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OREGON STATE SANITARY AUTHORITY MEETING MATERIALS

State of Oregon
Department of Environmental Quality

AGENDA

State Sanitary Authority Meeting

10:00 a.m., February 28, 1969

Room 36, Portland State Office Building

A. Minutes of 136th meeting (January 31, 1969)

B. Project plans for January 1969

C. Proposed Carbon Monoxide Ambient Air Standards

D. Waste Discharge Permits - Renewals

(1) Brooks-Scanlon - Bend
(2) Douglas Fir Plywood - Dillard
(3) Gilchrist Timber Co. - Gilchrist
(4) International Paper Co. - Gardiner
(5) Oak Lodge Sanitary District - Milwaukie
(6) Roseburg Lumber Co. - Dillard
(7) St. Helens
(8) United Flav-R-Pac
(9) Wood Village

E. Waste Discharge Permits - Regular

Domestic

(1) Brownsville (N)
(2) Brownsville (S)
(3) Cave Junction
(4) Clatskanie
(5) Estacada
(6) La Grande
(7) Lakeview

Industrial

(1) Muirhead Canning Co. - The Dalles
(2) Permapost Products - Hillsboro
(3) San Juan Lumber Co. - John Day

F. Publishers Paper Company preliminary tax credit application

G. Pacific Steel Foundry Company, Revocation and Reissuance of Tax Certificate

H. Sanitary sewer - Glasco, Inc., Beaverton

I. Medford - Bear Creek Valley Sanitary Authority

J. Hines Lumber Co. (Westfir) proposal for debris control

MINUTES OF THE 137th MEETING

of the

Oregon State Sanitary Authority

February 28, 1969

The 137th meeting of the Oregon State Sanitary Authority was called to order by the Chairman at 10:10 a.m., February 28, 1969, in Room 36 of the State Office Building, 1400 S.W. 5th Avenue, Portland, Oregon. Members present were John D. Mosser, Chairman; B.A. McPhillips, Herman P. Meierjurgen and Storrs S. Waterman. Mr. Edward C. Harms, Jr. was unable to attend because of a conflicting obligation.

Participating staff members were: Kenneth H. Spies, Secretary; E.J. Weathersbee, Deputy State Sanitary Engineer; Arnold B. Silver, Legal Counsel; Joseph A. Jensen, Assistant Chief Engineer; Harold L. Sawyer, Supervisor, Waste Discharge Permit Program; Fred M. Bolton, C.K. Ashbaker and James R. Sheetz, District Engineers; Edgar R. Lynd, Supervisor, Municipal Waste Treatment Program; Lloyd O. Cox, Supervisor, Industrial Waste Pollution Control, and Richard P. Reiter, Assistant District Engineer.

MINUTES

It was MOVED by Mr. McPhillips, seconded by Mr. Meierjurgen and carried that the minutes of the 136th meeting of the Sanitary Authority held on January 31, 1969, be approved as prepared by the Secretary.

PROJECT PLANS

It was MOVED by Mr. Waterman, seconded by Mr. McPhillips and carried that the actions taken by the staff on the following 9 sets of project plans and reports for water pollution control during the month of January be approved:

Water Pollution Control

Date	Location	Project	Action
1/10/69	Stayton	Wilco Road sewer and pump station	Prov. app.
1/15/69	Josephine County	Harbeck-Fruitdale sewers	Prov. app.
1/17/69	North Powder	Preliminary report	Approved
1/22/69	Dee (U.S. Plywood)	Prelim. Engrg. report for secondary treatment	Prel. app.
1/20/69	Springfield (College Ply)	Plywood glue wastes holding lagoon	Cond. app.

Date	Location	Project	Action
1/22/69	Troutdale	Sewage treatment plant and sewers	Prov. app.
1/23/69	Portland (Rhodia, Inc.)	pH neutralization and carbon adsorption sys.	Cond. app.
1/27/69	Madras	Revised prel. report	Approved
1/29/69	Oak Lodge S.D.	Chlorination report	Approved

WASTE DISCHARGE PERMITS - Renewals

Mr. Sawyer had previously sent to the members copies of proposed renewal permits for the following: (1) Brooks-Scanlon, Bend; (2) Douglas Fir Plywood, Dillard; (3) Gilchrist Timber Co., Gilchrist; (4) International Paper Co., Gardiner; (5) Oak Lodge Sanitary District, Milwaukie; (6) Roseburg Lumber Co., Dillard; (7) United Flav-R-Pac; (8) Wood Village. Copies have also been made a part of the Authority's permanent files. The application from the city of St. Helens was received too late to process.

Brooks-Scanlon - Bend

Mr. Dick Gervais was present to represent the company.

Mr. Ashbaker said he had been in conference with Brooks-Scanlon the morning of the meeting and that they did have one major objection to the way the permit is written. He said the permit consists mainly of two programs: (1) A detailed program and time schedule shall be submitted by July 1, 1970, for either (a) terminating log handling operations in the Deschutes River, or (b) providing positive, year round control of debris equivalent to dry handling of logs or handling in a pond physically separated from the river, and (2) prior to July 1, 1969, improvements in and additions to the existing debris control facilities at the mill pickup point shall be completed so as to provide maximum control, and removal of debris and facilities shall be installed or procedures undertaken to minimize the generation of debris at all log dumping sites.

Mr. Ashbaker said that Brooks-Scanlon's objections to the permit were that during this first year from July 1969 to July 1970, until they decide whether they will be getting out of the river or going to a separate log pond, they would like not to change their log dumping procedures but just to control the bark by additional facilities for bark removal so that no bark will leave their property. It was Mr. Ashbaker's opinion that maybe the staff could go along with a compromise such that during the first year of operation and until the company decides whether or not they are going

to get out of the river, no change need be made in the log dumping procedures, but if they continue to use the river, regardless of how good the bark removal facilities are, that a change in dumping procedures would be made.

Mr. Weathersbee said the staff does not think that there is a completely successful or effective bark control method; therefore, the best approach is to not generate the bark, rather than generate the bark in the river and then try to remove it by various means.

The Chairman said he would like to know what kind of costs would be involved.

Mr. Gervais said that to convert one of the log deck dumpers that they now have would cost an estimated $30,000. He said the company is asking for this one year to demonstrate that it can keep the river clean and is confident that the debris can be controlled because this is an area near the mill where they can keep their hands on it. He stated further that if they cannot demonstrate that they can remove even the limited amount of bark that is generated from dumping by the sling system, then the company would have spent $30,000 for nothing.

The Chairman asked how long it would take to have log handling devices installed once the decision is made.

Mr. Gervais said 60 days at the very most.

After some discussion, it was MOVED by Mr. Mosser, seconded by Mr. McPhillips and carried that the expiration date on the waste discharge permit for Brooks-Scanlon be changed to September 30, 1970; that item (1) be amended to read, "A detailed program and time schedule shall be submitted by July 1, 1970, for either: (a) terminating log handling operations in the Deschutes River, or (b) providing by August 31, 1970 positive, year round control of debris equivalent to dry handling of logs or handling in a pond physically separated from the river"; that item (2) be revised to read "Prior to July 1, 1969, improvements in and additions to the existing debris control facilities at the mill pickup point shall be completed so as to provide maximum control and removal of debris"; that in item (4) the word "storage" in the second line be changed to "transport", and that the permit for Brooks-Scanlon as amended be renewed.

Oak Lodge Sanitary District

Mr. Sawyer reviewed briefly the proposed permit and a February 27, 1969 letter received from the district manager, copies of which have been made a part of the Authority's permanent files in this matter.

The Chairman said that counsel for the Sanitary Authority had advised him that one thing that can be done and the Chairman thought should be done soon in all domestic permits is to require a trained operator as a condition of the permit.

Mr. Harvey Scott, General Manager of the Oak Lodge Sanitary District, was present and stated that his letter to the staff under date of February 27, 1969, pointed out that they already had a restriction program on multi-family dwellings which has been in effect since May 1968, and enforced by the Board of the District and supported by the County Planning Commission. He went on to say that an engineering study of possible ways to increase the capacity of the existing sewage treatment had just been completed. He said this report was given to him by CH_2M last Wednesday and that at the same time the report was received the Board wanted to know whether they could open up permits again or restrict them further.

The Chairman said the staff would be glad to entertain engineering plans for modification of the plant. He said the staff's recommendations are not flatly prohibiting anything, but are saying a written approval must first be obtained from the Sanitary Authority before any major load is connected.

Mr. Scott said his Board is enthusiastically going ahead with plans now, but before starting construction they have several obstacles to overcome. It was his opinion that the proposed permit conditions deflated their ego.

