fluxes from the urbanized areas into which the lightering emissions may be transported would have to be quantified in time and space. If these urban emissions were not available from existing inventories, they would have to be determined in sufficient detail.

The transport simulations within any selected model would have to be based on the maximum available wind data, preferably from both surface and upper air observations, over both the ocean and land. The summer patterns, and the diurnal regimes thereof, should be emphasized, but all patterns associated with any air pollution episode in any season would have to be studied. Circulation patterns potentially causing inter-basin transfer of pollutants should be included also.

The dispersion of pollutants is determined by turbulent diffusion and the depth of the mixing layer. The former can be important in both the vertical and horizontal dimensions, and is influenced primarily by atmospheric stratification. Both this

stratification and the nature of the emissions sources, which also influences turbulent diffusion, differ between ocean and land and would have to be quantified.

Finally, the chemical reaction simulations within any selected model require relatively detailed background concentration input data, in the vicinity of the lightering emissions, as well as along the path of any simulated pollutant trajectory. Because of the diurnal variations in the wind field described above, there could be significant variations in air chemistry influencing the modeling results.

Relating to chemical simulations, it is apparent that several different photochemical oxidant mechanisms have been developed in recent years. Therefore, it may be possible to develop a reasonable, state-of-art estimate of the impact of hydrocarbon emissions associated with lightering operations on onshore oxidant concentrations. However, it is equally apparent that the state-of-art simulation for the conversion of surfur oxide stack gas emissions to sulfate is in its infancy, and that no such estimate may be available in this regard.

2.4.3 Research Implications

It is obvious from the foregoing that a technically sound assessment of the air quality impacts of lightering emissions offshore California requires studies involving a scope and sophistication far in excess of that presented in the Staff Report. That it taxes state-of-art is indicated by a review of current and proposed CARB research investigations reported in Staff Report 77-19-1. Approaches and required data integral to the subject of this commentary are prominent on the list. Several are listed below.

Emissions from Ships, Ship Operations, and Transfer of Oil in the South Coast Air Basin ($168,688).

Air Quality Simulation Model for Sulfate Aerosol Formation (proposed).

Development of a Comprehensive Mathematical Model for Photo-Chemical Air Pollution ($84,700).

At-Sea Studies of Air Pollution in the Marine Boundary in the Los Angeles Air Basin ($29,157).

Application of Atmospheric Tracer Techniques to Determine the Transport and Dispersion Associated with the Land Breeze-Sea Breeze Movement of Air Over the Los Angeles Coastal Zone ($177,377).

Sulfate Air Quality Management in the South Coast Air Basin ($125,580).

The above list contains studies involving emissions from ships, as well as those dealing with pollutant transport, dispersion, and atmospheric chemistry. Although several of the studies on the list are designed to extend knowledge of atmospheric characteristics and processes developed inland to offshore areas, not all studies are so directed. Notably, the sulfate aerosol simulation study (second item above) is found on a proposed list. The Board's stated requirement for the study involves establishment of a scientific basis "In order to develop technically sound control strategies" to deal with expected increases in sulfur dioxide emissions onshore (page 104, Staff Report 77-19-1; underlining ours). Obviously, any critical attempt to establish onshore impacts on oxidant and sulfate concentrations associated with offshore lightering emissions should be

integrated with the results of CARB's present and future studies described above. Indeed, the impact assessment itself is a substantial research endeavor, approaching the scope and sophistication of CARB's other research, in contrast to the superficial facts presented in the lightering operations Staff Report.

3.0 SUMMARY

The California Air Resources Board (CARB) is considering adoption of rules controlling the sulfur content of stack gas emissions and ullage vapor emissions from lighters operating in offshore waters east and south of San Clemente and Santa Catalina Islands, respectively. The stated justification for the proposed rules is the assertion that the emissions from the lightering operations prevent the achievement and maintenance of the State ambient air quality standards for oxidant and sulfates in the San Diego and South Coast Air Basins. CARB's demonstration of adverse onshore impact on these standards is based on a Meteorology Memorandum stating that the emitted pollutants are transported to the mainland.

Dames & Moore was retained by the Western Oil and Gas Association to review and comment upon the meteorology study described above. We were privileged to work with Dr. Morton Wurtele, Department of Atmospheric Sciences, University of California, Los Angeles, in the course of this study. Our preliminary comments are summarized below.

Deficient Scope

The stated objectives of the Meteorology Memorandum are to determine the likelihood of offshore emissions reaching shore and the boundaries of the source areas. The conclusions concerning transport are followed by a "discussion" of dispersion conditions. Thus, the Memorandum deals only with transport and fails to quantify pollutant concentrations onshore. No quantitive connection is made between amounts of hydrocarbon or sulfur dioxide emitted per unit time of lightering operation and incremental changes in oxidant or sulfate concentrations onshore. Both oxidant and sulfates are formed by chemical reactions in the atmosphere. CARB has failed to

consider the atmospheric chemistry of pollutants known to be reactive. In fact, two of the three basic atmospheric processes influencing the emissions have been neglected in CARB's work. It must be concluded that the work is grossly deficient in scope. Therefore, it is useless for the purpose of demonstrating adverse impact.

Poor Data Base

Wind data from islands and ships are used extensively in the Memorandum, but the inherent limitations of such data are not discussed. The low number and relative density of data points on islands in contrast to the mainland is readily apparent. The ship data constitute a very limited number of observations that often are estimates rather than measurements made with instruments. Some of the island observations apparently are not made on a 24-hour basis.

Wind observations on an island may or may not represent air flow over the open ocean at various distances from the island. Deflection of flow and local eddies are expected to occur near such obstructions. Further, island winds may be significantly influenced by local terrain. CARB's trajectories (Chart 1) near the lightering area depend critically on observations from San Clemente and Santa Catalina islands. These trajectories are subject to question, given the limitations discussed above, on the basis of input data alone.

Emissions Transport to Shore Unsubstantiated

In attempting to demonstrate transport from the offshore lightering area to the mainland coast, two wind fields based on separate techniques are presented in the Meteorology Memorandum. Chart 1 shows streamlines drawn to resultant winds and Charts 2-5 show pre-

vailing winds. Neither of these techniques are appropriate to represent paths along which polluted air parcels move when the winds are unsteady. As indicated by a reference cited in the Memorandum (Weather Bureau Technical Paper No. 54), the wind field between the islands and mainland, to the extent that it is known, varies significantly on a daily basis. The streamlines and prevailing winds on Charts 1-5 obscure these essential details, and do not adequately represent the offshore wind field. Therefore, it must be concluded that CARB's conclusions pertaining to transport from the lightering area to the coast are unsubstantiated. Moreover, the data on which Charts 2-5 are based are inconsistent with statements in the Memorandum concerning transport of pollution into the South Coast Air Basin.

Dispersion Considerations

In the Memorandum, Pasquill's diffusion equations are used to estimate the extent of the lateral spread of emissions as they arrive at the coast. This exercise is invalid for at least two reasons. First, Pasquill's formulas, based on a simple Gaussian dispersion model, are invalid if a shearing flow or deformation field is present or if the wind turns with time. Those are precisely the conditions that occur within the 60-mile distance between the lightering area and the coast, given the marked diurnal variation in winds. Second, the lightering operation is treated as a stationary point source, but actually is a moving point source. Thus, the width of the plume given in the Memorandum is grossly in error, if one accepts the exercise as valid in the first place.

Required Information

The processes that affect the concentrations of pollutants emitted from a source include transport, dispersion, and chemical reactions. One or a combination of the available state-of-art models that include simulations to account for these processes would have to be applied by CARB in order to make a reliable impact assessment. If no such models were found to be suitable, one would have to be developed. In any event, the model would have to be tested and the levels of confidence of its predictions established. Considerable input data described in Section 2.4.2 of this report would have to be developed.

A technically sound assessment of the air quality impacts of lightering emissions offshore California requires studies involving a scope and sophistication far in excess of that presented in the Staff Report. That it taxes state-of-art is indicated by a review of current and proposed CARB research investigations reported in Staff Report 77-19-1. Analytical approaches and required data integral to the subject of this commentary are prominent on the list. CARB's impact assessments should be integrated with the results of CARB's own present and future research. Indeed, the lightering emissions impact assessment itself is a substantial research endeavor, equaling the scope and sophistication of CARB's other reserach, in contrast to the superficial facts presented in the lightering operations Staff Report.

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ATTACHMENT I

APPENDIX B

Staff Memo Regarding Meteorology

State of California

Memorandum

To : Tom Austin
Deputy Executive Officer

Harmon Wong-Woo, Chief
Stationary Source Control Division

Date : October 21, 1977

Subject: Pollutant Transport -- Southern California Coastal Waters

From : Air Resources Board

Two analytical approaches have been used to develop an answer to the questions: Are pollutant emissions from sources offshore from the San Diego Air Basin likely to reach the basin's coastline? If so, what are the boundaries of such source areas?

One of the analytical approaches used to help answer the above questions invloves the development of mean trajectory patterns; the other approach invloves an examination of wind frequency data. The conclusions reached concerning transport over the southern California coastal waters are given below followed by a discussion of the charts developed and dispersion conditions.

The analysis indicates that pollutant emissions released over a large area of southern California coastal waters will, on the average in summer, be transported into the San Diego Air Basin. This area includes San Clemente Island and surrounding waters. This transport is a predominant feature of the summertime circulation pattern. It occurs overall (day and night considered) about 58%* of the time during the July-September period. The next most frequent flow during this period is more southerly. It occurs about 24%* of the time during July-September and tends to transport pollutants from the tanker lightering area into the South Coast Air Basin.

Mean Trajectory Pattern -- Summer

The mean June-September trajectory pattern for the southern California coastal waters is given in Chart 1. The data plotted at the island and coastal stations are the resultant wind vectors as determined for each station from historical meteorological records. The direction of each vector is shown by an arrow and the speed associated with that vector is shown by a number of plotted near the arrow's tail. The directions of the individual vectors have been used to determine the areawide resultant pattern of airflow shown by the continuous solid lines. The path (trajectory) taken by a parcel of air will tend to be parallel to these lines and at the speeds shown.

The pattern indicates that a large area of the coastal waters is essentially upwind from the coastline of the San Diego Air Basin. This area is hsown by light shading in Chart 1. Based on resultant wind vectors, pollutants released in this area during summer will generally be transported into the basin. The area westward from the coast includes San Clemente, Santa Catalina and San Nicolas Islands thence northward to include San Miguel and Santa Rosa Islands.

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* "California Air Quality Data -- Vol. VII, No. 4 (1975)."

Pollutants released to the north of the shaded area in Chart 1 and in the Santa Barbara Channel will, on the average, be transported into the South Coast and to a lesser extent the South Central Coast Air Basin. Pollutants released to the south or west of the shaded area in Chart 1 will not, on the average, be transported into California.

The transport pattern given in Chart 1 represents mean conditions during a 4-month (largely summertime) period. Transport patterns, of course, vary from day-to-day and from season-to-season. On occasion they may be about the same or they may be quite different than shown. To help illustrate this point, we are developing a daily transport chart for July 16, 1977 and a seasonal transport chart for the winter period.

The resultant vector wind speed offshore, as shown in Chart 1, increases westward from the coast of the South Coast and San Diego Air Basins. Resultant speeds increase, for example, from 5 to 7 to 13 mph from San Diego to San Clemente Island to San Nicolas Island. Resultant speeds increase, for example, from 3 to 5 to 15 to 16 mph from Oxnard to Anacapa Island to Santa Rosa Island to San Miguel Island. The resultant speeds are useful for estimating the rate of transport along the resultant wind direction line. For example, the speed along the line from San Clemente Island to the coast is about 6 mph and the distance about 60 mi. Hence the time required to travel this distance is about 10 hrs.

Prevailing Airflow Regime--Summer

The prevailing airflow regimes for the southern California coastal waters are given for the months June-September in Charts 2-5. The data plotted are the most frequent (prevailing) wind directions observed in a square area (30 nautical miles to a side) surrounding the data point. The most frequent direction is shown by a wind arrow. The percent occurrence of that direction is shown by a percent number plotted under or to the left of the arrow's tail. The mean wind speed for those directions is shown by a number plotted above or to the right of the arrow's tail.

As shown in Charts 2-5, the prevailing flow offshore from the San Diego Air Basin is westerly during all months (June-September). West wind observations account for 1/3 of all the observations taken. Such flow is consistent for example, with the movement of air parcels (polluted or otherwise) from Santa Catalina and San Clemente Islands toward the basin's coastline.

The prevailing wind speed increases westward from the coast of the above two basins, as shown in Charts 2-5. The prevailing speed can be used as an input wind speed into the Pasquill diffusion equations to obtain an estimate of concentration estimates downwind from an emission point. In addition to wind speed, such equations depend on source condition, source strength, and atmospheric stability.

The data appearing on these charts was obtained from the publication "Climatological Study, Southern California Operating Area." This publication was prepared by the National Weather Service and published by direction of the Commander, Naval Weather Service Command in March 1971.

Tom Austin
Harmon Wong-Woo

October 21, 1977

Dispersion Conditions

The dispersion of pollutants released offshore in summer is determined primarily by the wind speed, the nature and extent of the low-level inversion, and the nature of the pollutant emissions. The secondary factors include surface roughness (typically smooth), mixing conditions below the inversion (typically good), and terrain (none). The typical secondary conditions described above are assumed; the primary conditions (other than wind speed which is discussed above) are discussed below.