After some discussion it was MOVED by Mr. Mosser, seconded by Mr. Meierjurgen and carried that the existing permit for Oak Lodge Sanitary District be extended to March 31, 1969, and in the meantime if they have language that they think is more suitable for restriction of industry, major apartment houses and similar types of loads than the language contained in the proposed permit, they can submit their language to the Authority and it will be considered at the next meeting.

The Chairman commented that by that time the staff will have devised the provisions which will be included in all permits for domestic plants requiring a trained operator as a condition of the permit.

International Paper Co. - Gardiner

The Chairman referred to Mr. Jensen's letter of February 19, 1969, and asked if the staff thought it would take until December 31, 1970 to gather enough data to make a decision as to whether or not the waste control facilities for International Paper at Gardiner are adequate.

Mr. Sawyer said that it may not take that long. He said the staff wanted to place the company on notice that what they are presently doing may not be adequate if further requirements are made as a result of present studies and that the company is aware of this.

Mr. Weathersbee said that at the time the Waste Discharge Permit was drafted the staff did not have a final report on the study that was being made. He said they do have the report now. He went on to say that the Federal Water Pollution Control Administration has recommended that primary sedimentation be required for ocean discharge.

St. Helens

Mr. Sawyer said that the staff did not get the St. Helens application in time to prepare recommendations; therefore, the staff proposed that the City's present permit be extended until March 31, 1969 to allow time to complete preparation of the recommended conditions.

It was then MOVED by Mr. Mosser, seconded by Mr. Meierjurgen and carried that the renewal permits with conditions as proposed by the staff for Douglas Fir Plywood, Dillard; Gilchrist Timber Co., Gilchrist; International Paper Co., Gardiner; Roseburg Lumber Co., Dillard; and United Flav-R-Pac be approved and that the existing permits for St. Helens and Wood Village be extended until March 31, 1969.

PACIFIC STEEL FOUNDRY COMPANY, Revocation and Reissuance of Tax Certificate

The Chairman said that this is a transfer of ownership on this certificate in which case the old certificate would be cancelled and a new one issued in its place.

It was MOVED by Mr. Mosser, seconded by Mr. Waterman and carried that Certificate No. 18 be revoked as of February 1, 1969, and that a new certificate be issued to Pacific Steel Foundry Company based on application T-69.

WASTE DISCHARGE PERMITS - Regular

The staff had previously sent copies of proposed waste discharge permits to the Authority members for the following municipal systems: (1) Brownsville (N); (2) Brownsville (S); (3) Cave Junction; (4) Clatskanie; (5) Estacada; (6) La Grande; (7) Lakeview, and industries: (1) Muirhead Canning Co., The Dalles; (2) Permapost Products, Hillsboro; (3) San Juan Lumber Co., John Day. Copies have also been made a part of the Authority's permanent files.

Domestic

The Chairman asked what would be a reasonable period of time to allow for cities to obtain a certified sewage treatment plant operator if they do not already have one.

Mr. Lynd replied that September 1972 has been set as a reasonable length of time for everyone to obtain a certified operator if they do not already have one.

Mr. Lynd said that Mr. Gil Meigs from Stevens, Thompson and Runyan was present representing the city of La Grande and would like to say a few words.

Mr. Meigs said that the city of La Grande contacted his firm about two weeks ago with regard to providing service for design of their chlorination facilities. He said that the city at first was trying to do the designing themselves and had budgeted what they thought was enough money for the undertaking, but as it turns out the city had not been thinking the situation through thoroughly, and that although the deadline for chlorination is May 1, the design has not yet been begun nor does the city have sufficient funds to finance the project. He said the city had only budgeted $8,000, whereas it is likely that it will require $30,000 to $35,000 for the job. This may mean that the city will have to go into the next fiscal year. Because of these conditions Mr. Meigs requested that the date for requirement of chlorination be changed to October 1, 1969.

Mr. Lynd said that the city of La Grande was sent a letter on November 27, 1967, following adoption of the implementation plan, specifically setting forth these requirements.

The Chairman asked if there had been any correspondence with the city saying that they must hire an engineer by a certain date and submit plans by a certain date.

Mr. Weathersbee said he was not aware of any such correspondence.

The Chairman asked if the staff thought October is a reasonable date for providing the necessary facilities.

Mr. Weathersbee said he thought it was reasonable.

After further discussion, it was MOVED by Mr. Mosser, seconded by Mr. Waterman and carried that permits be approved as submitted by the staff for Brownsville (N), Brownsville (S), Cave Junction and Clatskanie, and that a permit be approved for La Grande to expire December 31, 1969 as submitted by the staff but with the following additional amendments: In item (1) change the date of May 1 to October 1, 1969; at the end of item (a) under (1) insert "prior to April 30, 1969"; and in item (b) under (1) strike out "All facilities shall be constructed", and insert instead "Construction shall be started by July 1, 1969 and shall be in accordance with the approved plans."

No action was taken on Estacada as the temporary permit will remain in effect until the next Sanitary Authority meeting when requirements for plant operator qualifications can be considered.

Lakeview

It was MOVED by Mr. Mosser, seconded by Mr. McPhillips and carried that the Waste Discharge Permit for Lakeview be issued as submitted by the staff with the following amendments: The expiration date be changed to December 31, 1969; detailed engineering plans and specifications be submitted to the Oregon State Board of Health and State Sanitary Authority by May 1, 1969; construction to begin by July 1, 1969 and chlorination facilities be put in operation by October 1, 1969.

The Chairman asked that the staff take a look at the temporary permits and get letters out on them indicating a time schedule.

Industrial

The Chairman asked if any of the people from Muirhead Canning Company, Permapost Products and San Juan Lumber Company had raised any questions. Mr. Sheetz commented about the Muirhead Canning Company waste disposal system and Mr. Reiter about the processes used by the Permapost Products Company.

It was MOVED by Mr. McPhillips, seconded by Mr. Mosser and carried that the permits for Muirhead Canning Co., The Dalles; Permapost Products, Hillsboro; and San Juan Lumber Co., John Day be approved as recommended by the staff.

PUBLISHERS PAPER COMPANY PRELIMINARY TAX CREDIT APPLICATION

Mr. Pete Schnell was present to represent Publishers Paper Company and said that the interest and cost factors right now are slightly more than 10% higher than what was submitted to the staff by the company in its two applications for pollution control facilities for tax relief purposes; (1) for a pulp washing and liquor collection system and (2) spent sulfite liquor evaporation and incineration system.

The Chairman said in view of the fact that costs are going up and interest is a factor, and due to the fact that the company is ahead of the required schedule, he would be inclined to grant the request that these facilities be certified as pollution control facilities.

It was MOVED by Mr. Meierjurgen, seconded by Mr. Waterman and carried that the facilities described for the above do qualify as pollution control facilities for tax relief purposes under ORS 449.605 to ORS 449.645.

Mr. Schnell reminded the members and staff that they are invited to a tour of the Oregon City mill next Wednesday morning March 5 at 9:00 a.m.

The meeting was recessed at 11:55 a.m. for lunch and reconvened at 2:10 p.m.

SANITARY SEWER - GLASCO, INC., BEAVERTON

The Chairman said that Glasco, Inc. has had an existing plant connected to the Fanno Creek sewers, that the company now has constructed and is about to place in operation a new plant immediately adjacent to the present plant, that the company claims that it would take only one short section of pipe to hook into the Fanno Creek sewer, but it would cost several thousand dollars to hook into Beaverton. The Chairman said that the company has asked permission to hook into the Fanno Creek sewer and that the city of Beaverton joins in this request. He said if this request is granted, the city of Beaverton will construct a new pumping station which will take off one-half the load from Western Kraft, all of L.D. Heater Music Co. and School District #48 now connected to Fanno Creek.

Mr. Lynd reported on a meeting the staff had with the Beaverton city officials on February 18. He said the staff was not sure at this time as to the actual amount of sewage flow that would be diverted by the proposed pump station.

A letter received at the meeting from the city of Beaverton was then read.

It was MOVED by Mr. Mosser, seconded by Mr. McPhillips and carried that this transfer be approved subject to the staff's confirming Monday morning to its own satisfaction that the load that is being added to Fanno Creek by Glasco Inc. will not be greater than the load that will be diverted from Fanno Creek when the city of Beaverton completes its new pump station which is to be no later than August 1, 1969.

CENTURY 21 HOMES

A letter received from Century 21 Homes containing a request to make a new sewer connection to the Fanno Creek system in exchange for an existing connection which is to be abandoned was read by the Secretary.

The Chairman said that this is the same company which made the three illegal connections, that they want to construct a new office building and will be vacating an existing hookup and are requesting a new hookup two doors north, that plumbing facilities in use will not be increased, and that their staff will remain the same.

The Chairman said he thought the request should come from the local governing agency rather than from the company. He said further that if they are willing to take on the policing of the old connection and think it should be done, then it was his opinion the Authority should consider it, but he said he did not want to get into a position of passing on each household every time this comes up.

MEDFORD - BEAR CREEK VALLEY SANITARY AUTHORITY

Mr. Manville Heisel, attorney for the Bear Creek Valley Sanitary Authority, was present and said that there had been an abandonment of discussions with the city of Medford. He said the city of Medford had met with the Mayors of Central Point and Phoenix and the entire Board of the Bear Creek Valley Sanitary Authority last Monday morning and again on Tuesday at which time an agreement in principle was reached on all matters

of controversy. He said that the attorneys for the cities had a third meeting on Wednesday for the purpose of making sure of a mutual understanding so that something could be put into writing, that this was done but on Thursday the city repudiated the agreement, and that this means they are again back where they were several months ago.

Mr. Heisel said that the entire system was first designed by the Bear Creek Valley Sanitary Authority to be under one head with the Bear Creek Valley Sanitary Authority building a plant and interceptor system and later developing the trunks and laterals. He said in January 1968, the officials from the city of Medford said they were going to build a plant themselves and would talk about the interceptor system later. Last May it was determined that the city of Medford would pay 37%, the Bear Creek Valley Sanitary Authority 58%, Central Point 3.75% and Phoenix 1.25% of the interceptor system, all based on four separate general obligation bond issues. He said that the Bear Creek Valley Sanitary Authority is not concerned with district boundaries or city boundaries, but that the cities are. Consequently, this means installation of a very complicated and rather expensive system of measuring how much sewage is going from each jurisdiction into the interceptor. He said every time there is an annexation a new meter must be installed. This is the city of Medford's proposal and the city demands that it be under its jurisdiction.

Mr. Heisel said further that the Bear Creek Valley Sanitary Authority on the other hand feels there should be a uniform rate applicable throughout the entire service area. He said at this point negotiations in their present form have broken down. He commented that it is the feeling of the Bear Creek Valley Sanitary Authority that the sewer system they have been working on is an engineer's dream but a political nightmare. He said that the Authority is proposing the possibility of building a second plant which he did not think is too far removed as it would cost the residents in that area no more. He said the Bear Creek Valley Sanitary Authority is not concerned about extra cost to anyone, that they know which is the best engineering plan, and that they have found they must consider the most workable plan. He said the engineering is about two-thirds done, plus the preliminary work and aerial mapping which are all done.

The Chairman said he would like to make it clear what the State Sanitary Authority's policy is in this matter and then presented the following statement:

The State Sanitary Authority is deeply concerned by news of a new breakdown in the negotiations between the city of Medford and the Bear Creek Valley Sanitary Authority. The start of improvements to the Medford treatment plant of any facilities to serve surrounding territory have already been long delayed to permit negotiations that would result in a regional collection and treatment system. At each delay we have been assured agreement was almost reached. We still believe that agreement is desirable.

If the governing bodies of Medford, other cities involved and Bear Creek Valley Sanitary Authority cannot agree, we would urge them to submit the issues to independent arbitration. Regardless of the local decision we wish to make clear to the people of the area the policies of the State Sanitary Authority as follows:

1. Failure to approve financing for the new Medford treatment plant will inevitably mean tighter and prolonged restrictions on new construction in Medford.

2. Federal and state grants will only be approved for regional facilities or facilities that are equally efficient to and no more costly in construction and operation than regional facilities would be.

3. If either agency independently constructs facilities to serve the region, federal and state grants will only be approved if there is agreement with the other or if service is offered the other on a fair and non-discriminatory basis.

It was MOVED by Mr. Mosser, seconded by Mr. Waterman and carried that the policy statement be formally adopted and that it be transmitted to the agencies involved.

Mr. Heisel asked the Chairman if the State Sanitary Authority or any portion of it would act as a non-interested arbitration body.

The Chairman replied that the State Sanitary Authority would be reluctant to be placed in that position, but if it came down to it and there was no one in the community to serve in this capacity, then he thought the State Sanitary Authority Board would serve in this capacity,

but he said it was his honest opinion that the county commissioners, legislators or some group in that area should serve as the arbitrators.

HINES LUMBER CO. (Westfir) PROPOSAL FOR DEBRIS CONTROL

Mr. Lloyd Cox gave a staff report which has been made a part of the Authority's permanent files in this matter.

Mr. Meierjurgen asked if the company contemplates removing the bark from the log pond overflow.

Mr. Cox said the debris would be collected at the pond overflow and this is why the staff requested that the company put in the new log let-down devices. He said the company is only asking for an extension of time for installation of these devices, one of which would be installed on government land.

The Chairman asked if there was any possibility that permission would not be granted for installation of the device on federal land.

Mr. Cox said he did not believe there would be any problem.

After some discussion it was MOVED by Mr. McPhillips, seconded by Mr. Waterman and carried that the staff's recommendations be adopted for the debris control program for Hines Lumber Company at Westfir as follows: (1) The phase of the project concerning debris removal at the point of the log pond overflow (conveyor and screening) be approved as submitted with the understanding that if these controls are not satisfactory additional requirements will be requested. (2) The installation of two new mechanical log let-down devices be approved, but are to be completed by October 1, 1969. Should the company be able to justify to the satisfaction of the Sanitary Authority at a later date that an extension of time is necessary to complete this phase of the project, this matter would be reconsidered by the Authority.

There being no further business, the meeting adjourned at 4:20 p.m.

Respectfully submitted,

Kenneth H. Spies

Kenneth H. Spies, Secretary

Project Plans

During the month of January 1969 the following 9 sets of project plans and engineering reports were reviewed and the action taken as indicated by the Water Quality Control Section.

Date	Location	Project	Action
1/10/69	Stayton	Wilco Road sewer and pump station	Prov. app.
1/15/69	Josephine County	Harbeck-Fruitdale sewers	Prov. app.
1/17/69	North Powder	Preliminary Report	Approved
1/22/69	Dee (U.S. Plywood)	Prelim. Engrg. Report for secondary treatment	Prel. App.
1/20/69	Springfield (College Ply)	Plywood Glue wastes holding lagoon	Cond. app.
1/22/69	Troutdale	Sewage treatment plant and sewers	Prov. app.
1/23/69	Portland (Rhodia, Inc.)	pH neutralization and carbon adsorption sys.	Cond. app.
1/27/69	Madras	Revised prel. report	Approved
1/29/69	Oak Lodge S.D.	Chlorination report	Approved

OREGON STATE SANITARY AUTHORITY

AIR QUALITY CONTROL

PROPOSED AMBIENT AIR QUALITY STANDARD FOR CARBON MONOXIDE

The concentrations of carbon monoxide in the ambient atmosphere shall not exceed the value enumerated below:

I. Definitions

A. Ambient Air - The air that surrounds the earth excluding the general volume of gases contained within any building or structure.

B. Primary Air Mass Station (PAMS) - A station designed to measure contamination in an air mass and represent a relatively broad area. The sampling site shall be representative of the general area concerned and not be contaiminated by any special source. The probe inlet shall be a minimum of thirty feet and a maximum of 150 feet above ground level. Actual elevation should vary to prevent adverse exposure conditions caused by surrounding buildings and terrain. The probe inlet shall be placed approximately twenty feet above the rooftop and meteorological measurement shall be made at approximately the same level as the probe inlet.

C. Primary Ground Level Monitoring Station (PGLMS) - A station designed to provide information on contaminant concentrations near the ground and provide data valid for the immediate area only. The probe inlet shall be ten to twenty feet above ground level with a desired optimum height of twelve feet. The sampling site shall be representative of the immediate area and not be contaminated by any unique source. The probe inlet shall not be less than two feet from any building or wall.

II. Air Quality Standard

Carbon monoxide in the ambient air measured at either a Primary Air Mass or a Primary Ground Level Monitoring Station shall not exceed an average concentration of twenty (20) parts per million by volume for any consecutive eight (8) hours.

January 16, 1969

III. Method of Measurement

For determining compliance with this regulation, carbon monoxide shall be measured by an infrared carbon monoxide analyzer. The analyzer shall have a full-scale range of one hundred (100) parts per million or less and be calibrated with known zero and span gases. Measurement shall be made according to the infrared method attached. Other continuous and manual methods of measurement will be accepted after approval by the State Sanitary Authority if they can be shown to be comparable to the infrared technique in reproducibility, selectivity, sensitivity, and accuracy.

IV. Reporting of Data

Local and regional air pollution control agencies monitoring carbon monoxide shall notify the State Sanitary Authority each time concentrations of carbon monoxide exceed the standard. Notification shall be made by telephone immediately after validation of the violation and also by mail on forms provided by the state agency. Data to be reported shall include:

A. Location of sampler.

B. Time span involved.

C. Concentrations recorded.

D. Type of sampler used.

E. Other relevant information requested by the state.

An annual report summarizing all occurrences of concentrations exceeding the standard shall be submitted to the state agency.