--Vertical Dispersion

Pollutant emissions attributable to the transfer process of the crude oil are probably mostly released near the surface and with little upward velocity and little temperature buoyancy. Stack emissions from the boilers, on the other hand, are probably released from stacks some 30 to 40 meters above the surface and with a sufficient exit velocity and temperature buoyancy to given an effective stack height of approximately 120 meters. Thus, the initial distribution of the two types of emissions is in the lower 120 meters of the atmosphere.

The offshore area is dominated in summer by a strong and persistant inversion layer which typically exists with a base height of about 1500 ft above the water. This extremely stable layer of air acts to isolate the surface mixing layer (and any pollution it may contain) from the air aloft. Pollutants released in the mixing layer below the inversion are, in essence, confined to that mixing layer.

For the June-August period, the long-term characteristics of the inversion in the San Diego area can be determined from the data given in Tables 1-3. As shown, for example in Table 2, the most frequent July inversions have bases between 1000 to 2000 ft above the water. These inversions are relatively strong and thick, the most frequent temperature difference between the base and top being 12 to 18^{o}F and the most frequent thickness of the layer being 2000 to 2500 ft. Considering both the nighttime (4 a.m.) and daytime (4 p.m.) inversion occurrences in July, over 92% of them have bases between the surface and 2000 ft. This indicates that pollutants released in the offshore area will, on the average, be confined to a surface-air layer less than 2000 ft. thick.

--Horizontal Dispersion

Assuming a pollutant emission source 5 miles east of San Clemente Island, for example, the extent of lateral spread of the emissions as they arrive at the coast at San Diego can be estimated using Pasquill's diffusion equations. The travel distance is approximately 60 mi. At this distance the horizontal standard deviation is about 2.4 miles for neutral conditions. Thus, virtually all of

the pollutant material will flow within a band extending 6 miles to either side of the axis of flow. If this axis of flow intercepts central San Diego, virtually the entire pollutant cloud from this emission source would enter the basin in a band extending 6 mi. north and 6 mi. south of San Diego.

References

This memorandum is based on information from a number of references. The specific and general references used by the author of this memorandum are described below.

These references are all available for public inspection in the Meteorological Document File of the ARB's Technical Services Division.

a. The airflow frequency statements on page one are based on material presented in "California Air Quality Data -- Vol. VII, No. 4."

b. Chart 1 is based on about 230,000 wind observations made by trained personnel of the Coast Guard, Civil Aeronautics Administration, Air Force, Weather Bureau, Marine Corps, and Navy. These data were all obtained from the national climatological record archives or the U. S. Government Printing Office.

c. Charts 2-5 are based on a 1971 publication entitled "Climatological Study, Southern California Operating Area" prepared by the direction of Commander Naval Weather Service.

d. Other publiched data that have been helpful in describing the summertime onshore transport inlcude:

(1) -- "The Uses of Meteorological Data in Large-Scale Air Pollution Surveys." This 1958 report was prepared by Stanford Research Institute for the State of California. The author is Gordon Bell.

(2) -- Technical Paper 54 "Meteorological Summaries Pertinent to Atmospheric Transport and Dispersion Over Southern California." This 1965 report was prepared by the U. S. Weather Bureau. The author is Gerald DeMarrais.

(3) -- "Atlas of Climatic Charts of the Oceans." This 1938 report was prepared by the U. S. Weather Bureau. The author is Willard McDonald.

(4) -- "California South Coast Air Basin Hourly Wind Flow Patterns." This 1977 report was prepared by the South Coast Air Quality Management District. The author is Ralph Keith.

(5) -- "Wind in California." This 1960 report (revised 1971) was prepared by the State of California's Department of Water Resources. The author of the revised report is James Goodridge.

(6) -- "Climatic Atlas of the United States." This 1968 report was prepared by the U. S. Environmental Science Services Administration. The author is Woodrow Jacobs.

Spencer Duckworth, Chief
Air Analysis Branch

cc: Alan Goodley
Robert McMullen
Pete Venturini

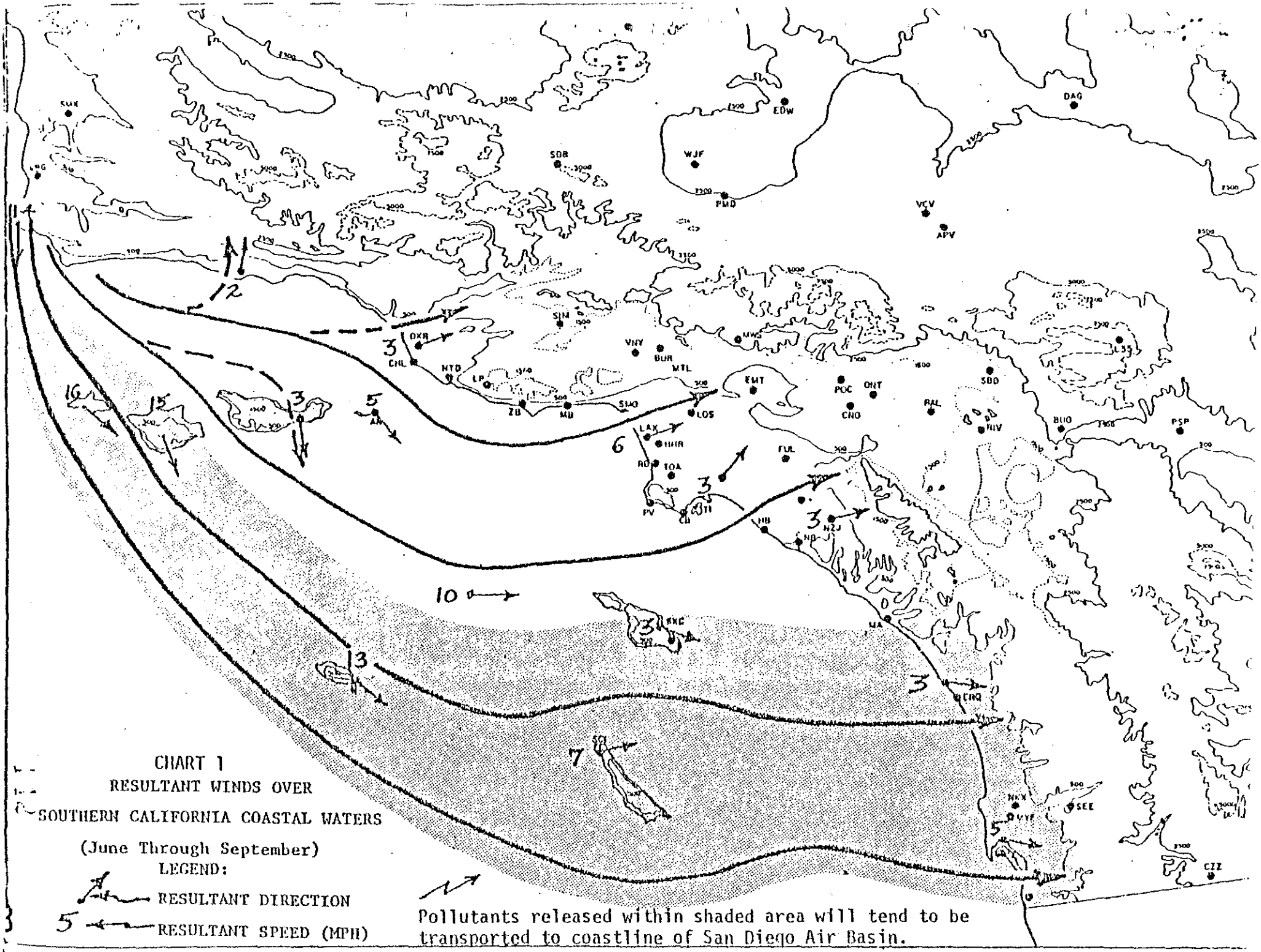


CHART 1

RESULTANT WINDS OVER

SOUTHERN CALIFORNIA COASTAL WATERS

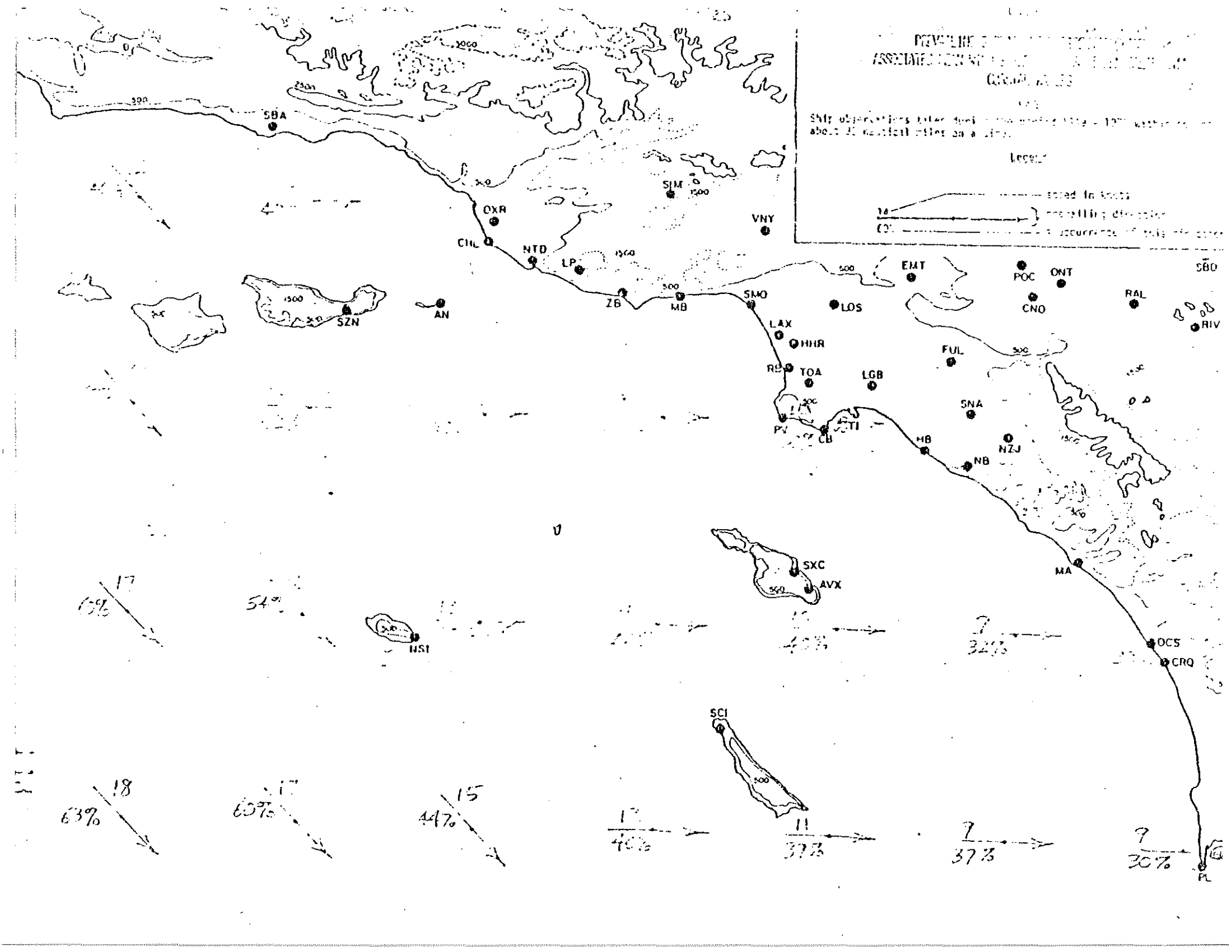
(June Through September)

LEGEND:

RESULTANT DIRECTION

5 RESULTANT SPEED (MPH)

Pollutants released within shaded area will tend to be transported to coastline of San Diego Air Basin.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NTD
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SMO
LAX
HHR
RB
TOA
PV
CB
TI
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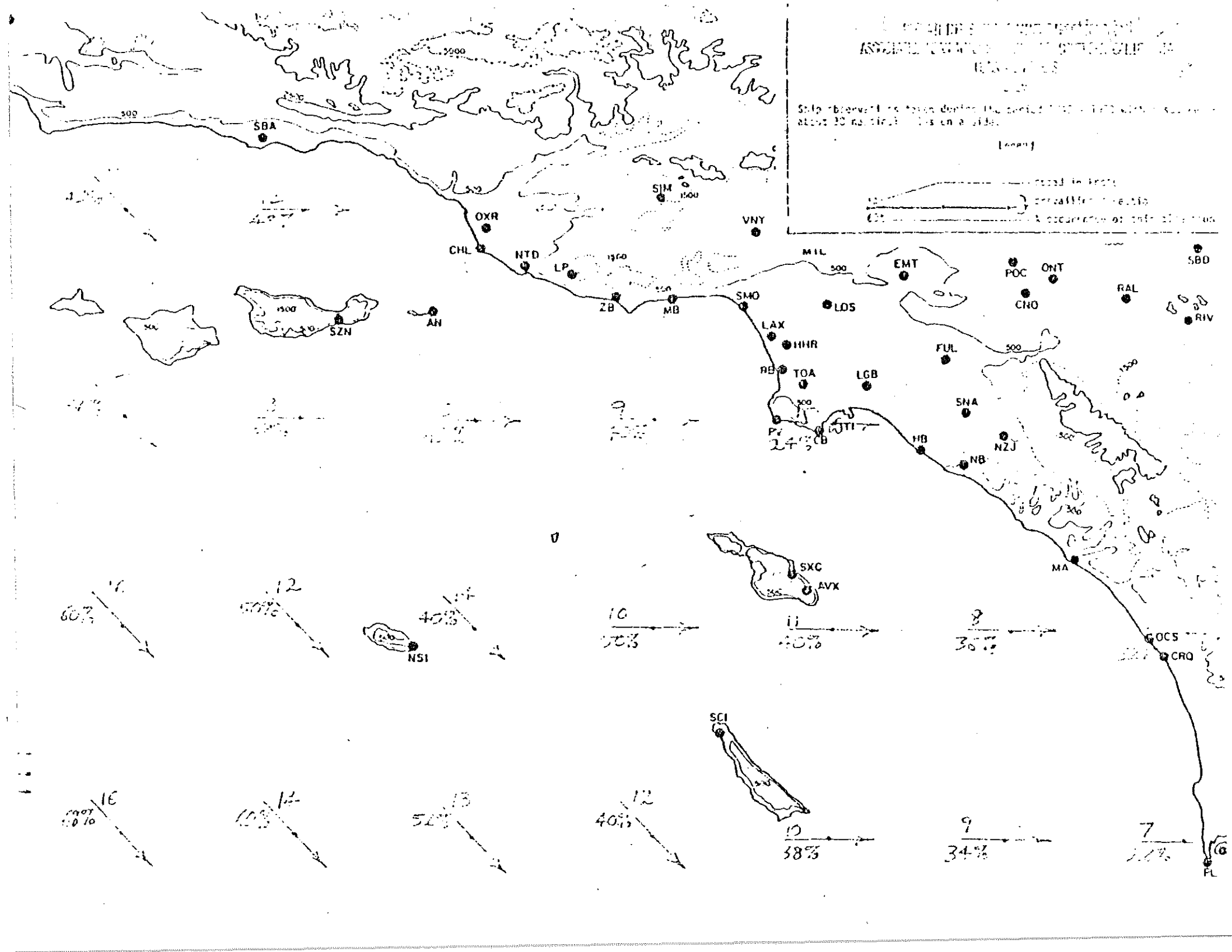
NB
SNA
LGB
FUL
NZJ
MA
EMT
POC
ONT
CNO
RAL
SBD
RIV
LOS
VNY
SIM
SZN
AN
SXC
AVX
NSI
SCI
OCS
CRQ
PL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LDS
LAX
HHR
FUL
TOA
LGB
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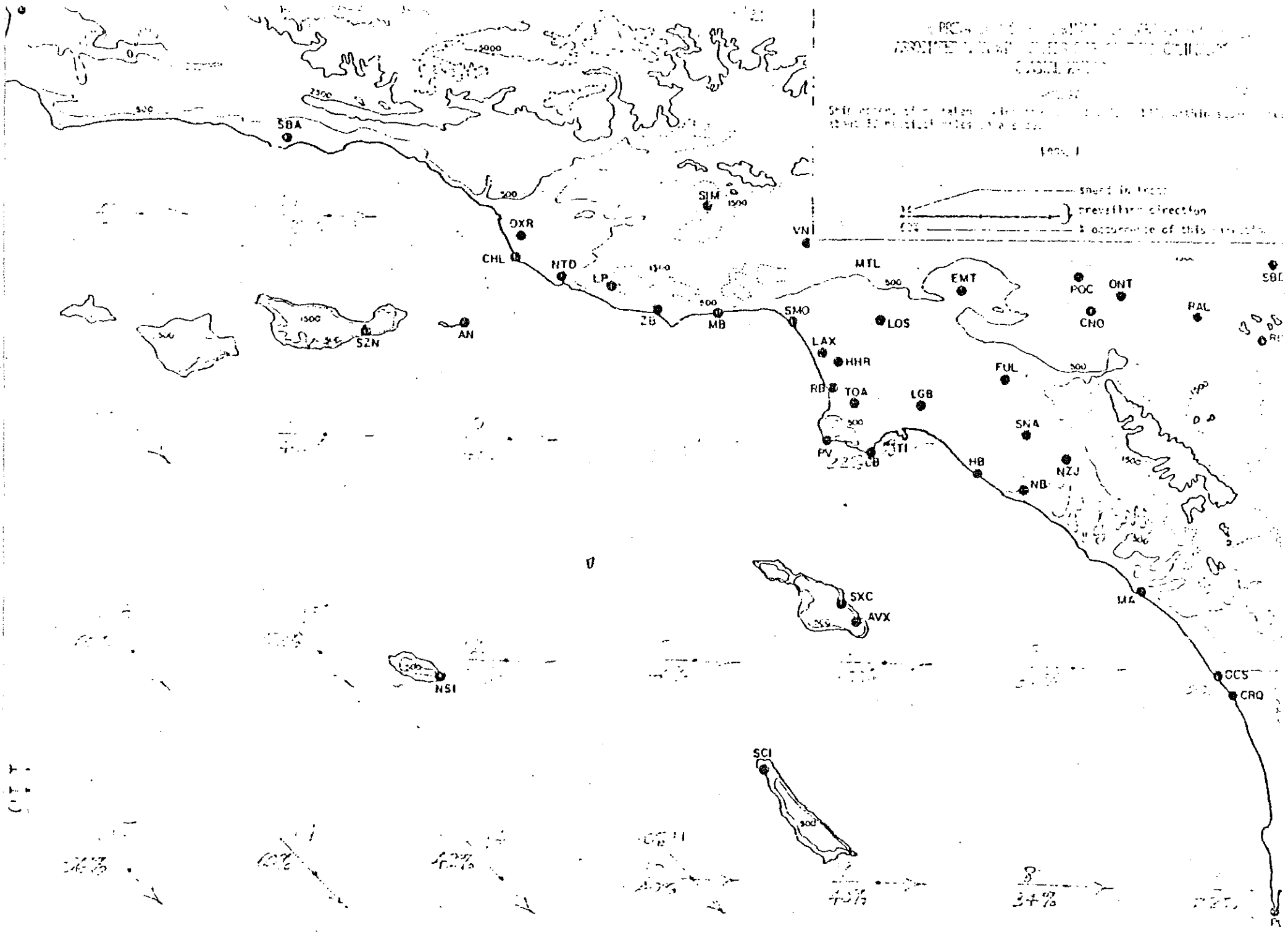
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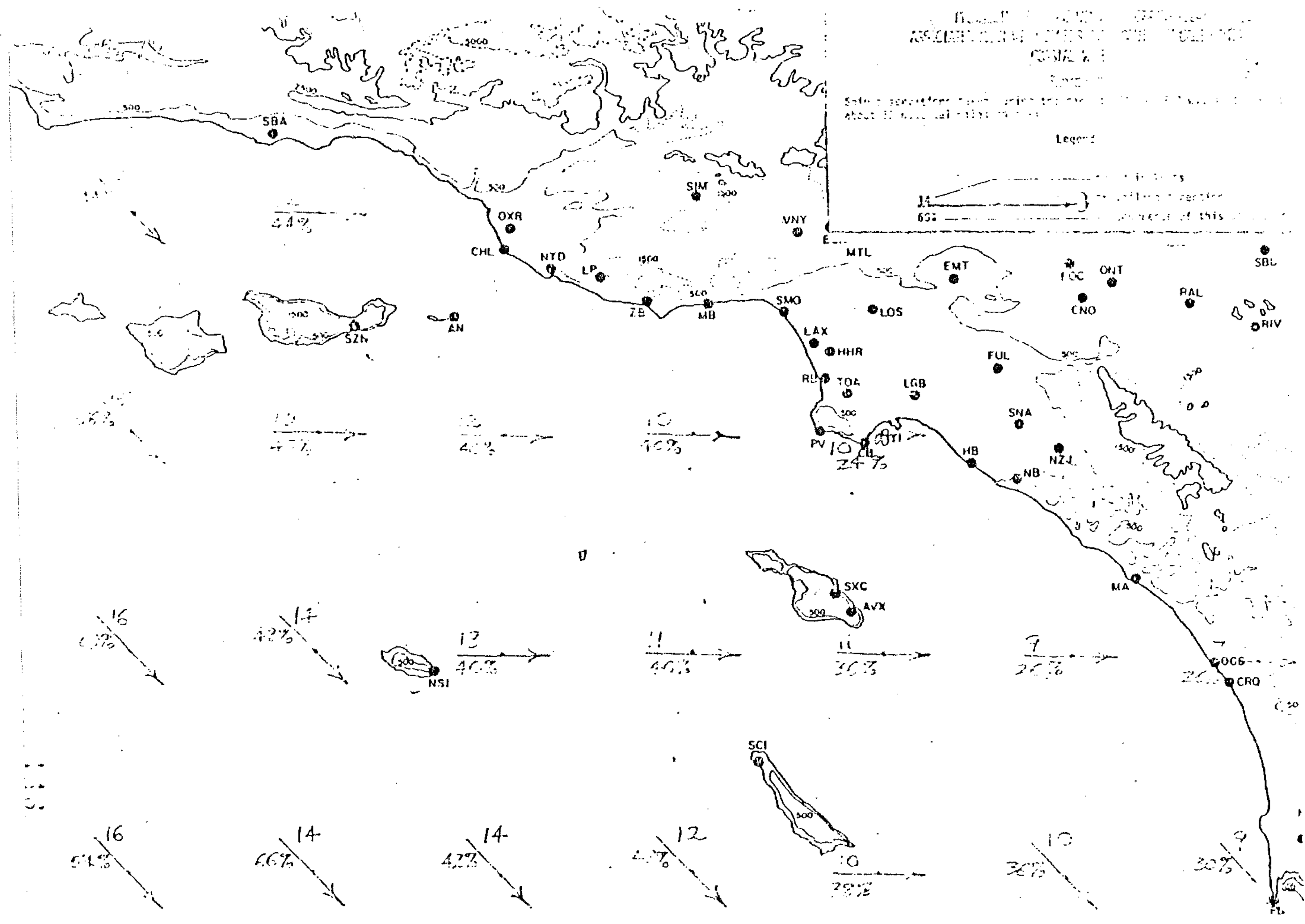
Legend
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36%
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26%
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51%
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66%
14
42%
10
28%
10
36%
9
30%

CALIFORNIA AIR RESOURCES BOARD

TEMPERATURE INVERSION CHARACTERISTICS - FREQUENCY OF OCCURRENCE

[illegible], ELEVATION [illegible] FEET

[illegible], 1957-1976

[illegible]	FREQUENCY	TEMPERATURE DIFFERENCE (F) (TOP MINUS BASE) [illegible] To [illegible]	6.1 To 12.0	12.1 To 18.0	18.1 To 24.0	24.1 To 30.0	> 30.0	THICKNESS (FEET) (TOP MINUS BASE) 0 To 500	501 To 1000	1001 To 1500	1501 To 2000	2001 To 2500	2501 To 3000	3001 To 3500	3501 To 4000	4001 To 4500	4501 To 5000	> 5000
[illegible]																		
[illegible]	[illegible]	16	5	1[illegible]	1[illegible]	[illegible]	0	9	3	6	13	9	5	8	[illegible]	1	1	0
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NONE	12																	
MISSING	1																	
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CALIFORNIA AIR RESOURCES BOARD

TEMPERATURE INVERSION CHARACTERISTICS - FREQUENCY OF OCCURRENCE

SAN DIEGO, ELEVATION 407 FEET

JULY, 1957-1976

BASE	FREQUENCY	TEMPERATURE DIFFERENCE (F) (TOP MINUS BASE)						THICKNESS (FEET) (TOP MINUS BASE)										
		2.1 TO 6.0	6.1 TO 12.0	12.1 TO 18.0	18.1 TO 24.0	24.1 TO 30.0	> 30.0	0 TO 500	501 TO 1000	1001 TO 1500	1501 TO 2000	2001 TO 2500	2501 TO 3000	3001 TO 3500	3501 TO 4000	4001 TO 4500	4501 TO 5000	> 5000
0400 PST																		
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7[illegible]	93	3	15	46	3[illegible]	5	0	6	11	16	20	17	16	6	3	1	1	1
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[illegible]	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7[illegible]	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9[illegible]	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	1																	
[illegible]	1																	
TOTAL	620	9	76	275	206	43	5	10	54	84	121	150	96	58	28	11	4	2
1400 PST																		
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15[illegible]	222	16	75	105	24	2	0	9	26	40	43	45	27	23	5	3	1	0
20[illegible]	92	2	17	19	4	0	0	0	4	12	12	7	4	2	0	0	1	0
25[illegible]	7	0	1	5	1	0	0	0	0	2	1	2	0	2	0	0	0	0
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[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	1																	
[illegible]	1																	
TOTAL	620	69	237	253	54	5	0	21	70	113	140	131	74	45	17	4	3	0