TO : Members of Oregon State Sanitary Authority

Mr. John D. Mosser, Chairman
Mr. Storrs S. Waterman
Mr. B. A. McPhillips
Mr. Herman P. Meierjurgen
Mr. Edward C. Harms

FROM : Air Quality Control

DATE : January 28, 1969

SUBJECT: Proposed Air Quality Standards - Carbon Monoxide

The attached information pertaining to carbon monoxide is being mailed to air quality regions and interested persons. The attached information is essentially the same as the State of Washington Air Pollution Control Board issued with reference to a public hearing which will be held to consider adoption of the standard at Olympia on February 13, 1969. The exception is that Washington included in the proposed regulation the "air quality objective" listed on page 2. The staff proposal does not mention the "objective". Whether the objective should be included, incorporated in a separate policy section, or entirely omitted as in the attached draft is a matter for discussion and decision by the Authority.

The current plan is to ask the Sanitary Authority at the February meeting to authorize a public hearing which will consider adoption of the standard proposed.

Public Notice

Proposed Criteria for Carbon Monoxide Objectives and Standards
Carbon Monoxide Ambient Air Standards
Method of Measurement and Reporting

Oregon State Sanitary Authority
Air Quality Control
1400 S.W. 5th Avenue
Portland, Oregon 97201

January 2, 1969

The attached information and proposals have been prepared by the Oregon State Sanitary Authority and the Washington State Air Pollution Control Board for distribution at this time to allow for review, receipt of comments or statements, or inquiries before a public hearing is held.

Testimony relevant to the proposed standards will be received at the time of the public hearing pertaining to adoption of the standards. The time and place of the hearing will be announced at a later date.

Comments or inquiries should be addressed to the

Oregon State Sanitary Authority
Air Quality Control
Post Office Box 231
Portland, Oregon 97207

CRITERIA

FOR

CARBON MONOXIDE OBJECTIVES & STANDARDS

OREGON-WASHINGTON AIR QUALITY COMMITTEE

December 9, 1968

Supercedes all editions dated prior to December 9, 1968

C O N T E N T S

DEFINITIONS

AIR QUALITY OBJECTIVE -- The concentration and exposure time of a contaminant or multiple contaminants in the ambient air below which according to present knowledge undesirable effects will not occur.

AIR QUALITY STANDARD -- An established concentration, exposure time and frequency of occurrence of a contaminant or multiple contaminants in the ambient air which shall not be exceeded.

PRIMARY AIR MASS STATION (PAMS) -- A type of station designed to measure contamination in an air mass and represent a relatively broad area. The sampling site shall be representative of the general area concerned and not be contaminated by any special source. The probe inlet shall be a minimum of thirty feet and a maximum of 150 feet above ground level. Actual elevation should vary to prevent adverse exposure conditions caused by surrounding buildings and terrain. The probe inlet shall be placed approximately twenty feet above the rooftop and meteorological measurement shall be made at approximately the same level as the probe inlet.

PRIMARY GROUND LEVEL MONITORING STATION (PGLMS) -- Stations designed to provide information on contaminant concentrations near the ground and provide data valid for the immediate area only. The probe inlet shall be ten to twenty feet above ground level with a desired optimum height of twelve feet. The sampling site shall be representative of the immediate area and not be contaminated by any unique source. The probe inlet shall not be less than two feet from any building or wall.

SUMMARY, OBJECTIVE AND STANDARD

Carbon monoxide has relatively well understood toxic effects on the body. By combining with hemoglobin in the same manner as oxygen, but with far greater affinity, the inhaled carbon monoxide interferes with the capacity of the blood to transport and release oxygen to the tissues. A small amount of carbon monoxide, enough to form less than 1% carboxyhemoglobin (COHb) in the blood, is released in the normal breakdown of hemoglobin in the body. Below the concentration associated with this minimal level of carboxyhemoglobin, ambient carbon monoxide is of no public health importance (Ref. 21).

Significant physiological effects may occur in many individuals when 5% of the hemoglobin is combined with carbon monoxide. The equilibrium relationships among carbon monoxide, oxygen and hemoglobin are such that this will occur at a carbon monoxide concentration of 30 parts per million for several hours when oxygen is at normal alveolar partial pressure of 100 millimeters of mercury (Ref. 3, 20, 21). Impairment would be enhanced by decrease of ambient oxygen pressure as at high altitude and by any disease which in itself limits the uptake of oxygen in the lungs, the capacity of the blood to carry oxygen, or the ability of the circulatory system to distribute blood to the tissues (Ref. 21).

Chronic or synergistic effects of carbon monoxide are not well documented at low concentrations, but there is some evidence that tolerance to carbon monoxide is decreased when certain other contaminants are present (Ref. 1).

It appears unreasonable that the community environment should impose loads of 5% COHb on the special population that may be susceptible to this concentration. Twenty parts per million CO will produce 3.2% COHb at

equilibrium. Superimposition of heavy smoking will impose a body burden greater than 5% COHb (Ref. 22).

Due to the numerous potentially important unknown factors influencing the effects of carbon monoxide as it exists in our atmosphere, it is considered desirable to establish an objective concentration below the level which is known to cause effects under controlled conditions. The standard concentration should, with due consideration of special population groups and unknown synergistic effects, protect the populace from undue health risks. It is, therefore, recommended that the following standards and objectives be adopted for carbon monoxide in the ambient air.

STANDARD: Carbon monoxide in the ambient air measured at either a Primary Air Mass or a Primary Ground Level Monitoring Station shall not exceed an average concentration of twenty (20) parts per million by volume for any consecutive eight (8) hour period.

OBJECTIVES: Carbon monoxide in the ambient air measured at either a Primary Air Mass or a Primary Ground Level Monitoring Station will not exceed an average concentration of:

Ten (10) parts per million by volume for any consecutive eight (8) hours,

OR

Five (5) parts per million by volume for any consecutive twenty-four (24) hours.

It is recognized that information now being developed in California may indicate an adverse effect at a 2% COHb level which would necessitate lowering the standard proposed above. Appropriate revisions will be recommended when adequate documentation becomes available.

METHOD OF MEASUREMENT AND ANALYSIS

For the purposes of evaluating atmospheric concentrations of carbon monoxide for compliance with the objectives and standards, the infrared carbon monoxide analyzer adjusted to full scale not exceeding 100 ppm calibrated with known zero and span gases will be considered the primary monitoring instrument. The measurements must be taken at either Primary Air Mass Stations or Primary Ground Level Monitoring Stations. Other continuous and manual methods of measuring carbon monoxide will be accepted if they have been shown to be comparable to the infrared unit for reproducibility, selectivity, accuracy, and sensititivity at the concentrations being measured under similar conditions of measurement.

ACTION GUIDE

If the carbon monoxide standard concentration is exceeded, action shall be initiated by the responsible control agency. Due to the lack of direct control over the automobile, which is the major source of carbon monoxide, actual abatement may be difficult to achieve. The first time the standard is exceeded an evaluation should be conducted to determine if the levels occurred during a normal situation or were the result of unusual traffic and/or weather conditions. The measuring site and probable causes should also be evaluated to determine if the excessive concentration was limited to the immediate area of the sampler or may have been representative of a wider episode. Validity and accuracy of the measurement should be verified. The potential for recurrence of concentrations exceeding the standard should then be estimated and the need for further action determined.

The lack of source control for carbon monoxide at the present time makes the effectiveness of a control program dependent in part on the predictive capability for episodes and rapid evaluation of sampling data in order to implement the action guide.

The news media may be notified after consultation with other agencies concerned, and such notification should be made as soon as the occurrence is documented. Due to the time period involved in the standard, it would not be possible to take corrective action for the occurrence of concern so abatement should be directed at preventing recurrence of high concentrations. Future violations of the standard may ultimately be prevented through knowledge of traffic flows and weather conditions and appropriate action designed to minimize the occurrence. The action guide, however, needs to include a general long-range plan that would reduce concentrations throughout an entire community and shorter term action designed to prevent localized occurrences of high concentrations.

The long-range program should include activity in the inspection of automotive exhaust control devices, the consideration of traffic patterns and alternate modes of transportation. Other abatement action may include staggered scheduling of office hours by businesses and government to alleviate peak traffic periods and restrictions on traffic flow in urban areas or portions thereof.

More immediate assurance of precluding recurrence of excessive concentrations can be obtained by implementing a program in cooperation with local authorities to (1) predict potential episodes; (2) alert the public to reduce numbers of vehicles in use; (3) reroute traffic around normal congested areas.

The success of several of the control procedures suggested will depend

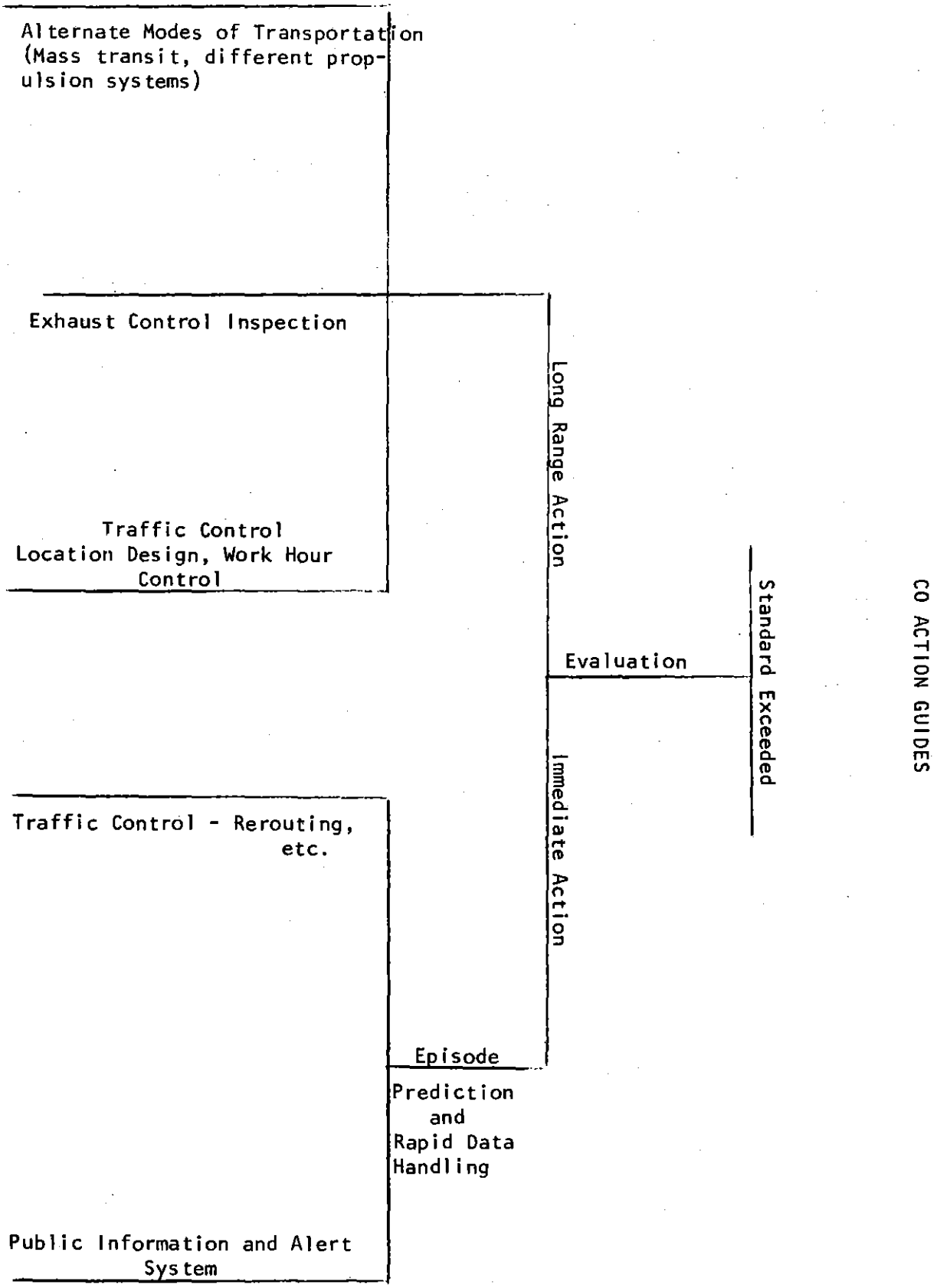
upon cooperation between agencies to achieve proper traffic control. The appropriate traffic department and local police department should be informed of the program and made aware of the specific areas of concern. High localized carbon monoxide concentrations may result from inadequate traffic movement and can be alleviated by effective control of vehicle flow.

If the carbon monoxide air quality standard is exceeded, the agency documenting the violation shall take the following action:

1. State -- Notify the appropriate local agencies immediately after validating the measurement. Notification shall include:
   A. Location of violation.
   B. Time span involved.
   C. Actual concentrations recorded.
   D. Control action planned.
2. Local or Regional -- Notify the state air pollution control agency immediately after validating the measurement. Notification shall be made by telephone and by mail, utilizing forms provided by the state. Information to be submitted includes:
   A. Location of violation.
   B. Time span involved.
   C. Actual concentrations recorded.
   D. Comments on potential control.

All air pollution control agencies monitoring carbon monoxide shall prepare annual summaries of occurrences exceeding the standard and submit these summaries to the state agency.

The air pollution control agencies should consider the objectives in initiating a long-range program of carbon monoxide source control.


Alternate Modes of Transportation (Mass transit, different propulsion systems)
Exhaust Control Inspection
Traffic Control Location Design, Work Hour Control
Long Range Action
Standard Exceeded
Evaluation
Immediate Action
Traffic Control - Rerouting, etc.
Episode
Prediction and Rapid Data Handling
Public Information and Alert System
CO ACTION GUIDES

DISCUSSION OF CARBON MONOXIDE

The primary consideration in setting an acceptable objective and standard for carbon monoxide concentration in air is the effect of the gas on human health.

Carbon monoxide is one of the three most common products of fuel combustion; carbon dioxide and water vapor are the other two. Most of the carbon monoxide in the atmosphere results from incomplete combustion of carbonaceous materials. Carbon monoxide is quite stable in the atmosphere. Because it remains unchanged for several days, carbon monoxide has been used to calculate the dispersal volume of other pollutants. At high levels of concentration, carbon monoxide, more than any other air pollutant, has been identified as a participant in synergistic reactions. For example, the combined effect of carbon monoxide in the presence of hydrogen sulfide or nitrogen dioxide is more severe than the sum of the effects of each of the gases. At low levels such synergism has not been established (Ref. 1). The present data in the literature is mainly based on the effects of carbon monoxide, without the presence of other pollutants.

Human hemoglobin has an affinity 210 times greater for carbon monoxide than oxygen at 38^{o} C (body temperature) under certain conditions (Ref. 2). A relatively small concentration of carbon monoxide in the inhaled air can tie up significant quantities of hemoglobin as carboxyhemoglobin. Hemoglobin is then unavailable for the transport of oxygen to the various body tissues. Secondary, though probably important, effects of carbon monoxide result from carboxyhemoglobin inhibiting the dissociation of oxygen and hemoglobin molecules. This further reduces the body's oxygen supply. Carbon monoxide in the blood also reduces the partial pressure of oxygen as a gas in the blood, and thereby lessens the moving force that

causes the oxygen to diffuse into the tissues.

The amount of carbon monoxide within the body is related to both its concentration in the air and the length of time the individual is exposed. Unless the concentration in the air is sufficient to bring about death, an equilibrium condition is established between the carbon monoxide in the air breathed and that in the blood.

In a concentration range of 0-100 ppm after equilibrium, each 1 ppm of carbon monoxide has inactivated 0.17% of body hemoglobin (Ref. 2, 3).

Health effects are dependent upon the carbon monoxide content of the blood, the partial pressure of the oxygen in the air breathed, the duration of exposure, the ambient temperature, the work effort (oxygen demand), the metabolic efficiency of the person, his health status, genotype and degree of and capacity for inurement to exposure. The rate of uptake of carbon monoxide by blood when air containing carbon monoxide is breathed increased from three to six fold between rest and heavy work output. The rate of uptake of carbon monoxide is influenced by the partial pressure of oxygen in the air breathed, and increases with altitude. The rate of uptake is dependent upon pulmonary diffusion; normal adult males, during moderate exercise show a carbon monoxide diffusion capacity ranging from 13.6 to 49.2 cc per minute.

The absorption process for air containing less than 200 ppm of carbon monoxide by volume will be substantially complete in from two to twelve hours, as will its elimination in normal air. At normal activity, half of the carbon monoxide in the blood may be lost in four hours (Ref. 20).

Biologic response time for carbon monoxide is quite different from response time for an odorous or irritant gas. The uptake and excretion of carbon monoxide is an exponential function at low concentrations. The rate of uptake is directly proportional to the gradient between alveoli and pul-

monary capillary (Ref. 25).