CALIFORNIA AIR RESOURCES BOARD

TEMPERATURE INVERSION CHARACTERISTICS - FREQUENCY OF OCCURRENCE

SAN DIEGO, ELEVATION 407 FEET

AUGUST, 1957-1976

HEIGHT OF INVERSION BASE (FEET)	FREQUENCY	TEMPERATURE DIFFERENCE (F) (TOP MINUS BASE) 0.0 To 6.0	6.1 To 12.0	12.1 To 18.0	18.1 To 24.0	24.1 To 30.0	> 30.0	THICKNESS (FEET) (TOP MINUS BASE) 0 To 500	501 To 1000	1001 To 1500	1501 To 2000	2001 To 2500	2501 To 3000	3001 To 3500	3501 To 4000	4001 To 4500	4501 To 5000	> 5000
[illegible]																		
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[illegible]	3	[illegible]	1	1	1	0	0	1	2	0	0	0	0	0	0	0	0	0
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[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	[illegible]		[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	[illegible]																	
MISSING	[illegible]																	
TOTAL	[illegible]	37	116	299	156	15	0	23	61	119	147	123	76	42	20	5	5	1
[illegible]																		
SURFACE	2	1	1	0	0	0	0	1	0	0	0	1	0	0	0	0	0	0
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[illegible]	[illegible]	26	39	16	2	0	0	0	13	14	16	22	9	5	2	1	0	1
[illegible]	[illegible]	[illegible]	[illegible]	88	6	0	0	10	37	42	62	45	19	11	4	1	0	0
[illegible]	[illegible]	27	[illegible]	84	4	0	0	13	37	41	51	35	15	16	1	1	0	1
[illegible]	[illegible]	[illegible]	21	19	1	0	0	3	13	15	4	9	0	0	0	0	0	0
[illegible]	23	5	15	3	0	0	0	3	4	4	5	5	1	1	0	0	0	0
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[illegible]	3	3	0	0	0	0	0	1	1	0	0	0	0	1	0	0	0	0
[illegible]	1	[illegible]	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
[illegible]	1	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
[illegible]	[illegible]	[illegible]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NONE	7																	
MISSING	2																	
TOTAL	620	[illegible]	[illegible]	210	13	0	0	31	108	117	140	118	51	34	7	3	0	2

APPENDIX C

UNITED STATES COAST GUARD

STATEMENT

BEFORE THE

CALIFORNIA AIR RESOURCES BOARD

PUBLIC HEARING

BILTMORE HOTEL, LOS ANGELES

NOVEMBER 21, 1977

GOOD MORNING. I AM COMMANDER JONATHAN IDE, UNITED STATES COAST GUARD, HERE TODAY REPRESENTING REAR ADMIRAL ROBERT I. PRICE, COMMANDER OF THE ELEVENTH COAST GUARD DISTRICT, HEADQUARTERED IN LONG BEACH. WE WELCOME THIS OPPORTUNITY TO PRESENT OUR VIEWS CONCERNING THE PROPOSED RULES FOR CONTROLLING EMISSIONS FROM LIGHTERING OPERATIONS.

THE COAST GUARD IS COMMITTED TO IMPROVING THE QUALITY OF THE MARINE ENVIRONMENT. IN FACT, IT IS ONE OF THE SEVEN MAJOR OBJECTIVES OF THE COAST GUARD. AS YOU ARE WELL AWARE, WE HAVE BEEN QUITE ACTIVE IN THIS AREA FOR A NUMBER OF YEARS ESPECIALLY IN THE AREA OF WATER POLLUTION PREVENTION.

HOWEVER, ANOTHER MAJOR OBJECTIVE OF THE COAST GUARD IS TO ASSURE THE SAFETY AND SECURITY OF VESSELS AND OF PORTS AND WATERWAYS AND THEIR RELATED SHORESIDE FACILITIES. IT IS OUR VIEW THAT

SAFETY AND ENVIRONMENTAL PROTECTION MUST BE COMPLIMENTARY AND NOT MUTUALLY EXCLUSIVE.

WITH REGARD TO THE PROPOSED RULES, WHILE IN SUPPORT OF THEIR INTENT, WE FORESEE SERIOUS DIFFICULTIES WHICH WE WANT TO MAKE KNOWN TO THE CALIFORNIA AIR RESOURCES BOARD. WE NOTE THE EXTENSIVE CHANGES IN THE DRAFT BEFORE US TODAY FROM EARLIER DRAFTS, ESPECIALLY INCLUSION OF THE PROVISION THAT NOTHING SHALL BE REQUIRED THAT VIOLATES COAST GUARD REQUIREMENTS, YET THERE REMAIN THREE GENERAL AREAS OF THE PROPOSED RULES THAT WE WISH TO ADDRESS:

1. SAFETY, AS A FUNCTION OF THE AVAILABLE OPTIONS THE RULES WOULD ALLOW,
2. THE DEGREE TO WHICH THE EMISSIONS ARE A RECOGNIZED PROBLEM, AND
3. THE LEGAL AUTHORITY OF THE STATE OF CALIFORNIA TO EXERT JURISDICTION MORE THAN 3 MILES OFFSHORE.

WITH REGARD TO SAFETY THE PROPOSED RULE ALLOWS FOR EITHER HARDWARE OPTIONS OR FOR OPERATIONAL OPTIONS BOTH OF WHICH ARE OF CONCERN.

THE HARDWARE OPTION IMPLIES THAT SOME TYPE OF EQUIPMENT WILL BE REQUIRED TO BE INSTALLED ABOARD TANK VESSELS FOR THE PURPOSE OF CONTROLLING EMISSIONS. WE ENVISION THE POSSIBILITIES FOCUSING ON EITHER AN INCINERATOR OR A VAPOR RECOVERY SYSTEM(VRS). AN INCINERATOR WOULD APPEAR TO BE OUT OF THE QUESTION SINCE IT INTRODUCES ANOTHER SOURCE OF IGNITION ONBOARD THAT COULD BE

DIFFICULT TO CONTROL. A VAPOR RECOVERY SYSTEM OFFERS A SOMEWHAT BETTER ALTERNATIVE, YET NOT WITHOUT FORMIDABLE PROBLEMS ITSELF.

VRS HAS BEEN UNDER STUDY BY THE COAST GUARD FOR SEVERAL YEARS. WE BECAME INVOLVED INITIALLY IN RESPONSE TO THE ENVIRONMENTAL PROTECTION AGENCY'S (EPA) INTENTION TO REQUIRE THE RECOVERY OF VAPORS FROM TANK VESSELS LOADING GASOLINE IN THE HOUSTON/GALVESTON TEXAS AREA. AT THAT TIME, THE COAST GUARD BEGAN PRELIMINARY DEVELOPMENT OF REGULATIONS FOR MARINE VAPOR RECOVERY SYSTEMS(VRS). THE PRIMARY THRUST OF THE COAST GUARD'S EFFORTS WAS HAZARD IDENTIFICATION AND MITIGATION. FOUR AREAS WERE INITIALLY IDENTIFIED AS POTENTIALLY HAZARDOUS; (1) FLAME/EXPLOSION PROPAGATION, (2) INTRODUCTION OF ADDITIONAL IGNITION SOURCES, (3) INABILITY TO ACCURATELY GAGE CLOSED CARGO TANKS WITH PRESENTLY INSTALLED SYSTEMS, AND (4) OVER/UNDER PRESSURIZATION OF CARGO TANKS. THE COAST GUARD INITIATED SEVERAL RESEARCH AND DEVELOPMENT(R&D) PROJECTS TO INVESTIGATE THESE POTENTIAL PROBLEM AREAS. IN ADDITION, PUBLIC COMMENT WAS SOLICITED WITH REGARD TO VRS.

THIRTY-EIGHT (38) COMMENTS ON THE COAST GUARD'S APRIL 1976 NOTICE OF PROPOSED RULEMAKING WERE RECEIVED. THESE PUBLIC COMMENTS WERE UNANIMOUS IN THEIR APPREHENSION WITH REGARD TO THE HAZARDS INHERENT WITH THE COLLECTION AND TRANSMISSION OF FLAMMABLE MIXTURES. MANY OF THESE COMMENTS WERE FINELY DETAILED AND EXHIBITED SOUND ENGINEERING JUDGEMENT. ANALYSIS OF THESE NEGATIVE COMMENTS APPEARS TO REINFORCE THE CONCERNS ORIGINALLY VOICED BY THE COAST

GUARD RELATIVE TO THE HAZARDS OF VRS FOR TANK VESSELS. ADDITIONALLY, PRELIMINARY RESULTS FROM CG-R&D PROJECTS HAVE INDICATED THAT THE HAZARDS ASSOCIATED WITH VRS ARE INDEED SIGNIFICANT, AND FURTHER EFFORT MUST BE EXPENDED TO FURTHER DELINEATE AND MITIGATE THESE HAZARDS.

TO DATE, THE COAST GUARD HAS UNDERTAKEN SEVERAL R&D PROJECTS TO EVALUATE THE SCOPE OF THE HAZARDS ASSOCIATED WITH THE COLLECTION AND TRANSMISSION OF FLAMMABLE VAPORS THAT ARE TYPICAL OF VRS OPERATION. LITERATURE SEARCHES HAVE YIELDED NUMEROUS STUDIES THAT HAVE BEEN CONDUCTED WITH FLAMMABLE MIXTURES IGNITED WITHIN CLOSED VESSELS, E.G., PIPING, DUCTS, PRESSURE VESSELS, ETC.

THESE STUDIES INDICATE THAT THE PROPAGATION OF A FLAME FRONT AND THE POSSIBLE DETONATION OF ENCLOSED FLAMMABLE MIXTURES IS A PHENOMENON WHICH IS NOT YET WHOLLY UNDERSTOOD.

THEREFORE, THE COAST GUARD BELIEVES THAT ADDITIONAL DATA MUST BE OBTAINED ON FLAME/DETONATION PROPAGATION AND ITS QUENCHING OR SUPPRESSION. THIS INFORMATION IS ESSENTIAL BEFORE REASONABLE ASSURANCES OF RELIABILITY AND SAFETY CAN BE GIVEN FOR SPECIFIC TYPES OF FLAME CONTROL OR EXPLOSION SUPPRESSION DEVICES. IT IS ANTICIPATED THAT OUR R&D PROJECT, ENTITLED, "DESIGN CRITERIA FOR FLAME CONTROL DEVICES FOR CARGO VENTING SYSTEMS," WILL PROVIDE SUCH DATA. THIS R&D PROJECT IS PRESENTLY BEING MODIFIED TO ALSO TEST COMMERCIALLY-AVAILABLE FLAME CONTROL DEVICES.

ANOTHER R&D PROJECT WE HAVE IS ENTITLED, "VENT SYSTEMS AND LOADING CRITERIA FOR AVOIDING TANK OVERPRESSURIZATION." THIS PROJECT IS BEING UNDERTAKEN IN TWO DISTINCT PHASES. THE FIRST PHASE, WHICH HAS BEEN RECENTLY COMPLETED, CONSISTED OF MATHEMATICAL MODELING TO EVALUATE THE OVERPRESSURE OF ANY GIVEN CARGO TRANSFER OPERATOR, BASED UPON CARGO PROPERTIES, LOADING RATE, TANK CHARACTERISTICS, AND THE VENT SYSTEM. THE SECOND PHASE, THE ACTUAL VALIDATION OF THE MATHEMATICAL MODEL BY PRESSURIZING REPRESENTATIVE TANK MODELS, WILL COMMENCE SHORTLY.

THE RESULTS OF THESE OVERPRESSURIZATION TESTS SHOULD GIVE INSIGHT INTO THE RELIEF OF TANK OVER/UNDER PRESSURIZATION. FUTURE CARGO TANK VENT SIZING AND RELIEF DEVICE CRITERIA WILL BE DEPENDENT UPON THIS DATA. IT IS WIDELY BELIEVED THAT THE VENT SYSTEMS PRESENTLY INSTALLED ON TANK VESSELS MAY BE INADEQUATE FOR USE WITH VRS.

ALTHOUGH THE RESULTS OF OUR R&D PROJECTS HAVE BEEN HELPFUL, THE COAST GUARD REQUIRES SUPPLEMENTARY DATA BEFORE APPROVAL OF A TANK VESSEL VRS COULD BE GRANTED. ELEMENTS WHICH MUST BE FURTHER DEVELOPED TO INSURE THE PROPER ASSESSMENT RELATIVE TO SAFE OPERATION OF VRS ARE AS FOLLOWS:

- ADEQUATE SUPPRESSION OF FLAME/EXPLOSION PROPAGATION WITHIN THE VRS
- MINIMIZATION OF IGNITION SOURCES
- ACCURATE METHODS FOR GAGING LIQUID CARGO LEVELS WITHIN CLOSED TANKS

- ADEQUATE RELIEF OF CARGO TANK OVER/UNDER PRESSURIZATION

IF THE COAST GUARD'S EXPERIENCE IN THIS AREA CAN BE USED AS AN ACCURATE INDICATOR, AN ACCEPTABLE VRS FOR GASOLINE, CRUDE OIL, AND SIMILAR CARGOES WILL NOT BE AVAILABLE FOR THREE TO FIVE YEARS.