The amount of carbon monoxide in cigarette smoke varies between 1% and 2.5% by volume. At first glance, it might appear that the effects of carbon monoxide from smoking and exposure to ambient carbon monoxide are additive. By examining the relationship between alveolar partial pressure of carbon monoxide (Pco), pulmonary capillary Pco, and uptake, it can be seen that such is not the case. For example, if a subject has 7% carboxyhemoglobin in his blood and is exposed to 25 ppm of carbon monoxide, he will actually excrete carbon monoxide. If exposed to 50 ppm, there will be no uptake, and if exposed to 100 ppm, the uptake will be quite slow (Ref. 6).

The dissociation of carboxyhemoglobin in the blood to its original state of carbon monoxide and hemoglobin and subsequent elimination of carbon monoxide from the lung is a slow process; it has been estimated that at the end of each hour, only 15% of the carboxyhemoglobin that was present in the beginning of the hour will be dissociated (Ref. 7).

Symptoms such as headache, fatigue and dizziness appear in healthy workers engaged in light labor near sea level when about 10% of the hemoglobin is combined with carbon monoxide. Such degree of saturation could be achieved by continuously breathing air containing 50 ppm of carbon monoxide for six to eight hours (Ref. 10 and 11). Disturbance of coordination, judgment, psychomotor tasks and visual acuity may appear at 2% HbCO but become significant when about 5% HbCO saturation is reached (Ref. 12 and 13). This would occur at carbon monoxide concentrations of 30 ppm for eight hours or more (Ref. 3). One thousand parts per million of carbon monoxide in the air with sufficient duration of exposure is adequate to tie up half the hemoglobin necessary for the function of oxygen transportation

in the body. Severe headache, restlessness, shaking, weakness, cramps, deep coma, paralysis and death may be caused by the paralysis of the breathing mechanism and by hemorrhage in the brain (Ref. 8).

Carboxyhemoglobin concentrations in persons smoking from twenty to thirty cigarettes daily range from 3% to 10%, with an average of 5%. Three to five hours are required to bring the carboxyhemoglobin concentrations from 10% down to 5% while breathing clean air at sea level. The degree of hypoxia caused by a 5% to 10% carboxyhemoglobin concentration is by itself not disabling; however, it does lower the altitude tolerance by about 335 feet for every percent carboxyhemoglobin present. The combined effect of unavailable hemoglobin due to elevation and carbon monoxide can have effects such as a considerable decrease in visual threshold and adverse effects on judgment. At high altitudes such as 11,000 feet, a normal man with 5% - 10% carboxyhemoglobin present would be functioning with a marginal reserve in the face of coronary insufficiency. An anemic subject with any degree of coronary insufficiency might well be in a highly precarious situation if 5 to 10% carboxyhemoglobin is present in his blood.

The oxygen demand of pregnant females increases by about 15% to 25%. Another rather frequent accompaniment of the gravid state is iron deficiency anemia. All of these factors tend to decrease hypoxic tolerance (Ref. 6).

Depending on the rapidity of onset, hypoxia, or lack of sufficient oxygen, is usually classified under the following headings: (1) fulminating hypoxia: diminution of the oxygen content of the blood over a period of seconds; (2) acute hypoxia: diminution of the oxygen content of the blood over a period of minutes to hours; and (3) chronic hypoxia: diminution of the oxygen content of the blood over a period of days, months, or years. This form of hypoxia is usually accompanied by varying degrees of compensa-

tion referred to as acclimatization (Ref. 6).

From the foregoing discussion, it appears that an exposure of 50 ppm carbon monoxide for several hours will result in carbon monoxide hemoglobin concentrations of 7 - 10%, depending on individual variations and activity.

Carbon monoxide not only combines with hemoglobin, but also combines with constituents of the iron-containing cytochrome system. The formation of carboxyhemoglobin decreases the total hemoglobin pool available for oxygen transport. Since little oxygen is carried in physical solution, the tissues become hypoxic when the increase in carboxyhemoglobin reaches a critical concentration. Moreover, if tissue hypoxis leads to metabolic acidosis, the oxyhemoglobin dissociation curve shifts to the right which decreases the oxygen binding capacity of the remaining hemoglobin. The toxic effects of carbon monoxide are thus entirely related to disturbances in tissue oxidations (Ref. 14).

The poisonous action of carbon monoxide is due chiefly to combination with hemoglobin and myoglobin to form carboxyhemoglobin and carboxymyoglobin and thereby to interfere with the oxygenation of these substances. Carbon monoxide also combines with ferrous cytochrome oxidase, one of the respiratory enzymes of tissues, and prevents its actions, particularly at higher concentrations of the gas (Ref. 2).

In earlier work it has been pointed out that the anoxic symptoms caused by carbon monoxide poisoning greatly surpass in severity those of anemia when the blood oxygen content is the same in the two conditions. In such cases of carbon monoxide poisoning, some of the iron atoms of the hemoglobin molecule hold carbon monoxide and some hold oxygen molecules. At the low oxygen tensions present in the tissues and capillaries, these

mixed molecules give up their oxygen much less readily than do hemoglobin molecules holding the same quantity of oxygen alone. Consequently, the presence of carbon monoxide with oxygen in the hemoglobin molecule may cause severe tissue anoxia, whereas the same oxygen content in the absence of carbon monoxide may prove adequate. Carbon monoxide thus exerts a double action. It prevents the uptake of normal quantities of oxygen in the lungs and interferes with the unloading of oxygen in the tissues (Ref. 2).

There is still some feeling that carbon monoxide has noxious effects beyond its hypoxic effect when it replaces oxygen from the latter's combination with hemoglobin in the circulating blood. This is a subject that needs clarification. There are differences in scientific opinion as to whether or not carbon monoxide has toxic effects per se. It is still a question whether or not there is such an entity as chronic carbon monoxide poisoning, resulting from long, chronic exposure to the gas at concentration levels too low to cause acute poisoning (Ref. 15).

Additional factors may also play deleterious roles, but probably minor ones. One of these factors is the production of tissue acidosis associated with carbon monoxide poisoning. This comes about by two mechanisms: (1) Since tissue cells are forced to operate at lower than normal O_2 tensions anaerobic metabolism and therefore lactic acid production increases. (2) Since carbon monoxide hemoglobin does not transport CO_2 and also impairs this function in residual intact hemoglobin, CO_2 tends to accumulate at the cellular level. The resulting tissue acidosis diminishes the ability of cells to take up oxygen so that some secondary histotoxic hypoxia is added to the anemic hypoxia (Ref. 16).

Studies in the U.S.S.R. have developed clinical and experimental evidence that 20-30 mg/m^3 (18-27 ppm) are levels at which disturbances in the central nervous system are noticeable. In considering a total population of children, aged, sick, and generally feeble persons, the following recommendations are made: The maximal allowable limit of average daily carbon monoxide concentrations in the city atmosphere is not to be above 2 mg/cubic meter (or 1.3 ppm). Maximal single concentrations of carbon monoxide in the atmospheric air must not exceed 5 mg/cubic meter (or 4 ppm) (Ref. 8, 17).

In considering the setting of a standard for ambient air concentrations of carbon monoxide, California authorities reviewed the multiple sources of exposure that man is subjected to and decided that 5% hemoglobin inactivation would become a basis for standards. This could be attained by an exposure to a concentration of 30 ppm for eight hours or 120 ppm for one hour. There is some interference with physiological function at such levels and their standard by definition, is at the "serious" level. In setting the standard, it was earlier thought that exposure on a twenty-four hour basis would be preferable over an eight hour exposure period. However, in reviewing daily concentrations, a double peak was observed and they reasoned that an eight hour period would produce a maximal COHb level. Also, most of the data on toxicity of carbon monoxide are available for an eight hour exposure and on such a basis, an eight hour exposure period appeared preferable. They do recognize, however, that further work on the effects of fluctuating levels is desirable. The standards set by California in their opinion, places unusual reliance on two areas of scientific work, namely epidemiology and physiology (Ref. 18).

Available work indicates the value of the concept of the body burden in setting air quality standards. So far, in California, the concept has been used in the air quality standards for carbon monoxide. As further work justifies it, it may be reasonable to express the carbon monoxide standard in somewhat more flexible form as any of the levels of exposure, which, given certain rates of uptake, and excretion, would produce 5% carboxyhemoglobin (Ref. 19). Current thinking is to use 2% COHb as the "standard" level (Ref. 26).

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OREGON STATE SANITARY AUTHORITY

AIR QUALITY CONTROL

PROPOSED AMBIENT AIR QUALITY STANDARD FOR CARBON MONOXIDE

The concentrations of carbon monoxide in the ambient atmosphere shall not exceed the value enumerated below:

1. Definitions

   A. Ambient Air - The air that surrounds the earth excluding the general volume of gases contained within any building or structure.

   B. Primary Air Mass Station (PAMS) - A station designed to measure contamination in an air mass and represent a relatively broad area. The sampling site shall be representative of the general area concerned and not be contaiminated by any special source. The probe inlet shall be a minimum of thirty feet and a maximum of 150 feet above ground level. Actual elevation should vary to prevent adverse exposure conditions caused by surrounding buildings and terrain. The probe inlet shall be placed approximately twenty feet above the rooftop and meteorological measurement shall be made at approximately the same level as the probe inlet.

   C. Primary Ground Level Monitoring Station (PGLMS) - A station designed to provide information on contaminant concentrations near the ground and provide data valid for the immediate area only. The probe inlet shall be ten to twenty feet above ground level with a desired optimum height of twelve feet. The sampling site shall be representative of the immediate area and not be contaminated by any unique source. The probe inlet shall not be less than two feet from any building or wall.

II. Air Quality Standard

   Carbon monoxide in the ambient air measured at either a Primary Air Mass or a Primary Ground Level Monitoring Station shall not exceed an average concentration of twenty (20) parts per million by volume for any consecutive eight (8) hours.

January 16, 1969

III. Method of Measurement

For determining compliance with this regulation, carbon monoxide shall be measured by an infrared carbon monoxide analyzer. The analyzer shall have a full-scale range of one hundred (100) parts per million or less and be calibrated with known zero and span gases. Measurement shall be made according to the infrared method attached. Other continuous and manual methods of measurement will be accepted after approval by the State Sanitary Authority if they can be shown to be comparable to the infrared technique in reproducibility, selectivity, sensitivity, and accuracy.

IV. Reporting of Data

Local and regional air pollution control agencies monitoring carbon monoxide shall notify the State Sanitary Authority each time concentrations of carbon monoxide exceed the standard. Notification shall be made by telephone immediately after validation of the violation and also by mail on forms provided by the state agency. Data to be reported shall include:

A. Location of sampler.

B. Time span involved.

C. Concentrations recorded.

D. Type of sampler used.

E. Other relevant information requested by the state.

An annual report summarizing all occurrences of concentrations exceeding the standard shall be submitted to the state agency.

OREGON STATE SANITARY AUTHORITY AIR QUALITY CONTROL SECTION

Reporting Form for Violation of Carbon Monoxide Regulation

(Ambient Air Standard)

Agency Reporting _____ Date _____

Sampling Location _____

Date and Time Period of Violation _____

Type of Station: Air Mass (PAMS) ☐ Ground Level (PGLMS) ☐ Station No. _____

Concentrations Measured:

A. Eight Hour Average Concentrations (Record All 8 Hour Averages >20 PPM) _____ PPM Time Span _____

Type of Equipment:

I.R. ☐

Other ☐ Specify _____

B. Hourly Averages Within Period Violation Occurred:

Starting Time	Concentration (PPM)	Starting Time	Concentration (PPM)

C. Previous Eight or Twenty-four One Hourly Averages if Significant (Optional):

Starting Time	Conc. (PPM)	Starting Time	Conc. (PPM)	Starting Time	Conc. (PPM)

Control Recommendations: (Optional) _____

Name _____

Title _____

12/23/68

CARBON MONOXIDE

METHOD OF DETERMINATION & REPORTING FOR CONTINUOUS INFRARED ANALYSIS

General

The infrared absorption of a compound is a characteristic of the type and arrangement of the atoms making up its molecules.

Dual beam infrared analysis is accomplished in the following manner: Two helices of nichrome wire are heated to about 1200°F. at which temperature they emit infrared energy. This energy is passed through two parallel optical paths, one the reference path and the other the sample path, to the sensing element.

In the non-dispersive Luft infrared analyzers (LIRA)[1], the signal is generated in the following manner: An interruptor alternately blocks the sample and reference beams. The sensing element, a capacitance microphone, responds to the arithmetical difference in radiant energies between the two beams, and converts the optical signal to an electrical impulse which is then amplified to a level necessary for operation of a meter, recorder or other readout device.

Infrared analyzers are not sensitive to flow rates. However, they are sensitive to vibration and temperature changes. The long-path instruments have heaters included in the optical benches with thermostats to maintain a constant temperature for the sample stream as it passes through the analyzer.

Apparatus

To monitor atmospheric carbon monoxide with an automatic analyzer, the following equipment and materials are recommended:

1. One LIRA analyzer complete with pump, control devices, and readout unit (i.e. Strip chart recorder).
2. One two-liter Erlenmeyer flask.

3. One two-hole rubber stopper.
4. Two pieces of 8 mm glass tubing, one of sufficient length to reach within ½ inch of the bottom of the Erlenmeyer flask, the other to extend 1 inch beyond the bottom of the stopper into the flask.
5. Sufficient ¼ inch tygon tubing to allow a three-foot condensation loop between the Erlenmeyer flask and the input port of the instrument.

   (Items 3, 4, and 5 are needed when humidity control is maintained by saturation.)

6. One cylinder of span gas made of carbon monoxide and either reconstituted air or nitrogen, of a concentration to be in the upper 25% of the recorder scale (i.e. On a 0 to 100 ppm recorder, 85 ppm would be a good concentration for the span gas.).
7. One cylinder of zero gas of reconstituted air (21% O_2, 79% N_2).
8. One hopcalite tube[2].

   (Items 7 and 8 may be replaced by other zero gas known to be free of CO.)

9. Two 2-stage pressure regulators with attendant valves and restraints for installation of gas cylinders.
10. Sufficient copper tubing, ¼ inch I.D., refrigeration grade, to plumb the cylinders of zero and span gas to the control panel. The attached drawings show the method for plumbing the instrument and the method for constructing the hopcalite tube.

Operation & Calibration

The instrument must be allowed to reach operating temperature before data is recorded. (Allow at least two hours for the instrument to reach equilibrium.) It should then be balanced, zeroed and spanned. Zeroing and spanning shall be repeated at least once per week. The zero and span gases and the sample air shall be passed through a bubbler or other humidity control device to maintain a constant moisture content. It is recommended to flow the reconstituted air (zero gas) through a hopcalite filter to eliminate any measurable concentrations of CO.

The instrument shall be rebalanced whenever there is inadequate zero and span adjustment available on the control panel and whenever maintenance

is performed on the instrument's electrical or optical systems.

Interferences

Water vapor and carbon dioxide have slight overlapping absorption spectra with carbon monoxide in the infrared region. These interferences are removed somewhat in the construction of the filter cell of the instrument.

Carbon dioxide (CO_2) response should be less than 1 ppm indicated CO for 1000 ppm CO_2. As atmospheric concentrations are in the order of 300 ppm CO_2, the interference from CO_2 should always be less than 0.5 ppm CO.

Water vapor concentration varies very widely in the atmosphere, and a rejection ratio of 2500:1 (2500 ppm H_2O may cause a response of not more than 1 ppm CO) is generally accepted. To correct for conditions where wide variations in atmospheric moisture content occur, proper humidity controls must be applied to assure that sample, zero and span gases all have the same relative humidity when passed into the analyzer. Insertion of a water bubbler in the sampling line of the instrument to assure a saturated gas stream at all times is one way of correcting for water vapor interference.

Other contaminants in concentrations commonly found in the atmosphere do not interfere with the infrared carbon monoxide analysis.

Data Recording & Reporting

Data shall be recorded on strip chart recorders, tape units or other devices compatible with the analyzer and data processing system in use.

Results shall be reported in parts per million and data for each day shall include:

1. All hourly averages (A minimum of six instantaneous readings are needed each hour to calculate the average.).
2. Maximum hourly average and time of occurrence.
3. Twenty-four hour average.

4. Number hours >20 ppm.
5. Maximum eight-hour average and time of occurrence.
6. All eight-hour averages >20 ppm and times of occurrences.