WE WOULD LIKE TO EMPHASIZE THAT BECAUSE OF THE NEED FOR ADDITIONAL HYDROCARBON EMISSION DATA AS WELL AS OTHER TECHNICAL PROBLEMS WITH VRS, THE EPA HAS SUSPENDED INDEFINITELY THE COMPLIANCE DATES ESTABLISHED FOR THE RECOVERY OF VOLATILE COMPOUND VAPORS FROM SHIP AND BARGE LOADING IN THE HOUSTON/GALVESTON AREA. THIS ACTION WAS ANNOUNCED IN THE FEDERAL REGISTER OF NOVEMBER 16, 1976.

THE OPERATIONAL OPTIONS, AS ALTERNATIVES FOR REDUCING TANK VESSEL EMISSIONS, GENERATE OTHER PROBLEMS.

IF VESSEL OPERATORS MOVE FURTHER WEST, OUTSIDE THE SO-CALLED COASTAL WATERS, THE OPERATION WILL BE IN MORE EXPOSED WATERS WHICH ARE INHERENTLY LESS SAFE. THERE WOULD ALSO BE THE INCREASED PROBABILITY OF MORE OIL SPILLS AS WELL AS LONGER TRANSITS THAT CONSUME MORE FUEL AND TIME FOR THE LIGHTER. TO MAINTAIN A GIVEN THRUPUT WOULD REQUIRE EITHER MORE LIGHTERING SHIPS THUS INCREASING TRAFFIC, OR MORE LINGERING OF VLCC'S.

IF THE OPERATORS MOVE TO A LOCATION SOUTH OF THE UNITED STATES - MEXICAN BORDER THEY MAY ESCAPE DOMESTIC REGULATION BUT THE SAME CONCERNS AS WITH THE MOVING WEST OPTION ARISE. IF POTENTIAL INTERNATIONAL COMPLICATIONS COULD BE RESOLVED, THE SHIPS COULD

CONCEIVABLY LIGHTER IN EVEN CLOSER PROXIMITY TO SAN DIEGO THAN PRESENTLY. IN THE ABSENCE OF A SCIENTIFIC BASIS FOR THE SO-CALLED COASTAL WATERS, IT IS NOT CLEAR HOW CALIFORNIA WOULD BE AFFECTED.

OTHER OPERATIONAL OPTIONS SUGGESTED INCLUDE TANK WASHING PRIOR TO LOADING OUTSIDE THE COASTAL WATERS AS MENTIONED ON PAGE 51 OF THE CARB REPORT. REQUIRING TANK WASHING AS AN OPERATIONAL OPTION, WHEN IT WOULD NOT OTHERWISE OCCUR, ENCOURAGES WATER POLLUTION SINCE THE OILY WASH WATER MUST BE DISPOSED OF SOMEWHERE. A SLOP TANK ON THE VLCC WOULD BE A BETTER APPROACH, BUT EVEN THIS MUST BE CAREFULLY INVESTIGATED. WE WOULD NOT WANT THE OILY BALLAST TO GO INTO SEGREGATED BALLAST TANKS WHICH MUST BE KEPT CLEAN. IN ANY CASE, IF TANK WASHING WERE FEASIBLE, IT DOES TAKE TIME, AT LEAST A DAY, THUS REQUIRING ADDITIONAL TIME TO TRAVEL THE DISTANCE TO AND FROM THE BOUNDARIES OF THE SO-CALLED COASTAL WATERS. THEREFORE, THE LIGHTERING OPERATION WILL EXTEND OVER A LONGER PERIOD OF TIME NOT ONLY WILL THE LIGHTERS CONSUME MORE FUEL BUT ALSO THEY WILL HAVE TO ENGAGE IN THE HAZARDOUS TANK WASHING OPERATION.

PAGE 51 OF THE REPORT SUGGESTS THAT SHORT LOADING WOULD BE AN ACCEPTABLE OPERATIONAL SOLUTION. THE CONSEQUENCES OF SHORT LOADING CLEARLY LEADS TO DECREASED STABILITY OF THE SHIP BECAUSE OF THE FREE SURFACE EFFECT AS WELL AS THE POSSIBILITY OF STRUCTURAL DAMAGE FROM THE SLOSHING OF THE CARGO. IN ADDITION, A MUCH GREATER VAPOR SATURATION OF THE TANK ATMOSPHERE COULD OCCUR FROM THE WETTING AND DRYING OF THE TANK FROM THE SLOSHING,

NONE OF WHICH WOULD BE PRESENT IN A PRESSED-UP TANK.

WE ARE REALLY UNCERTAIN OF YOUR INTENTIONS REGARDING SHORT LOADING. YOU PROPOSE A 10-FOOT ULLAGE WHICH WE TAKE TO BE BASED UPON THE SIGNIFICANT DIFFERENCE IN VAPOR CONCENTRATION BETWEEN THE CARGO SURFACE AND THE TOP OF THE TANK. WE THOUGHT THAT THIS ULLAGE LIMITATION WAS INTENDED TO PREVENT EMISSION OF THE HEAVY VAPOR LAYERS NEAR THE CARGO SURFACE. HOWEVER, WE FIND IN THE PROPOSAL BEFORE US TODAY THE STATEMENT ON PAGE 40 THAT VAPORS ARE "GENERALLY WELL-MIXED AND OF UNIFORM CONCENTRATION." THIS IS CONTRARY TO AVAILABLE SCIENTIFIC AND EMPIRICAL INFORMATION. THE RESULT IS THAT WE ARE NOT AT ALL CLEAR AS TO YOUR RATIONALE FOR OR RECOGNITION OF THE CONSEQUENCES OF SHORT LOADING.

LET ME MOVE ON TO ADDRESS THE AREA DEALING WITH THE SIGNIFICANCE OF THE PROBLEM. HOW DOES LIGHTERING OFFSHORE NEAR SAN CLEMENTE ISLAND AFFECT AIR QUALITY? THE ANALYSIS OFFERED BY THE CARB STAFF IS A METEOROLOGICAL STUDY WHICH SIMPLY INDICATES THAT THE WIND TENDS TO BLOW FROM WEST TO EAST. BUT, WHAT FRACTION OF OFFSHORE EMISSIONS IS ACTUALLY TRANSPORTED TO SHORE? THE BOUNDARIES DRAWN IN THE CARB REPORT TO DEFINE "COASTAL WATER" OF SOUTHERN CALIFORNIA ARE FAR TOO NEATLY CONSTRUCTED TO HAVE ANY SCIENTIFIC BASIS. SINCE THE MAJOR AND PERHAPS ONLY ACTIVITY EMITTING HYDROCARBONS OFFSHORE IS LIGHTERING, IT IS APPROPRIATE TO ASK WHETHER ANY SCIENTIFIC INSTRUMENTATION DOWNWIND OF THAT OPERATION HAS BEEN CONDUCTED. SURELY THE EFFLUENTS MUST EVENTUALLY DISSIPATE, CHANGE THEIR CHEMICAL COMPOSITION, OR FALL IN THE SEA OR TO EARTH. THE CARB REPORT PRESENTATION LEADS THE READER TO BELIEVE

THAT EFFLUENTS ISSUED INTO THE AIR UPWIND OF CALIFORNIA MUST INEVITABLY REACH CALIFORNIA IN FULL STRENGTH AND UNALTERED IN THEIR STATE. COMMON SENSE WOULD EXPECT A GRADUATED FIELD DOWNWIND OF THE EMISSION POINT WHERE ONE WOULD FIND, PROGRESSIVELY, 90 PERCENT OF FULL STRENGTH, THEN 80 PERCENT AND SO ON, DIMINISHING WITH DISTANCE. IN ADDITION, DURING THE SUMMER, A PRONOUNCED LAND-SEA BREEZE ZONE EXISTS BOTH 5 TO 10 MILES OFFSHORE AND INSHORE THAT ESSENTIALLY ESTABLISHES AN OSCILLATING ZONE BETWEEN NIGHT AND DAY DELAYING OR EVEN AVERTING THE ARRIVAL OF EFFLUENTS ONSHORE. THE REPORT ALSO SUGGESTS THE WORST CASE WHICH IS DEFINED AS THE MAXIMUM EFFLUENT FROM THREE VESSELS DISCHARGING SIMULTANEOUSLY. THIS INFORMATION IS INADEQUATE IF NOT ACCOMPANIED BY AN ESTIMATE OF HOW OFTEN THAT CONDITION IS LIKELY TO OCCUR, AND SECONDARILY, THERE SHOULD BE AN INDICATION OF HOW MUCH EFFLUENT MAY ACTUALLY REACH SHORE. THERE BEING NO OTHER OPERATION GOING ON OFFSHORE TO BE MISTAKEN FOR THESE SOURCES, IT SEEMS A RELATIVELY SIMPLE BUSINESS TO CARRY OUT A DOWNWIND, SCIENTIFICALLY INSTRUMENTED EFFORT USING TRACERS SUCH AS SILVER CHLORIDE THAT IS USED IN ARTIFICIAL RAINMAKING. WE WOULD SUGGEST INCLUSION OF A METHOD TO VARY THE INTENSITY OF THE EMISSIONS BY DELIBERATELY CAUSING THE COINCIDENCE OF OPERATIONS FOR THE MAXIMUM EMISSIONS AND ALSO TERMINATING THE OPERATIONS TO ACHIEVE MINIMUM EMISSIONS IN ORDER TO INDICATE THE SENSITIVITY OF THE CONTRIBUTION FROM LIGHTERING EMISSIONS AIR QUALITY. YOU COULD THEN BACK UP THESE ANALYTIC WIND FLOW "STUDIES" WITH HARD, SCIENTIFIC EMISSION DATA. UNTIL THAT IS DONE, THESE PROPOSALS MAY BE CHALLENGED AS TO NECESSITY. IT DOES NOTHING

FOR THE ENVIRONMENTAL CAUSE TO PRESENT UNPROVEN ALLEGATIONS WHEN AN OPPORTUNITY EXISTS TO PROVIDE HARD, INCONTROVERTIBLE FACTS. WE URGE SUCH AN EFFORT BE CARRIED OUT AND TO CONSIDER THE SO-CALLED STUDY PRESENTED IN THIS REPORT AS ONLY INDICATING THE POTENTIAL FOR A PROBLEM FROM LIGHTERING. IT WOULD ALSO BE HELPFUL IF THE REPORT SPECIFIED STAFF ASSUMPTIONS AS TO THE EMISSION FACTORS SO THAT THE READER COULD FOLLOW THE NUMBERS USED. AS IT IS NOW, THE REPORT IS SIMPLY AN OPINION IN THIS REGARD.

I WOULD ALSO LIKE TO ADDRESS COAST GUARD REGULATORY EFFORTS REGARDING SEGREGATED BALLAST AND INERT GAS SYSTEMS. REFERENCE IS MADE ON PAGE 54 IN THE CARB REPORT TO COAST GUARD REGULATIONS WHICH ARE IN A PROPOSED STATE. THE PRESUMPTION IS MADE BY THE CARB THAT THESE WILL BE IN EFFECT IN A SHORT TIME. UNDER THE FEDERAL ADMINISTRATIVE PROCEDURES ACT A LENGTHY AND FORMAL ANALYSIS OF MEASURES HAVING FAR-REACHING EFFECTS IS REQUIRED. IT IS SUGGESTED IN THE CARB REPORT THAT THERE IS NO GREAT PROBLEM IN RETROFITTING OF INERT GAS SYSTEMS AND SEGREGATED BALLAST. IF THAT IS IN FACT FOUND TO BE THE CASE, SUCH MAY BE REQUIRED. HOWEVER, THE CARB STAFF TAKES IT FOR GRANTED THAT THESE WILL BE REQUIRED, TAKES A CASUAL VIEW OF THE TIME A VESSEL WILL BE OUT OF SERVICE, AND SHOWS NO RECOGNITION OF THE LIMITED SHIP BUILDING AND REPAIR FACILITIES IN THIS COUNTRY. THE LENGTH OF TIME TO EFFECT A CHANGE IN EQUIPMENT ABOARD SHIP MAY NOT BE VERY LONG ONCE IN THE SHIPYARD, BUT THE WAIT FOR THE WORK TO BE SCHEDULED AND THE PROCUREMENT OF MATERIALS CAN BE SIGNIFICANT. FURTHER-

MORE, IT IS STATED IN THE CARB REPORT THAT THE COAST GUARD IS PROPOSING THAT ALL TANKERS GREATER THAN 20,000 DEADWEIGHT BE "RETROFITTED WITH FULLY SEGREGATED BALLAST AND INERT GAS SYSTEMS." IT IS NOT KNOWN WHAT IS MEANT BY "FULLY SEGREGATED" IN THIS APPLICATION. IT DOES NOT APPEAR IN THE GLOSSARY. I CAN ASSURE YOU THAT THE COAST GUARD TECHNICAL STAFF IS WELL AWARE OF A SIGNIFICANT VARIATION IN THE RELATIONSHIP BETWEEN LIGHTWEIGHT AND DEADWEIGHT WITH SIZE WHICH MAKES IT IMPRACTICAL TO REQUIRE AN APPRECIABLE AMOUNT OF SEGREGATED BALLAST IN SMALLER SHIPS. THUS, THIS REMARK IS WISHFUL THINKING BY INFERRING THAT SEGREGATED BALLAST IN LIGHTERING SIZE SHIPS WILL BE REQUIRED AT A LEVEL RESEMBLING THAT EMPLOYED AND PRACTICAL OF ATTAINMENT IN A VLCC.