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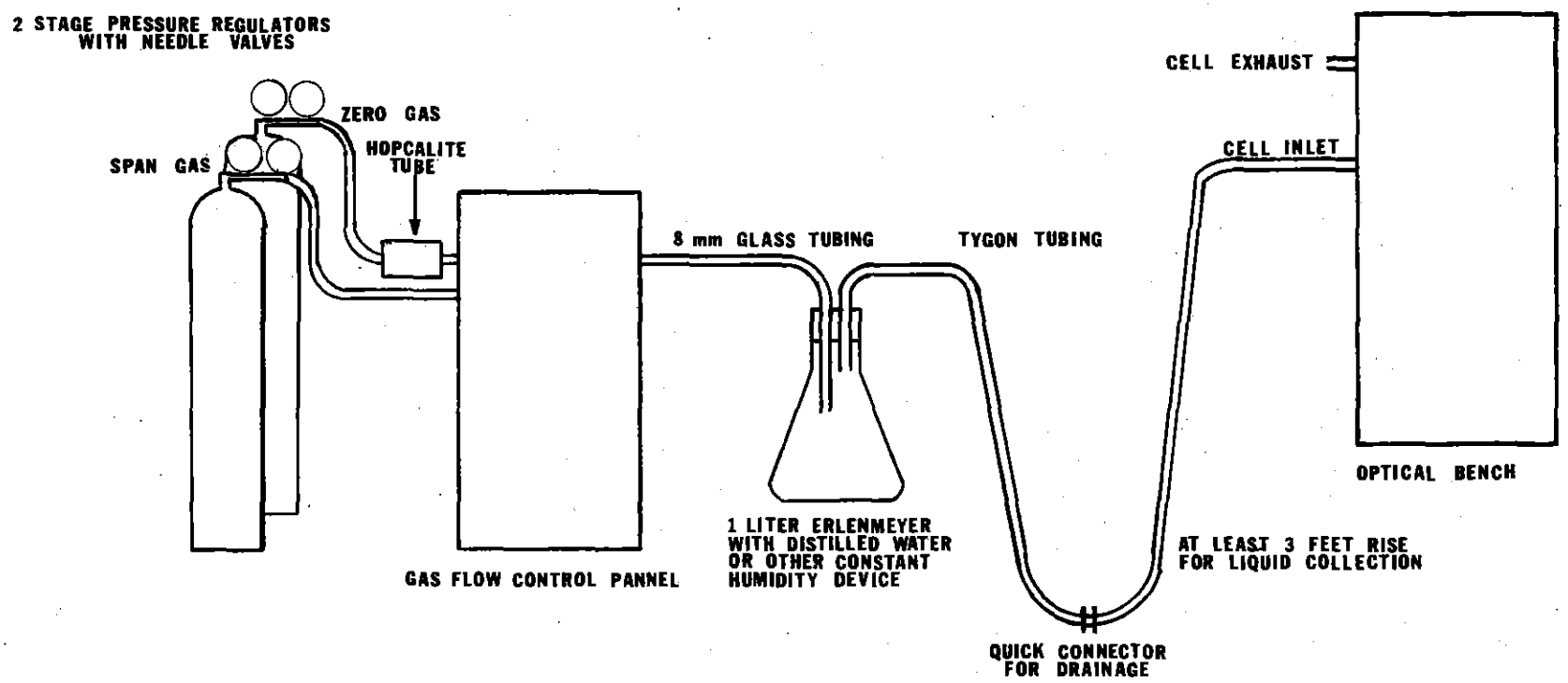
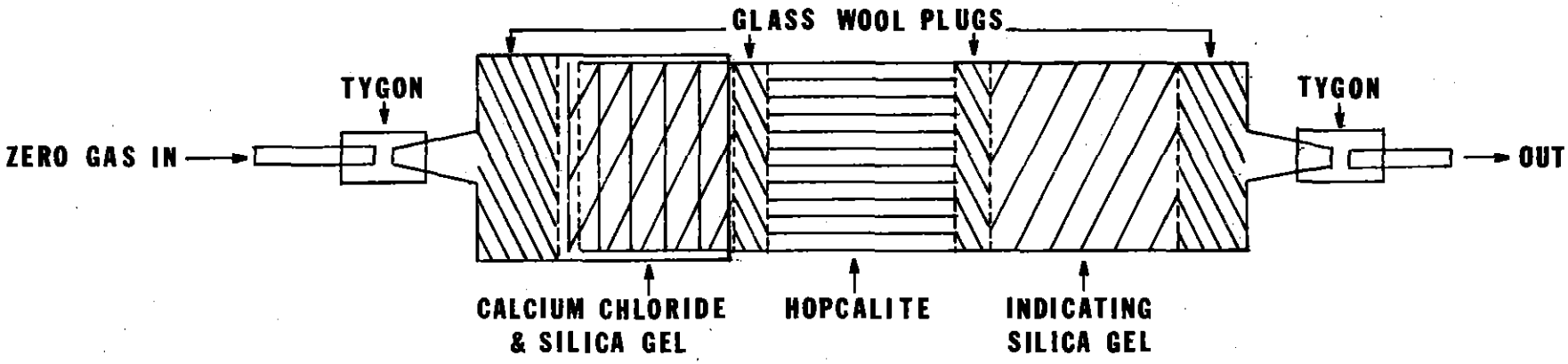


TYPICAL PLUMBING INSTALLATION

NON DISPERSIVE I. R. CARBON MONOXIDE ANALYZER

PLASTIC DRYING TUBE



MATERIALS:
INDICATING SILICA GEL - MATHISON CO.
HOPCALITE - MINE SAFETY APPLIANCE CO.

HOPCALITE ZERO GAS TUBE

INFRA RED CO ANALYSERS

NO SCALE CLG-68

MEMORANDUM

February 28, 1969

TO: Members of the Sanitary Authority

FROM: Harold L. Sawyer

SUBJECT: Pollution Control Facility Certificate No. 18 Issued to Pacific Steel Foundry Company

On May 24, 1968, Pollution Control Facility Certificate No. 18 was issued to Pacific Steel Foundry Company for a baghouse installation with an actual cost of $51,124.57, in accordance with the information submitted in application No. T-20. Pacific Steel Foundry Company filed notice of election on June 10, 1968, to take the excise tax credit relief under ORS 317.072. The attached letter from Douglas H. Stearns, Attorney, officially notifies the Sanitary Authority of the disposal of the assets of Pacific Steel Foundry Company, including the certified air pollution control facilities, effective February 1, 1969.

ORS 317.072 (6) provides as follows:

> "Upon any sale, exchange, or other disposition of facility, notice thereof shall be given to the Sanitary Authority who shall revoke the certification covering such facility as of the date of such disposition. The transferee may apply for a new certificate under ORS 449.635, but the tax credit available to such transferee shall be limited to the amount of credit not claimed by the transferor."

The transferee, after changing the corporate name to Pacific Steel Foundry Company, has filed an application requesting reissuance of the certificate for the facilities described in application T-20 filed by the original Pacific Steel Foundry Company. This application was received on February 18, 1969, and has been assigned application No. T-69.

It is recommended that certificate number 18 be revoked as of February 1, 1969, and that a new certificate be issued to Pacific Steel Foundry Company based on application T-69. In legal counsel's opinion, formal notice of revocation and the period necessary to demand a hearing are not required within the purview of ORS 317.072 (6).

Attachment

McMURRY, PACKWOOD, STEARNS & SHERRY
ATTORNEYS AT LAW
717 CORBETT BUILDING
430 S.W. MORRISON STREET
PORTLAND, OREGON 97204

GARRY P. McMURRY
ROBERT W. PACKWOOD
DOUGLAS H. STEARNS
LEO C. SHERRY, JR.

227-3231

February 4, 1969

File No.

OREGON STATE SANITARY AUTHORITY
Waste Discharge Permit Program
Received: FEB 5 1969
Appl. No: T-20 (F-69)

Oregon Sanitary Authority
1400 SW Fifth Avenue
Portland, Oregon

Attn: Mr. Harold Sawyer

Re: Pacific Steel Foundry Co.
Your file no.: T-20

Gentlemen:

This letter is written to you pursuant to the provisions of ORS 449.605 to 449.645 and also pursuant to a telephone conversation between Mr. Harold Sawyer of your office and Mr. Kenneth M. Judd, President of Pacific Steel Foundry Co., an Oregon corporation.

Effective February 1, 1969, Pacific Steel Foundry Co. was liquidated and all of its assets, including their air pollution control facilities certified by you pursuant to the provisions of the above numbered sections of the Oregon Revised Statutes, were assigned and transferred to its parent corporation, K.J. Industries, Inc., an Oregon corporation, and K.J. Industries, Inc. is now the legal owner of said air pollution control facilities. A copy of the assignment is enclosed herewith.

On February 3, 1969, K.J. Industries, Inc. filed an amendment to its Articles of Incorporation whereby it changed its name to Pacific Steel Foundry Co.

The new Pacific Steel Foundry Co. hereby applies for a certificate under the provisions of ORS 449.605 et.seq. with the understanding that the tax credit available to it is limited to the amount of credit not heretofore claimed by the old Pacific Steel Foundry Co.

The information on the cost of air pollution facilities, a description of the materials incorporated in such facilities, the machinery and equipment made a part of said facilities, the operational procedure of such facilities and the statement of the purposes of pollution prevention control or reduction to be served by the facilities set forth in the old Pacific Steel Foundry Co.'s application for certification are hereby adopted by the new Pacific Steel Foundry Co. and by this

reference are made a part of this application.

If you desire any additional information in connection with this application, please do not hesitate to contact the undersigned.

Very truly yours,

Douglas H. Stearns

DHS:bf