SEVERAL STATEMENTS ARE COUCHED IN INACCURATE MARINE TERMINOLOGY. THIS ALSO APPLIES TO A FEW DEFINITIONS IN THE GLOSSARY. THOSE OF US ACCUSTOMED TO THE CORRECT USAGE OF THESE TERMS ARE THEREFORE LEFT IN DOUBT OF EXACTLY WHAT IS INTENDED. IN THE INTEREST OF SAVING TIME, I WON'T ELABORATE FURTHER. HOWEVER, I HAVE ATTACHED A GLOSSARY OF RECOGNIZED USAGE FROM A COAST GUARD PUBLICATION THAT SHOULD PROVE HELPFUL.

I WOULD ALSO LIKE TO INVITE YOUR ATTENTION TO THE FACT THAT LIGHTERING HAS BEEN THE TOPIC OF BOTH LEGISLATIVE AND REGULATORY CONCERN WITHIN THE FEDERAL GOVERNMENT. THE COAST GUARD PUBLISHED PROPOSED REGULATIONS IN THE FEDERAL REGISTER FOR JUNE 27, 1977, TO DEAL WITH OIL-TRANSFER OPERATIONS WITHIN THE U.S. TERRITORIAL SEA AND CONTIGUOUS ZONE (THAT IS, OUT TO 12 NAUTICAL MILES).

THE COMMENT PERIOD ON THESE PROPOSED REGULATIONS CLOSED ON SEPTEMBER 2, AND THE COMMENTS RECEIVED ARE NOW BEING REVIEWED AT COAST GUARD HEADQUARTERS IN WASHINGTON.

IN ADDITION, THE U.S. SENATE RECENTLY PASSED AND SENT TO THE HOUSE A BILL ENTITLED THE "TANKER AND VESSEL SAFETY ACT OF 1977," WHICH WOULD SUBSTANTIALLY AMEND THE PORTS AND WATERWAYS SAFETY ACT OF 1972. THE BILL, IF ENACTED IN ITS PRESENT FORM, WOULD ALSO PROVIDE FOR FEDERAL REGULATION OF LIGHTERING WITHIN, AND TO SOME EXTENT EVEN BEYOND, THE CONTIGUOUS ZONE. THE HOUSE, OF COURSE, MAY MAKE CHANGES IN THE BILL, AND THE FINAL FORM OF THE LEGISLATION IS AS YET UNPREDICTABLE. IF EITHER THE PROPOSED COAST GUARD REGULATIONS OR THE PENDING LEGISLATION, OR BOTH, SHOULD ENTER INTO EFFECT, THE PROPOSED STATE REGULATIONS WOULD ALMOST CERTAINLY INVOLVE CONFLICTS AS TO THE MANNER IN WHICH LIGHTERING WOULD BE REGULATED. WE NOTE THAT THE U.S. SUPREME COURT IS NOW CONSIDERING A CASE ARISING UNDER WASHINGTON STATE' S TANKER LAW, IN WHICH THE LOWER COURT CONCLUDED THAT THE PORTS AND WATERWAYS SAFETY ACT PREEMPTS TANKER OPERATIONS FROM REGULATION BY THE STATE. THE DECISION IN THAT CASE COULD, TO A LARGE EXTENT, CONTROL THE VALIDITY OF THE PROPOSED REGULATIONS BEING DISCUSSED HERE TODAY.

WE WOULD ALSO SUGGEST THAT THE STATE'S ASSERTION OF AUTHORITY TO REGULATE THE ACTIVITY OF VESSELS OUTSIDE THE 3-MILE LIMIT OF THE STATE'S WATERS, EVEN THOUGH THE EFFECT OF THE REGULATION

WOULD BE RATHER INDIRECT, MAY EXCEED THE POWERS OF THE STATE. WHILE THE UNITED STATES HAS JURISDICTION WITH RESPECT TO CUSTOMS, FISCAL, IMMIGRATION AND SANITARY MATTERS IN THE WATERS OF THE CONTIGUOUS ZONE OUT TO TWELVE NAUTICAL MILES OFFSHORE, THE WATERS IN THE CONTIGUOUS ZONE AND BEYOND RETAIN THEIR CHARACTER AS HIGH SEAS. AS A MATTER OF INTERNATIONAL LAW, VESSELS OF ALL NATIONS HAVE AN UNRESTRICTED RIGHT TO NAVIGATE FREELY ON THE HIGH SEAS AND THE UNITED STATES HAS A FUNDAMENTAL INTEREST IN MAINTAINING THE FREEDOM OF NAVIGATION IN THE EXPECTATION THAT ITS OWN VESSELS WILL RECEIVE SIMILAR TREATMENT. RESTRICTIONS IN THE RECOGNIZED RIGHT OF FREEDOM OF NAVIGATION SHOULD NOT BE IMPOSED LIGHTLY FOR THEY CARRY INTERNATIONAL IN ADDITION TO STATE AND NATIONAL IMPLICATIONS. AS YOU KNOW THE U.S. CONSTITUTION VESTS IN THE FEDERAL GOVERNMENT THE POWER TO ACT FOR THE SEVERAL STATES IN MATTERS OF FOREIGN RELATIONS.

IT IS OF COURSE FOR THE COURTS TO DECIDE QUESTIONS OF THE KINDS I JUST DESCRIBED, BUT IN THE FACE OF THE PROBLEMS OF CONSTITUTION MAGNITUDE WHICH MAY EXIST, WE WOULD URGE THE STATE TO CAREFULLY STUDY WHETHER OR NOT TO UNDERTAKE TO REGULATE, EVEN INDIRECTLY, THE ACTIVITIES OF VESSELS SEAWARD OF THE STATE'S WATERS. TO ACT IN HASTE WILL ALMOST SURELY INVITE LITIGATION.

WE HAVE TRIED TO DELINEATE THE HAZARDS WHICH WE SEE IN THE OPTIONS YOU HAVE LEFT AS POSSIBILITIES. THE SAFETY, ENVIRONMENTAL AND OTHER ISSUES ARE OF CONCERN TO US. IT IS THE COAST GUARD'S OPINION THAT AT THE PRESENT TIME THESE UNRESOLVED CONCERNS FAR OUTWEIGHT THE SPECULATIVE IMPROVEMENT IN AIR QUALITY, HOWEVER,

THE COAST GUARD DOES NOT BELIEVE THAT THE HAZARDS IDENTIFIED ARE INSURMOUNTABLE. WE DO BELIEVE THAT THE TRUE SOLUTION LIES IN THE DIRECTION OF ZONED CONSTRUCTION OF MODERN TERMINAL FACILITIES AND/OR DEEP WATER PORTS TO PRECLUDE THE NECESSITY FOR LIGHTERING. WE WOULD ALSO URGE PROPER CONSIDERATION BE GIVEN TO THIS AREA.

THE COAST GUARD IS SERIOUS ABOUT ITS CONCERN WITH AIR QUALITY. WE HAVE DEVOTED ABOUT 700 THOUSAND DOLLARS TO RESEARCH IN THE VAPOR RECOVERY SYSTEM SAFETY AREA. IN THE INTEREST OF SCIENTIFIC INFORMATION WE ARE WILLING TO REQUEST AN EXTENSION OF OUR R&D CONTRACTS TO LOOK INTO THE SHIP TO SHIP VAPOR TRANSFER SITUATION SHOULD THE CARB SO REQUEST. YOU SHOULD ALSO BE AWARE THAT LOCALLY WE ARE ASSISTING THE CURRENT BALLOON AIR SAMPLING RESEARCH BEING CONDUCTED IN THE SANTA BARBARA CHANNEL AND WILL BE PLEASED TO PROVIDE SIMILAR NAUTICAL POSITION AND TRACKING SERVICES IN ANY FURTHER SCIENTIFIC EFFORTS DEDICATED TO ESTABLISHING JUST WHAT IMPACT OFFSHORE LIGHTERING MAY HAVE ON AIR QUALITY IN CALIFORNIA.

THANK YOU.

lane county

February 23, 1978

Environmental Quality Commission
1234 S. W. Morrison Street
Portland, Oregon 97205

ATTN: JOE RICHARDS, CHAIRMAN

Dear Members:

We take this opportunity to offer our support in encouraging you to adopt a temporary moratorium on the issuance of construction permits for the installation of subsurface sewage disposal systems in the geographically described area of River Road/Santa Clara area of Lane County, as described on the attached Exhibit A. Investigations by this Division over the past several years have indicated that the ground water table in that area is becoming grossly polluted by septic tank effluent being discharged into it. We have concerns for the immediate health of individuals living within this area especially those which might be utilizing this ground water for domestic water supply in spite of the fact that public water is available.

Our further longrange concern is that this natural resource, the ground water lying beneath this area, is being destroyed in a manner which will negate its future use by future generations. The attitude of some has been, "we are not using it for domestic purposes now, therefore why should we not deposit waste into it?" We feel that the responsibility lies within our jurisdictions to protect this natural resource for use by future generations.

Your consideration of this request for immediate moratorium of further development in this area is greatly appreciated.

Very truly yours,

John C. Stoner

John C. Stoner, R.S., Director
Environmental Health Division

JCS/mm
Enc. 1
CC: Robert Whittaker (CH&SS), Roy Burns (Water Pollution), Board of County Commissioners

EXHIBIT A

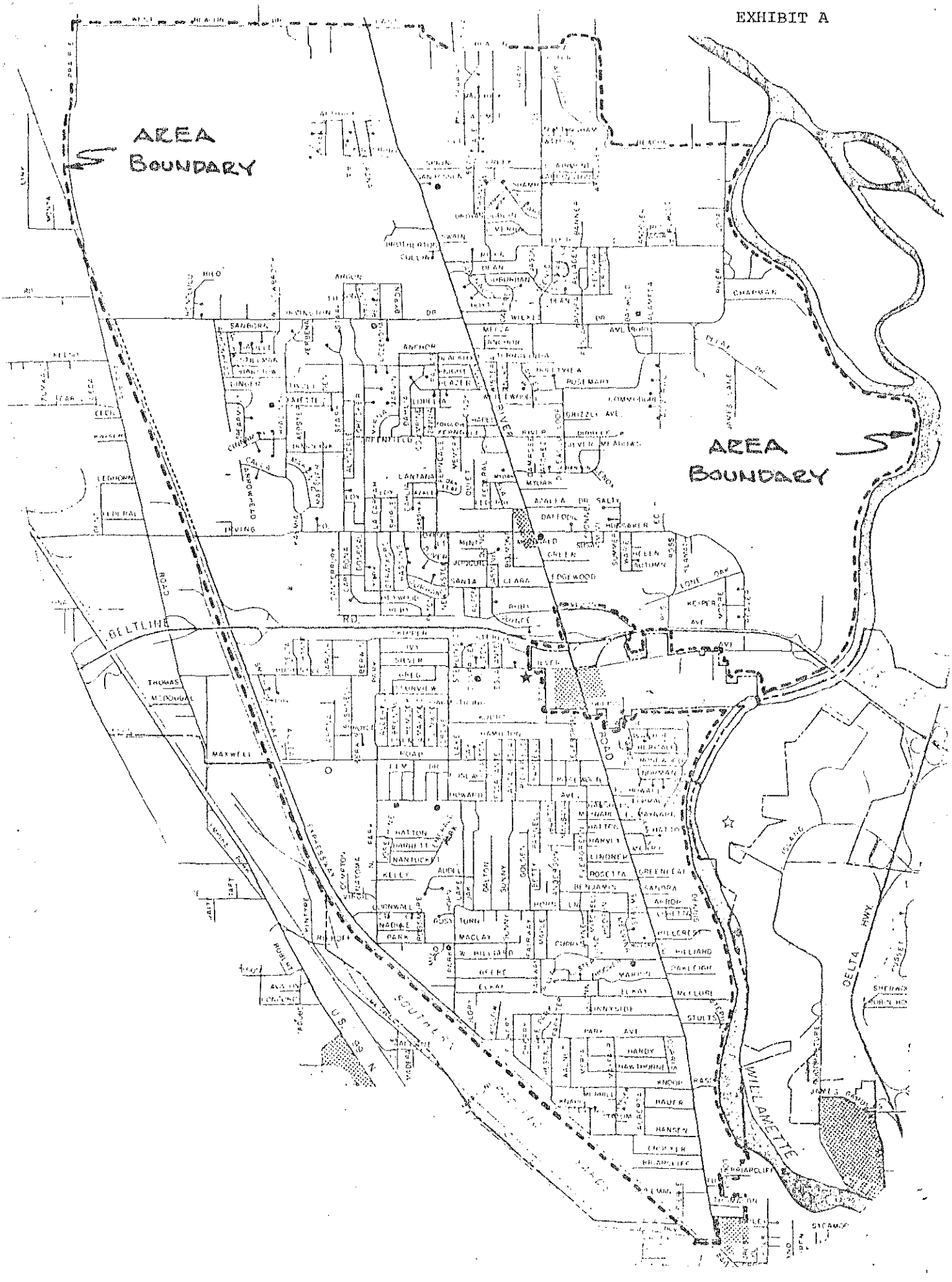


EXHIBIT "A"

MEMORANDUM

lane county

TO Environmental Quality Commission

FROM Roy L. Burns, Director - Water Pollution Control

SUBJECT River Road - Santa Clara Area
Request for Establishment of a Moratorium

DATE February 23, 1978

On February 22, 1978 the Lane County Board of Commissioners approved Resolution No. 78-2-22-3 (copy attached) which requests that you "... place a moratorium upon the issuance of construction permits and favorable reports of evaluation of site suitability for new subsurface sewage disposal systems within the boundaries of River Road - Santa Clara, Oregon ...". The Board further resolved to aggressively pursue a solution to the waste disposal needs of the area, and to re-assess the situation after six months to ascertain whether or not the moratorium should be continued.

Attached for your information is a very brief preliminary staff report which describes the River Road - Santa Clara area.

In short, the River Road - Santa Clara area presents serious potential groundwater contamination problems resulting from subsurface sewage disposal systems serving a very large, densely developed residential community. It is these concerns for public health and groundwater quality which led the Board to take the action described previously.

Discussion of the moratorium has been on-going in the local area for some time now. As a result, there has been a substantial surge of permit/site inspection activity in the past couple of months. In order to reduce such speculative land development activity, the Board has directed their Legal Counsel to develop an order prohibiting further land divisions and rezonings in the River Road - Santa Clara area for consideration and action.

Attached for your consideration are several items associated with the establishment of a moratorium on further subsurface disposal system installations in the River Road - Santa Clara area, as follows:

1. The Lane County Board of Commissioner's Resolution No. 78-2-22-3 previously discussed.

2. The preliminary staff report previously discussed.

3. A map indicating the proposed River Road - Santa Clara moratorium area.

4. A written description of the proposed River Road - Santa Clara moratorium area boundaries.

5. A draft of findings which you could adopt in support of the proposed temporary rule to establish a moratorium in the River Road - Santa Clara area, if appropriate, as described in the "Recommended Action", below.

REQUESTED ACTION:

You are requested to consider the Board's resolution and to adopt a temporary moratorium on the issuance of construction permits and favorable site suitability reports in the River Road - Santa Clara area at this time. During the period of the temporary moratorium, the necessary public notice could be given and hearings held on the creation of the full moratorium. In the meantime, the crush of permit/site inspection applications based on speculation and subsequent aggravation of the potential problem would be averted.

IN THE BOARD OF COUNTY COMMISSIONERS OF LANE COUNTY, OREGON

RESOLUTION) IN THE MATTER OF ESTABLISHING A TEMPORARY MORATORIUM ON CONSTRUCTION PERMITS FOR SUBSURFACE SEWAGE DISPOSAL SYSTEMS IN RIVER ROAD - SANTA CLARA, OREGON

78 -2-22-3

WHEREAS, the Lane County Board of Commissioners adopted, effective June 9, 1971, a moratorium on major subdivision activity in the River Road - Santa Clara area based upon a concern that effluent from subsurface sewage disposal systems was contaminating ground water and surface water in the area, and

WHEREAS, the above mentioned moratorium on major subdivisions has remained in effect to date, but considerable development has continued to take place on previously platted lots and through minor partitioning, and

WHEREAS, a groundwater study, published in June, 1972 by Roger Dickinson, of the River Road - Santa Clara area found nitrate contamination of the groundwater in excess of U.S. Public Health Service standards and concluded that such contamination was related to the dense development on subsurface sewage disposal systems, and

WHEREAS, a more recent, unpublished groundwater contamination study of the River Road - Santa Clara area by the Lane County Environmental Health Division proved inconclusive due to extremely limited winter rainfalls and the resultant low groundwater table levels, and

WHEREAS, the Lane County Board of Commissioners initiated a detailed technical evaluation of the River Road - Santa Clara area on August 3, 1977, in an effort to determine the relationship between groundwater quality in the area and existing and projected residential development, and

WHEREAS, the State of Oregon Environmental Quality Commission, pursuant to ORS 454.605 to 454.745, has been granted the authority over subsurface sewage disposal systems within the State of Oregon, and therefore be it hereby

RESOLVED that the State of Oregon Environmental Quality Commission be requested to place a moratorium upon the issuance of construction permits and favorable reports of evaluation of site suitability for new subsurface sewage disposal systems within the boundaries of River Road - Santa Clara, Oregon hereinafter attached as Appendix A.

RESOLVED that this moratorium shall last only for a six month period until the detailed technical evaluation of the relationship between the groundwater quality of the River Road - Santa Clara area and existing and projected residential development is concluded and the appropriate follow-up actions have been completed.

FURTHER RESOLVED that, after a six month period, the Lane County Board of Commissioners is committed to review the situation and review any proposals that address groundwater quality.

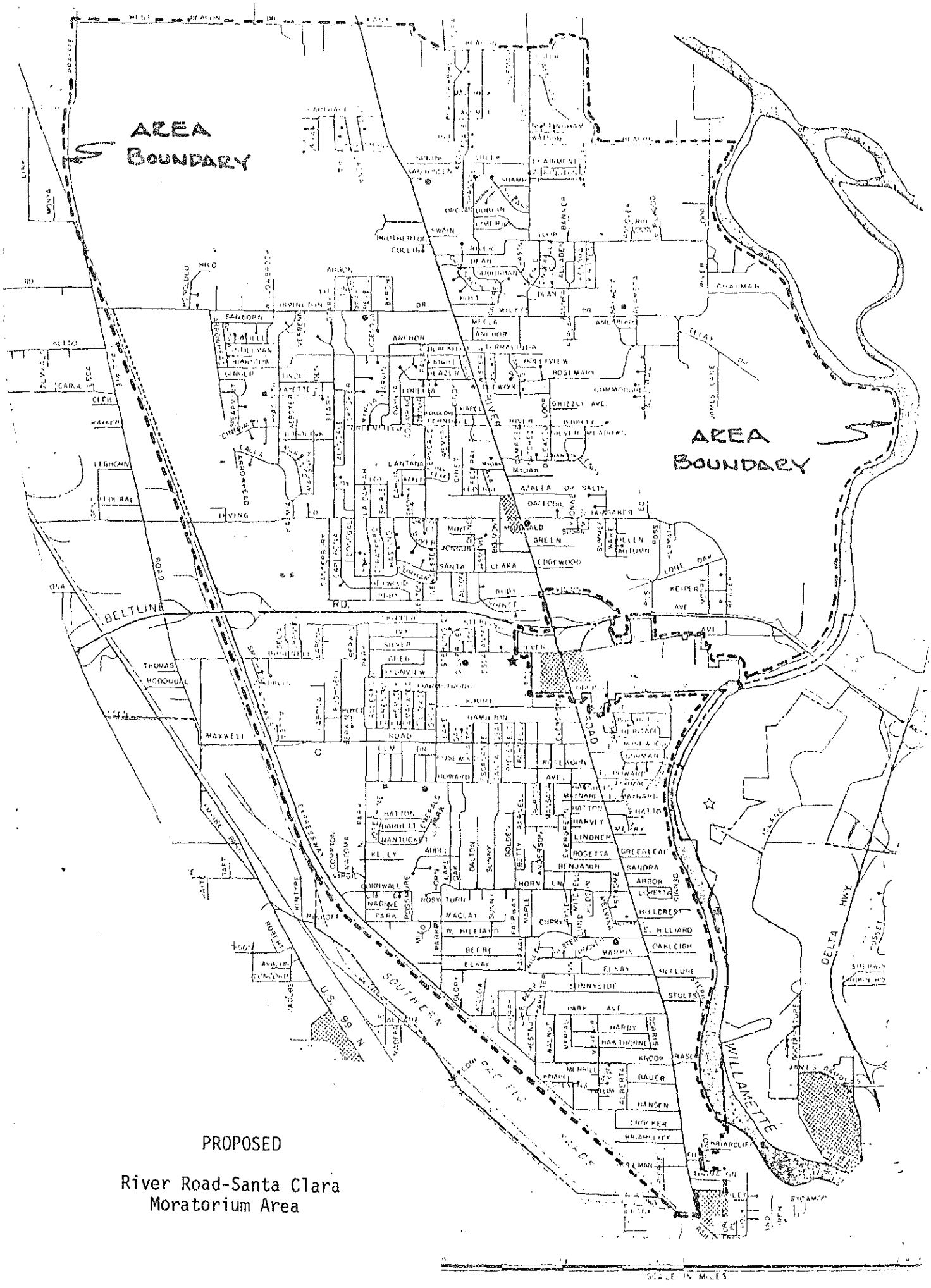
DATED this 22nd day of February, 1978

BOARD OF COUNTY COMMISSIONERS,
LANE COUNTY, OREGON

/s/ Gerald H. Rust, Jr.
Chairman, Lane County Board of Commissioners

GCS:dkl

APPROVED AS TO FORM
DATE Feb 23, 1978 lane county
OFFICE OF LEGAL COUNSEL



PROPOSED

River Road-Santa Clara
Moratorium Area

PRELIMINARY STAFF REPORT
MODIFIED BY WATER POLLUTION CONTROL DIVISION STAFF
FROM JANUARY 11, 1978 PRELIMINARY REPORT TO LAND COUNTY BOARD OF COMMISSIONERS
BY H. RANDY SWEET, CONSULTING HYDROGEOLOGIST
RIVER ROAD - SANTA CLARA AREA

DEMOGRAPHY:

Significant development and increased growth in the River Road - Santa Clara area began in the 1940's and 1950's and reached a peak in the 1960's. Between 1940 and 1976 the population increased from approximately 3,000 to 27,500. The current estimate of dwelling units equivalents in the area is approximately 8,488. Essentially all of the population in the area disposes of sewage wastes through individual subsurface disposal systems.

GEOLOGY:

The River Road - Santa Clara area is underlain by recent alluvium, that is, lenses of gravel, pebbles and sand with minor silt and clay. Older alluvium occupies the western portion of the area while younger alluvium predominates the flood plain of the Willamette River. Both the older and younger alluvium provide large quantities of water to wells, evidence of their high permeability or hydraulic conductivity.

SOILS:

Excessively well drained to moderately well drained soils dominate the River Road - Santa Clara area, including gravelly alluvium, sandy loam, silt loam and silty clay loam. Most of the soils in the area can readily accept septic tank effluent. However, the subsurface disposal in the more well drained soils can result in rapid movement and inadequate treatment of septic tank effluent as it percolates from the disposal system to the shallow underlying alluvia aquifer. In other words, efficient disposal, but limited treatment of some constituants is the net result.

HYDROGEOLOGY:

The River Road - Santa Clara area receives more than 40 inches of precipitation annually (measured at Mahlon Sweet Airport). Precipitation is the major source of recharge to the shallow alluvial aquifer in the area with about 13 inches annually reaching the water table and the balance accounted for as runoff, evaporation and/or transpiration by vegetation.

The Willamette River and its tributaries are the main surface drains for the regional, intermediate and local groundwater discharge. The deep seated regional and intermediate flow systems receive recharge from the Cascades and Coast Range, as well as their foothills. The shallower local flow system is recharged by the above mentioned infiltrating precipitation on and immediately adjacent to the valley plain. Groundwater underflow in the local system is generally from the South (Eugene area) and toward the North-Northwest. The shallow nature of the local groundwater flow system as well as its high permeability or hydraulic conductivity make it particularly accessible for development, but also susceptible to contamination from surface sources.

While the immediate River Road - Santa Clara area utilizes imported water for domestic purposes supplied through the water districts serving the area, the area downgradient depends on groundwater as a sole source for domestic purposes. Household use and disposal of imported water via septic tank - drainfields may provide an estimated 1.1 billion gallons per year of aquifer recharge. This is about 30 percent of the total volume calculated for annual aquifer recharge.

GROUNDWATER QUALITY:

The quality of the groundwater in the shallow, local flow system in the Willamette Valley is generally acceptable for domestic consumption under natural conditions. In developed areas, a nimber of contaminants can be introduced to the aquifer, for example, via septic tank drainfield disposal as in this study area. Also, groundwater underflow from the adjacent upgradient Eugene urban area may provide significant amounts of contaminant to the study area. It is not possible to quantify this contribution due to lack of data points, specifically sampling stations.

While a number of parameters are important to water quality, nitrate has been the indicating parameter most widely discussed with respect to the River Road - Santa Clara area. This is primarily due to the fact that nitrate is an excellent tracer in groundwater movement due to its relative mobility and ease of testing. Nitrate is also significant in the E.P.A. has set a drinking water limit of 10 mg/l NO_3-N. While nitrate has been mentioned most frequently as the indicator of groundwater contamination in the area, several other water quality parameters have also been shown to be elevated above anticipated background levels.

Nitrogen is introduced to the groundwater by both natural, e.g. precipitation and vegetation, and induced sources, e.g. fertilizers, sanitary wastes and other land use or disposal activities. In the study area it has been estimated that precipitation and water supply background account for about one percent, dwelling unit fertilizer use about 8 percent, and sanitary wastes about 91 percent of the more than 536,000 lbs/yr of nitrogen generated. Note: Agricultural fertilizer and "other" sources have not been quantified.

Applying the estimates outlined above for recharge and nitrogen production in the River Road - Santa Clara area and assuming that dispersion and dillution are the primary mechanisms for attenuation of the nitrate-nitrogen entering the groundwater, it is possible to calculate the resultant concentrations expected in the groundwater. Initial estimates of the theoretical concentrations range from 3.7 to 16 mg/l NO_3-N, given the existing development densities. These levels compare to values ranging from 1.5 to 26.2 mg/l NO_3-N, observed at selected sampling stations during previous monitoring efforts.

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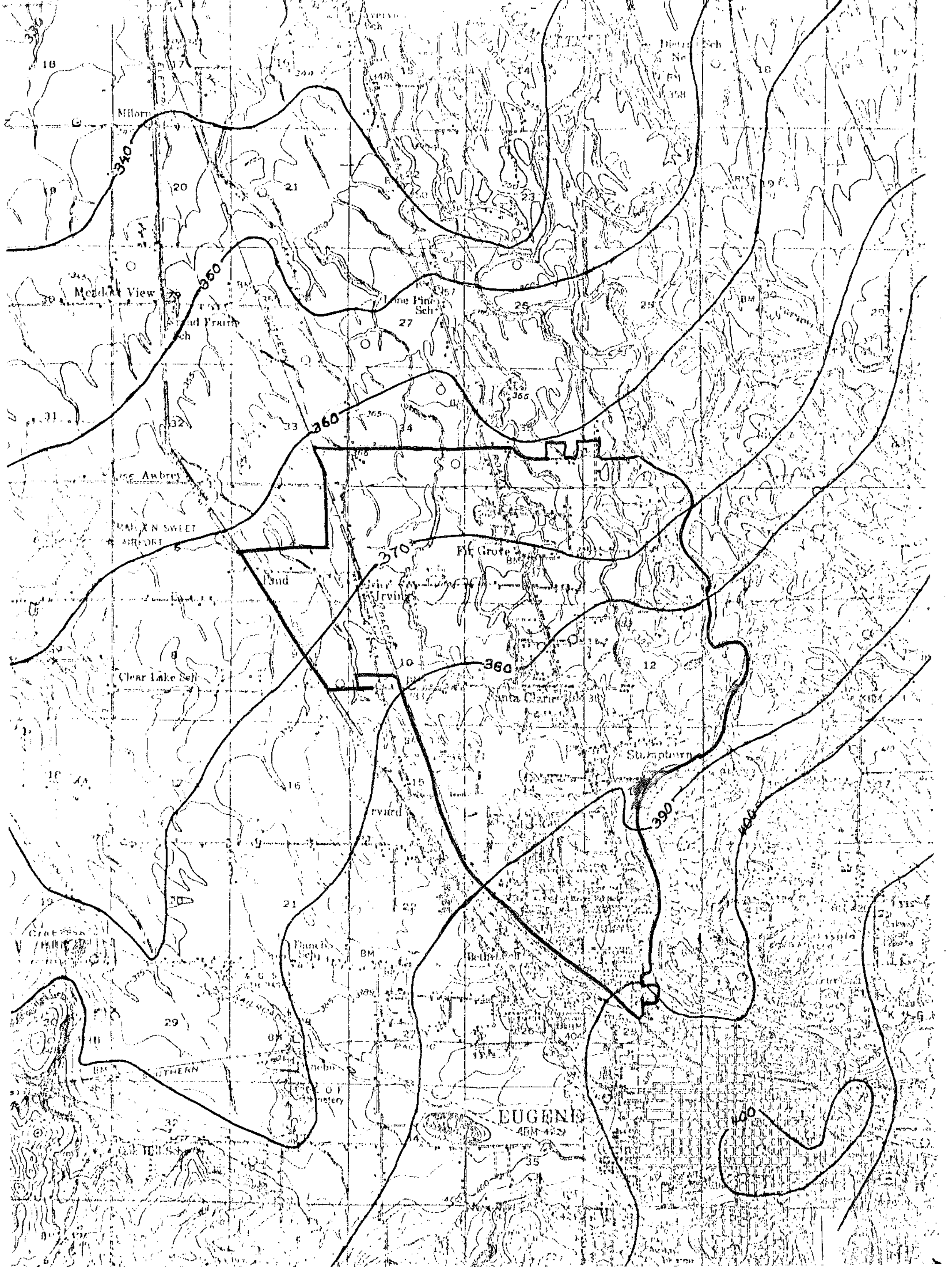

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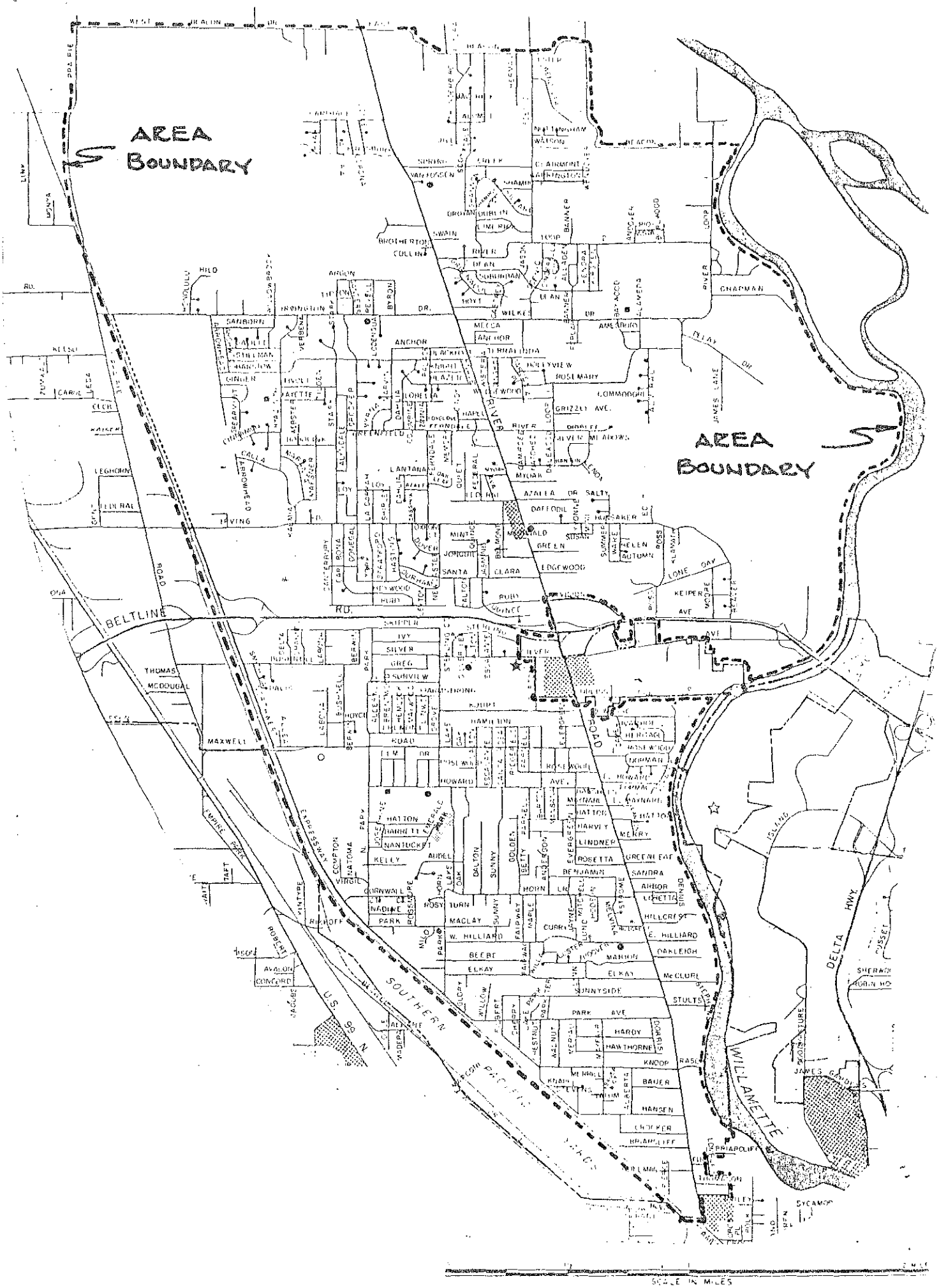
AREA BOUNDARY
AREA BOUNDARY
BELTLINE RD.
SOUTHERN PACIFIC
WILLAMETTE
DELTA HWY
SCALE IN MILES

EXHIBIT "A"

PROPOSED

Amend Oregon Administrative Rules 340-71-020 by adding a new subsection (9) to read as follows:

"(9) Pursuant to ORS 454.685, neither the Director nor his authorized representatives shall issue either construction permits or favorable reports of evaluation of site suitability for new subsurface sewage disposal systems within the boundaries of the following described geographic area of the State:

The area generally known as River Road - Santa Clara, and defined by the Boundary submitted by the Board of County Commissioners for Lane which is bounded on the South by the City of Eugene, on the West by the Southern Pacific Railroad, on the North by Beacon Drive, and on the East by the Willamette River, and containing all or portions of T-16S, R-4W, Sections 33, 34, 35, 36, T-17S, R-4W, Sections 1, 2, 3, 4, 10, 11, 12, 13, 14, 15, 22, 23, 24, 25, and T-17S, R-1E, Sections 6, 7, 18, Willamette Meridian.

Before the Environmental Quality Commission of the State of Oregon:

FINDINGS:

The Environmental Quality Commission finds that failure to act promptly in the adoption of a temporary rule, OAR 340-71-020(9), imposing a moratorium on issuance of construction permits for new subsurface sewage disposal systems or favorable reports of evaluation for site suitability within the boundaries of the River Road - Santa Clara area of Lane County will result in serious prejudice to the public interest or the interest of the parties concerned for the following reasons:

(1) Substantial presumptive evidence indicates that contamination of the ground water is resulting from the widespread and intensive use of subsurface sewage disposal systems in the River Road - Santa Clara area at the present time.

(2) The major source of nitrogen, a significant groundwater contaminant, in the River Road - Area is disposal of sewage wastes by septic tank - drainfield systems.

(3) As the production of nitrogen and other pollutants is directly related to the contributing population, groundwater contamination in the River Road - Santa Clara area may be expected to worsen as the population utilizing septic tank - drainfield systems for disposal of sewage wastes increases over time.

(4) Any time delay associated with establishment of a moratorium will most likely result in submittal of a very large number of speculative subsurface sewage disposal system permit/site inspection applications from the River Road - Santa Clara area and a subquent aggravation of the groundwater contamination problem.

(5) Establishment of the moratorium at this time will provide a respite during which the full moratorium issue can be considered following adequate public notice and hearings.

(DATE)

CHAIRMAN
ENVIRONMENTAL QUALITY COMMISSION

The Department has received 20 disposal requests involving out-of-state wastes from Chem-Nuclear. These consist of the following:

Disp. Req. No.	Waste Type/Origin	Quantity Requested for Disposal Present (Approx.)	Future
	British Columbia, Canada		
111	Arsenic contaminated bark/ sand mixture.	25-55 gal. drums	25 drums/yr.
112	PCB capacitors and various unwanted pesticides	50 drums PCB wastes plus 4,000 lbs. pesticides.	may periodically reoccur.
113	PCB capacitors, various pesticides and lab chemicals	20 drums of used capacitors, 88 drums plus 30 metal boxes of various sizes of pesticides and lab chemicals.	may periodically reoccur.
119	Capacitors and PCB contaminated articles	6 used capacitors and 400 cu. ft. contaminated articles	Arlington may expect to receive a total of 427 capacitors.
125	Obsolete lube products.	16,000 pounds	None
132	Sodium cyanide spill clean-up.	150 cu. yds.	None
93	Unwanted 2,4,5 T herbicides	50 drums	None
137	PCB contaminated dirt, rags, and spill clean-up.	11 drums	None
111 ADD.#1	PCB wastes including capacitors, spill clean-up, and contaminated timbers.	6 capacitors, 40 cu. yds. spill clean-up, and 24 pieces of timbers.	None
Verbal			
10-12-77	Unwanted lab chemicals	200 pounds	None
12-21-77	PCB capacitors and clean-up rags.	2 drums	None
12-21-77	Capacitors (PCB)	2 units	None
1-30-78	Capacitors and spill clean-up (PCB)	1 drum	None
	Washington		
31 ADD. #3	Six items:		
	1) Flammable paint wastes	9,320 gals.	9,320 gals./yr.
	2) Paint sludge (non-flammable)	45,000 gals.	45,000 gals./yr.
	3) Spent pickling solution.	42,500 gals.	42,500 gals./yr.
	4) Otto fuel drum liners and clean-up waste.	3,000 cu. ft.	3,000 cu. ft./yr.
	5) Mercury contaminated liquid waste.	100 lbs.	100 lbs./yr.
	6) Asbestos insulation	1,000 lbs.	1,000 lbs./yr.
Verbal			
2-7-78	Unwanted pesticides	2 drums	None
2-8-78	Unwanted lab chemicals	1 cu. ft.	None

Disp. Req. No.	Waste Type/Origin	Quantity Requested for Disposal Present (Approx.)	Future
134	Unwanted pesticides	300 gallons	200 gals./yr.
136	Resins consisting of acrylamide and styrene.	150,000 pounds	150,000 lbs./yr.
95 ADD. #1	Old cyanide products	6,400 pounds	6,600 lbs./yr.
	Idaho		
135	Used sulfuric acid	3,000 gals.	None

It is recommended that the EQC approves the wastes for disposal at the Arlington Site.